Supplemental materials

Table S1 PubMed and Ovid (Embase and MEDLINE) search strategy

(((((asthma[Title/Abstract] OR asthmatic[Title/Abstract]) AND crossover[Title/Abstract]) OR ((asthma[Title/Abstract] OR asthmatic[Title/Abstract]) AND (randomized [Title/Abstract] OR randomised OR clinical trial[Title/Abstract]) AND placebo[Title/Abstract]))) AND ((tezepelumab[Title/Abstract] OR dupilumab[Title/Abstract] OR benralizumab[Title/Abstract] OR mepolizumab[Title/Abstract] OR reslizumab[Title/Abstract] OR omalizumab[Title/Abstract] OR tralokinumab[Title/Abstract] OR pitrakinra[Title/Abstract] OR lebrikizumab[Title/Abstract] OR lirentelimab[Title/Abstract] OR AK002[Title/Abstract] OR anti-[Title/Abstract] OR biologic[Title/Abstract] OR monoclonal[Title/Abstract] OR anti-TNF*[Title/Abstract] OR (TNF-alpha[Title/Abstract] AND antagonists[Title/Abstract])))) AND ((airway[Title/Abstract] OR hyperresponsiveness[Title/Abstract] OR hyper responsiveness[Title/Abstract] OR hyper-responsiveness[Title/Abstract] OR hyperreactivity[Title/Abstract] OR hyper reactivity[Title/Abstract] OR hyper-reactivity[Title/Abstract] OR bronchoprovocation[Title/Abstract] OR eucapnic voluntary hyperpnea[Title/Abstract] OR EVH[Title/Abstract] OR acetylcholine[Title/Abstract] OR adenosine monophosphate[Title/Abstract] OR methacholine[Title/Abstract] OR mannitol[Title/Abstract] OR histamine[Title/Abstract] OR cyclic AMP[Title/Abstract] OR cAMP[Title/Abstract] OR exercise[Title/Abstract] OR allergen challenge[Title/Abstract] OR early phase response*[Title/Abstract] OR early-phase response*[Title/Abstract] OR early phase allergic response*[Title/Abstract] OR early-phase allergic response*[Title/Abstract] OR late phase response*[Title/Abstract] OR late-phase response*[Title/Abstract] OR late phase allergic response*[Title/Abstract] OR late-phase allergic response*[Title/Abstract]))

Table S2 Literature screen of articles for inclusion and exclusion

Title	Authors	Citation	DOI	Include/exclude	Reason for inclusion/exclusion
Effect of aerosolized anti-IgE (E25) on airway responses to inhaled allergen in asthmatic subjects	Fahy JV, Cockcroft DW, Boulet LP, Wong HH, Deschesnes F, Davis EE, Ruppel J, Su JQ, Adelman DC.	Am J Respir Crit Care Med. 1999 Sep;160(3):1023-7. doi: 10.1164/ajrccm.160.3.9810012.	10.1164/ajrccm.160.3.9810012	Include	Small RCT - monoclonal antibody of IgE (E25), AHR assessed
Effects of interleukin-6 receptor blockade on allergen-induced airway responses in mild asthmatics	Revez JA, Bain LM, Watson RM, Towers M, Collins T, Killian KJ, O'Byrne PM, Gauvreau GM, Upham JW, Ferreira MA.	Clin Transl Immunology. 2019 Jun 14;8(6):e1044. doi: 10.1002/cti2.1044. eCollection 2019.	10.1002/cti2.1044	Include	Small RCT - proof of concept trial - tocilizumab
Effects of recombinant human interleukin-12 on eosinophils, airway hyper-responsiveness, and the late asthmatic response	Bryan SA, O'Connor BJ, Matti S, Leckie MJ, Kanabar V, Khan J, Warrington SJ, Renzetti L, Rames A, Bock JA, Boyce MJ, Hansel TT, Holgate ST, Barnes PJ.	Lancet. 2000 Dec 23-30;356(9248):2149-53. doi: 10.1016/S0140-6736(00)03497-8.	10.1016/S0140-6736(00)03497-8	Include	RCT - recombinant human interleukin-12
Effect of an anti-M1 prime monoclonal antibody, MEMP1972A, in a phase II proof-of-activity allergen challenge study in patients with mild asthma.	Gauvreau G, Boulet L.-P. Cockcroft D.W. Davis B. Fitzgerald M.J. Leigh R. Dahlen B. Mayers I. Scheerens H. Maciuca R. Matthews J.G. Harris J.M. O'Byrne P.M.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2012. San Francisco, CA United States. Conference Publication: (var.pagings). 185(MeetingAbstracts) (no pagination), 2012. Date of Publication: 2012.	10.1164/ajrccm-conference.2012.185.1_MeetingAbstracts.A6793	Include	EAR, LAR and AHR measured
Effect of an interleukin-4 variant on late phase asthmatic response to allergen challenge in asthmatic patients: results of two phase 2a studies	Wenzel S, Wilbraham D, Fuller R, Getz EB, Longphre M.	Lancet. 2007 Oct 20;370(9596):1422-31. doi: 10.1016/S0140-6736(07)61600-6.	10.1016/S0140-6736(07)61600-6	Include	RCT - pitrakinra
Effect of omalizumab on adenosine 5'-monophosphate responsiveness in subjects with allergic asthma	Prieto L, Gutiérrez V, Colás C, Tabar A, Pérez-Francés C, Bruno L, Uixera S.	Int Arch Allergy Immunol. 2006;139(2):122-31. doi: 10.1159/000090387. Epub 2005 Dec 21.	10.1159/000090387	Include	Small RCT - omalizumab
Effect of recombinant human platelet-activating factor-acetylhydrolase on allergen-induced asthmatic responses	Henig NR, Aitken ML, Liu MC, Yu AS, Henderson WR Jr.	Am J Respir Crit Care Med. 2000 Aug;162(2 Pt 1):523-7. doi: 10.1164/ajrccm.162.2.9911084.	10.1164/ajrccm.162.2.9911084	Include	EAR, LAR measured
Effect of tezepelumab on airway inflammatory cells, remodelling, and hyperresponsiveness in patients with moderate-to-severe uncontrolled asthma (CASCADE): a double-blind, randomised, placebo-controlled, phase 2 trial	Diver S, Khalfaoui L, Emson C, Wenzel SE, Menzies-Gow A, Wechsler ME, Johnston J, Molfino N, Parnes JR, Megally A, Colice G, Brightling CE.	Lancet Respir Med. 2021 Jul 9:S2213-2600(21)00226-5. doi: 10.1016/S2213-2600(21)00226-5. Online ahead of print.	10.1016/S2213-2600(21)00226-5	Include	RCT - tezepelumab, CASCADE
Effect of tralokinumab, an interleukin-13 neutralising monoclonal antibody, on eosinophilic airway inflammation in uncontrolled moderate-to-severe asthma (MESOS): a multicentre, double-blind, randomised, placebo-controlled phase 2 trial	Russell RJ, Chachi L, FitzGerald JM, Backer V, Olivenstein R, Titlestad IL, Ulrik CS, Harrison T, Singh D, Chaudhuri R, Leaker B, McGarvey L, Siddiqui S, Wang M, Braddock M, Nordenmark LH, Cohen D, Parikh H, Colice G, Brightling CE; MESOS study investigators.	Lancet Respir Med. 2018 Jul;6(7):499-510. doi: 10.1016/S2213-2600(18)30201-7. Epub 2018 May 21.	10.1016/j.anai.2018.07.005	Include	MESOs study
Effect of tumor necrosis factor antagonism on allergen-mediated asthmatic airway inflammation	Rouhani FN, Meitin CA, Kaler M, Miskinis-Hilligoss D, Stylianou M, Levine SJ.	Respir Med. 2005 Sep;99(9):1175-82. doi: 10.1016/j.rmed.2005.02.031. Epub 2005 Mar 23.	10.1016/j.rmed.2005.02.031	Include	AHR measured
Effects of an anti-TSLP antibody on allergen-induced asthmatic responses	Gauvreau GM, O'Byrne PM, Boulet LP, Wang Y, Cockcroft D, Bigler J, FitzGerald JM, Boedigheimer M, Davis BE, Dias C, Gorski KS, Smith L, Bautista E, Comeau MR, Leigh R, Parnes JR.	N Engl J Med. 2014 May 29;370(22):2102-10. doi: 10.1056/NEJMoa1402895. Epub 2014 May 20.	10.1056/NEJMoa1402895	Include	RCT - tezepelumab
Effects of an interleukin-5 blocking monoclonal antibody on eosinophils, airway hyper-responsiveness, and the late asthmatic response	Leckie MJ, ten Brinke A, Khan J, Diamant Z, O'Connor BJ, Walls CM, Mathur AK, Cowley HC, Chung KF, Djukanovic R, Hansel TT, Holgate ST, Sterk PJ, Barnes PJ.	Lancet. 2000 Dec 23-30;356(9248):2144-8. doi: 10.1016/s0140-6736(00)03496-6.	10.1016/s0140-6736(00)03496-6	Include	RCT - IL-5 antagonist SB-240563
Effects of interleukin-13 blockade on allergen-induced airway responses in mild atopic asthma	Gauvreau GM, Boulet LP, Cockcroft DW, Fitzgerald JM, Carlsten C, Davis BE, Deschesnes F, Duong M, Durn BL, Howie KJ, Hui L, Kasaian MT, Killian KJ, Strinich TX, Watson RM, Y N, Zhou S, Raible D, O'Byrne PM.	Am J Respir Crit Care Med. 2011 Apr 15;183(8):1007-14. doi: 10.1164/rccm.201008-1210OC. Epub 2010 Nov 5.	10.1164/rccm.201008-1210OC	Include	RCT - anti-IL-13 treatment
Effects of omalizumab (Xolair) on airway hyperresponsiveness.	Patel B.M, Chiang D.T, Clark J.P, Romero F.A, Casale T.B.	Journal of Allergy and Clinical Immunology. Conference: 2009 American Academy of Allergy, Asthma and Immunology (AAAAI) Annual Meeting. Washington, DC United States. Conference Publication: (var.pagings). 123(2 SUPPL. 1) (pp S263), 2009. Date of Publication: February 2009.	10.1016/j.jaci.2008.12.1020	Include	AHR measured
Effects of treatment with anti-immunoglobulin E antibody omalizumab on airway inflammation in allergic asthma	Djukanović R, Wilson SJ, Kraft M, Jarjour NN, Steel M, Chung KF, Bao W, Fowler-Taylor A, Matthews J, Busse WW, Holgate ST, Fahy JV.	Am J Respir Crit Care Med. 2004 Sep 15;170(6):583-93. doi: 10.1164/rccm.200312-1651OC. Epub 2004 Jun 1.	10.1164/rccm.200312-1651OC	Include	Small RCT - omalizumab
Efficacy and safety of an inhaled anti-TSLP antibody fragment in adults with mild atopic asthma.	Gauvreau G.M, Hohlfeld J.M, Grant S, Jain M, Cabanski M, Pertel P, Boulet L, Cockcroft D.W, Davis B, Fitzgerald J.M, Korn S, Kornmann O, Leigh R, Mayers I, Watz H, Lecot J, O'Byrne P.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2020. Philadelphia, PA United States. 201(1) (no pagination), 2020. Date of Publication: 2020.	10.1164/ajrccm-conference.2020.201.1_MeetingAbstracts.A4207	Include	EAR, LAR measured
Eosinophils in bronchial mucosa of asthmatics after allergen challenge: effect of anti-IgE treatment	van Rensen EL, Evertse CE, van Schadewijk WA, van Wijngaarden S, Ayre G, Mauad T, Hiemstra PS, Sterk PJ, Rabe KF.	Allergy. 2009 Jan;64(1):72-80. doi: 10.1111/j.1398-9995.2008.01881.x. Epub 2008 Dec 12.	10.1111/j.1398-9995.2008.01881.x	Include	AHR not measured
Eosinophil's role remains uncertain as anti-interleukin-5 only partially depletes numbers in asthmatic airway	Flood-Page PT, Menzies-Gow AN, Kay AB, Robinson DS.	Am J Respir Crit Care Med. 2003 Jan 15;167(2):199-204. doi: 10.1164/rccm.200208-789OC. Epub 2002 Oct 17.	10.1164/rccm.200208-789OC	Include	Small RCT - mepolizumab
Evidence of a role of tumor necrosis factor alpha in refractory asthma	Berry MA, Hargadon B, Shelley M, Parker D, Shaw DE, Green RH, Bradding P, Brightling CE, Wardlaw AJ, Pavord ID	N Engl J Med 2006; 354:697-708	10.1056/NEJMoa050580	Include	TNF-alpha - etharcept study
Immunological and clinical changes in allergic asthmatics following treatment with omalizumab	Noga O, Hanf G, Kunkel G.	Int Arch Allergy Immunol. 2003 May;131(1):46-52. doi: 10.1159/000070434.	10.1159/000070434	Include	RCT substudy, treatment randomised and AHR assessed
Inhibitory effects of an anti-IgE antibody E25 on allergen-induced early asthmatic response	Boulet LP, Chapman KR, Côté J, Kalra S, Bhagat R, Swystun VA, Laviolette M, Cleland LD, Deschesnes F, Su JQ, DeVault A, Fick RB Jr, Cockcroft DW.	Am J Respir Crit Care Med. 1997 Jun;155(6):1835-40. doi: 10.1164/ajrccm.155.6.9196083.	10.1164/ajrccm.155.6.9196083	Include	Early omalizumab study
Mepolizumab and exacerbations of refractory eosinophilic asthma	Haldar P, Brightling CE, Hargadon B, Gupta S, Monteiro W, Sousa A, Marshall RP, Bradding P, Green RH, Wardlaw AJ, Pavord ID.	N Engl J Med. 2009 Mar 5;360(10):973-84. doi: 10.1056/NEJMoa0808991.	10.1056/NEJMoa0808991	Include	RCT - mepolizumab
Omalizumab protects against allergen- induced bronchoconstriction in allergic (immunoglobulin E-mediated) asthma	Zielen S, Lieb A, De La Motte S, Wagner F, de Monchy J, Fuhr R, Munzu C, Koehne-Voss S, Rivière GJ, Kaiser G, Erpenbeck VJ.	Int Arch Allergy Immunol. 2013;160(1):102-10. doi: 10.1159/000339243. Epub 2012 Aug 28.	10.1159/000339243	Include	EAR measured
Omalizumab therapy for asthma patients with poor adherence to inhaled corticosteroid therapy	Hendeles L, Khan YR, Shuster JJ, Chesrown SE, Abu-Hasan M.	Ann Allergy Asthma Immunol. 2015 Jan;114(1):58-62.e2. doi: 10.1016/j.anai.2014.10.012.	10.1016/j.anai.2014.10.012	Include	AHR measured
OX40L blockade and allergen-induced airway responses in subjects with mild asthma	Gauvreau GM, Boulet LP, Cockcroft DW, FitzGerald JM, Mayers I, Carlsten C, Laviolette M, Killian KJ, Davis BE, Larché M, Kipling C, Dua B, Mosesova S, Putnam W, Zheng Y, Scheerens H, McClintock D, Matthews JG, O'Byrne PM.	Clin Exp Allergy. 2014 Jan;44(1):29-37. doi: 10.1111/cea.12235.	10.1111/cea.12235	Include	Small RCT - anti-OX40L Mab
The effect of an anti-IgE monoclonal antibody on the early- and late-phase responses to allergen inhalation in asthmatic subjects	Fahy JV, Fleming HE, Wong HH, Liu JT, Su JQ, Reimann J, Fick RB Jr, Boushey HA.	Am J Respir Crit Care Med. 1997 Jun;155(6):1828-34. doi: 10.1164/ajrccm.155.6.9196082.	10.1164/ajrccm.155.6.9196082	Include	Early omalizumab study
The effect of benralizumab on allergen-induced responses in subjects with mild allergic asthma	Gauvreau, G, Sehmi, R, FitzGerald J, Leigh, R, Cockcroft D, Davis B, Mayers, I, Boulet LB, Salter, B, Cusack, R, Satia, I, Killian, K, Mitchell, P, Werkstrom, V, Durzynski, T, Shoemaker, K, Katial, R, Newbold, P, O'Byrne, P	J Allergy Clin Immunol 2021; 147(2): AB157	10.1016/j.jaci.2020.12.563	Include	LAR measured
The effect of tezepelumab on airway hyperresponsiveness to mannitol in asthma (UPSTREAM)	Sverrild A, Hansen S, Hvidtfeldt M, Clausson CM, Cozzolino O, Cerps S, Uller L, Backer V, Erjefält J, Porsbjerg C.	Eur Respir J. 2021 May 28:2101296. doi: 10.1183/13993003.01296-2021. Online ahead of print.	10.1183/13993003.01296-2021	Include	RCT - tezepelumab, UPSTREAM
The effects of an anti-CD11a mAb, efalizumab, on allergen-induced airway responses and airway inflammation in subjects with atopic asthma	Gauvreau GM, Becker AB, Boulet LP, Chakir J, Fick RB, Greene WL, Killian KJ, O'byrne PM, Reid JK, Cockcroft DW.	J Allergy Clin Immunol. 2003 Aug;112(2):331-8. doi: 10.1067/mai.2003.1689.	10.1067/mai.2003.1689	Include	Efalizumab - allergen challenge performed
The effects of lebrikizumab in patients with mild asthma following whole lung allergen challenge	Scheerens H, Arron JR, Zheng Y, Putnam WS, Erickson RW, Choy DF, Harris JM, Lee J, Jarjour NN, Matthews JG.	Clin Exp Allergy. 2014 Jan;44(1):38-46. doi: 10.1111/cea.12220.	10.1111/cea.12220	Include	Small RCT - lebrikizumab
Targeting membrane-expressed IgE B cell receptor with an antibody to the M1 prime epitope reduces IgE production	Gauvreau GM, Harris JM, Boulet LP, Scheerens H, Fitzgerald JM, Putnam WS, Cockcroft DW, Davis BE, Leigh R, Zheng Y, Dahlén B, Wang Y, Maciuca R, Mayers I, Liao XC, Wu LC, Matthews JG, O'Byrne PM.	Sci Transl Med. 2014 Jul 2;6(243):243ra85. doi: 10.1126/scitranslmed.3008961.	10.1126/scitranslmed.3008961	Exclude	AHR not measured
[Effects of ginkgo leave concentrated oral liquor in treating asthma]	Li MH, Zhang HL, Yang BY.	Zhongguo Zhong Xi Yi Jie He Za Zhi. 1997 Apr;17(4):216-8.		Exclude	Not biologic
[The effect of inhaled heparin on airway responsiveness to metacholine in asthmatic children]	Stelmach I, Jerzyńska J, Bobrowska M, Brzozowska A, Majak P, Kuna P.	Pol Arch Med Wewn. 2001 Jul;106(1):567-72.		Exclude	Not biologic
[The effect of inhaled heparin on post-leukotriene bronchoconstriction in children with bronchial asthma]	Stelmach I, Jerzyńska J, Bobrowska M, Brzozowska A, Majak P, Kuna P.	Pol Merkur Lekarski. 2002 Feb;12(68):95-8.		Exclude	Not biologic
A combined phase I/IIa study of the safety, bronchodilator and bronchoprotective effects of nebulized RPL554, a dual PDE3/4-inhibitor, in healthy subjects and asthmatics.	Franciosi L, Diamant Z, Morelli N, De Kam M, Cohen A, Walker M, Page C.	Clinical and Translational Allergy. Conference: EAACI International Severe Asthma Forum, ISAF 2012. Gothenburg Sweden. Conference Publication: (var.pagings). 3(SUPPL. 1) (no pagination), 2013. Date of Publication: 03 May 2013.		Exclude	Not biologic
A detailed phenotypic analysis of immune cell populations in the bronchoalveolar lavage fluid of atopic asthmatics after segmental allergen challenge	Boomer JS, Parulekar AD, Patterson BM, Yin-Declue H, Deppong CM, Crockford S, Jarjour NN, Castro M, Green JM.	Allergy Asthma Clin Immunol. 2013 Sep 17;9(1):37. doi: 10.1186/1710-1492-9-37.	10.1186/1710-1492-9-37	Exclude	Not RCT
A halotyrosine antibody that detects increased protein modifications in asthma patients	Jin H, Hallstrand TS, Daly DS, Matzke MM, Nair P, Bigelow DJ, Pounds JG, Zangar RC.	J Immunol Methods. 2014 Jan 31;403(1-2):17-25. doi: 10.1016/j.jim.2013.11.013. Epub 2013 Dec 2.	10.1016/j.jim.2013.11.013	Exclude	Not RCT
A meta-analysis of the effect of prolonged treatment with macrolides for management of asthma.	Demirel N, Reiter J, Mendy A, Gasana J, Vieira E.R, Colin A, Quizon A, Forno E.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2013. Philadelphia, PA United States. Conference Publication: (var.pagings). 187(MeetingAbstracts) (no pagination), 2013. Date of Publication: 2013.		Exclude	Meta-analysis
A phase 1 study evaluating the pharmacokinetics, safety and tolerability of repeat dosing with a human IL-13 antibody (CAT-354) in subjects with asthma	Singh D, Kane B, Molfino NA, Faggioni R, Roskos L, Woodcock A.	BMC Pulm Med. 2010 Jan 8;10:3. doi: 10.1186/1471-2466-10-3.	10.1186/1471-2466-10-3	Exclude	AHR not measured
A Phase 2a Study of Benralizumab for Patients with Eosinophilic Asthma in South Korea and Japan	Park HS, Kim MK, Imai N, Nakanishi T, Adachi M, Ohta K, Tohda Y; Asian Benralizumab Study Group.	Int Arch Allergy Immunol. 2016;169(3):135-45. doi: 10.1159/000444799. Epub 2016 Apr 21.	10.1159/000444799	Exclude	AHR not measured
A phase 2B study of inhaled Pitrakinra, an IL-4/IL-13 antagonist, successfully identified responder subpopulations of patients with uncontrolled asthma.	Otulana B.A. Wenzel S.E. Ind P.W. Bowden A. Puthukkeril S. Tomkinson A. Meyers D.A. Bleecker E.R. Yen Y.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2011. Denver, CO United States. Conference Publication: (var.pagings). 183(1 MeetingAbstracts) (no pagination), 2011. Date of Publication: 01 May 2011.		Exclude	EAR, LAR or AHR not measured
A pilot randomized controlled trial of pioglitazone for the treatment of poorly controlled asthma in obesity	Dixon AE, Subramanian M, DeSarno M, Black K, Lane L, Holguin F.	Respir Res. 2015 Nov 26;16:143. doi: 10.1186/s12931-015-0303-6.	10.1186/s12931-015-0303-6	Exclude	Not biologic
A pilot study of zafirlukast as an anti-inflammatory agent in the treatment of adults with cystic fibrosis	Conway SP, Etherington C, Peckham DG, Whitehead A.	J Cyst Fibros. 2003 Mar;2(1):25-8. doi: 10.1016/S1569-1993(02)00142-X.	10.1016/S1569-1993(02)00142-X	Exclude	Not biologic
A predictive model for determining the efficacy of multiple doses of QGE031 (ligelizumab) versus omalizumab and placebo in inhibiting the allergen-induced early asthmatic response.	Gauvreau G.M. Boulet L.-P. Leigh R. Cockcroft D.W. Davis B.E. Mayers I. FitzGerald J. Dahlen B. Watson R.M. Milot J. Swystun V. Hui L. Lantz A.-S. Bowen M. Arm J. Maahs S. Meiser K. Lowe P. Skerjanec A. Carlsten C. Strandberg K. Killian K.J. Laviolette M. Drollmann A. O'Byrne P.M.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2015. Denver, CO United States. Conference Publication: (var.pagings). 191(MeetingAbstracts) (no pagination), 2015. Date of Publication: 2015.	10.1164/ajrccm-conference.2015.191.1_MeetingAbstracts.A2488	Exclude	No relevant data
A proof-of-concept study to evaluate the antiinflammatory effects of a novel soluble cyclodextrin formulation of nebulized budesonide in patients with mild to moderate asthma	Williamson PA, Menzies D, Nair A, Tutuncu A, Lipworth BJ.	Ann Allergy Asthma Immunol. 2009 Feb;102(2):161-7. doi: 10.1016/S1081-1206(10)60248-7.	10.1016/S1081-1206(10)60248-7	Exclude	Not biologic
A prospective, randomized, case controlled pilot study to evaluate the effect of ketotifen on the adverse events associated with peanut desensitization in children with peanut allergies.	Berlin N. Maclachlan S. Leader N. Penn D. Sussman G.	Journal of Allergy and Clinical Immunology. Conference: 2012 Annual Meeting of the American Academy of Allergy, Asthma and Immunology, AAAAI 2012. Orlando, FL United States. Conference Publication: (var.pagings). 129(2 SUPPL. 1) (pp AB28), 2012. Date of Publication: February 2012.		Exclude	Not biologic
A randomised, placebo controlled trial of the effect of an inhaled SYK inhibitor on allergen induced airways responses in mild asthma.	Allan R. Jones I. Bartley M. Wilbraham D. Singh D.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2012. San Francisco, CA United States. Conference Publication: (var.pagings). 185(MeetingAbstracts) (no pagination), 2012. Date of Publication: 2012.		Exclude	Not biologic
A randomized clinical trial of passive immunotherapy with single-dose anti-Fel d1 monoclonal antibodies REGN 1908-1909 in catinduced rhinoconjunctivitis: Exploratory efficacy endpoints, safety, and.	Durham S. Schwabe C. Robson R. Ahlstrom Emanuelsson C. Shamji M. Singh D. Mant T. Clarke G. Zhong S. Kamal M. Newell D. Stahl N. Yancopoulos G.D. Kostic A.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: 36th Annual Congress of the European Academy of Allergy and Clinical Immunology, EAACI 2017. Helsinki Finland. 72(Supplement 103) (pp 64-65), 2017. Date of Publication: August 2017.		Exclude	Not asthma
A randomized trial of the efficacy and safety of quilizumab in adults with inadequately controlled allergic asthma	Harris JM, Maciuca R, Bradley MS, Cabanski CR, Scheerens H, Lim J, Cai F, Kishnani M, Liao XC, Samineni D, Zhu R, Cochran C, Soong W, Diaz JD, Perin P, Tsukayama M, Dimov D, Aqache I, Kelsen SG.	Respir Res. 2016 Mar 18;17:29. doi: 10.1186/s12931-016-0347-2.	10.1186/s12931-016-0347-2	Exclude	AHR not measured
A randomized, controlled trial to evaluate the effect of an anti-interleukin-9 monoclonal antibody in adults with uncontrolled asthma	Oh CK, Leigh R, McLaurin KK, Kim K, Hultquist M, Molfino NA.	Respir Res. 2013 Sep 19;14(1):93. doi: 10.1186/1465-9921-14-93.	10.1186/1465-9921-14-93	Exclude	AHR not measured
A randomized, controlled, phase 2 study of AMG 317, an IL-4Ralpha antagonist, in patients with asthma	Corren J, Busse W, Meltzer EO, Mansfield L, Bensch G, Fahrenholz J, Wenzel SE, Chon Y, Dunn M, Weng HH, Lin SL.	Am J Respir Crit Care Med. 2010 Apr 15;181(8):788-96. doi: 10.1164/rccm.200909-1448OC. Epub 2010 Jan 7.	10.1164/rccm.200909-1448OC	Exclude	AHR not measured
A randomized, double-blind trial of the effect of glucocorticoid, antileukotriene and beta-agonist treatment on IL-10 serum levels in children with asthma	Stelmach I, Jerzynska J, Kuna P.	Clin Exp Allergy. 2002 Feb;32(2):264-9. doi: 10.1046/j.1365-2222.2002.01286.x.	10.1046/j.1365-2222.2002.01286.x	Exclude	Not biologic
A randomized, double-blind trial of the effect of treatment with formoterol on clinical and inflammatory parameters of asthma in children	Stelmach I, Gorski P, Jerzynska J, Stelmach W, Majak P, Kuna P.	Ann Allergy Asthma Immunol. 2002 Jul;89(1):67-73. doi: 10.1016/S1081-1206(10)61913-8.	10.1016/S1081-1206(10)61913-8	Exclude	Not biologic
A randomized, double-blind trial of the effect of treatment with montelukast on bronchial hyperresponsiveness and serum eosinophilic cationic protein (ECP), soluble interleukin 2 receptor (sIL-2R), IL-4, and soluble intercellular adhesion molecule 1 (sICAM-1) in children with asthma	Stelmach I, Jerzynska J, Kuna P.	J Allergy Clin Immunol. 2002 Feb;109(2):257-63. doi: 10.1067/mai.2002.121456.	10.1067/mai.2002.121456	Exclude	Not biologic
A randomized, double-blind trial of the effect of treatment with montelukast on bronchial hyperresponsiveness and serum eosinophilic cationic protein (ECP), soluble interleukin 2 receptor (sIL-2R), IL-4, and soluble intercellular adhesion molecule 1 (sICAM-1) in children with asthma	Stelmach I, Jerzynska J, Kuna P.	J Allergy Clin Immunol. 2002 Feb;109(2):257-63. doi: 10.1067/mai.2002.121456.	10.1067/mai.2002.121456	Exclude	Not biologic
A randomized, double-blind, placebo-controlled of vitamin D for Irish children with asthma: Baseline data.	Hutchinson K. Kerley C. Elnazir B. Couglan D. Greally P. Rochev Y. Faul J.L.	Irish Journal of Medical Science. Conference: 39th Annual Meeting of the Irish Endocrine Society. Galway Ireland. Conference Publication: (var.pagings). 183(9 SUPPL. 1) (pp S443), 2014. Date of Publication: October 2014.	10.1007/s11845-014-1186-0	Exclude	Not biologic
A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY TO EVALUATE THE EFFECT OF DUPILUMAB ON AIRWAY REMODELING IN PATIENTS WITH UNCONTROLLED, MODERATE-TO-SEVERE ASTHMA: THE VESTIGE STUDY.	De Prado Gomez L. Castro M. Papi A. Ardeleanu M. Deniz Y. Rowe P.	Chest. Conference: CHEST 2021 Annual Meeting. Virtual, Online. 160(4 Supplement) (pp A1492-A1495), 2021. Date of Publication: October 2021.		Exclude	Not RCT
A randomized, double-blind, placebo-controlled, parallel-group study of the efficacy of omalizumab in prevention of bronchoconstriction following environmental aeroallergen exposure.	Corren J. Wood R.A. Patel D. Zhu J. Fish J.E.	Journal of Allergy and Clinical Immunology. Conference: 2010 Annual Meeting of the American Academy of Allergy, Asthma and Immunology, AAAAI. New Orleans, LA United States. Conference Publication: (var.pagings). 125(2 SUPPL. 1) (pp AB72), 2010. Date of Publication: February 2010.	10.1016/j.jaci.2009.12.282	Exclude	No relevant data
A randomized, placebo-controlled trial evaluating effects of lebrikizumab on airway eosinophilic inflammation and remodelling in uncontrolled asthma (CLAVIER)	Austin CD, Gonzalez Edick M, Ferrando RE, Solon M, Baca M, Mesh K, Bradding P, Gauvreau GM, Sumino K, FitzGerald JM, Israel E, Bjermer L, Bourdin A, Arron JR, Choy DF, Olsson JK, Abreu F, Howard M, Wong K, Cai F, Peng K, Putnam WS, Holweg CTJ, Matthews JG, Kraft M, Woodruff PG; CLAVIER Investigators.	Clin Exp Allergy. 2020 Dec;50(12):1342-1351. doi: 10.1111/cea.13731. Epub 2020 Oct 4.	10.1186/s12931-020-01513-x	Exclude	AHR not measured
A retrospective analysis of respiratory infections and nasopharyngitis rates in trials of anti-IL-17A therapies.	Hynes G.M. Pavord I.D. Hinks T.S.C.	Thorax. Conference: British Thoracic Society Winter Meeting, BTS 2019. London United Kingdom. 74(Supplement 2) (pp A85-A86), 2019. Date of Publication: December 2019.		Exclude	Not asthma
A single bout of exercise is associated with a transient reduction to exhaled nitric oxide in physically inactive adults with asthma.	Scott H. Latham J. Callister R. Pretto J. Saltos N. Upham J. Wood L.	Respirology. Conference: 2015 Annual Scientific Meetings of the Thoracic Society of Australia and New Zealand and the Australian and New Zealand Society of Respiratory Science, TSANZSRS 2015. Gold Coast, QLD Australia. Conference Publication: (var.pagings). 20(SUPPL. 2) (pp 68), 2015. Date of Publication: March 2015.		Exclude	No relevant data

A single dose of REGN1908-1909 reduced the rate of early asthma responses, chest symptoms and rescue medication use in cat-allergic subjects with mild asthma for up to 3 months following a controlled cat allergen challenge: A phase 2, randomized, double-blind, placebo-controlled study.	De Blay F.J. Gherasim A. Domis N. Meier P. Shawki F. Deveaux M. Ramesh D. Perlee L. Herman G. Weinreich D.M. Yancopoulos G.D. O'Brien M.P.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: European Academy of Allergy and Clinical Immunology Hybrid Congress, EAACI 2021. Krakow Poland. 76(SUPPL 110) (pp 645), 2021. Date of Publication: November 2021.	10.1016/j.jaci.2009.12.282	Exclude	No relevant data
A Single-Dose of REGN1908-1909 Reduced Bronchoconstriction in Cat-Allergic Subjects with Mild Asthma for up to 3 months following a controlled cat allergen challenge: A Phase 2, Randomized, Double-Blind, Placebo-Controlled Study.	De Blay De Gaix F. Gherasim A. Domis N. Meier P. Shawki F. DeVeaux M. Ramesh D. Perlee L. Herman G. Weinreich D. Yancopoulos G. OBrien M.	Journal of Allergy and Clinical Immunology. Conference: 2021 AAAAI Virtual Annual Meeting. Virtual, Online. 147(2 Supplement) (pp AB158), 2021. Date of Publication: February 2021.	10.1016/j.jaci.2020.12.567	Exclude	No relevant data
A study to evaluate safety and efficacy of mepolizumab in patients with moderate persistent asthma	Flood-Page P, Swenson C, Faiferman I, Matthews J, Williams M, Brannick L, Robinson D, Wenzel S, Busse W, Hansel TT, Barnes NC; International Mepolizumab Study Group.	Am J Respir Crit Care Med. 2007 Dec 1;176(11):1062-71. doi: 10.1164/rccm.200701-085OC. Epub 2007 Sep 13.	10.1164/rccm.200701-085OC	Exclude	No relevant data
A surveillance study of natural rhinovirus colds in young adults with mild asthma.	Stallings A. McLaughlin A. Murphy D. Carper H. Platts-Mills T. Heymann P.	Journal of Allergy and Clinical Immunology. Conference: 2009 American Academy of Allergy, Asthma and Immunology (AAAAI) Annual Meeting. Washington, DC United States. Conference Publication: (var.pagings). 123(2 SUPPL. 1) (pp S56), 2009. Date of Publication: February 2009.		Exclude	Not RCT
Activated protein C inhibits lung inflammation in asthma patients after intrabronchial allergen challenge.	De Boer D.J. Majoor C.J. Marieke B. Meijers J.C. Zeerleder S. De Vos A.F. Van 't Veer C. Van Der Zee J. Van Der Poll T.	Journal of Thrombosis and Haemostasis. Conference: 24th Congress of the International Society on Thrombosis and Haemostasis. Amsterdam Netherlands. Conference Publication: (var.pagings). 11(SUPPL. 2) (pp 105), 2013. Date of Publication: July 2013.		Exclude	Not biologic
Acute additive effect of montelukast and beclomethasone on AMP induced bronchoconstriction	Mastruzzo C, Contrafatto MR, Crimi C, Palermo F, Vancheri C, Crimi N.	Respir Med. 2010 Oct;104(10):1417-24. doi: 10.1016/j.rmed.2010.04.014. Epub 2010 May 14.	10.1016/j.rmed.2010.04.014	Exclude	Not biologic
Acute anti-inflammatory effects of inhaled budesonide in asthma: a randomized controlled trial	Gibson PG, Saltos N, Fakes K.	Am J Respir Crit Care Med. 2001 Jan;163(1):32-6. doi: 10.1164/ajrccm.163.1.9807061.	10.1164/ajrccm.163.1.9807061	Exclude	Not biologic
Adverse effects of beta-agonists: are they clinically relevant?	Abramson MJ, Walters J, Walters EH.	Am J Respir Med. 2003;2(4):287-97. doi: 10.1007/BF03256657.	10.1007/BF03256657	Exclude	Not biologic
Aerosolised hyaluronic acid prevents exercise-induced bronchoconstriction, suggesting novel hypotheses on the correction of matrix defects in asthma	Petrigni G, Allegra L.	Pulm Pharmacol Ther. 2006;19(3):166-71. doi: 10.1016/j.pupt.2005.03.002. Epub 2006 Jan 5.	10.1016/j.pupt.2005.03.002	Exclude	Not biologic
Aerosols of hyaluronan partially prevent bronchoconstriction induced by ultrasonically nebulised distilled water in asthmatics.	Allegra L. Dellan Patrona S. Comi A. Fasano V. Longo L. Terzano C. Petrigni G.	GIMT - Giornale Italiano delle Malattie del Torace. 60(4) (pp 243-248), 2006. Date of Publication: 2006.		Exclude	Not biologic
Airway and systemic effects of soluble and suspension formulations of nebulized budesonide in asthmatic children	Basu K, Nair A, Williamson PA, Mukhopadhyay S, Lipworth BJ.	Ann Allergy Asthma Immunol. 2009 Nov;103(5):436-41. doi: 10.1016/S1081-1206(10)60365-1.	10.1016/S1081-1206(10)60365-1	Exclude	Not biologic
Airway inflammatory response to ozone in subjects with different asthma severity	Vagaggini B, Carnevali S, Macchioni P, Taccola M, Fornai E, Bacci E, Bartoli ML, Cianchetti S, Dente FL, Di Franco A, Giannini D, Paggiaro PL.	Eur Respir J. 1999 Feb;13(2):274-80. doi: 10.1034/j.1399-3003.1999.13b09.x.	10.1034/j.1399-3003.1999.13b09.x	Exclude	Not biologic
Airways hyper-responsiveness to bradykinin and methacholine: effects of inhaled fluticasone	Reynolds CJ, Togias A, Proud D.	Clin Exp Allergy. 2002 Aug;32(8):1174-9. doi: 10.1046/j.1365-2745.2002.01443.x.	10.1046/j.1365-2745.2002.01443.x	Exclude	Not RCT
Allergen induced reduction in airway smooth muscle is attenuated by budesonide and formoterol combination therapy.	Kelly M.M. O'Connor T. Leigh R. Gwozd C. Gauvreau G. O'Byrne P.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2010. New Orleans, LA United States. Conference Publication: (var.pagings). 181(1 MeetingAbstracts) (no pagination), 2010. Date of Publication: 01 May 2010.		Exclude	Not biologic
Allergen inhalation challenge, refractoriness and the effects of ibuprofen	Nomani S, Cockcroft DW, Davis BE.	Allergy Asthma Clin Immunol. 2016 May 24;12:24. doi: 10.1186/s13223-016-0127-z. eCollection 2016.	10.1186/s13223-016-0127-z	Exclude	Not biologic
Allergen specific immunotherapy attenuates early and late phase reactions in lower airways of birch pollen asthmatic patients: a double blind placebo-controlled study	Arvidsson MB, Löwhagen O, Rak S.	Allergy. 2004 Jan;59(1):74-80. doi: 10.1046/j.1398-9995.2003.00334.x.	10.1046/j.1398-9995.2003.00334.x	Exclude	Not biologic
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An evaluation of colchicine as an alternative to inhaled corticosteriods in moderate asthma. National Heart, Lung, and Blood Institute's Asthma Clinical Research Network	Fish JE, Peters SP, Chambers CV, McGeady SJ, Epstein KR, Boushey HA, Cherniack RM, Chinchilli VM, Drazen JM, Fahy JV, Hurd SS, Israel E, Lazarus SC, Lemanske RF, Martin RJ, Mauger EA, Sorkness C, Szefler SJ.	Am J Respir Crit Care Med. 1997 Oct;156(4 Pt 1):1165-71. doi: 10.1164/ajrccm.156.4.9703012.	10.1164/ajrccm.156.4.9703012	Exclude	Not biologic
An evaluation of the effect of saffron supplementation on the antibody titer to heat-shock protein (HSP) 70, hsCRP and spirometry test in patients with mild and moderate persistent allergic asthma: A triple-blind, randomized placebo-controlled trial	Hosseini SA, Zilaee M, Shoushtari MH, Ghasemi Dehcheshmeh M.	Respir Med. 2018 Dec;145:28-34. doi: 10.1016/j.rmed.2018.10.016. Epub 2018 Oct 19.	10.1016/j.rmed.2018.10.016	Exclude	Not biologic
An evaluation of the effects of saffron supplementation on the asthma clinical symptoms and asthma severity in patients with mild and moderate persistent allergic asthma: a double-blind, randomized placebo-controlled trial	Zilaee M, Hosseini SA, Jafarirad S, Abolnezhadian F, Cheraghian B, Namjoyan F, Ghadiri A.	Respir Res. 2019 Feb 22;20(1):39. doi: 10.1186/s12931-019-0998-x.	10.1186/s12931-019-0998-x	Exclude	Not biologic
An in vivo and in vitro comparison of inhaled steroid delivery via a novel vortex actuator and a conventional valved holding chamber	Menzies D, Nair A, Fardon T, Barnes M, Burns P, Lipworth B.	Ann Allergy Asthma Immunol. 2007 May;98(5):471-9. doi: 10.1016/S1081-1206(10)60762-4.	10.1016/S1081-1206(10)60762-4	Exclude	Not biologic
An inhaled dose of budesonide induces genes involved in transcription and signaling in the human airways: enhancement of anti- and proinflammatory effector genes	Leigh R, Mostafa MM, King EM, Rider CF, Shah S, Dumonceaux C, Traves SL, McWhae A, Kolisnik T, Kooi C, Slater DM, Kelly MM, Bieda M, Miller-Larsson A, Newton R.	Pharmacol Res Perspect. 2016 Jul 12;4(4):e00243. doi: 10.1002/prp2.243. eCollection 2016 Aug.	10.1002/prp2.243	Exclude	Not biologic
An inhaled steroid improves markers of airway inflammation in patients with mild asthma	Jatakanon A, Lim S, Chung KF, Barnes PJ.	Eur Respir J. 1998 Nov;12(5):1084-8. doi: 10.1183/09031936.98.12051084.	10.1183/09031936.98.12051084	Exclude	Not biologic
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Anti-alphasthmatic effects of amomum compactum.	Lee M. Lee N. Lee J. Jung D. Lee H. Seo C. Kim J. Ha H. Shin H.	Journal of Allergy and Clinical Immunology. Conference: 2010 Annual Meeting of the American Academy of Allergy, Asthma and Immunology, AAAAI. New Orleans, LA United States. Conference Publication: (var.pagings). 125(2 SUPPL. 1) (pp AB34), 2010. Date of Publication: February 2010.		Exclude	Not biologic
Anti-CD23	Rosenwasser LJ, Meng J.	Clin Rev Allergy Immunol. 2005 Aug;29(1):61-72. doi: 10.1385/CRIAI:29:1:061.	10.1385/CRIAI:29:1:061	Exclude	Review
Anticholinergic for asthma treatment in children and adolescents.	Capizzi A. Sacco O. Girosi D. Olcese R. Tosca M. Rossi G.A.	Pediatric Pulmonology. Conference: 18th International Congress of Pediatric Pulmonology. Chiba Japan. 54(Supplement 1) (pp S27-S29), 2019. Date of Publication: June 2019.		Exclude	Not biologic
Anticholinergic therapy for chronic asthma in children over two years of age	McDonald NJ, Bara AI.	Cochrane Database Syst Rev. 2003;(3):CD003535. doi: 10.1002/14651858.CD003535.	10.1002/14651858.CD003535	Exclude	Review
Anticholinergic therapy for chronic asthma in children over two years of age. [Review] [122 refs]	McDonald NJ, Bara AI.	Cochrane Database of Systematic Reviews. (3):CD003535, 2003		Exclude	Not biologic
Anti-histamines for prolonged non-specific cough in children	Chang AB, Peake J, McElrea MS.	Cochrane Database Syst Rev. 2006 Jul 19;(3):CD005604. doi: 10.1002/14651858.CD005604.pub2.	10.1002/14651858.CD005604.pub2	Exclude	Review
Anti-histamines for prolonged non-specific cough in children	Chang AB, Peake J, McElrea MS.	Cochrane Database Syst Rev. 2008 Apr 16;(2):CD005604. doi: 10.1002/14651858.CD005604.pub3.	10.1002/14651858.CD005604.pub3	Exclude	Review
Anti-IgE (omalizumab) inhibits late-phase reactions and inflammatory cells after repeat skin allergen challenge	Ong YE, Menzies-Gow A, Barkans J, Benyahia F, Ou TT, Ying S, Kay AB.	J Allergy Clin Immunol. 2005 Sep;116(3):558-64. doi: 10.1016/j.jaci.2005.05.035.	10.1016/j.jaci.2005.05.035	Exclude	No relevant data
Anti-IL-5 (mepolizumab) therapy induces bone marrow eosinophil maturational arrest and decreases eosinophil progenitors in the bronchial mucosa of atopic asthmatics	Menzies-Gow A, Flood-Page P, Sehmi R, Burman J, Hamid Q, Robinson DS, Kay AB, Denburg J.	J Allergy Clin Immunol. 2003 Apr;111(4):714-9. doi: 10.1067/mai.2003.1382.	10.1067/mai.2003.1382	Exclude	AHR not measured
Anti-IL5 therapies for asthma	Farne HA, Wilson A, Powell C, Bax L, Milan SJ.	Cochrane Database Syst Rev. 2017 Sep 21;9(9):CD010834. doi: 10.1002/14651858.CD010834.pub3.	10.1002/14651858.CD010834.pub3	Exclude	Review
Anti-IL-5 treatment reduces deposition of ECM proteins in the bronchial subepithelial basement membrane of mild atopic asthmatics	Flood-Page P, Menzies-Gow A, Phipps S, Ying S, Wangoo A, Ludwig MS, Barnes N, Robinson D, Kay AB.	J Clin Invest. 2003 Oct;112(7):1029-36. doi: 10.1172/JCI17974.	10.1172/JCI17974	Exclude	AHR not measured
Anti-immunoglobulin E therapy with omalizumab for asthma	Hendeles L, Sorkness CA.	Ann Pharmacother. 2007 Sep;41(9):1397-410. doi: 10.1345/aph.1K005. Epub 2007 Aug 14.	10.1345/aph.1K005	Exclude	Review
Anti-inflammatory activity of 1,8-cineol (eucalyptol) in bronchial asthma: a double-blind placebo-controlled trial	Juergens UR, Dethlefsen U, Steinkamp G, Gillissen A, Repges R, Vetter H.	Respir Med. 2003 Mar;97(3):250-6. doi: 10.1053/rmed.2003.1432.	10.1053/rmed.2003.1432	Exclude	Not biologic
Anti-inflammatory and anti-asthmatic effects of Viola mandshurica W. Becker (VM) ethanolic (EtOH) extract on airway inflammation in a mouse model of allergic asthma	Lee MY, Yuk JE, Kwon OK, Kim HS, Oh SR, Lee HK, Ahn KS.	J Ethnopharmacol. 2010 Jan 8;127(1):159-64. doi: 10.1016/j.jep.2009.09.033. Epub 2009 Sep 25.	10.1016/j.jep.2009.09.033	Exclude	Not biologic
Anti-inflammatory and lung function effects of montelukast in asthmatic volunteers exposed to sulfur dioxide	Gong H Jr, Linn WS, Terrell SL, Anderson KR, Clark KW.	Chest. 2001 Feb;119(2):402-8. doi: 10.1378/chest.119.2.402.	10.1378/chest.119.2.402	Exclude	Not biologic
Anti-inflammatory duration of action of fluticasone furoate/vilanterol trifenatate in asthma: a cross-over randomised controlled trial	Bardsley G, Daley-Yates P, Baines A, Kempsford R, Williams M, Mallon T, Braithwaite I, Riddell K, Joshi S, Bareille P, Beasley R, Finnleton J; study team.	Respir Res. 2018 Jul 13;19(1):133. doi: 10.1186/s12931-018-0836-6.	10.1186/s12931-018-0836-6	Exclude	Not biologic
Anti-inflammatory effect of a novel inhaled dual PDE3/4 inhibitor RPL554 in man, a unique "first-in-class" drug for the treatment of COPD & asthma.	Singh D. Reid F. Franciosi L. Walker M. Page C.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2013. Barcelona Spain. Conference Publication: (var.pagings). 42(SUPPL. 57) (no pagination), 2013. Date of Publication: 01 Sep 2013.		Exclude	Not biologic
Anti-inflammatory effect of itraconazole in stable allergic bronchopulmonary aspergillosis: a randomized controlled trial	Wark PA, Hensley MJ, Saltos N, Boyle MJ, Toneguzzi RC, Epid GD, Simpson JL, McElduff P, Gibson PG.	J Allergy Clin Immunol. 2003 May;111(5):952-7. doi: 10.1067/mai.2003.1388.	10.1067/mai.2003.1388	Exclude	Not biologic
Anti-inflammatory effect of roxithromycin in patients with aspirin-intolerant asthma	Shoji T, Yoshida S, Sakamoto H, Hasegawa H, Nakagawa H, Amayasu H.	Clin Exp Allergy. 1999 Jul;29(7):950-6. doi: 10.1046/j.1365-2222.1999.00551.x.	10.1046/j.1365-2222.1999.00551.x	Exclude	Not biologic
Anti-inflammatory effects of high-dose inhaled fluticasone versus oral prednisone in asthma exacerbations	Belda J, Margarit G, Martínez C, Bellido-Casado J, Casan P, Torrejón M, Brufal M, Rodríguez-Jerez F, Sanchis J.	Eur Respir J. 2007 Dec;30(6):1143-9. doi: 10.1183/09031936.00050306. Epub 2007 Aug 9.	10.1183/09031936.00050306	Exclude	Not biologic
Anti-inflammatory effects of once daily low dose inhaled ciclesonide in mild to moderate asthmatic patients	Wilson AM, Duong M, Pratt B, Dolovich M, O'Byrne PM.	Allergy. 2006 May;61(5):537-42. doi: 10.1111/j.1398-9995.2006.01061.x.	10.1111/j.1398-9995.2006.01061.x	Exclude	Not biologic
Anti-inflammatory effects of salmeterol compared with beclomethasone in eosinophilic mild exacerbations of asthma: a randomized, placebo controlled trial	Turner MO, Johnston PR, Pizzichini E, Pizzichini MM, Hussack PA, Hargreave FE.	Can Respir J. 1998 Jul-Aug;5(4):261-8. doi: 10.1155/1998/868379.	10.1155/1998/868379	Exclude	Not biologic
Antileukotriene drugs in childhood asthma: what is their place in therapy?	Selvadurai H, Mellis C.	Paediatr Drugs. 2000 Sep-Oct;2(5):367-72. doi: 10.2165/00128072-200002050-00004.	10.2165/00128072-200002050-00004	Exclude	Review
Anti-oxidant N-acetylcysteine diminishes diesel exhaust-induced increased airway responsiveness in person with airway hyper-reactivity	Carlsten C, MacNutt MJ, Zhang Z, Sava F, Pui MM.	Toxicol Sci. 2014 Jun;139(2):479-87. doi: 10.1093/toxsci/kfu040.	10.1093/toxsci/kfu040	Exclude	Not biologic
Baseline type 2 biomarker levels and response to tezepelumab in severe asthma	Corren J, Pham TH, Gil EG, Salapa K, Ren P, Parnes JR, Colice G, Griffiths JM.	Allergy. 2021 Dec 16. doi: 10.1111/all.15197. Online ahead of print.	10.1111/all.15197	Exclude	AHR not measured
Basophil histamine release decreases during omalizumab therapy in allergic asthmatics	Noga O, Hanf G, Kunkel G, Kleine-Tebbe J.	Int Arch Allergy Immunol. 2008;146(1):66-70. doi: 10.1159/000112504. Epub 2007 Dec 14.	10.1159/000112504	Exclude	Not RCT
Beclomethasone dipropionate attenuates airways hyperresponsiveness to neurokinin A and histamine in asthma	Prosperini G, Arcidiacono G, Ciamarra I, Crimi N, Polosa R.	Respir Med. 2006 Jun;100(6):1006-12. doi: 10.1016/j.rmed.2005.09.038. Epub 2005 Nov 15.	10.1016/j.rmed.2005.09.038	Exclude	Not biologic
Benefit from anti-inflammatory treatment during clinical remission of atopic asthma	van den Toorn LM, Prins JB, de Jongste JC, Leman K, Mulder PG, Hoogsteden HC, Overbeek SE.	Respir Med. 2005 Jun;99(6):779-87. doi: 10.1016/j.rmed.2004.11.011. Epub 2005 Jan 12.	10.1016/j.rmed.2004.11.011	Exclude	Not biologic
Benralizumab reduces exacerbations and improves lung function in adults with uncontrolled eosinophilic asthma.	Castro M. Gossage D.L. Ward C.K. Wu Y. Khatri D.B. Molfino N.A. Raible D.G.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2014. San Diego, CA United States. Conference Publication: (var.pagings). 189(MeetingAbstracts) (no pagination), 2014. Date of Publication: 2014.		Exclude	AHR not measured
Benralizumab, an anti-interleukin 5 receptor α monoclonal antibody, versus placebo for uncontrolled eosinophilic asthma: a phase 2b randomised dose-ranging study	Castro M, Wenzel SE, Bleecker ER, Pizzichini E, Kuna P, Busse WW, Gossage DL, Ward CK, Wu Y, Wang B, Khatry DB, van der Merwe R, Kolbeck R, Molfino NA, Raible DG.	Lancet Respir Med. 2014 Nov;2(11):879-890. doi: 10.1016/S2213-2600(14)70201-2. Epub 2014 Oct 8.	10.1016/S2213-2600(14)70201-2	Exclude	AHR not measured
Biologic therapy in asthma: entering the new age of personalized medicine	Fait ML, Wenzel SE.	J Asthma. 2014 Sep;51(7):669-76. doi: 10.3109/02770903.2014.910221. Epub 2014 May 13.	10.3109/02770903.2014.910221	Exclude	Review
Blood eosinophil count group shifts and kinetics in severe eosinophilic asthma	Lugogo NL, Kreindler JL, Martin UJ, Cook B, Hirsch I, Trudo FJ.	Ann Allergy Asthma Immunol. 2020 Aug;125(2):171-176. doi: 10.1016/j.anai.2020.04.011. Epub 2020 Apr 22.	10.1016/j.anai.2020.04.011	Exclude	AHR not measured
Bromotyrosines in sputum proteins and treatment effects of terbutaline and budesonide in asthma	van Dalen CJ, Aldridge RE, Chan T, Senthilmohan R, Hancox RJ, Cowan JO, Taylor DR, Town GI, Kettle AJ.	Ann Allergy Asthma Immunol. 2009 Oct;103(4):348-53. doi: 10.1016/S1081-1206(10)60536-4.	10.1016/S1081-1206(10)60536-4	Exclude	Not biologic
Bronchodilator effect of a novel inhaled dual PDE3/4 inhibitor, RPL554, in mild allergic asthma & rhinitis.	Diamant Z. Franciosi L. Morelli N. Zuiker R. Kamerling I. De Kam M. Burggraaf K. Cohen A. Walker M. Page C.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2013. Barcelona Spain. Conference Publication: (var.pagings). 42(SUPPL. 57) (no pagination), 2013. Date of Publication: 01 Sep 2013.		Exclude	Not biologic
Bronchodilator reversibility, airway eosinophilia and anti-inflammatory effects of inhaled fluticasone in COPD are not related	Reid DW, Wen Y, Johns DP, Williams TJ, Ward C, Walters EH.	Respirology. 2008 Nov;13(6):799-809. doi: 10.1111/j.1440-1843.2008.01380.x.	10.1111/j.1440-1843.2008.01380.x	Exclude	Not biologic
Bronchoprotective effect of vilanterol against methacholine-induced bronchoconstriction in mild asthmatics: A randomized three-way crossover study	Westbury GLM, Blais CM, Davis BE, Cockcroft DW.	Ann Allergy Asthma Immunol. 2018 Sep;121(3):328-332. doi: 10.1016/j.anai.2018.07.005. Epub 2018 Jul 12.	10.1016/j.anai.2018.07.005	Exclude	Not biologic
Bronchoprotective effects of leukotriene receptor antagonists in asthma: a meta-analysis	Currie GP, Lipworth BJ.	Chest. 2002 Jul;122(1):146-50. doi: 10.1378/chest.122.1.146.	10.1378/chest.122.1.146	Exclude	Meta-analysis
Budesonide but not nedocromil sodium reduces exhaled nitric oxide levels in asthmatic children	Carrà S, Gagliardi L, Zanconato S, Scollo M, Azzolin N, Zacchello F, Baraldi E.	Respir Med. 2001 Sep;95(9):734-9. doi: 10.1053/rmed.2001.1130.	10.1053/rmed.2001.1130	Exclude	Not biologic
Butterbur, a herbal remedy, confers complementary anti-inflammatory activity in asthmatic patients receiving inhaled corticosteroids	Lee DK, Haggart K, Robb FM, Lipworth BJ.	Clin Exp Allergy. 2004 Jan;34(1):110-4. doi: 10.1111/j.1365-2222.2004.01838.x.	10.1111/j.1365-2222.2004.01838.x	Exclude	Not biologic
Calcitriol-treatment in patients with severe persistent asthma: A randomized, placebo-controlled study.	Breitenbuecher A. Voit U. Miedinger D. Chhajed P. Krapf R. Leuppi J.D.	Respiration. Conference: Gemeinsame Jahresversammlung der Schweizerische Gesellschaft fur Pneumologie / Societe Suisse de Pneumologie Schweizerische Gesellschaft fur Pediatrische Pneumologie / Societe Suisse de Pneumologie Pediatrique Schweizerische Gesellschaft fur Thoraxchirurgie / Societe Suisse de Chirurgie Thoracique Schweizerische Vereinigung fur Endoskopie Personal / Association Suisse du Personnel en Endoscopie 2014. Interlaken Switzerland. Conference Publication: (var.pagings). 87(6) (pp 523-524), 2014. Date of Publication: June 2014.		Exclude	Not biologic
CASCADE: a phase 2, randomized, double-blind, placebo-controlled, parallel-group trial to evaluate the effect of tezepelumab on airway inflammation in patients with uncontrolled asthma	Emson C, Diver S, Chachi L, Megally A, Small C, Downie J, Parnes JR, Bowen K, Colice G, Brightling CE.	Respir Res. 2020 Oct 13;21(1):265. doi: 10.1186/s12931-020-01513-x.	10.1016/j.anai.2021.01.012	Exclude	Not RCT
Changes in sputum counts and airway hyperresponsiveness after budesonide: monitoring anti-inflammatory response on the basis of surrogate markers of airway inflammation	Prosperini G, Rajakulasingam K, Cacciola RR, Spicuzza L, Rorke S, Holgate ST, Di Maria GU, Polosa R.	J Allergy Clin Immunol. 2002 Dec;110(6):855-61. doi: 10.1067/mai.2002.130050.	10.1067/mai.2002.130050	Exclude	Not biologic
Changing the natural history of asthma through early interventions: A summary.	Martinez F.D.	Pediatric Pulmonology. Conference: 16th Congress of the International Pediatric Pulmonology, CIPP 2017. Lisbon Portugal. 52(Supplement 46) (pp S22-S23), 2017. Date of Publication: June 2017.		Exclude	Not RCT
Characterization of respiratory deposition of fluticasone-salmeterol hydrofluoroalkane-134a and hydrofluoroalkane-134a beclomethasone in asthmatic patients	Leach CL, Kuehl PJ, Chand R, Ketai L, Norenberg JP, McDonald JD.	Ann Allergy Asthma Immunol. 2012 Mar;108(3):195-200. doi: 10.1016/j.anai.2012.01.010.	10.1016/j.anai.2012.01.010	Exclude	Not biologic
Ciclesonide improves measures of small airway involvement in asthma	Cohen J, Douma WR, ten Hacken NH, Vonk JM, Oudkerk M, Postma DS.	Eur Respir J. 2008 Jun;31(6):1213-20. doi: 10.1183/09031936.00082407. Epub 2008 Feb 20.	10.1183/09031936.00082407	Exclude	Not biologic
Circulating MicroRNAs and Treatment Response in Childhood Asthma	Li J, Panganiban R, Kho AT, McGeachie MJ, Farnam L, Chase RP, Weiss ST, Lu Q, Tantisira KG.	Am J Respir Crit Care Med. 2020 Jul 1;202(1):65-72. doi: 10.1164/rccm.201907-1454OC.	10.1164/rccm.201907-1454OC	Exclude	AHR not measured
Clarithromycin suppresses bronchial hyperresponsiveness associated with eosinophilic inflammation in patients with asthma	Amayasu H, Yoshida S, Ebana S, Yamamoto Y, Nishikawa T, Shoji T, Nakagawa H, Hasegawa H, Nakabayashi M, Ishizaki Y.	Ann Allergy Asthma Immunol. 2000 Jun;84(6):594-8. doi: 10.1016/S1081-1206(10)62409-X.	10.1016/S1081-1206(10)62409-X	Exclude	Not biologic
Classification of childhood asthma phenotypes and long-term clinical responses to inhaled anti-inflammatory medications	Howrylak JA, Fuhlbrigge AL, Strunk RC, Zeiger RS, Weiss ST, Raby BA; Childhood Asthma Management Program Research Group.	J Allergy Clin Immunol. 2014 May;133(5):1289-300, 1300.e1-12. doi: 10.1016/j.jaci.2014.02.006.	10.1016/j.jaci.2014.02.006	Exclude	Not RCT

Clemastine causes immune suppression through inhibition of extracellular signal-regulated kinase-dependent proinflammatory cytokines.	Johansen P. Weiss A. Bunter A. Waeckerle-Men Y. Fettelschoss A. Odermatt B. Kundig T.M.	Journal of Allergy and Clinical Immunology. 128(6) (pp 1286-1294), 2011. Date of Publication: December 2011.		Exclude	Not biologic
Clinical and immunologic effects of a single dose of Anti-Fel D 1-IgG4 monoclonal antibodies in cat allergic individuals: A double blind randomized placebo-controlled study.	Tang J. Singh I. Parkin R. Wang C. Kostic A. Durham S. Radin A. Shamji M.	Clinical and Experimental Allergy. Conference: 2018 Annual Meeting of the British Society for Allergy and Clinical Immunology, BSACI 2018. Shropshire United Kingdom. 48(11) (pp 1528), 2018. Date of Publication: November 2018.	10.1111/cea.13296	Exclude	No relevant data
Clinical evaluation of the effect of anti-allergic mattress covers in patients with moderate to severe asthma and house dust mite allergy: a randomised double blind placebo controlled study	Rijssenbeek-Nouwens LH, Oosting AJ, de Bruin-Weller MS, Bregman I, de Monchy JG, Postma DS.	Thorax. 2002 Sep;57(9):784-90. doi: 10.1136/thorax.57.9.784.	10.1136/thorax.57.9.784	Exclude	Not biologic
Clinical trial design, nasal allergen challenge models, and considerations of relevance to pediatrics, nasal polyposis, and different classes of medication.	Akerlund A. Andersson M. Leflein J. Lildholdt T. Mygind N.	Journal of Allergy and Clinical Immunology. 115(3 SUPPL.) (pp S460-S482), 2005. Date of Publication: March 2005.		Exclude	Review
Clinical trial: Impact of Probiotical on asthma control and inflammation.	Moermans C. Graff S. Medard L. Schleich F. Paulus V. Guissard F. Henket M. Louis R.	European Respiratory Journal. Conference: European Respiratory Society International Congress, ERS 2020. Virtual. 56(Supplement 64) (no pagination), 2020. Date of Publication: September 2020.		Exclude	Not biologic
Cluster analysis and characterization of response to mepolizumab. A step closer to personalized medicine for patients with severe asthma	Ortega H, Li H, Suruki R, Albers F, Gordon D, Yancey S.	Ann Am Thorac Soc. 2014 Sep;11(7):1011-7. doi: 10.1513/AnnalsATS.201312-454OC.	10.1513/AnnalsATS.201312-454OC	Exclude	Not RCT
Combined exposure to diesel exhaust and allergen enhances allergic inflammation in the bronchial submucosa of atopic subjects.	Hosseini A. Hackett T.L. Hirota J. McNagny K. Wilson S. Carlsten C.	Allergy, Asthma and Clinical Immunology. Conference: Canadian Society of Allergy and Clinical Immunology Annual Scientific Meeting 2015. Vancouver, BC Canada. 12(Supplement 1) (no pagination), 2016. Date of Publication: 2016.		Exclude	No relevant data
Combined inhalation of beta2 -agonists improves swim ergometer sprint performance but not high-intensity swim performance	Kalsen A, Hostrup M, Bangsbo J, Backer V.	Scand J Med Sci Sports. 2014 Oct;24(5):814-22. doi: 10.1111/sms.12096. Epub 2013 Jul 9.	10.1111/sms.12096	Exclude	Not biologic
Combined mediator blockade or topical steroid for treating the unified allergic airway	Barnes ML, Menzies D, Fardon TC, Burns P, Wilson AM, Lipworth BJ.	Allergy. 2007 Jan;62(1):73-80. doi: 10.1111/j.1398-9995.2006.01263.x.	10.1111/j.1398-9995.2006.01263.x	Exclude	Not biologic
Comparative efficacy and anti-inflammatory profile of once-daily therapy with leukotriene antagonist or low-dose inhaled corticosteroid in patients with mild persistent asthma	Dempsey OJ, Kennedy G, Lipworth BJ.	J Allergy Clin Immunol. 2002 Jan;109(1):68-74. doi: 10.1067/mai.2002.120559.	10.1067/mai.2002.120559	Exclude	Not biologic
Comparison between the effects of generic and original salmeterol/fluticasone combination (SFC) treatment on airway inflammation in stable asthmatic patients	Maneechotesuwan K, Assawabhumi J, Rattanasaengloet K, Suthamsmai T, Pipopsuthipaiboon S, Udompunturak S.	J Med Assoc Thai. 2014 Mar;97 Suppl 3:S91-100.		Exclude	Not biologic
Comparison of combination inhalers vs inhaled corticosteroids alone in moderate persistent asthma	Lee DK, Jackson CM, Currie GP, Cockburn WJ, Lipworth BJ.	Br J Clin Pharmacol. 2003 Nov;56(5):494-500. doi: 10.1046/j.1365-2125.2003.01887.x.	10.1046/j.1365-2125.2003.01887.x	Exclude	Not biologic
Comparison of the anti-inflammatory effects of extra-fine hydrofluoroalkane-beclomethasone vs fluticasone dry powder inhaler on exhaled inflammatory markers in childhood asthma	Robroeks CM, van de Kant KD, van Vliet D, Kester AD, Hendriks HJ, Damoiseaux JG, Wodzig WK, Rijkers GT, Dompeling E, Jöbsis Q.	Ann Allergy Asthma Immunol. 2008 Jun;100(6):601-7. doi: 10.1016/S1081-1206(10)60052-X.	10.1016/S1081-1206(10)60052-X	Exclude	Not biologic
Computational modelling prediction and clinical validation of impact of benralizumab on airway smooth muscle mass in asthma.	Chachi L. Diver S. Kaul H. Nisa P. Newbold P. Brightling C.E.	European Respiratory Journal. Conference: 29th International Congress of the European Respiratory Society, ERS. Madrid Spain. 54(Supplement 63) (no pagination), 2019. Date of Publication: September 2019.		Exclude	Not RCT
Controlled trial of inhaled budesonide in patients with cystic fibrosis and chronic bronchopulmonary Psuedomonas aeruginosa infection	Bisgaard H, Pedersen SS, Nielsen KG, Skov M, Laursen EM, Kronborg G, Reimert CM, Høiby N, Koch C.	Am J Respir Crit Care Med. 1997 Oct;156(4 Pt 1):1190-6. doi: 10.1164/ajrccm.156.4.9612044.	10.1164/ajrccm.156.4.9612044	Exclude	Not biologic
Correction to Lancet Respir Med 2021; 9: 1299-312 (The Lancet Respiratory Medicine (2021) 9(11) (1299-1312), (S2213260021002265), (10.1016/S2213-2600(21)00226-5)).	Anonymous	The Lancet Respiratory Medicine. 9(11) (pp e106), 2021. Date of Publication: November 2021.		Exclude	No relevant data
Critique of trials in allergic bronchopulmonary aspergillosis and fungal allergy	Moss RB.	Med Mycol. 2006 Sep 1;44(Supplement 1):S269-S272. doi: 10.1080/13693780600835757.	10.1080/13693780600835757	Exclude	Not biologic
Cromolyn sodium suppresses eosinophilic inflammation in patients with aspirin-intolerant asthma	Amayasu H, Nakabayashi M, Akahori K, Ishizaki Y, Shoji T, Nakagawa H, Hasegawa H, Yoshida S.	Ann Allergy Asthma Immunol. 2001 Aug;87(2):146-50. doi: 10.1016/S1081-1206(10)62210-7.	10.1016/S1081-1206(10)62210-7	Exclude	Not biologic
Daclizumab improves asthma control in patients with moderate to severe persistent asthma: a randomized, controlled trial	Busse WW, Israel E, Nelson HS, Baker JW, Charous BL, Young DY, Vexler V, Shames RS; Daclizumab Asthma Study Group.	Am J Respir Crit Care Med. 2008 Nov 15;178(10):1002-8. doi: 10.1164/rccm.200708-1200OC. Epub 2008 Sep 11.	10.1164/rccm.200708-1200OC	Exclude	AHR not measured
Dehydroepiandrosterone (DHEA): hypes and hopes	Rutkowski K, Sowa P, Rutkowska-Talipska J, Kuryliszyn-Moskal A, Rutkowski R.	Drugs. 2014 Jul;74(11):1195-207. doi: 10.1007/s40265-014-0259-8.	10.1007/s40265-014-0259-8	Exclude	Review
Depletion of airway eosinophils by benralizumab an anti-IL5 receptor alpha monoclonal antibody.	Gossage D.L. Laviolette M. Gauvreau G.M. Leigh R. Kolbeck R. Wu Y. Richman L. Molfino N.A.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2012. San Francisco, CA United States. Conference Publication: (var.pagings). 185(MeetingAbstracts) (no pagination), 2012. Date of Publication: 2012.		Exclude	AHR not measured
Design of dose range finding study with allergen specific immunotherapy in patients with house dust mite induced allergic rhinitis/rhinoconjunctivitis.	Bachert C. Pfaar O. Roger A. Riechelmann H. Oude Elberink J. Nell M. Boot J.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: 31st Congress of the European Academy of Allergy and Clinical Immunology. Geneva Switzerland. Conference Publication: (var.pagings). 67(SUPPL. 96) (pp 522-523), 2012. Date of Publication: November 2012.		Exclude	Not RCT
Desloratadine reduces systemic allergic inflammation following nasal provocation in allergic rhinitis and asthma patients	Reinartz SM, Overbeek SE, Kleinjan A, van Drunen CM, Braunstahl GJ, Hoogsteden HC, Fokkens WJ.	Allergy. 2005 Oct;60(10):1301-7. doi: 10.1111/j.1398-9995.2005.00911.x.	10.1111/j.1398-9995.2005.00911.x	Exclude	Not biologic
Desloratadine: A preclinical and clinical overview.	Norman P. Dihlmann A. Rabasseda X.	Drugs of Today. 37(4) (pp 215-227), 2001. Date of Publication: 2001.		Exclude	Review
Detection of increased levels of Th2-derived cytokines in ultracentrifuged sputum following allergen challenge and their responsiveness to fluticasone.	Ruddy M. Zuiker R. Morelli N. Mogg R. Rivas V. Van Dyck K. De Lepeleire I. Tanen M. Pica-Mendez A. Diamant Z.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2010. New Orleans, LA United States. Conference Publication: (var.pagings). 181(1 MeetingAbstracts) (no pagination), 2010. Date of Publication: 01 May 2010.		Exclude	Not biologic
Development of a tool predicting severity of allergic reaction during peanut challenge	Chinthrajah RS, Purington N, Andorf S, Rosa JS, Mukai K, Hamilton R, Smith BM, Gupta R, Galli SJ, Desai M, Nadeau KC.	Ann Allergy Asthma Immunol. 2018 Jul;121(1):69-76.e2. doi: 10.1016/j.anai.2018.04.020. Epub 2018 Apr 27.	10.1016/j.anai.2018.04.020	Exclude	Not RCT
Different effects of inhaled aspirinlike drugs on allergen-induced early and late asthmatic responses	Sestini P, Refini RM, Pieroni MG, Vaghi A, Robuschi M, Bianco S.	Am J Respir Crit Care Med. 1999 Apr;159(4 Pt 1):1228-33. doi: 10.1164/ajrccm.159.4.9709045.	10.1164/ajrccm.159.4.9709045	Exclude	Not biologic
Differential effects of fluticasone and montelukast on allergen-induced asthma	Palmqvist M, Bruce C, Sjöstrand M, Arvidsson P, Lötvall J.	Allergy. 2005 Jan;60(1):65-70. doi: 10.1111/j.1398-9995.2005.00633.x.	10.1111/j.1398-9995.2005.00633.x	Exclude	Not RCT
Distinct upper airway bacterial microbiota differentially relate to exacerbation and rhinovirus infection in pediatric asthmatics.	McCauley K, Valladares R, LeBeau P, Tran H, Calatroni A, Boushey H.A, Gern J.E, Jackson D.J, Lynch S.V.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2017. Washington, DC United States. 195 (no pagination), 2017. Date of Publication: 2017.		Exclude	AHR not measured
Dose-dependent anti-inflammatory effect of inhaled mometasone furoate/formoterol in subjects with asthma	Nolte H, Pavord I, Backer V, Spector S, Shekar T, Gates D, Nair P, Hargreave F.	Respir Med. 2013 May;107(5):656-64. doi: 10.1016/j.rmed.2013.02.010. Epub 2013 Mar 13.	10.1016/j.rmed.2013.02.010	Exclude	Not biologic
Dose-dependent inactivation of airway tryptase with a novel dissociating anti-tryptase antibody (MTPS9579A) in healthy participants: A randomized trial	Rymut SM, Sukumaran S, Sperinde G, Bremer M, Galanter J, Yoshida K, Smith J, Banerjee P, Sverkos V, Cai F, Steffen V, Henderson LM, Rhee H, Belloni PN, Lin JH, Staton TL.	Clin Transl Sci. 2021 Sep 27. doi: 10.1111/cts.13163. Online ahead of print.		Exclude	Not RCT
Double-blind, randomized, dose-escalation, placebo-controlled phase-1 study of the chemokine inhibitor Xc-8.	Renner A. Marth K. Romanova J. Pohl W.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: 37th Annual Congress of the European Academy of Allergy and Clinical Immunology, EAACI 2018. Munich Germany. 73(Supplement 105) (pp 204), 2018. Date of Publication: August 2018.		Exclude	Not biologic
Double-blind, randomized, placebo-controlled trial of effect of nedocromil sodium on clinical and inflammatory parameters of asthma in children allergic to dust mite	Stelmach I, Jerzynska J, Brzozowska A, Kuna P.	Allergy. 2001 Jun;56(6):518-24. doi: 10.1034/j.1398-9995.2001.056006518.x.	10.1034/j.1398-9995.2001.056006518.x	Exclude	Not biologic
Dupilumab (DPL) improves upper and lower airway outcomes in chronic rhinosinusitis with nasal polyps (CRSwNP) with nonsteroidal anti-inflammatory drug-exacerbated respiratory disease (NSAID-ERD): Pooled results from SINUS-24, SINUS-52 Phase 3 trials.	Laidlaw T.M. Mullol J. Canonica G.W. Bachert C. Han J.K. Zhang M. Lu X. Patel N. Graham N.M.H. Staudinger H. Mannent L.P. Amin N.	European Respiratory Journal. Conference: 29th International Congress of the European Respiratory Society, ERS. Madrid Spain. 54(Supplement 63) (no pagination), 2019. Date of Publication: September 2019.		Exclude	Not asthma
Dupilumab Efficacy in Patients with Uncontrolled, Moderate-to-Severe Allergic Asthma	Corren J, Castro M, O'Riordan T, Hanania NA, Pavord ID, Quirce S, Chipps BE, Wenzel SE, Thangavelu K, Rice MS, Harel S, Jagerschmidt A, Khan AH, Kamat S, Maroni J, Rowe P, Lu Y, Amin N, Pirozzi G, Ruddy M, Graham NMH, Teper A.	J Allergy Clin Immunol Pract. 2020 Feb;8(2):516-526. doi: 10.1016/j.jaip.2019.08.050. Epub 2019 Sep 12.	10.1016/j.jaip.2019.08.050	Exclude	AHR not measured
Dupilumab improved lung function in patients with uncontrolled, moderate-to-severe asthma.	Castro M. Rabe K.F. Kraft M. Corren J. Pavord I.D. Katelaris C. Tohda Y. Rice M.S. Lu Y. Rowe P. Staudinger H.W. Amin N. Akinlade B. Graham N.M.H. Teper A.	American Journal of Respiratory and Critical Care Medicine. Conference: 2019 International Conference of the American Thoracic Society , ATS 2019. Dallas, TX United States. 199(9) (no pagination), 2019. Date of Publication: May 2019.		Exclude	AHR not measured
Dupilumab improves asthma control as assessed by total and individual item scores of the 6-item asthma control questionnaire in patients with severe chronic rhinosinusitis with nasal polyps and comorbid asthma: Pooled results from the sinus-24 and sinus-52 phase 3 studies.	Bachert C. Han J.K. Desrosiers M. Hellings P.W. Mao X. Zhang M. Amin N. Mannent L.P. Kamat S. Khan A.H.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2020. Philadelphia, PA United States. 201(1) (no pagination), 2020. Date of Publication: 2020.		Exclude	AHR not measured
Dupilumab improves lung function in patients with uncontrolled, moderate-to-severe asthma	Castro M, Rabe KF, Corren J, Pavord ID, Katelaris CH, Tohda Y, Zhang B, Rice MS, Maroni J, Rowe P, Pirozzi G, Amin N, Ruddy M, Akinlade B, Graham NMH, Teper A.	ERJ Open Res. 2020 Jan 27;6(1):00204-2019. doi: 10.1183/23120541.00204-2019. eCollection 2020 Jan.	10.1183/23120541.00204-2019	Exclude	AHR not measured
Dupilumab improves upper and lower airway disease control in chronic rhinosinusitis with nasal polyps and asthma	Laidlaw TM, Bachert C, Amin N, Desrosiers M, Hellings PW, Mullol J, Maspero JF, Gevaert P, Zhang M, Mao X, Khan AH, Kamat S, Patel N, Graham NMH, Ruddy M, Staudinger H, Mannent LP.	Ann Allergy Asthma Immunol. 2021 May;126(5):584-592.e1. doi: 10.1016/j.anai.2021.01.012. Epub 2021 Jan 16.	10.1183/13993003.01296-2021	Exclude	AHR not measured
Dupilumab Improves Upper and Lower Airway Outcome Measures in Patients With CRSwNP With NSAID-ERD: Pooled Results from the SINUS-24 and SINUS-52 Phase 3 Trials.	Laidlaw T.M. Joaquim M. Canonica W. Bachert C. Han J.K. Zhang M. Lu X. Patel N. Graham N.M.H. Staudinger H. Mannent L.P. Amin N.	World Allergy Organization Journal. Conference: World Allergy Congress 2019. Lyon France. 13(8) (no pagination), 2020. Article Number: 100398. Date of Publication: August 2020.		Exclude	Not asthma
Dupilumab improves upper and lower airway outcome measures in patients with severe chronic rhinosinusitis with nasal polyps and comorbid asthma: Pooled results from the SINUS-24 and SINUS-52 phase 3 studies.	Laidlaw T. Cho S. Maspero J.F. Canonica G.W. Sher L. Bachert C. Han J.K. Mao X. Zhang M. Patel N. Graham N.M.H. Staudinger H. Mannent L.P. Amin N.	American Journal of Respiratory and Critical Care Medicine. Conference: 2019 International Conference of the American Thoracic Society , ATS 2019. Dallas, TX United States. 199(9) (no pagination), 2019. Date of Publication: May 2019.		Exclude	AHR not measured
Dupilumab improves upper and lower airway outcomes in chronic rhinosinusitis with nasal polyps (CRSwNP) with nonsteroidal anti-inflammatory drug-exacerbated respiratory disease (NSAID-ERD): Pooled results from SINUS-24, SINUS-52 phase 3 trials.	Laidlaw T.M. Mullol J. Canonica G.W. Bachert C. Han J.K. Lu X. Patel N. Graham N.M.H. Staudinger H. Mannent L.P. Amin N.	Canadian Journal of Respiratory, Critical Care, and Sleep Medicine. Conference: 13th Annual Canadian Respiratory Conference. Niagara Falls, ON Canada. 4(Supplement 2) (pp 31-32), 2020. Date of Publication: 2020.		Exclude	Not asthma
Dupilumab rapidly and significantly improves lung function and decreases inflammation by 2 weeks after treatment initiation in patients with uncontrolled persistent asthma.	Papi A. Swanson B.N. Staudinger H. Rowe P. Maroni J. Jayawardena S. Hamilton J. Amin N. Pirozzi G. Akinlade B. Graham N.M.H. Teper A.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2017. Washington, DC United States. 195 (no pagination), 2017. Date of Publication: 2017.		Exclude	AHR not measured
Dupilumab suppresses Th2 inflammation in adult asthma and atopic dermatitis.	Swanson B. Ming J. Ren H. Wang L. Wenzel S. Beck L. Diiccio T. Li Y. Belomestnov P. Graham N. Pirozzi G. Hamilton J.	World Allergy Organization Journal. Conference: 2013 WAO Symposium on Immunotherapy and Biologics. Chicago, IL United States. Conference Publication: (var.pagings). 7(SUPPL. 1) (no pagination), 2014. Date of Publication: 03 Feb 2014.		Exclude	AHR not measured
DUPILUMAB UNMASKS EOSINOPHILIC GRANULOMATOSIS WITH POLYANGIITIS.	Murag S. Melehani J. Filsoof D. Nadeau K. Sharon Chinthrajah R.	Chest. Conference: CHEST 2021 Annual Meeting. Virtual, Online. 160(4 Supplement) (pp A8-A9), 2021. Date of Publication: October 2021.		Exclude	Not RCT
Duration of effect of single-dose inhaled fluticasone propionate on AMP-induced bronchoconstriction	Luijk B. Kempsford RD, Wright AM, Zanen P, Lammers JW.	Eur Respir J. 2004 Apr;23(4):559-64. doi: 10.1183/09031936.04.00043504.	10.1183/09031936.04.00043504	Exclude	Not biologic
Dynamic hyperinflation: A treatable trait in asthma.	Van Der Meer A.N.C. De Jong K. Bel E.H. Ten Brinke A.	American Journal of Respiratory and Critical Care Medicine. Conference: 2019 International Conference of the American Thoracic Society , ATS 2019. Dallas, TX United States. 199(9) (no pagination), 2019. Date of Publication: May 2019.		Exclude	Not biologic
Early emergency department treatment of acute asthma with systemic corticosteroids. [Review] [12 refs]	Rowe BH, Spooner C, Ducharme FM, Bretzlaff JA, Bota GW	Cochrane Database of Systematic Reviews. (2):CD002178, 2000		Exclude	Review
Effect of a novel selective inhaled steroid on the allergen-induced early and late asthmatic response in adults with mild asthma: A randomised study.	Bareille P. Allen A. Hardes K. Donald A.	Current Drug Therapy. 8(3) (pp 155-163), 2013. Date of Publication: 2013.		Exclude	Not biologic
Effect of a single dose of salmeterol on the increase in airway eosinophils induced by allergen challenge in asthmatic subjects	Dente FL, Bancalari L, Bacci E, Bartoli ML, Carnevali S, Cianchetti S, Di Franco A, Giannini D, Vagaggini B, Testi R, Paggiaro PL.	Thorax. 1999 Jul;54(7):622-4. doi: 10.1136/thx.54.7.622.	10.1136/thx.54.7.622	Exclude	Not biologic
Effect of anti-IL-13 treatment on airway dimensions in severe asthma.	Brightling C.E. Nordenmark L. Jain M. Piper E. She D. Braddock M. Colice G. Tornling G.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2015. Denver, CO United States. Conference Publication: (var.pagings). 191(MeetingAbstracts) (no pagination), 2015. Date of Publication: 2015.		Exclude	AHR not measured
Effect of anti-IL-13 treatment on airway dimensions in severe asthma: Subgroup analysis.	Brightling C.E. Nordenmark L.H. Jain M. Piper E. She D. Braddock M. Colice G. Tornling G.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2015. Amsterdam Netherlands. Conference Publication: (var.pagings). 46(SUPPL. 59) (no pagination), 2015. Date of Publication: 01 Sep 2015.		Exclude	AHR not measured
Effect of antioxidant supplementation on diesel exhaust (DE)-associated changes in airway reactivity and innate immunity: A controlled crossover exposure study in humans.	Carlsten C. Pui M. MacNutt M. DyBuncio A. Lay J. Alexis N.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2011. Denver, CO United States. Conference Publication: (var.pagings). 183(1 MeetingAbstracts) (no pagination), 2011. Date of Publication: 01 May 2011.		Exclude	Not biologic
Effect of aspirin on airway inflammation and pulmonary function in patients with persistent asthma	Menzies D, Nair A, Meldrum KT, Hopkinson P, Lipworth BJ.	J Allergy Clin Immunol. 2008 May;121(5):1184-1189.e4. doi: 10.1016/j.jaci.2008.01.009. Epub 2008 Mar 4.	10.1016/j.jaci.2008.01.009	Exclude	Not biologic
Effect of azelastine, montelukast, and their combination on allergen-induced bronchoconstriction in asthma	Richter K, Grönke L, Janicki S, Maus J, Jörres RA, Magnussen H.	Pulm Pharmacol Ther. 2008;21(1):61-6. doi: 10.1016/j.pupt.2006.11.005. Epub 2006 Dec 6.	10.1016/j.pupt.2006.11.005	Exclude	Not biologic
Effect of cetirizine on bronchial hyperresponsiveness in patients with seasonal allergic rhinitis and asthma	Aubier M, Neukirch C, Peiffer C, Melac M.	Allergy. 2001 Jan;56(1):35-42. doi: 10.1034/j.1398-9995.2001.00629.x.	10.1034/j.1398-9995.2001.00629.x	Exclude	Not biologic
Effect of formoterol on clinical parameters and lung functions in patients with bronchial asthma: a randomised controlled trial	Akpinarli A, Tuncer A, Saraçlar Y, Sekerel BE, Kalayci O.	Arch Dis Child. 1999 Jul;81(1):45-8. doi: 10.1136/adc.81.1.45.	10.1136/adc.81.1.45	Exclude	Not biologic
Effect of inhaled apocynin on reactive oxygen species concentrations in exhaled breath condensate of asthmatics.	Stefanska J. Sarniak A. Wlodarczyk A. Sokolowska M. Doniec Z. Nowak D. Pawliczak R.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2011. Amsterdam Netherlands. Conference Publication: (var.pagings). 38(SUPPL. 55) (no pagination), 2011. Date of Publication: 01 Sep 2011.		Exclude	Not biologic
Effect of inhaled low molecular weight heparin on methacholine-induced bronchoconstriction	Ceyhan BB, Celikel T.	Int J Clin Pharmacol Ther. 2000 Sep;38(9):446-51. doi: 10.5414/cpp38446.	10.5414/cpp38446	Exclude	Not biologic
Effect of inhaled steroids on airway hyperresponsiveness, sputum eosinophils, and exhaled nitric oxide levels in patients with asthma	van Rensen EL, Straathof KC, Veselic-Charvat MA, Zwinderman AH, Bel EH, Sterk PJ.	Thorax. 1999 May;54(5):403-8. doi: 10.1136/thx.54.5.403.	10.1136/thx.54.5.403	Exclude	Not biologic
Effect of montelukast on time-course of exhaled nitric oxide in asthma: influence of LTC4 synthase A(-444)C polymorphism	Whelan GJ, Blake K, Kissoon N, Duckworth LJ, Wang J, Sylvester JE, Lima JJ.	Pediatr Pulmonol. 2003 Nov;36(5):413-20. doi: 10.1002/ppul.10385.	10.1002/ppul.10385	Exclude	Not biologic
Effect of n-3 polyunsaturated fatty acids in asthma after low-dose allergen challenge	Schubert R, Kitz R, Beermann C, Rose MA, Lieb A, Sommerer PC, Moskovits J, Alberternst H, Böhles HJ, Schulze J, Zielen S.	Int Arch Allergy Immunol. 2009;148(4):321-9. doi: 10.1159/000170386. Epub 2008 Nov 11.	10.1159/000170386	Exclude	Not biologic
Effect of pranlukast on bronchial inflammation in patients with asthma	Yoshida S, Ishizaki Y, Shoji T, Onuma K, Nakagawa H, Nakabayashi M, Akahori K, Hasegawa H, Amayasu H.	Clin Exp Allergy. 2000 Jul;30(7):1008-14. doi: 10.1046/j.1365-2222.2000.00834.x.	10.1046/j.1365-2222.2000.00834.x	Exclude	Not biologic
Effect of prasugrel in patients with asthma: results of PRINA, a randomized, double-blind, placebo-controlled, cross-over study	Lussana F, Di Marco F, Terraneo S, Parati M, Razzari C, Scavone M, Femia EA, Moro A, Centanni S, Cattaneo M.	J Thromb Haemost. 2015 Jan;13(1):136-41. doi: 10.1111/jth.12779. Epub 2014 Dec 16.	10.1111/jth.12779	Exclude	Not biologic
Effect of salmeterol on allergen-induced airway inflammation in mild allergic asthma	Boulet LP, Chakir J, Milot J, Boutet M, Laviolette M.	Clin Exp Allergy. 2001 Mar;31(3):430-7. doi: 10.1046/j.1365-2222.2001.01014.x.	10.1046/j.1365-2222.2001.01014.x	Exclude	Not biologic
Effect of second generation antihistamines on pulmonary function in bronchial asthma: A single blind cross-over clinical trial.	Pushkala S. Gitanjali B.	Australasian Medical Journal. Conference: 4th International Medical Students' Research Conference of the Forum for Medical Students' Research (India). Mumbai India. Conference Publication: (var.pagings). 5(1) (pp 99), 2012. Date of Publication: 2012.		Exclude	Not biologic
Effect of short- and long-acting inhaled beta2-agonists on exhaled nitric oxide in asthmatic patients	Yates DH, Kharitonov SA, Barnes PJ.	Eur Respir J. 1997 Jul;10(7):1483-8. doi: 10.1183/09031936.97.10071483.	10.1183/09031936.97.10071483	Exclude	Not biologic
Effect of slow-release theophylline on nasal antigen challenge in subjects with allergic rhinitis	Aubier M, Neukirch C, Maachi M, Boucara D, Engelstätter R, Steinijans V, Samoyeau R, Dehoux M.	Eur Respir J. 1998 May;11(5):1105-10. doi: 10.1183/09031936.98.11051105.	10.1183/09031936.98.11051105	Exclude	Not biologic
Effect of tezepelumab on airway inflammation in patients with moderate-to-severe uncontrolled asthma: A phase 2, randomized, double-blind, placebo-controlled study (CASCADE).	Diver S.E. Khalfaoui L. Emson C. Wenzel S.E. Menzies-Gow A. Wechsler M. Johnston J. Downie J. Parnes J.R. Megally A. Colice G. Brightling C.E.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2021. Virtual. 203(9) (no pagination), 2021. Date of Publication: May 2021.		Exclude	AHR not measured
EFFECT OF TEZEPELUMAB ON LUNG FUNCTION IN PATIENTS WITH SEVERE, UNCONTROLLED ASTHMA IN THE PHASE 3 NAVIGATOR STUDY.	Israel E. Menzies-Gow A. Colice G. Ambrose C. Hunter G. Cook W. Molfino N. Llanos-Ackert J.-P.	Chest. Conference: CHEST 2021 Annual Meeting. Virtual, Online. 160(4 Supplement) (pp A41-A43), 2021. Date of Publication: October 2021.		Exclude	AHR not measured

Effect of the leukotriene receptor antagonist pranlukast on cellular infiltration in the bronchial mucosa of patients with asthma	Nakamura Y, Hoshino M, Sim JJ, Ishii K, Hosaka K, Sakamoto T.	Thorax. 1998 Oct;53(10):835-41. doi: 10.1136/thx.53.10.835.	10.1136/thx.53.10.835	Exclude	Not biologic
Effect of tralokinumab upon eosinophilic airway inflammation in participants with moderate to severe, uncontrolled asthma (MESOS).	Russell R.J. Fitzgerald J.M. Backer V. Wang M. Braddock M. Nordenmark L.H. Cohen D. Parikh H. Colice G. Brightling C.E.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2018. San Diego, CA United States. 197(MeetingAbstracts) (no pagination), 2018. Date of Publication: 2018.		Exclude	AHR not measured
Effectiveness of the leukotriene receptor antagonist zafirlukast for mild-to-moderate asthma. A randomized, double-blind, placebo-controlled trial	Suissa S, Dennis R, Ernst P, Sheehy O, Wood-Dauphinee S.	Ann Intern Med. 1997 Feb 1;126(3):177-83. doi: 10.7326/0003-4819-126-3-199702010-00001.	10.7326/0003-4819-126-3-199702010-00001	Exclude	Not biologic
Effects of adding a leukotriene antagonist or a long-acting beta(2)-agonist in asthmatic patients with the glycine-16 beta(2)-adrenoceptor genotype	Lipworth BJ, Dempsey OJ, Aziz I, Wilson AM.	Am J Med. 2000 Aug 1;109(2):114-21. doi: 10.1016/s0002-9343(00)00454-x.	10.1016/s0002-9343(00)00454-x	Exclude	Not biologic
Effects of adding either a leukotriene receptor antagonist or low-dose theophylline to a low or medium dose of inhaled corticosteroid in patients with persistent asthma	Dempsey OJ, Fowler SJ, Wilson A, Kennedy G, Lipworth BJ.	Chest. 2002 Jul;122(1):151-9. doi: 10.1378/chest.122.1.151.	10.1378/chest.122.1.151	Exclude	Not biologic
Effects of AMG 157, an anti-thymic stromal lymphopoietin monoclonal antibody, on allergen-induced early and late phase airway responses in subjects with mild atopic asthma.	Gauvreau G.M. O'Byrne P.M. Boulet L.-P. Wang D. Cockcroft D.W. Bigler J. FitzGerald J.M. Boedigheimer M. Davis B.E. Dias C. Gorski K. Smith L. Bautista E. Leigh R. Parnes J.R.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2014. San Diego, CA United States. Conference Publication: (var.pagings). 189(MeetingAbstracts) (no pagination), 2014. Date of Publication: 2014.	10.1164/ajrccm-conference.2014.189.1_MeetingAbstracts.A6667	Exclude	Duplicate abstract
Effects of anti-IgE in asthmatic subjects	Frew AJ.	Thorax. 1998 Aug;53 Suppl 2(Suppl 2):S52-7. doi: 10.1136/thx.53.2008.s52.	10.1136/thx.53.2008.s52	Exclude	Review
Effects of anti-M1 prime monoclonal antibody, MEMP1972A following allergen challenge in patients with mild asthma.	Gauvreau G. Boulet L.-P. Cockcroft D. Davis B. Fitzgerald M. Leigh R. Dahlen B. Mayers I. Scheerens H. Maciuca R. Matthews J. Harris J. O'Byrne P.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2012. Vienna Austria. Conference Publication: (var.pagings). 40(SUPPL. 56) (no pagination), 2012. Date of Publication: 01 Sep 2012.		Exclude	Duplicate abstract
Effects of atorvastatin added to inhaled corticosteroids on lung function and sputum cell counts in atopic asthma	Hothersall EJ, Chaudhuri R, McSharry C, Donnelly I, Lafferty J, McMahon AD, Weir CJ, Meiklejohn J, Sattar N, McInnes I, Wood S, Thomson NC.	Thorax. 2008 Dec;63(12):1070-5. doi: 10.1136/thx.2008.100198. Epub 2008 Aug 29.	10.1136/thx.2008.100198	Exclude	Not biologic
Effects of benralizumab on airway eosinophils in asthmatic patients with sputum eosinophilia	Laviolette M, Gossage DL, Gauvreau G, Leigh R, Olivenstein R, Katial R, Busse WW, Wenzel S, Wu Y, Datta V, Kolbeck R, Molfino NA.	J Allergy Clin Immunol. 2013 Nov;132(5):1086-1096.e5. doi: 10.1016/j.jaci.2013.05.020. Epub 2013 Jul 16.	10.1016/j.jaci.2013.05.020	Exclude	AHR not measured
Effects of budesonide and formoterol on allergen-induced airway responses, inflammation, and airway remodeling in asthma	Kelly MM, O'Connor TM, Leigh R, Otis J, Gwozd C, Gauvreau GM, Gauldie J, O'Byrne PM.	J Allergy Clin Immunol. 2010 Feb;125(2):349-356.e13. doi: 10.1016/j.jaci.2009.09.011. Epub 2009 Dec 6.	10.1016/j.jaci.2009.09.011	Exclude	Not biologic
Effects of fluticasone plus salmeterol versus twice the dose of fluticasone in asthmatic patients	Currie GP, Bates CE, Lee DK, Jackson CM, Lipworth BJ.	Eur J Clin Pharmacol. 2003 May;59(1):11-5. doi: 10.1007/s00228-003-0571-9. Epub 2003 Mar 22.	10.1007/s00228-003-0571-9	Exclude	Not biologic
Effects of fluticasone propionate on inflammatory cells in COPD: an ultrastructural examination of endobronchial biopsy tissue	Gizycki MJ, Hattotuwa KL, Barnes N, Jeffery PK.	Thorax. 2002 Sep;57(9):799-803. doi: 10.1136/thorax.57.9.799.	10.1136/thorax.57.9.799	Exclude	Not biologic
Effects of formoterol on histamine induced plasma exudation in induced sputum from normal subjects	Greiff L, Wollmer P, Andersson M, Svensson C, Persson CG.	Thorax. 1998 Dec;53(12):1010-3. doi: 10.1136/thx.53.12.1010.	10.1136/thx.53.12.1010	Exclude	Not biologic
Effects of inhaled beta agonist and corticosteroid treatment on nuclear transcription factors in bronchial mucosa in asthma	Hancox RJ, Stevens DA, Adcock IM, Barnes PJ, Taylor DR.	Thorax. 1999 Jun;54(6):488-92. doi: 10.1136/thx.54.6.488.	10.1136/thx.54.6.488	Exclude	Not biologic
Effects of inhaled bronchodilators and corticosteroids on exercise induced arterial hypoxaemia in trained male athletes	Hodges AN, Lynn BM, Koehle MS, McKenzie DC.	Br J Sports Med. 2005 Dec;39(12):917-20. doi: 10.1136/bjsm.2005.017806.	10.1136/bjsm.2005.017806	Exclude	Not biologic
Effects of inhaled corticosteroid therapy on expression and DNA-binding activity of nuclear factor kappaB in asthma	Hart L, Lim S, Adcock I, Barnes PJ, Chung KF.	Am J Respir Crit Care Med. 2000 Jan;161(1):224-31. doi: 10.1164/ajrccm.161.1.9809019.	10.1164/ajrccm.161.1.9809019	Exclude	Not biologic
Effects of intranasal salmeterol and fluticasone given alone and in combination in persistent allergic rhinitis.	Lipworth B.J. Short P. Burns P. Nair A.	Annals of Allergy, Asthma and Immunology. 108(1) (pp 54-59), 2012. Date of Publication: January 2012.		Exclude	Not biologic
Effects of ketotifen on symptoms and on bronchial mucosa in patients with atopic asthma	Hoshino M, Nakamura Y, Shin Z, Fukushima Y.	Allergy. 1997 Aug;52(8):814-20. doi: 10.1111/j.1398-9995.1997.tb02152.x.	10.1111/j.1398-9995.1997.tb02152.x	Exclude	Not biologic
Effects of montelukast-desloratadine combination on early and late asthma responses Davis BE, Illamperuma C, Gauvreau GM, et al. Single-dose desloratadine and montelukast and allergen-induced late airway responses. Eur Respir J 2009;33(6):1302-308	Antoniu SA.	Expert Opin Pharmacother. 2009 Oct;10(15):2577-9. doi: 10.1517/14656560903207027.	10.1517/14656560903207027	Exclude	Not biologic
Effects of omalizumab on basophil and mast cell responses using an intranasal cat allergen challenge.	Eckman J.A. Sterba P.M. Kelly D. Alexander V. Liu M.C. Bochner B.S. MacGlashan Jr. D.W. Saini S.S.	Journal of Allergy and Clinical Immunology. 125(4) (pp 889-895.e7), 2010. Date of Publication: April 2010.	10.1016/j.jaci.2009.09.012	Exclude	No relevant data
Effects of omalizumab on changes in pulmonary function induced by controlled cat room challenge	Corren J, Wood RA, Patel D, Zhu J, Yegin A, Dhillon G, Fish JE.	J Allergy Clin Immunol. 2011 Feb;127(2):398-405. doi: 10.1016/j.jaci.2010.09.043.	10.1016/j.jaci.2010.09.043	Exclude	No relevant data
Effects of once-daily formoterol and budesonide given alone or in combination on surrogate inflammatory markers in asthmatic adults	Aziz I, Wilson AM, Lipworth BJ.	Chest. 2000 Oct;118(4):1049-58. doi: 10.1378/chest.118.4.1049.	10.1378/chest.118.4.1049	Exclude	Not biologic
Effects of on-demand beta2-agonist inhalation in moderate-to-severe asthma. A randomized controlled trial	Richter B, Bender R, Berger M.	J Intern Med. 2000 Jun;247(6):657-66. doi: 10.1046/j.1365-2796.2000.00677.x.	10.1046/j.1365-2796.2000.00677.x	Exclude	Not biologic
Effects of orally inhaled budesonide in seasonal allergic rhinitis	Greiff L, Andersson M, Svensson C, Linden M, Wollmer P, Brattsand R, Persson CG.	Eur Respir J. 1998 Jun;11(6):1268-73. doi: 10.1183/09031936.98.11061268.	10.1183/09031936.98.11061268	Exclude	Not biologic
Effects of salmeterol on mucosal inflammation in asthma: a placebo-controlled study	Jeffery PK, Venge P, Gizycki MJ, Egerod I, Dahl R, Faurschou P.	Eur Respir J. 2002 Dec;20(6):1378-85. doi: 10.1183/09031936.02.00542001.	10.1183/09031936.02.00542001	Exclude	Not biologic
Effects of tezepelumab on asthma exacerbations and type 2 biomarkers in patients with severe, uncontrolled asthma with and without nasal polyps: Results from a post-hoc analysis of the phase 2b pathway study.	Emson C. Corren J. Saapa K. Hellqvist A. Parnes J.R. Colice G.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2020. Philadelphia, PA United States. 201(1) (no pagination), 2020. Date of Publication: 2020.		Exclude	AHR not measured
Efficacy and safety of inhaled nebulized sodium nitrite in asthmatic patients	Sriboonyong T, Kawamatawong T, Sriwantana T, Srihirun S, Titapiwatanakun V, Vivithanaporn P, Pornsuriyasak P, Sibmooh N, Kamalaporn H.	Pulm Pharmacol Ther. 2021 Feb;66:101984. doi: 10.1016/j.pupt.2020.101984. Epub 2020 Dec 15.	10.1016/j.pupt.2020.101984	Exclude	Not biologic
Efficacy and safety of RPL554, a dual PDE3 and PDE4 inhibitor, in healthy volunteers and in patients with asthma or chronic obstructive pulmonary disease: findings from four clinical trials	Francioni LG, Diamant Z, Banner KH, Zuiker R, Morelli N, Kamerling IM, de Kam ML, Burggraaf J, Cohen AF, Cazzola M, Calzetta L, Singh D, Spina D, Walker MJ, Page CP.	Lancet Respir Med. 2013 Nov;1(9):714-27. doi: 10.1016/S2213-2600(13)70187-5. Epub 2013 Oct 25.	10.1016/S2213-2600(13)70187-5	Exclude	Not biologic
Efficacy of Andolast in Mild to Moderate Asthma: A Randomized, Controlled, Double-Blind Multicenter Study (The Andast Trial)	Malerba M, D Amato M, Radaeli A, Giacovelli G, Rovati L, Arshad SH, Holgate ST.	Curr Pharm Des. 2015;21(26):3835-43. doi: 10.2174/1381612821666150407101614.	10.2174/1381612821666150407101614	Exclude	Not biologic
Efficacy of anti-interleukin-5 therapy with mepolizumab in patients with asthma: a meta-analysis of randomized placebo-controlled trials	Liu Y, Zhang S, Li DW, Jiang SJ.	PLoS One. 2013;8(3):e59872. doi: 10.1371/journal.pone.0059872. Epub 2013 Mar 27.	10.1371/journal.pone.0059872	Exclude	Meta-analysis
Efficacy of CSJ117 on allergen-induced asthmatic response in mild atopic asthma patients.	Hohlfeld J. Gauvreau G.M. Boulet L.P. Cockcroft D.W. Davis B.E. FitzGerald J.M. Korn S. Kornmann O. Leigh R. Mayers I. Watz H. Grant S. Jain M. Cabanski M. Pertel P. Lecot J. O'Byrne P.	Pneumologie. Conference: 61. Kongress der Deutschen Gesellschaft fur Pneumologie und Beatmungsmedizin e.V.. Virtual. 75(SUPPL 1) (pp S33), 2021. Date of Publication: April 2021.	10.1055/s-0041-1723320	Exclude	Duplicate abstract
Efficacy of dupilumab in chronic rhinosinusitis with nasal polyps and comorbid asthma by baseline biomarkers of type 2 inflammation from the pooled population of the SINUS-24 and SINUS-52 phase 3 trials.	Maspero J.F. Bachert C. Walter Canonica G. Swanson B.N. Cho S.H. Harel S. Jagerschmidt A. Zhang M. Mao X. Mannent L.P. Amin N.	Allergy, Asthma and Clinical Immunology. Conference: Canadian Society of Allergy and Clinical Immunology Annual Scientific Meeting, CSACI 2020. Virtual. 17(SUPPL 1) (no pagination), 2021. Date of Publication: 2021.		Exclude	AHR not measured
Efficacy of dupilumab in chronic rhinosinusitis with nasal polyps and comorbid asthma by baseline biomarkers of type 2 inflammation: SINUS-24 and SINUS-52 phase 3 trials.	Maspero J.F. Bachert C. Canonica G.W. Swanson B.N. Cho S.H. Harel S. Jagerschmidt A. Zhang M. Mao X. Mannent L.P. Amin N.	Clinical and Experimental Allergy. Conference: Annual Meeting of the British Society for Allergy and Clinical Immunology, BSACI 2020. Virtual. 51(1) (pp 173-174), 2021. Date of Publication: January 2021.		Exclude	AHR not measured
Efficacy of leukotriene receptor antagonist in bronchial hyperresponsiveness and hypersensitivity to analgesic in aspirin-intolerant asthma	Yoshida S, Sakamoto H, Ishizaki Y, Onuma K, Shoji T, Nakagawa H, Hasegawa H, Nakabayashi M, Amayasu H.	Clin Exp Allergy. 2000 Jan;30(1):64-70. doi: 10.1046/j.1365-2222.2000.00797.x.	10.1046/j.1365-2222.2000.00797.x	Exclude	Not biologic
EFFICACY OF TEZEPELUMAB IN PATIENTS WITH SEVERE, UNCONTROLLED ASTHMA GROUPED BY BASELINE BMI IN THE NAVIGATOR STUDY.	Chupp G. Menzies-Gow A. Ambrose C. Cook W. Kmita K. Lindsley A. Llanos-Ackert J.-P. Colice G. Lugogo N.	Chest. Conference: CHEST 2021 Annual Meeting. Virtual, Online. 160(4 Supplement) (pp A37-A40), 2021. Date of Publication: October 2021.		Exclude	AHR not measured
Efficacy of zinc supplementation in reducing the severity of childhood asthma exacerbation.	Rerksuppaphol S.	European Journal of Pediatrics. Conference: European Academy of Paediatrics Congress and MasterCourse 2017, EAP 2017. Ljubljana Slovenia. 176(11) (pp 1490), 2017. Date of Publication: November 2017.		Exclude	Not biologic
Emotional reactivity of the airways in asthma: consistency across emotion-induction techniques and emotional qualities	Ritz T, Kullowatz A, Goldman MD, Kanniess F, Magnussen H, Dahme B.	Biol Psychol. 2010 Apr;84(1):74-81. doi: 10.1016/j.biopsycho.2010.02.016. Epub 2010 Mar 6.	10.1016/j.biopsycho.2010.02.016	Exclude	Not biologic
Enantiomer-specific effects of albuterol on airway inflammation in healthy and asthmatic cats	Reinero CR, Delgado C, Spinka C, DeClue AE, Dhand R.	Int Arch Allergy Immunol. 2009;150(1):43-50. doi: 10.1159/000210379. Epub 2009 Apr 2.	10.1159/000210379	Exclude	Not RCT
Eosinophilic granulomatosis with polyangiitis patient characteristics and clinical response to mepolizumab compared to placebo.	Steinfeld J. Mallett S. Brown J. Bradford E.S. Yancey S. Wechsler M.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2018. San Diego, CA United States. 197(MeetingAbstracts) (no pagination), 2018. Date of Publication: 2018.		Exclude	AHR not measured
Eosinophils and eosinophilic cationic protein in induced sputum and blood: effects of budesonide and terbutaline treatment	Aldridge RE, Hancox RJ, Cowant JO, Frampton CM, Town GI, Taylor DR.	Ann Allergy Asthma Immunol. 2002 Nov;89(5):492-7. doi: 10.1016/s1081-1206(10)62087-x.	10.1016/s1081-1206(10)62087-x	Exclude	Not biologic
Evaluation of cytokine modulators for asthma	Hendeles L, Asmus M, Chesrown S.	Paediatr Respir Rev. 2004;5 Suppl A:S107-12. doi: 10.1016/s1526-0542(04)90020-6.	10.1016/s1526-0542(04)90020-6	Exclude	Review
Evaluation of salmeterol or montelukast as second-line therapy for asthma not controlled with inhaled corticosteroids	Wilson AM, Dempsey OJ, Sims EJ, Lipworth BJ.	Chest. 2001 Apr;119(4):1021-6. doi: 10.1378/chest.119.4.1021.	10.1378/chest.119.4.1021	Exclude	Not biologic
Exercise-induced bronchoconstriction and asthma	Dryden DM, Spooner CH, Stickland MK, Vandermeer B, Tjosvold L, Bialy L, Wong K, Rowe BH.	Evid Rep Technol Assess (Full Rep). 2010 Jan;(189):1-154, v-vi.		Exclude	Review
Exhaled nitric oxide in bronchiectasis: the effects of inhaled corticosteroid therapy	Tsang KW, Tan KC, Ho PL, Ooi GC, Khong PL, Leung R, Mak JC, Tipoe GL, Ko C, Lam WK.	Int J Tuberc Lung Dis. 2004 Nov;8(11):1301-7.		Exclude	Not biologic
Exhaled nitric oxide in children with asthma receiving Xolair (omalizumab), a monoclonal anti-immunoglobulin E antibody	Silkoff PE, Romero FA, Gupta N, Townley RG, Milgrom H.	Pediatrics. 2004 Apr;113(4):e308-12. doi: 10.1542/peds.113.4.e308.	10.1542/peds.113.4.e308	Exclude	AHR not measured
Exploring the effects of omalizumab in allergic asthma: an analysis of biomarkers in the EXTRA study	Hanania NA, Wenzel S, Rosén K, Hsieh HJ, Mosesova S, Choy DF, Lal P, Arron JR, Harris JM, Busse W.	Am J Respir Crit Care Med. 2013 Apr 15;187(8):804-11. doi: 10.1164/rccm.201208-1414OC.	10.1164/rccm.201208-1414OC	Exclude	AHR not measured
Fast beneficial systemic anti-inflammatory effects of inhaled budesonide and formoterol on circulating lymphocytes in asthma	Rüdiger JJ, Gencay M, Yang JQ, Bihl M, Tamm M, Roth M.	Respirology. 2013 Jul;18(5):840-7. doi: 10.1111/resp.12104.	10.1111/resp.12104	Exclude	Not biologic
Fevipiprant (QAW039) reduces airway smooth muscle mass in asthma via antagonism of the prostaglandin D2 receptor 2 (Dp2).	Saunders R.M. Kaul H. Berair R. Singapuri A. Chernyavsky I. Chachi L. Biddle M. Sutcliffe A. Laurencin M. Bacher G. Bourne M. Pavord I.D. Wardlaw A. Siddiqui S. Kay R. Brook B.S. Smallwood R. Brightling C.E.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2017. Washington, DC United States. 195 (no pagination), 2017. Date of Publication: 2017.		Exclude	Not biologic
Fluticasone and ibuprofen do not add to the effect of salmeterol on organic dust-induced airway inflammation and bronchial hyper-responsiveness	Strandberg K, Ek A, Palmberg L, Larsson K.	J Intern Med. 2008 Jul;264(1):83-94. doi: 10.1111/j.1365-2796.2008.01928.x. Epub 2008 Feb 21.	10.1111/j.1365-2796.2008.01928.x	Exclude	Not biologic
Formoterol delivered by Turbuhaler: in pediatric asthma	Cheer SM, Warner GT, Easthope SE.	Paediatr Drugs. 2003;5(1):63-8; discussion 69. doi: 10.2165/00128072-200305010-00008.	10.2165/00128072-200305010-00008	Exclude	Review
Four-year follow-up in children with moderate/severe uncontrolled asthma after withdrawal of a 1-year omalizumab treatment	Baena-Cagnani CE, Teijeiro A, Canonica GW.	Curr Opin Allergy Clin Immunol. 2015 Jun;15(3):267-71. doi: 10.1097/ACI.0000000000000161.	10.1097/ACI.0000000000000161	Exclude	Not RCT
Functional endoscopic sinus surgery improved asthma symptoms as well as PEFR and olfaction in patients with nasal polyposis	Ehnhage A, Olsson P, Kölbeck KG, Skedinger M, Dahlén B, Alenius M, Stjärne P; NAFS Study Group.	Allergy. 2009 May;64(5):762-9. doi: 10.1111/j.1398-9995.2008.01870.x. Epub 2009 Feb 2.	10.1111/j.1398-9995.2008.01870.x	Exclude	Not biologic
Gamma tocopherol-enriched supplement reduces sputum eosinophilia and endotoxin-induced sputum neutrophilia in volunteers with asthma	Burbank AJ, Duran CG, Pan Y, Burns P, Jones S, Jiang Q, Yang C, Jenkins S, Wells H, Alexis N, Kesimer M, Bennett WD, Zhou H, Peden DB, Hernandez ML.	J Allergy Clin Immunol. 2018 Apr;141(4):1231-1238.e1. doi: 10.1016/j.jaci.2017.06.029. Epub 2017 Jul 20.	10.1016/j.jaci.2017.06.029	Exclude	Not biologic
Gas exchange response to a PAF receptor antagonist, SR 27417A, in acute asthma: a pilot study	Gómez FP, Marrades RM, Iglesia R, Roca J, Barberà JA, Chung KF, Rodriguez-Roisin RM.	Eur Respir J. 1999 Sep;14(3):622-6. doi: 10.1034/j.1399-3003.1999.14c23.x.	10.1034/j.1399-3003.1999.14c23.x	Exclude	Not biologic
Grass pollen immunotherapy: IL-10 induction and suppression of late responses precedes IgG4 inhibitory antibody activity.	Francis J.N. James L.K. Paraskevopoulos G. Wong C. Calderon M.A. Durham S.R. Till S.J.	Journal of Allergy and Clinical Immunology. 121(5) (pp 1120-1125.e2), 2008. Date of Publication: May 2008.		Exclude	Not biologic
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Heightened response of eosinophilic asthmatic patients to the CRTH2 antagonist OC000459	Pettipher R, Hunter MG, Perkins CM, Collins LP, Lewis T, Baillet M, Steiner J, Bell J, Payton MA.	Allergy. 2014 Sep;69(9):1223-32. doi: 10.1111/all.12451. Epub 2014 Jul 14.	10.1111/all.12451	Exclude	Not biologic
Heterogeneity of FeNO response to inhaled steroid in asthmatic children	Buchvald F, Eiberg H, Bisgaard H.	Clin Exp Allergy. 2003 Dec;33(12):1735-40. doi: 10.1111/j.1365-2222.2003.01822.x.	10.1111/j.1365-2222.2003.01822.x	Exclude	Not biologic
High-Dose Inhaled Salbutamol Does Not Improve 10-km Cycling Time Trial Performance	Koch S, Ahn JR, Koehle MS.	Med Sci Sports Exerc. 2015 Nov;47(11):2373-9. doi: 10.1249/MSS.0000000000000679.	10.1249/MSS.0000000000000679	Exclude	Not RCT
Immunomodulatory and anti-allergy effects of CVT-E002, a patented proprietary extract of North American ginseng.	Ebeling C. Gordon J.R. Adamko D.J. Vethanayagam D. Cave A. Sikora C. Filderman R. Filderman K. Knight A. Keith P. Predy G. Rittenbach K.A. Lutsiak C. Sutherland S.K. Shan J.J.	Journal of Pharmacy and Pharmaceutical Sciences. Conference: Multidisciplinary Approaches to Modern Therapeutics: Joining Forces for a Healthier Tomorrow. An International Symposium Held Jointly by Canadian Society for Pharmaceutical Sciences, CSPS, Canadian Society for Pharmacology and Therapeutics, CSPT, Controlled Release Society, CRS-Canadian Chapter, and Natural Health Products Research Society of Canada, NHPRS. Montreal, QC Canada. Conference Publication: (var.pagings). 14(3) (pp 59s-60s), 2011. Date of Publication: 2011.		Exclude	Not biologic
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Impact of asthma exacerbations on health related quality of life in patients with severe asthma.	Nelsen L.M. Gunsoy N. Cockle S.M. Albers F.C. Jones P.W.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2017. Washington, DC United States. 195 (no pagination), 2017. Date of Publication: 2017.		Exclude	AHR not measured
Impact of baseline clinical asthma characteristics on the response to mepolizumab: a post hoc meta-analysis of two Phase III trials	Lemiere C, Taillé C, Lee JK, Smith SG, Mallett S, Albers FC, Bradford ES, Yancey SW, Liu MC.	Respir Res. 2021 Jun 22;22(1):184. doi: 10.1186/s12931-021-01767-z.	10.1186/s12931-021-01767-z	Exclude	Meta-analysis
Importin-13 genetic variation is associated with improved airway responsiveness in childhood asthma	Raby BA, Van Steen K, Lasky-Su J, Tantisira K, Kaplan F, Weiss ST.	Respir Res. 2009 Jul 20;10(1):67. doi: 10.1186/1465-9921-10-67.	10.1186/1465-9921-10-67	Exclude	Not biologic
Improved activity levels in patients with asthma: A post hoc analysis of omalizumab therapy.	Modena B.D. Greene A. Ko J. Janampally P. Mumneh N. Millette L.A. Holweg C.T.J. Maselli D.J.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2021. Virtual. 203(9) (no pagination), 2021. Date of Publication: May 2021.		Exclude	No relevant data
Ineffectiveness of a four week treatment with the thromboxane synthetase inhibitor, imidazole salycilate, in reducing airway hyperresponsiveness to methacholine in asthmatics	Peccini F, Dottorini ML, Casucci G, Mezzasoma AM, Sorbini CA, Tantucci C.	Monaldi Arch Chest Dis. 1997 Apr;52(2):130-7.		Exclude	Not biologic
Ineffectiveness of a four week treatment with the thromboxane synthetase inhibitor, imidazole salycilate, in reducing airway hyperresponsiveness to methacholine in asthmatics.	Peccini F Dottorini ML Casucci G Mezzasoma AM Sorbini CA Tantucci C	Monaldi Archives for Chest Disease. 52(2):130-7, 1997 Apr.		Exclude	Not biologic
Influence of salmeterol on chronic and allergen-induced airway inflammation in mild allergic asthma: A pilot study.	Boulet L.-P. Turcotte H. Boutet M. Dube J. Gagnon M. Laviolette M.	Current Therapeutic Research - Clinical and Experimental. 58(4) (pp 240-259), 1997. Date of Publication: 1997.		Exclude	Not biologic
Influence of the Chungkookjang on histamine-induced wheal and flare skin response: a randomized, double-blind, placebo controlled trial	Kwon DY, Yang HJ, Kim MJ, Kang HJ, Kim HJ, Ha KC, Back HI, Kim SY, Park EO, Kim MG, Yun SK, Chae SW, Cho BH.	BMC Complement Altern Med. 2011 Dec 5;11:125. doi: 10.1186/1472-6882-11-125.	10.1186/1472-6882-11-125	Exclude	Not biologic
Inhaled apocynin decreases reactive oxygen species concentrations in exhaled breath condensate - Phase I of clinical trial.	Stefanska J. Sarniak A. Wlodarczyk A. Doniec Z. Nowak D. Pawliczak R.	Scandinavian Journal of Immunology. Conference: 39th Meeting of Scandinavian Society for Immunology Jointly with the Baltic Immunological Society. Tallinn Estonia. Conference Publication: (var.pagings). 71(6) (pp 509), 2010. Date of Publication: June 2010.		Exclude	Not biologic
Inhaled beclomethasone dipropionate (BDP) prevents seasonal changes in atopic asthmatics	Ponticiello A, Vatrella A, Parrella R, Romano L, Zofra S, Berlinqieri GM, Bariffi F.	Monaldi Arch Chest Dis. 1997 Apr;52(2):112-7.		Exclude	Not biologic
Inhaled beta2-agonists increase power development in elite athletes.	Hostrup M. Kalsen A. Kreiberg M. Bangsbo J. Backer V.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2013. Barcelona Spain. Conference Publication: (var.pagings). 42(SUPPL. 57) (no pagination), 2013. Date of Publication: 01 Sep 2013.		Exclude	Not biologic
Inhaled corticosteroids and growth of airway function in asthmatic children	Merkus PJ, van Pelt W, van Houwelingen JC, van Essen-Zandvliet LE, Duiverman EJ, Kerrebijn KF, Quanjer PH.	Eur Respir J. 2004 Jun;23(6):861-8. doi: 10.1183/09031936.04.00031504.	10.1183/09031936.04.00031504	Exclude	Not biologic
Inhaled corticosteroids compared to placebo for prevention of exercise induced bronchoconstriction	Koh MS, Tee A, Lasserson TJ, Irving LB.	Cochrane Database Syst Rev. 2007 Jul 18;(3):CD002739. doi: 10.1002/14651858.CD002739.pub3.	10.1002/14651858.CD002739.pub3	Exclude	Review

Inhaled corticosteroids in airway remodelling in COPD.	Soltani A. Sohal S. Reid D. Muller H.K. Weston S. Wood-Baker R. Walters E.H.	Thorax. Conference: British Thoracic Society, BTS Winter Meeting 2009. London United Kingdom. Conference Publication: (var.pagings). 64(SUPPL. 4) (pp A55). 2009. Date of Publication: December 2009.		Exclude	Not biologic
Inhaled corticosteroids increase interleukin-10 but reduce macrophage inflammatory protein-1alpha, granulocyte-macrophage colony-stimulating factor, and interferon-gamma release from alveolar macrophages in asthma	John M, Lim S, Seybold J, Jose P, Robichaud A, O'Connor B, Barnes PJ, Chung KF.	Am J Respir Crit Care Med. 1998 Jan;157(1):256-62. doi: 10.1164/ajrccm.157.1.9703079.	10.1164/ajrccm.157.1.9703079	Exclude	Not biologic
Inhaled steroids compared with disodium cromoglycate in preschool children with episodic viral wheeze	De Baets F, Van Daele S, Franckx H, Vinaimont F.	Pediatr Pulmonol. 1998 Jun;25(6):361-6. doi: 10.1002/(sici)1099-0496(199806)25:6<361::aid-ppul1>3.0.co;2-k.	10.1002/(sici)1099-0496(199806)25:6<361::aid-ppul1>3.0.co;2-k	Exclude	Not biologic
Inhibition of mast cell tryptase by inhaled APC 366 attenuates allergen-induced late-phase airway obstruction in asthma	Krishna MT, Chauhan A, Little L, Sampson K, Hawksworth R, Mant T, Djukanovic R, Lee T, Holgate S.	J Allergy Clin Immunol. 2001 Jun;107(6):1039-45. doi: 10.1067/mai.2001.115631.	10.1067/mai.2001.115631	Exclude	Not biologic
Inhibitory effect of a leukotriene receptor antagonist (montelukast) on neurokinin A-induced bronchoconstriction	Crimi N, Pagano C, Palermo F, Mastruzzo C, Prosperini G, Pistorio MP, Vancheri C.	J Allergy Clin Immunol. 2003 Apr;111(4):833-9. doi: 10.1067/mai.2003.161.	10.1067/mai.2003.161	Exclude	Not biologic
Intraperitoneal mesenchymal stem cell administration ameliorates allergic rhinitis in the murine model	Işık S, Karaman M, Adan A, Kıray M, Bağrıyanık HA, Sözmen ŞÇ, Kozanoğlu İ, Karaman Ö, Baran Y, Uzuner N.	Eur Arch Otorhinolaryngol. 2017 Jan;274(1):197-207. doi: 10.1007/s00405-016-4166-3. Epub 2016 Jul 5.	10.1007/s00405-016-4166-3	Exclude	Not biologic
Investigating the effect of sildenafil on improving lung function and quality of life in the patients with severe asthma	Borsi H, Raji H, Shoushtari MH, Tavakol H, Haghighizadeh MH, Mal-Amir MD.	J Family Med Prim Care. 2019 Jul;8(7):2361-2363. doi: 10.4103/jfmpc.jfmpc_334_19.	10.4103/jfmpc.jfmpc_334_19	Exclude	Not biologic
Investigational medical therapies for recalcitrant nasal polyps.	Rose D.M. Salazar K.	Annals of Allergy, Asthma and Immunology. Conference: 2011 Annual Meeting of the American College of Allergy, Asthma and Immunology. Boston, MA United States. Conference Publication: (var.pagings). 107(5 SUPPL. 1) (pp A122-A123), 2011. Date of Publication: November 2011.		Exclude	Not RCT
Irreversible airway obstruction in childhood asthma? A clinician's viewpoint	König P.	Pediatr Pulmonol. 2002 Apr;33(4):307-10. doi: 10.1002/ppul.10090.	10.1002/ppul.10090	Exclude	Not RCT
Kinetics of TH2 biomarkers in sputum of asthmatics following inhaled allergen	Zuiker RG, Ruddy MK, Morelli N, Mogg R, Rivas VM, van Dyck K, De Lepeleire I, Tanen MR, Boot JD, Kamerling IM, Diamant Z.	Eur Clin Respir J. 2015 May 26;2. doi: 10.3402/ecrj.v2.28319. eCollection 2015.	10.3402/ecrj.v2.28319	Exclude	Not biologic
KIT Inhibition by Imatinib in Patients with Severe Refractory Asthma	Cahill KN, Katz HR, Cui J, Lai J, Kazani S, Crosby-Thompson A, Garofalo D, Castro M, Jarjour N, DiMango E, Erzurum S, Trevor JL, Shenov K, Chinchilli VM, Wechsler ME, Laidlaw TM, Boyce JA, Israel E.	N Engl J Med. 2017 May 18;376(20):1911-1920. doi: 10.1056/NEJMoa1613125.	10.1056/NEJMoa1613125	Exclude	Not biologic
Late Breaking Abstract - Efficacy of CS J117 on allergen-induced asthmatic responses in mild atopic asthma patients.	Gauvreau G. Hohlfeld J. Boulet L.-P. Cockcroft D. Davis B. Fitzgerald J.M. Korn S. Kornmann O. Leigh R. Mayers I. Watz H. Grant S. Jain M. Cabanski M. Pertel P. Jones I. Lecot J. O'Byrne P.	European Respiratory Journal. Conference: European Respiratory Society International Congress, ERS 2020. Virtual. 56(Supplement 64) (no pagination), 2020. Date of Publication: September 2020.	10.1183/13993003.congress-2020.3690	Exclude	Duplicate abstract
Late Breaking Abstract - Efficacy of oral prednisolone in patients with stable severe eosinophilic asthma (SEA) treated with Mepolizumab.	Yang J. Busby J. Heaney L.G. Brightling C.E. Pavord I.D. Borg K. McDowell P.J. Diver S. Shrimanker R. Smith S. Shepherd M. Lee W.N. Chaudhuri R.	European Respiratory Journal. Conference: European Respiratory Society International Congress, ERS 2020. Virtual. 56(Supplement 64) (no pagination), 2020. Date of Publication: September 2020.		Exclude	AHR not measured
Late-breaking abstract: A phase 2a study of benralizumab in adults with COPD.	Brightling C. Bafadhel M. Bleecker E. Panettieri R. She D. Ward C.K. Xu X. Van Der Merwe R.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. Conference Publication: (var.pagings). 44(SUPPL. 58) (no pagination), 2014. Date of Publication: 01 Sep 2014.		Exclude	Not asthma
Late-breaking abstract: Efficacy and safety of multiple doses of QGE031 (ligelizumab) versus omalizumab and placebo in inhibiting the allergen-induced early asthmatic response.	Gauvreau G.M. Boulet L.-P. Leigh R. Cockcroft D.W. Davis B.E. Mayers I. FitzGerald J.M. Dahlen B. Watson R.M. Milot J. Swystun V. Hui L. Lantz A.-S. Bowen M. Arm J. Maahs S. Meiser K. Lowe P. Skerjanec A. Carlsten C. Strandberg K. Killian K.J. Laviolette M. Drollmann A. O'Byrne P.M.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. Conference Publication: (var.pagings). 44(SUPPL. 58) (no pagination), 2014. Date of Publication: 01 Sep 2014.		Exclude	No relevant data
Late-breaking abstract: Reduction in exacerbations with mepolizumab in severe eosinophilic asthma: MENSA study.	Ortega H. Liu M. Pavord I. Brusselle G. FitzGerald J.M. Chetta A. Katz L. Keene O. Yancey S. Chanez P.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. Conference Publication: (var.pagings). 44(SUPPL. 58) (no pagination), 2014. Date of Publication: 01 Sep 2014.		Exclude	AHR not measured
Lebrikizumab in the personalized management of asthma	Thomson NC, Patel M, Smith AD.	Biologics. 2012;6:329-35. doi: 10.2147/BTT.S28666. Epub 2012 Sep 14.	10.2147/BTT.S28666	Exclude	Review
Lebrikizumab reduces serum periostin in asthma patients with elevated baseline periostin.	Scheerens H. Arron J. Choy D. Mosesova S. Lal P. Matthews J.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2012. Vienna Austria. Conference Publication: (var.pagings). 40(SUPPL. 56) (no pagination), 2012. Date of Publication: 01 Sep 2012.		Exclude	AHR not measured
Local Airway Concentration of Anti-Tryptase Antibody (MTPS9579A) Predicts Extent of Tryptase Disruption.	Rymut S. Yoshida K. Sukumaran S. Cai F. Sperinde G. Sverkos V. Banerjee P. Belloni P. Lin J.	Journal of Allergy and Clinical Immunology. Conference: 2020 AAAAI Annual Meeting. Philadelphia United States. 145(2 Supplement) (pp AB172), 2020. Date of Publication: February 2020.		Exclude	No relevant data
Local increase in the number of mast cells and expression of nerve growth factor in the bronchus of asthmatic patients after repeated inhalation of allergen at low-dose	Kassel O, de Blay F, Duvernelle C, Olgart C, Israel-Biet D, Krieger P, Moreau L, Muller C, Pauli G, Frossard N.	Clin Exp Allergy. 2001 Sep;31(9):1432-40. doi: 10.1046/j.1365-2222.2001.01177.x.	10.1046/j.1365-2222.2001.01177.x	Exclude	Not biologic
Long-acting beta 2-agonists. Role in primary care asthma treatment	D'Urzo AD.	Can Fam Physician. 1997 Oct;43:1773-7.		Exclude	Review
Long-term budesonide or nedocromil treatment, once discontinued, does not alter the course of mild to moderate asthma in children and adolescents	Strunk RC, Sternberg AL, Szefler SJ, Zeiger RS, Bender B, Tonascia J; Childhood Asthma Management Program (CAMP) Research Group.	J Pediatr. 2009 May;154(5):682-7. doi: 10.1016/j.jpeds.2008.11.036. Epub 2009 Jan 23.	10.1016/j.jpeds.2008.11.036	Exclude	Not biologic
Long-term effect of budesonide on hypothalamic-pituitary-adrenal axis function in children with mild to moderate asthma	Bacharier LB, Raissy HH, Wilson L, McWilliams B, Strunk RC, Kelly HW.	Pediatrics. 2004 Jun;113(6):1693-9. doi: 10.1542/peds.113.6.1693.	10.1542/peds.113.6.1693	Exclude	Not biologic
Low-dose mepolizumab effectively treats chronic relapsing eosinophilic granulomatosis with polyangiitis.	Thompson G. Vasilevski N. Ryan M. Baltic S. Thompson P.	Respirology. Conference: Australia and New Zealand Society of Respiratory Science and the Thoracic Society of Australia and New Zealand Annual Scientific Meeting , ANZSRS/TSANZ 2018. Adelaide, SA Australia. 23(Supplement 1) (pp 178), 2018. Date of Publication: March 2018.		Exclude	AHR not measured
Lung Computational Models and the Role of the Small Airways in Asthma	Foy BH, Soares M, Bordas R, Richardson M, Bell A, Singapuri A, Hargadon B, Brightling C, Burrowes K, Kay D, Owers-Bradley J, Siddiqui S.	Am J Respir Crit Care Med. 2019 Oct 15;200(8):982-991. doi: 10.1164/rccm.201812-2322OC.	10.1164/rccm.201812-2322OC	Exclude	Not RCT
Macrolides versus placebo for chronic asthma	Undela K, Goldsmith L, Kew KM, Ferrara G.	Cochrane Database Syst Rev. 2021 Nov 22;11(11):CD002997. doi: 10.1002/14651858.CD002997.pub5.	10.1002/14651858.CD002997.pub5	Exclude	Not biologic
Mast-cell stabilising agents to prevent exercise-induced bronchoconstriction	Spooner CH, Spooner GR, Rowe BH.	Cochrane Database Syst Rev. 2003;(4):CD002307. doi: 10.1002/14651858.CD002307.	10.1002/14651858.CD002307	Exclude	Review
Medical history in patients with refractory or unexplained chronic cough.	Dicpinigaitis P.V. Birring S.S. Mcgarvey L.P. Morice A.H. Pavord I.D. Smith J.A. La Rosa C. Li Q. Martin Nguyen A. Schelfhout J. Tzontcheva A. Muccino D.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: European Academy of Allergy and Clinical Immunology Hybrid Congress, EAACI 2021. Krakow Poland. 76(SUPPL 110) (pp 599-600), 2021. Date of Publication: November 2021.		Exclude	Not asthma
Medicinal benefits of Nigella sativa in bronchial asthma: A literature review	Koshak A, Koshak E, Heinrich M.	Saudi Pharm J. 2017 Dec;25(8):1130-1136. doi: 10.1016/j.jsps.2017.07.002. Epub 2017 Jul 11.	10.1016/j.jsps.2017.07.002	Exclude	Review
Mepolizumab (anti-IL-5) reduces exacerbations in patients with refractory eosinophilic asthma.	Pavord I. Korn S. Howarth P. Bleecker E. Buhl R. Keene O. Ortega H. Chanez P.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2012. Vienna Austria. Conference Publication: (var.pagings). 40(SUPPL. 56) (no pagination), 2012. Date of Publication: 01 Sep 2012.		Exclude	AHR not measured
Mepolizumab for prednisone-dependent asthma with sputum eosinophilia	Nair P, Pizzichini MM, Kjarsgaard M, Inman MD, Efthimiadis A, Pizzichini E, Hargreave FE, O'Byrne PM.	N Engl J Med. 2009 Mar 5;360(10):985-93. doi: 10.1056/NEJMoa0805435.	10.1056/NEJMoa0805435	Exclude	AHR not measured
Mepolizumab for severe eosinophilic asthma (DREAM): a multicentre, double-blind, placebo-controlled trial	Pavord ID, Korn S, Howarth P, Bleecker ER, Buhl R, Keene ON, Ortega H, Chanez P.	Lancet. 2012 Aug 18;380(9842):651-9. doi: 10.1016/S0140-6736(12)60988-X.	10.1016/S0140-6736(12)60988-X	Exclude	AHR not measured
Mepolizumab for the treatment of chronic asthma. a meta-analysis of randomized placebo-controlled trials.	Kanukula R. Likhar N. Dang A.	Value in Health. Conference: ISPOR 19th Annual European Congress. Vienna Austria. 19(7) (pp A876), 2016. Date of Publication: November 2016.		Exclude	Meta-analysis
Mepolizumab in copd with eosinophilic bronchitis: A randomized clinical trial.	Nair P.K. Dasgupta A. Kjarsgaard M. Capaldi D. Radford K. Aleman F.P. Parraga G. O'Byrne P.M.	Journal of Allergy and Clinical Immunology. Conference: 2016 Annual Meeting of the American Academy of Allergy, Asthma and Immunology, AAAAI 2016. Los Angeles, CA United States. Conference Publication: (var.pagings). 137(2 SUPPL. 1) (pp AB392), 2016. Date of Publication: February 2016.		Exclude	Not asthma
Mepolizumab versus placebo for asthma	Powell C, Milan SJ, Dwan K, Bax L, Walters N.	Cochrane Database Syst Rev. 2015 Jul 27;(7):CD010834. doi: 10.1002/14651858.CD010834.pub2.	10.1002/14651858.CD010834.pub2	Exclude	Review
Mepolizumab: 240563, anti-IL-5 monoclonal antibody - GlaxoSmithKline, anti-interleukin-5 monoclonal antibody - GlaxoSmithKline, SB 240563		Drugs R D. 2008;9(2):125-30. doi: 10.2165/00126839-200809020-00006.	10.2165/00126839-200809020-00006	Exclude	Review
Methacholine challenge tests: sample sizes required in crossover trials	Neuhäuser M, Jöckel KH.	Int J Clin Pharmacol Ther. 2006 Jan;44(1):27-30. doi: 10.5414/cpp44027.	10.5414/cpp44027	Exclude	No relevant data
Mild experimental exacerbation of asthma induced by individualised low-dose repeated allergen exposure. A double-blind evaluation	Palmqvist M, Pettersson K, Sjöstrand M, Andersson B, Löwhagen O, Lötvall J.	Respir Med. 1998 Oct;92(10):1223-30. doi: 10.1016/s0954-6111(98)90425-5.	10.1016/s0954-6111(98)90425-5	Exclude	Not biologic
Model-based clinical pharmacology profiling and exposure-response relationships of the efficacy and biomarker of lebrikizumab in patients with moderate-to-severe asthma	Zhu R, Zheng Y, Dirks NL, Vadhavkar S, Jin JY, Peng K, Holweg CTJ, Olsson J, Matthews JG, Putnam WS.	Pulm Pharmacol Ther. 2017 Oct;46:88-98. doi: 10.1016/j.pupt.2017.08.010. Epub 2017 Aug 24.	10.1016/j.pupt.2017.08.010	Exclude	Not RCT
Monoclonal anti-interleukin-5 treatment suppresses eosinophil but not T-cell functions	Büttner C, Lun A, Splettstoesser T, Kunkel G, Renz H.	Eur Respir J. 2003 May;21(5):799-803. doi: 10.1183/09031936.03.00027302.	10.1183/09031936.03.00027302	Exclude	AHR not measured
Montelukast 10 mg improves nasal function and nasal response to aspirin in ASA-sensitive asthmatics: a controlled study vs placebo	Micheletto C, Tognella S, Visconti M, Pomari C, Trevisan F, Dal Negro RW.	Allergy. 2004 Mar;59(3):289-94. doi: 10.1046/j.1398-9995.2003.00351.x.	10.1046/j.1398-9995.2003.00351.x	Exclude	Not biologic
Montelukast does not affect exercise performance at subfreezing temperature in highly trained non-asthmatic endurance athletes	Sue-Chu M, Sandsund M, Holand B, Bjermer L.	Int J Sports Med. 2000 Aug;21(6):424-8. doi: 10.1055/s-2000-3838.	10.1055/s-2000-3838	Exclude	Not biologic
Montelukast improves regional air-trapping due to small airways obstruction in asthma	Zeidler MR, Kleerup EC, Goldin JG, Kim HJ, Truong DA, Simmons MD, Sayre JW, Liu W, Elashoff R, Tashkin DP.	Eur Respir J. 2006 Feb;27(2):307-15. doi: 10.1183/09031936.06.00005605.	10.1183/09031936.06.00005605	Exclude	Not biologic
Montelukast in pediatric asthma management	Walia M, Lodha R, Kabra SK.	Indian J Pediatr. 2006 Apr;73(4):275-82. doi: 10.1007/BF02825818.	10.1007/BF02825818	Exclude	Review
Montelukast versus fluticasone: effects on lung function, airway responsiveness and inflammation in moderate asthma	Kanniess F, Richter K, Böhme S, Jörres RA, Magnussen H.	Eur Respir J. 2002 Oct;20(4):853-8. doi: 10.1183/09031936.02.00244602.	10.1183/09031936.02.00244602	Exclude	Not biologic
NAPPREB study protocol: A pivotal clinical trial to investigate clinical efficacy and potential response biomarkers to Benralizumab treatment in chronic rhinosinusitis with nasal polyps.	Heffler E. Puggioni F. Mauri P. Riccio A.M. Racca F. Malvezzi L. Spriano G. Paoletti G. De Luca F. Canonica G.W.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: European Academy of Allergy and Clinical Immunology Congress. Lisbon Portugal. 74(Supplement 106) (pp 889), 2019. Date of Publication: August 2019.		Exclude	Not asthma
NAVIGATOR: a phase 3 multicentre, randomized, double-blind, placebo-controlled, parallel-group trial to evaluate the efficacy and safety of tezepelumab in adults and adolescents with severe, uncontrolled asthma	Menzies-Gow A, Colice G, Griffiths JM, Almqvist G, Ponnarambil S, Kaur P, Ruberto G, Bowen K, Hellqvist Å, Mo M, Garcia Gil E.	Respir Res. 2020 Oct 13;21(1):266. doi: 10.1186/s12931-020-01526-6.	10.1186/s12931-020-01526-6	Exclude	AHR not measured
Nedocromil sodium for preventing exercise-induced bronchoconstriction	Spooner CH, Saunders LD, Rowe BH.	Cochrane Database Syst Rev. 2000;(2):CD001183. doi: 10.1002/14651858.CD001183.	10.1002/14651858.CD001183	Exclude	Review
Nedocromil sodium in obstructive airways disease: effect on symptoms and plasma protein leakage in sputum	Schoonbrood DF, Out TA, Hart AA, Habets FJ, Roos CM, Jansen HM.	Eur Respir J. 1997 Jul;10(7):1500-6. doi: 10.1183/09031936.97.10071500.	10.1183/09031936.97.10071500	Exclude	Not biologic
Neurocognitive functioning in children with mild and moderate asthma in the childhood asthma management program. The Childhood Asthma Management Program (CAMP) Research Group	Annett RD, Aylward EH, Lapidus J, Bender BG, DuHamel T.	J Allergy Clin Immunol. 2000 Apr;105(4):717-24. doi: 10.1067/mai.2000.105226.	10.1067/mai.2000.105226	Exclude	No relevant data
New therapies for non-CF bronchiectasis.	Byrnes C.	Pediatric Pulmonology. Conference: 17th International Congress of Pediatric Pulmonology, CIPP 2018. Toledo Spain. 53(Supplement 1) (pp S42-S43), 2018. Date of Publication: June 2018.		Exclude	Review
NO in exhaled air of asthmatic children is reduced by the leukotriene receptor antagonist montelukast	Bisgaard H, Loland L, Oj JA.	Am J Respir Crit Care Med. 1999 Oct;160(4):1227-31. doi: 10.1164/ajrccm.160.4.9903004.	10.1164/ajrccm.160.4.9903004	Exclude	Not biologic
Oil supplementation with a special combination of n-3 and n-6 long-chain polyunsaturated fatty acids does not protect for exercise induced asthma: a double-blind placebo-controlled trial	Dreßler M, Fussbroich D, Böhler L, Herrmann E, Benker N, Tytyk M, Schulze J, Schubert R, Beermann C, Zielen S.	Lipids Health Dis. 2020 Jul 13;19(1):167. doi: 10.1186/s12944-020-01343-2.	10.1186/s12944-020-01343-2	Exclude	Not biologic
Omalizumab for asthma in adults and children	Normansell R, Walker S, Milan SJ, Walters EH, Nair P.	Cochrane Database Syst Rev. 2014 Jan 13;(1):CD003559. doi: 10.1002/14651858.CD003559.pub4.	10.1002/14651858.CD003559.pub4	Exclude	Review
Omalizumab in allergic eosinophilic asthma and lung eosinophil numbers: A 78-week randomized controlled trial.	Djukanovic R. Wilson S.J. Castro M. Leigh R. Sutherland E.R. Canvin J. Peachey G. Ackrill J. Georgiou P. Chen C.-W.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2013. Barcelona Spain. Conference Publication: (var.pagings). 42(SUPPL. 57) (no pagination), 2013. Date of Publication: 01 Sep 2013.		Exclude	AHR not measured
Omalizumab in Asthma with Fixed Airway Obstruction: Post Hoc Analysis of EXTRA	Hanania NA, Fortis S, Haselkorn T, Gupta S, Mumneh N, Yoo B, Holweg CTJ, Chipps BE.	J Allergy Clin Immunol Pract. 2021 Aug 19:S2213-2198(21)00905-3. doi: 10.1016/j.jaip.2021.08.006. Online ahead of print.	10.1111/cts.13163	Exclude	AHR not measured
Omalizumab in patients with severe asthma and persistent sputum eosinophilia	Mukherjee M, Kjarsgaard M, Radford K, Huang C, Leigh R, Dorscheid DR, Lemiere C, Boulet LP, Waserman S, Martin J, Nair P.	Allergy Asthma Clin Immunol. 2019 Apr 3;15:21. doi: 10.1186/s13223-019-0337-2. eCollection 2019.	10.1186/s13223-019-0337-2	Exclude	AHR not measured
Omalizumab is effective in allergic and nonallergic patients with nasal polyps and asthma	Gevaert P, Calus L, Van Zele T, Blomme K, De Ruyck N, Bauters W, Hellings P, Brusselle G, De Bacquer D, van Cauwenberge P, Bachert C.	J Allergy Clin Immunol. 2013 Jan;131(1):110-6.e1. doi: 10.1016/j.jaci.2012.07.047. Epub 2012 Sep 27.	10.1016/j.jaci.2012.07.047	Exclude	AHR not measured
Omalizumab: a review of its use in the management of allergic asthma	Bang LM, Plosker GL.	Treat Respir Med. 2004;3(3):183-99. doi: 10.2165/00151829-200403030-00006.	10.2165/00151829-200403030-00006	Exclude	Review
Onset of Effect, Changes in Airflow Obstruction and Lung Volume, and Health-Related Quality of Life Improvements with Benralizumab for Patients with Severe Eosinophilic Asthma: Phase IIIb Randomized. Controlled Trial (SOLANA)	Panettieri RA Jr, Welte T, Shenoy KV, Korn S, Jandl M, Kerwin EM, Feijoo R, Barker P, Olsson RF, Martin UJ; SOLANA Study Investigators.	J Asthma Allergy. 2020 Feb 17;13:115-126. doi: 10.2147/JAA.S240044. eCollection 2020.	10.2147/JAA.S240044	Exclude	AHR not measured
Particle size and small airway effects of mometasone furoate delivered by dry powder inhaler	Berger R, Berger WE.	Allergy Asthma Proc. 2013 Jan-Feb;34(1):52-8. doi: 10.2500/aap.2013.34.3648.	10.2500/aap.2013.34.3648	Exclude	Not biologic
Pathophysiological role of leukotrienes in dermatological diseases: potential therapeutic implications	Wedi B, Kapp A.	BioDrugs. 2001;15(11):729-43. doi: 10.2165/00063030-200115110-00004.	10.2165/00063030-200115110-00004	Exclude	Not biologic
Patient characteristics predictive ofomalizumab response in extra.	Dorenbaum A. Trzaskoma B. Haselkorn T. Mink D. Chen H. Solari P.	Annals of Allergy, Asthma and Immunology. Conference: 2012 Annual Meeting of the American College of Allergy, Asthma and Immunology. Anaheim, CA United States. Conference Publication: (var.pagings). 109(SUPPL. 5) (pp A54), 2012. Date of Publication: November 2012.		Exclude	AHR not measured
Patients with asthma benefit from concomitant therapy with cineole: a placebo-controlled, double-blind trial	Worth H, Dethlefsen U.	J Asthma. 2012 Oct;49(8):849-53. doi: 10.3109/02770903.2012.717657.	10.3109/02770903.2012.717657	Exclude	Not biologic
Petasites hybridus extract (Ze 339) as an alternative, innovative treatment of seasonal allergic rhinitis.	Dumitru F. Schmidt-Weber C. Shamji M. Durham S. Hindersin S. Scheckenbach K. Wagenmann M. Klenzner T. Greve J. Zimmermann C. Zahner C. Drewe J. Chaker A.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: 30th Congress of the European Academy of Allergy and Clinical Immunology. Istanbul Turkey. Conference Publication: (var.pagings). 66(SUPPL. 94) (pp 360-361), 2011. Date of Publication: June 2011.		Exclude	Not biologic
Pharmacokinetics and pharmacodynamics of itepekimab in healthy adults and patients with asthma: Phase I first-in-human and first-in-patient trials	Kosloski MP, Kalliolias GD, Xu CR, Harel S, Lai CH, Zheng W, Davis JD, Kamal MA.	Clin Transl Sci. 2021 Sep 15. doi: 10.1111/cts.13157. Online ahead of print.	10.1111/cts.13157	Exclude	No relevant data
Pharmacological effect of lysozyme for COPD and bronchial asthma with sputum: A randomized, placebo-controlled, cross-over study.	Ohbayashi H. Setoguchi Y. Fukuchi Y. Shibata K. Sakata Y. Arai T.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. Conference Publication: (var.pagings). 44(SUPPL. 58) (no pagination), 2014. Date of Publication: 01 Sep 2014.		Exclude	Not biologic
Pharmacological interventions. Childhood asthma	Pedersen S. Szefler S.	Eur Respir J Suppl. 1998 Jul;27:40s-45s.		Exclude	Review
Phase 1 trial of a novel chemokine inhibitor.	Renner A. Marth K. Schmutz H. Romanova J. Ferko B. Pohl W.	European Respiratory Journal. Conference: 29th International Congress of the European Respiratory Society, ERS. Madrid Spain. 54(Supplement 63) (no pagination), 2019. Date of Publication: September 2019.		Exclude	Not biologic
Phase iii evaluation of the efficacy and safety of pt027 (Budesonide/albuterol PMDI) compared to placebo PMDI on exercise-induced bronchoconstriction in adult and adolescent subjects with asthma: The tyree study.	Laforce C.F. Chipps B.E. Albers F.C. Reilly L. Johnsson E. Andrews H. Cappelletti C. Maes A. Papi A.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2021. Virtual. 203(9) (no pagination), 2021. Date of Publication: May 2021.		Exclude	Not biologic
Phosphodiesterase 4 Inhibitors in Allergic Rhinitis/Rhinosinusitis	Janosova V, Calkovsky V, Pedan H, Behanova E, Hajtman A, Calkovska A.	Front Pharmacol. 2020 Jul 22;11:1135. doi: 10.3389/fphar.2020.01135. eCollection 2020.	10.3389/fphar.2020.01135	Exclude	Review
Population-based efficacy modeling of omalizumab in patients with severe allergic asthma inadequately controlled with standard therapy	Zhu R, Zheng Y, Putnam WS, Visich J, Eisner MD, Matthews JG, Rosen KE, D'Argenio DZ.	AAPS J. 2013 Apr;15(2):559-70. doi: 10.1208/s12248-013-9463-9. Epub 2013 Feb 15.	10.1208/s12248-013-9463-9	Exclude	AHR not measured
Possible anti-inflammatory effect of salmeterol against interleukin-8 and neutrophil activation in asthma in vivo	Reid DW, Ward C, Wang N, Zheng L, Bish R, Orsida B, Walters EH.	Eur Respir J. 2003 Jun;21(6):994-9. doi: 10.1183/09031936.03.00109702.	10.1183/09031936.03.00109702	Exclude	Not biologic
Possible Protective Effect of Omalizumab on Lung Function Decline in Patients Experiencing Asthma Exacerbations	Busse WW, Szefler SJ, Haselkorn T, Iqbal A, Ortiz B, Lanier BQ, Chipps BE.	J Allergy Clin Immunol Pract. 2021 Mar;9(3):1201-1211. doi: 10.1016/j.jaip.2020.10.027. Epub 2020 Oct 24.	10.1016/j.jaip.2020.10.027	Exclude	AHR not measured
Predictive and pharmacodynamic biomarkers of interleukin-13 blockade: Effect of lebrikizumab on late phase asthmatic response to allergen challenge.	Scheerens H. Arron J.R. Su Z. Zheng Y. Putnam W. Erickson R.W. Choy D.F. Lee J.H. Harris J.M. Jarjour N.N. Matthews J.G.	Journal of Allergy and Clinical Immunology. Conference: 2011 American Academy of Allergy, Asthma and Immunology, AAAAI Annual Meeting. San Francisco, CA United States. Conference Publication: (var.pagings). 127(2 SUPPL. 1) (pp AB164), 2011. Date of Publication: February 2011.	10.1016/j.jaci.2010.12.651	Exclude	No relevant data

Predictors of remitting, periodic, and persistent childhood asthma	Covar RA, Strunk R, Zeiger RS, Wilson LA, Liu AH, Weiss S, Tonascia J, Spahn JD, Szefler SJ; Childhood Asthma Management Program Research Group.	J Allergy Clin Immunol. 2010 Feb;125(2):359-366.e3. doi: 10.1016/j.jaci.2009.10.037.	10.1016/j.jaci.2009.10.037	Exclude	Not biologic
Prolonged protection of the new inhaled corticosteroid fluticasone furoate against AMP hyperresponsiveness in patients with asthma	van den Berge M, Luijk B, Bareille P, Dallow N, Postma DS, Lammers JW.	Allergy. 2010 Dec;65(12):1531-5. doi: 10.1111/j.1398-9995.2010.02414.x.	10.1111/j.1398-9995.2010.02414.x	Exclude	Not biologic
Protein carbonyl and sputum eosinophil number decrease with alpha-lipoic acid adjuvant therapy in asthma patients.	Vazquez-Armenta G. Barragan-Alvarez C. Loza-Valdes A. Ramos-Marquez M.E. Siller-Lopez F.	Free Radical Biology and Medicine. Conference: 19th Annual Meeting of the Society for Free Radical Biology and Medicine, SFRBM's 2012. San Diego, CA United States. Conference Publication: (var.pagings). 53(SUPPL. 2) (pp S117), 2012. Date of Publication: 01 Nov 2012.		Exclude	Not biologic
Randomised placebo-controlled study of the effect of paracetamol on asthma severity in adults	Ioannides SJ, Williams M, Jefferies S, Perrin K, Weatherall M, Siebers R, Crane J, Patel M, Travers J, Shirtcliffe P, Beasley R.	BMJ Open. 2014 Feb 12;4(2):e004324. doi: 10.1136/bmjopen-2013-004324.	10.1136/bmjopen-2013-004324	Exclude	Not biologic
Randomized controlled phase 2a study results using anti IL-33 in food allergy.	Liu C. Chinthrajah S. Long A. Luiy S. Londei M. Nadeau K.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: European Academy of Allergy and Clinical Immunology Congress. Lisbon Portugal. 74(Supplement 106) (pp 201), 2019. Date of Publication: August 2019.		Exclude	Not asthma
Randomized trial of inhaled flunisolide versus placebo among asthmatic patients discharged from the emergency department	Brenner BE, Chavda KK, Camargo CA Jr.	Ann Emerg Med. 2000 Nov;36(5):417-26. doi: 10.1067/mem.2000.110824.	10.1067/mem.2000.110824	Exclude	Not biologic
Randomized, double-blind, placebo-controlled, multicenter phase 2A study to evaluate the effect of a humanized interleukin-9 monoclonal antibody (MEDI-528) on exercise-induced bronchospasm.	Parker J. Brazinsky S. Miller D.S. Nayak A. Korenblat P.E. Sari S. White B. Molfino N.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2010. New Orleans, LA United States. Conference Publication: (var.pagings). 181(1 MeetingAbstracts) (no pagination), 2010. Date of Publication: 01 May 2010.	10.1164/ajrccm-conference.2010.181.1_MeetingAbstracts.A5394	Exclude	EAR, LAR or AHR not measured
Rapid effect of inhaled fluticasone propionate on airway responsiveness to adenosine 5'-monophosphate in mild asthma	Ketchell RI, Jensen MW, Lumley P, Wright AM, Allenby MI, O'connor BJ.	J Allergy Clin Immunol. 2002 Oct;110(4):603-6. doi: 10.1067/mai.2002.128486.	10.1067/mai.2002.128486	Exclude	Not biologic
Rapid effects of extrafine beclomethasone dipropionate/formoterol fixed combination inhaler on airway inflammation and bronchoconstriction in asthma: a randomised controlled trial	O'Connor BJ, Collarini S, Poli G, Brindicci C, Spinola M, Acerbi D, Barnes PJ, Leaker B.	BMC Pulm Med. 2011 Dec 21;11:60. doi: 10.1186/1471-2466-11-60.	10.1186/1471-2466-11-60	Exclude	Not biologic
RAPID IMPROVEMENT IN MORNING AND EVENING PEAK EXPIRATORY FLOW IN PATIENTS WITH SEVERE, UNCONTROLLED ASTHMA TREATED WITH TEZEPELUMAB.	Israel E. Ambrose C. Hunter G. Cook W. Llanos-Ackert J.-P. Ponnarambil S. Chupp G.	Chest. Conference: CHEST 2021 Annual Meeting. Virtual, Online. 160(4 Supplement) (pp A34-A36), 2021. Date of Publication: October 2021.		Exclude	AHR not measured
Recent Developments In Bronchial Thermoplasty For Severe Asthma	Thomson NC.	J Asthma Allergy. 2019 Nov 19;12:375-387. doi: 10.2147/JAA.S200912. eCollection 2019.	10.2147/JAA.S200912	Exclude	Review
Reduction of eosinophilic inflammation in the airways of patients with asthma using montelukast	Minoguchi K, Kohno Y, Minoguchi H, Kihara N, Sano Y, Yasuhara H, Adachi M.	Chest. 2002 Mar;121(3):732-8. doi: 10.1378/chest.121.3.732.	10.1378/chest.121.3.732	Exclude	Not biologic
Repeatability of allergen-induced airway inflammation	Gauvreau GM, Watson RM, Rerecich TJ, Baswick E, Inman MD, O'Byrne PM.	J Allergy Clin Immunol. 1999 Jul;104(1):66-71. doi: 10.1016/s0091-6749(99)70115-6.	10.1016/s0091-6749(99)70115-6	Exclude	No relevant data
Repeated dosing effects of mediator antagonists in inhaled corticosteroid-treated atopic asthmatic patients	Lee DK, Jackson CM, Haggart K, Lipworth BJ.	Chest. 2004 Apr;125(4):1372-7. doi: 10.1378/chest.125.4.1372.	10.1378/chest.125.4.1372	Exclude	Not biologic
Reslizumab for poorly controlled, eosinophilic asthma: a randomized, placebo-controlled study	Castro M, Mathur S, Hargreave F, Boulet LP, Xie F, Young J, Wilkins HJ, Henkel T, Nair P; Res-5-0010 Study Group.	Am J Respir Crit Care Med. 2011 Nov 15;184(10):1125-32. doi: 10.1164/rccm.201103-0396OC. Epub 2011 Aug 18.	10.1164/rccm.201103-0396OC	Exclude	AHR not measured
Reslizumab in Eosinophilic Asthma: A Review	Deeks ED, Brusselle G.	Drugs. 2017 May;77(7):777-784. doi: 10.1007/s40265-017-0740-2.	10.1007/s40265-017-0740-2	Exclude	Review
Risankizumab in Severe Asthma - A Phase 2a, Placebo-Controlled Trial	Brightling CE, Nair P, Cousins DJ, Louis R, Singh D.	N Engl J Med. 2021 Oct 28;385(18):1669-1679. doi: 10.1056/NEJMoa2030880.	10.1056/NEJMoa2030880	Exclude	No relevant data
Roflumilast attenuates allergen-induced inflammation in mild asthmatic subjects	Gauvreau GM, Boulet LP, Schmid-Wirlitsch C, Côté J, Duong M, Killian KJ, Milot J, Deschesnes F, Strinich T, Watson RM, Bredenbröker D, O'Byrne PM.	Respir Res. 2011 Oct 26;12(1):140. doi: 10.1186/1465-9921-12-140.	10.1186/1465-9921-12-140	Exclude	Not biologic
Roflumilast for asthma: Efficacy findings in mechanism of action studies	Bardin P, Kanniess F, Gauvreau G, Bredenbröker D, Rabe KF.	Pulm Pharmacol Ther. 2015 Dec;35 Suppl:S4-10. doi: 10.1016/j.pupt.2015.08.006. Epub 2015 Aug 19.	10.1016/j.pupt.2015.08.006	Exclude	Not biologic
Roflumilast, a phosphodiesterase 4 inhibitor, reduces airway hyperresponsiveness after allergen challenge	Louw C, Williams Z, Venter L, Leichtl S, Schmid-Wirlitsch C, Bredenbroker D, Bardin PG.	Respiration. 2007;74(4):411-7. doi: 10.1159/000095677. Epub 2006 Sep 5.	10.1159/000095677	Exclude	Not biologic
Roflumilast, an oral, once-daily phosphodiesterase 4 inhibitor, attenuates allergen-induced asthmatic reactions	van Schalkwyk E, Strydom K, Williams Z, Venter L, Leichtl S, Schmid-Wirlitsch C, Bredenbröker D, Bardin PG.	J Allergy Clin Immunol. 2005 Aug;116(2):292-8. doi: 10.1016/j.jaci.2005.04.023.	10.1016/j.jaci.2005.04.023	Exclude	Not biologic
Role of autophagy in regulating interleukin-10 and the responses to corticosteroids and statins in asthma	Maneechotesuwan K, Kasetsinsombat K, Wongkajornsilp A, Barnes PJ.	Clin Exp Allergy. 2021 Dec;51(12):1553-1565. doi: 10.1111/cea.13825. Epub 2021 Jan 22.	10.1111/cea.13825	Exclude	Not biologic
Role of local eosinophilopoietic processes in the development of airway eosinophilia in prednisone-dependent severe asthma	Sehmi R, Smith SG, Kjarsgaard M, Radford K, Boulet LP, Lemiere C, Prazma CM, Ortega H, Martin JG, Nair P.	Clin Exp Allergy. 2016 Jun;46(6):793-802. doi: 10.1111/cea.12695.	10.1111/cea.12695	Exclude	Not RCT
RPl554 (dual pde3/4 enzyme inhibitor): Baseline airway reversibility impacts immediate bronchodilation, in contrast to progressive symptom improvement.	Singh D. Maurer B.T. Martinez F.J. Bengtsson T.	American Journal of Respiratory and Critical Care Medicine. Conference: 2019 International Conference of the American Thoracic Society , ATS 2019. Dallas, TX United States. 199(9) (no pagination), 2019. Date of Publication: May 2019.		Exclude	Not biologic
Safety profile and clinical activity of multiple subcutaneous doses of MEDI-528, a humanized anti-interleukin-9 monoclonal antibody, in two randomized phase 2a studies in subjects with asthma	Parker JM, Oh CK, LaForce C, Miller SD, Pearlman DS, Le C, Robbie GJ, White WI, White B, Molfino NA; MEDI-528 Clinical Trials Group.	BMC Pulm Med. 2011 Feb 28;11:14. doi: 10.1186/1471-2466-11-14.	10.1186/1471-2466-11-14	Exclude	No relevant data
Safety, pharmacokinetics and pharmacodynamics of a novel anti-asthmatic drug, XC8, in healthy probands	Renner A, Romanova J, Ferko B, Schmutz H, Nebolsin V, Müller M, Badorrek P, Marth K, Pohl W.	Pulm Pharmacol Ther. 2019 Dec;59:101852. doi: 10.1016/j.pupt.2019.101852. Epub 2019 Oct 6.	10.1016/j.pupt.2019.101852	Exclude	No relevant data
Salmeterol resolves airway obstruction but does not possess anti-eosinophil efficacy in newly diagnosed asthma: a randomized, double-blind, parallel group biopsy study comparing the effects of salmeterol, fluticasone propionate, and disodium cromoglycate	Lindqvist A, Karjalainen EM, Laitinen LA, Kava T, Altraja A, Pulkkinen M, Halme M, Laitinen A.	J Allergy Clin Immunol. 2003 Jul;112(1):23-8. doi: 10.1067/mai.2003.1500.	10.1067/mai.2003.1500	Exclude	Not biologic
Sample sizes for clinical trials using sputum eosinophils as an outcome.	Dasgupta A. Nair P.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2012. San Francisco, CA United States. Conference Publication: (var.pagings). 185(MeetingAbstracts) (no pagination), 2012. Date of Publication: 2012.		Exclude	Review
Secondary prevention of asthma by the use of Inhaled Fluticasone propionate in Wheezy INfants (IFWIN): double-blind, randomised, controlled study	Murray CS, Woodcock A, Langley SJ, Morris J, Custovic A; IFWIN study team.	Lancet. 2006 Aug 26;368(9537):754-62. doi: 10.1016/S0140-6736(06)69285-4.	10.1016/S0140-6736(06)69285-4	Exclude	Not biologic
Selective COX-2 Inhibition Exerts No Negative Effects on Peripheral Blood Lymphocytes in Allergic Asthmatics	Gafvelin G, Grundström J, Edin Grimheden M, Sánchez Vidaurre S, Daham K, Dahlén SE, Dahlén B, van Hage M.	Int Arch Allergy Immunol. 2016;170(1):57-61. doi: 10.1159/000446960. Epub 2016 Jul 2.	10.1159/000446960	Exclude	Not biologic
Severe eosinophilic asthma treated with mepolizumab stratified by baseline eosinophil thresholds: a secondary analysis of the DREAM and MENSA studies	Ortega HG, Yancey SW, Mayer B, Gunsoy NB, Keene ON, Bleecker ER, Brightling CE, Pavord ID.	Lancet Respir Med. 2016 Jul;4(7):549-556. doi: 10.1016/S2213-2600(16)30031-5. Epub 2016 May 10.	10.1016/S2213-2600(16)30031-5	Exclude	AHR not measured
Severe exacerbations and inhaled corticosteroid load with as-needed budesonide/formoterol vs maintenance budesonide in mild asthma.	Bateman E. Reddel H.K. O'Byrne P.M. Barnes P.J. Zhong N. Keen C. Jorup C. Lamarca R. Siwek-Posluszna A. FitzGerald M.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2018. San Diego, CA United States. 197(MeetingAbstracts) (no pagination), 2018. Date of Publication: 2018.		Exclude	Not biologic
Short-term subcutaneous grass pollen immunotherapy under the umbrella of anti-IL-4: A randomized controlled trial	Chaker AM, Shamji MH, Dumitru FA, Calderon MA, Scadding GW, Makatsori M, Jones I, He QA, Subramanian KK, Arm JP, Durham SR, Schmidt-Weber CB.	J Allergy Clin Immunol. 2016 Feb;137(2):452-461.e9. doi: 10.1016/j.jaci.2015.08.046. Epub 2015 Oct 31.	10.1016/j.jaci.2015.08.046	Exclude	AHR not measured
Simvastatin does not exhibit therapeutic anti-inflammatory effects in asthma	Menzies D, Nair A, Meldrum KT, Fleming D, Barnes M, Lipworth BJ.	J Allergy Clin Immunol. 2007 Feb;119(2):328-35. doi: 10.1016/j.jaci.2006.10.014. Epub 2006 Dec 4.	10.1016/j.jaci.2006.10.014	Exclude	Not biologic
Soluble CD23 and interleukin-1 receptor antagonist in human asthmatics following antigen challenge	Amrol DJ, Hagaman DD, Sheller JR, Murray JJ.	J Asthma. 2005 Feb;42(1):73-6. doi: 10.1081/jas-200044761.	10.1081/jas-200044761	Exclude	Not RCT
Specific bronchial challenge test: Abbreviated method.	Martin M. Mur P. Feo F. Canto G. Vives R. Quejigo J.	Allergy: European Journal of Allergy and Clinical Immunology. Conference: 30th Congress of the European Academy of Allergy and Clinical Immunology. Istanbul Turkey. Conference Publication: (var.pagings). 66(SUPPL. 94) (pp 171), 2011. Date of Publication: June 2011.		Exclude	No relevant data
Spotlight on omalizumab in allergic asthma	Bang LM, Plosker GL.	BioDrugs. 2004;18(6):415-8. doi: 10.2165/00063030-200418060-00007.	10.2165/00063030-200418060-00007	Exclude	Not RCT
Sputum cellular and cytokine responses to inhaled endothelin-1 in asthma	Chalmers GW, MacLeod KJ, Thomson LJ, Little SA, Patel KR, McSharry C, Thomson NC.	Clin Exp Allergy. 1999 Nov;29(11):1526-31. doi: 10.1046/j.1365-2222.1999.00496.x.	10.1046/j.1365-2222.1999.00496.x	Exclude	No study drug
Sputum hyaluronan and versican in severe eosinophilic asthma	Avars AG, Altman LC, Potter-Perigo S, Radford K, Wight TN, Nair P.	Int Arch Allergy Immunol. 2013;161(1):65-73. doi: 10.1159/000343031. Epub 2012 Dec 14.	10.1159/000343031	Exclude	AHR not measured
Sputum hyaluronan as a biomarker of airway remodeling in severe asthma.	Ayars A.G. Altman L.C. Potter-Perigo S. Wight T.N. Nair P.	Journal of Allergy and Clinical Immunology. Conference: 2011 American Academy of Allergy, Asthma and Immunology, AAAAI Annual Meeting. San Francisco, CA United States. Conference Publication: (var.pagings). 127(2 SUPPL. 1) (pp AB8), 2011. Date of Publication: February 2011.		Exclude	AHR not measured
Squill Oxymel, a traditional formulation from Drimia Maritima (L.) Stearn, as an add-on treatment in patients with moderate to severe persistent asthma: A pilot, triple-blind, randomized clinical trial	Nejatbakhsh F, Karegar-Borzi H, Amin G, Eslaminejad A, Hosseini M, Bozorgi M, Gharabaghi MA.	J Ethnopharmacol. 2017 Jan 20;196:186-192. doi: 10.1016/j.jep.2016.12.032. Epub 2016 Dec 18.	10.1016/j.jep.2016.12.032	Exclude	Not biologic
Steroid effects on mucociliary clearance in outpatient asthma	Shah RV, Amin M, Sangwan S, Smaldone GC.	J Aerosol Med. 2006 Summer;19(2):208-20. doi: 10.1089/jam.2006.19.208.	10.1089/jam.2006.19.208	Exclude	Not biologic
Steroid naive eosinophilic asthma: anti-inflammatory effects of fluticasone and montelukast	Jayaram L, Pizzichini E, Lemière C, Man SF, Cartier A, Hargreave FE, Pizzichini MM.	Thorax. 2005 Feb;60(2):100-5. doi: 10.1136/thx.2004.021634.	10.1136/thx.2004.021634	Exclude	Not biologic
Steroid sparing effects of intranasal corticosteroids in asthma and allergic rhinitis	Nair A, Vaidyanathan S, Clearie K, Williamson P, Meldrum K, Lipworth BJ.	Allergy. 2010 Mar;65(3):359-67. doi: 10.1111/j.1398-9995.2009.02187.x. Epub 2009 Oct 5.	10.1111/j.1398-9995.2009.02187.x	Exclude	No relevant data
Studies of the effects of inhaled magnesium on airway reactivity to histamine and adenosine monophosphate in asthmatic subjects	Hill J, Lewis S, Britton J.	Clin Exp Allergy. 1997 May;27(5):546-51.		Exclude	Not biologic
Sustained benefit from using low-dose mepolizumab in patients with chronic relapsing eosinophilic granulomatosis with polyangiitis (EGPA).	Thompson G. Ryan M. Thompson P.	Internal Medicine Journal. Conference: 30th Annual Conference of the Australasian Society of Clinical Immunology and Allergy. Perth, WA Australia. 49(Supplement 4) (pp 32), 2019. Date of Publication: September 2019.		Exclude	AHR not measured
Targeting dynamic hyperinflation in moderate-to-severe asthma: a randomised controlled trial	van der Meer AN, de Jong K, Hoekstra-Kuik A, Bel EH, Ten Brinke A.	ERJ Open Res. 2021 Aug 16;7(3):00738-2020. doi: 10.1183/23120541.00738-2020. eCollection 2021 Jul.	10.1183/23120541.00738-2020	Exclude	Not biologic
Tezepelumab decreases matrix remodelling and inflammatory pathways in patients with asthma.	Sridhar S. Zhao W. Pham T.-H. Kearley J. White W.I. Wu Y. Parnes J.R. Roskos L.K. Griffiths J.M.	European Respiratory Journal. Conference: 29th International Congress of the European Respiratory Society, ERS. Madrid Spain. 54(Supplement 63) (no pagination), 2019. Date of Publication: September 2019.		Exclude	AHR not measured
TEZEPELUMAB PRODUCES CLINICALLY MEANINGFUL RESPONSES ON PATIENT-REPORTED OUTCOME MEASURES IN PATIENTS WITH SEVERE, UNCONTROLLED ASTHMA: RESULTS FROM THE PHASE 3 NAVIGATOR STUDY.	Lugogo N. Ponnarambil S. Ambrose C. Cook W. Hunter G. Llanos-Ackert J.-P. Corren J.	Chest. Conference: CHEST 2021 Annual Meeting. Virtual, Online. 160(4 Supplement) (pp A44-A47), 2021. Date of Publication: October 2021.		Exclude	AHR not measured
Tezepelumab Reduces Exacerbations Across All Seasons in Patients with Severe, Uncontrolled Asthma: A Post Hoc Analysis of the PATHWAY Phase 2b Study	Corren J, Karpefors M, Hellqvist Å, Parnes JR, Colice G.	J Asthma Allergy. 2021 Jan 11;14:1-11. doi: 10.2147/JAA.S286036. eCollection 2021.	10.2147/JAA.S286036	Exclude	AHR not measured
The A-444C polymorphism in the leukotriene C4 synthase gene is associated with aspirin-induced urticaria	Sánchez-Borges M, Acevedo N, Vergara C, Jiménez S, Zabner-Oziel P, Monzón A, Caraballo L.	J Investig Allergol Clin Immunol. 2009;19(5):375-82.		Exclude	Not RCT
The childhood asthma management program (CAMP): Design, rationale, and methods.	Shapiro G.G. DuHamel T.R. Wighton T.G. Chinn T. Bierman C.W. Furukawa C.T. Altman L.C. Virant F.S. Williams P.V. Minotti D.A. Kennedy M.S. Becker J.W. Reagan C. Eliassen H. Crawford D. Hammond B. Strodtbeck G. Sharpe M. Weiss S. Greineder D. Torda W. Tata M. Barrant P. DeFilippo A. Grace M. Haynes S. Higham M. Kelleher S. Koslof J. Madden N. Mandel D. Martinez A. McAuliffe J. Pacella P. Parks P. Plunkett A. Seligsohn K. Traylor J. Van Horn M. Ware J. Wells C. Whitman A. Reisman J. MacLusky I. Levison H. Hall A. Benedet Y. Chay J. Collinson M. Finlayson-Kulchin J. Gore K. Miki M. Sananes R. Adkinson N.F. Eggleston P. Huss K. Plotnick L. Pulsifer M. Rand C. Wheeler B. Bollers N. Hyatt K. Leritz B. Pessaro M. Philips S. Szefler S. Nelson H.S. Sundstrom D. Bender B. Brelsford K. Gleason M. Hassell J. Hendrickson C. Irvin C.G. Junk T. Liu A. Spahn J. White M.P. Feeley J. Bridges J. Ciacco J. Eltz M. Flynn M. Hefner M. Hettleman D. Jacobs J. Kamada A. Nimmagadda S. Sheridan J. Washington T. Willcutt E. Zeiger R. Horner A. Friedman N. Jalowayski A. Lincoln A. Mellon M.H. Schatz M. Harden K. Galbreath L.L. Hanson E. Jenson E.M. King S. Lopez B. Magiari M. Nelle C.A. Pizzo S. Rodriquez E. Easton J.G. Mostafa K. Moscona A. Sandoval K. McWilliams B. Annett R. Kelly H.W. Spicher M. Becker D. Bereket S. Braun M. Bush S. Hunt D. Moreshead M. Ortega B. Strunk R.C. Bloomberg G.R. Corry J.M. Smith T.F. Albers E. Davantes B. Belle G. Dolinsky M. Fisher E.B. Gaioni S.J. Glynn E. Herman C. Kemp D. Lawhon C. Meltzer S. Moseid C. Oliver-Welker T. Rodgers D. Turner C. White D.K. Caesar M. Richardson D.S. Ryan E. Sylvia S.C. Cherniack R. Tonascia J. Meinert C. Amend-Libercci D. Belt P. Collins K. Collison B. Dawson C. Dodge J. Donithan M. Easton D. Edmonds V. Ewing C. Harle J. Huffman R. Liang K.-Y. Meinert J. Nowakowski D. Owens R. Smith M. Sternberg A. Van Natta M. Wise R. Rice R. Hughes B. Lynch T. Vadlamani S. Hamilton R.G. Schatz C. Wisenauer J. Harbeck R.J. Emerick R. Watson B. Culkin C. Oliver S. Lung C.L. Mullen A. Taggart V. Randall P. Albert P. Hurd S. Kiley J. Wu M. Parker S. Letvenko W. Repko W. Poust R. Herold D. Elbert D. Eigen H. Cloutier M. Connett J. Cuttler L. Davis C.E. Evans D. Kattan M. Leikin S. Menendez R. Simons F.E.R. Meinert C.L.	Controlled Clinical Trials. 20(1) (pp 91-120), 1999. Date of Publication: February 1999.		Exclude	Not biologic
The Dutch hypothesis, implications for treatment of chronic obstructive pulmonary disease and asthma in a biomarker, monoclonal antibody world. Experience with IgE and omalizumab in a small pulmonary practice	Zaremba M.L. Elliott K. Redford A. Ali S. Shah N. Reddy S.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2011. Amsterdam Netherlands. Conference Publication: (var.pagings). 38(SUPPL. 55) (no pagination), 2011. Date of Publication: 01 Sep 2011.		Exclude	Review
The effect of a single high dose vitamin D3 on neutrophilic airway inflammation in nonatopic asthma.	De Groot J.C. Van Roon E.N. Storm H. Bel E.H. Ten Brinke A.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2012. Vienna Austria. Conference Publication: (var.pagings). 40(SUPPL. 56) (no pagination), 2012. Date of Publication: 01 Sep 2012.		Exclude	Not biologic
The effect of a single inhaled dose of a VLA-4 antagonist on allergen-induced airway responses and airway inflammation in patients with asthma	Ravensberg AJ, Luijk B, Westers P, Hiemstra PS, Sterk PJ, Lammers JW, Rabe KF.	Allergy. 2006 Sep;61(9):1097-103. doi: 10.1111/j.1398-9995.2006.01146.x.	10.1111/j.1398-9995.2006.01146.x	Exclude	Not biologic
The effect of anti-allergic mattress encasings on house dust mite-induced early- and late-airway reactions in asthmatic patients. A double-blind, placebo-controlled study	Rijssenbeek-Nouwens LH, Oosting AJ, De Monchy JG, Bregman I, Postma DS, De Bruin-Weller MS.	Clin Exp Allergy. 2002 Jan;32(1):117-25. doi: 10.1046/j.0022-0477.2001.01256.x.	10.1046/j.0022-0477.2001.01256.x	Exclude	Not biologic
The effect of azelastine on the infiltration of inflammatory cells into the bronchial mucosa and clinical changes in patients with bronchial asthma	Hoshino M, Nakamura Y.	Int Arch Allergy Immunol. 1997 Nov;114(3):285-92. doi: 10.1159/000237681.	10.1159/000237681	Exclude	Not biologic
The effect of azithromycin on RSV load and recurrent wheezing among infants hospitalized with RSV bronchiolitis.	Beigelman A. Bacharier L.B. Buller R. Mason S. Baty J. Schechtman K.B. Sajol G. Isaacson-Schmid M. Castro M. Storch G.A.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2015. Denver, CO United States. Conference Publication: (var.pagings). 191(MeetingAbstracts) (no pagination), 2015. Date of Publication: 2015.		Exclude	Not biologic
The effect of benralizumab on asthma exacerbation rates in patients with severe asthma: Systematic review and meta-analysis.	Mahdavian M. Asghari S. Mallay S. Pike J.	Canadian Journal of Respiratory Critical Care and Sleep Medicine. Conference: 11th Annual Canadian Respiratory Conference, CRC 2018. Vancouver, BC Canada. 2(2) (pp 98-99), 2018. Date of Publication: 2018.		Exclude	Review
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The effect of IVX-0142, a heparin-derived hypersulfated disaccharide, on the allergic airway responses in asthma	Duong M, Cockcroft D, Boulet LP, Ahmed T, Iverson H, Atkinson DC, Stahl EG, Watson R, Davis B, Milot J, Gauvreau GM, O'Byrne PM.	Allergy. 2008 Sep;63(9):1195-201. doi: 10.1111/j.1398-9995.2008.01707.x.	10.1111/j.1398-9995.2008.01707.x	Exclude	Not biologic
The effect of marimastat, a metalloprotease inhibitor, on allergen-induced asthmatic hyper-reactivity	Bruce C, Thomas PS.	Toxicol Appl Pharmacol. 2005 Jun 1;205(2):126-32. doi: 10.1016/j.taap.2004.10.005.	10.1016/j.taap.2004.10.005	Exclude	Not biologic
The effect of montelukast (MK-0476), a cysteinyl leukotriene receptor antagonist, on allergen-induced airway responses and sputum cell counts in asthma	Diamant Z, Grootendorst DC, Veselic-Charvat M, Timmers MC, De Smet M, Leff JA, Seidenberg BC, Zwinderman AH, Peszek I, Sterk PJ.	Clin Exp Allergy. 1999 Jan;29(1):42-51. doi: 10.1046/j.1365-2222.1999.00447.x.	10.1046/j.1365-2222.1999.00447.x	Exclude	Not biologic
The effect of montelukast on lung function and exhaled nitric oxide in infants with early childhood asthma	Straub DA, Moeller A, Minocchieri S, Hamacher J, Sennhauser FH, Hall GL, Wildhaber JH.	Eur Respir J. 2005 Feb;25(2):289-94. doi: 10.1183/09031936.05.00031904.	10.1183/09031936.05.00031904	Exclude	Not biologic
The effect of omalizumab on basophil and mast cell responses using an intranasal cat allergen challenge.	Eckman J.A. Sterba P.M. Kelly D. Alexander V. Bochner B.S. MacGlashan D.W. Saini S.S.	Journal of Allergy and Clinical Immunology. Conference: 2009 American Academy of Allergy, Asthma and Immunology (AAAAI) Annual Meeting. Washington, DC United States. Conference Publication: (var.pagings). 123(2 SUPPL. 1) (pp S196), 2009. Date of Publication: February 2009.	10.1016/j.jaci.2009.09.012	Exclude	EAR, LAR or AHR not measured
The effect of omalizumab on small airway inflammation as measured by exhaled nitric oxide in moderate-to-severe asthmatic patients	Pasha MA, Jourd'heuil D, Jourd'heuil F, Mahon L, Romero F, Feustel PJ, Evans M, Smith T, Mitchell J, Gendapodi P, Demeyere-Coursev KC, Townley RG.	Allergy Asthma Proc. 2014 May-Jun;35(3):241-9. doi: 10.2500/aap.2014.35.3741.	10.2500/aap.2014.35.3741	Exclude	No relevant data
The effect of prasugrel on bronchial hyperreactivity in patients with chronic asthma: A pilot, proof-of-concept randomized controlled trial (prina study).	Lussana F. Di Marco F. Terraneo S. Razzari C. Centanni S. Cattaneo M.	Blood Transfusion. Conference: 22nd National Congress of the Italian Society for Thrombosis and Hemostasis - SISET. Vicenza Italy. Conference Publication: (var.pagings). 10(SUPPL. 4) (pp s102), 2012. Date of Publication: September 2012.		Exclude	Not biologic
The effect of salmeterol on markers of airway inflammation following segmental allergen challenge	Calhoun WJ, Hinton KL, Kratzenberg JJ.	Am J Respir Crit Care Med. 2001 Mar;163(4):881-6. doi: 10.1164/ajrccm.163.4.2001060.	10.1164/ajrccm.163.4.2001060	Exclude	Not biologic
The effect of seratrodast on eosinophil cationic protein and symptoms in asthmatics	Fukuoka T, Miyake S, Umino T, Inase N, Tojo N, Yoshizawa Y.	J Asthma. 2003 May;40(3):257-64. doi: 10.1081/jas-120018322.	10.1081/jas-120018322	Exclude	Not biologic
The effect of the ET-1 receptor antagonist, bosentan, on patients with poorly controlled asthma: A 17 week, double-blind, placebo-controlled crossover pilot study.	Metersky M. Coyle T.	Chest. Conference: CHEST 2011. Honolulu, HI United States. Conference Publication: (var.pagings). 140(4 MEETING ABSTRACT) (no pagination), 2011. Date of Publication: October 2011.		Exclude	Not biologic
The effect of the inhaled PDE4 inhibitor CHF6001 on allergen-induced inflammation in asthmatic subjects.	Singh D. Leaker B.R. Boyce M. Nandeuil M.A. Collarini S. Mariotti F. Santoro D. Barnes P.J.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2014. San Diego, CA United States. Conference Publication: (var.pagings). 189(MeetingAbstracts) (no pagination), 2014. Date of Publication: 2014.		Exclude	Not biologic
The effect of the inhaled PDE4 inhibitor CHF6001 on allergen-induced inflammation in asthmatics.	Singh D. Leaker B. Boyce M. Nandeuil M.-A. Collarini S. Mariotti F. Santoro D. Barnes P.J.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. Conference Publication: (var.pagings). 44(SUPPL. 58) (no pagination), 2014. Date of Publication: 01 Sep 2014.		Exclude	Not biologic
The effect of the novel phosphodiesterase-4 inhibitor MEM 1414 on the allergen induced responses in mild asthma	Leaker BR, Singh D, Ali FY, Barnes PJ, O'Connor B.	BMC Pulm Med. 2014 Oct 28;14:166. doi: 10.1186/1471-2466-14-166.	10.1186/1471-2466-14-166	Exclude	Not biologic
The effect of the novel phosphodiesterase-4 inhibitor mem 1414 on the allergen-induced responses in mild asthma.	Leaker B.R. Singh D. Barnes P.J. Imrie M. Hughes R. O'Connor B.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2010. New Orleans, LA United States. Conference Publication: (var.pagings). 181(1 MeetingAbstracts) (no pagination), 2010. Date of Publication: 01 May 2010.		Exclude	Not biologic
The effect of the novel SHIP1 activator AQX-1125 on allergen-induced responses in mild to moderate asthma.	Leaker B. O'Connor B. Barnes P. Mckenzie L. Chernoff D. Neville J. Tam P. Stenton G. Harwig C. MacRury T.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2013. Barcelona Spain. Conference Publication: (var.pagings). 42(SUPPL. 57) (no pagination), 2013. Date of Publication: 01 Sep 2013.		Exclude	Not biologic
The effect of Theophylline in patients with allergic rhinitis: A double-blind, randomised, crossover study.	Sankaran P. Brockwell C. Wilson A.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. Conference Publication: (var.pagings). 44(SUPPL. 58) (no pagination), 2014. Date of Publication: 01 Sep 2014.		Exclude	Not asthma
The effect of vitamin D on airway reactivity and inflammation in asthmatic children: A double-blind placebo-controlled trial	Bar Yoseph R, Livnat G, Schnapp Z, Hakim F, Dabbah H, Goldbart A, Bentur L.	Pediatr Pulmonol. 2015 Aug;50(8):747-53. doi: 10.1002/ppul.23076. Epub 2014 Jul 2.	10.1002/ppul.23076	Exclude	Not biologic
The effect of vitamin D therapy on airway reactivity and airway inflammation in asthmatic children.	Bar-Yoseph R. Livnat G. Schnapp Z. Dabbah H. Goldbart A. Bentur L.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2013. Barcelona Spain. Conference Publication: (var.pagings). 42(SUPPL. 57) (no pagination), 2013. Date of Publication: 01 Sep 2013.		Exclude	Not biologic
The effects of spirulina (Arthrospira platensis) dietary supplement as an adjunct therapy for children aged 7 to 14 years old with asthma: A randomized - double blind placebo controlled clinical trial.	Ver Leigh Arciaga Manzon L. Agnes Gonzalez Andaya P.	World Allergy Organization Journal. Conference: XXIV World Allergy Congress 2015. Seoul South Korea. 9(SUPPL.1) (pp 7), 2016. Date of Publication: 14 Apr 2016.		Exclude	Not biologic
The effects of statin therapy on inflammatory markers in patients with copd: A double blind randomised controlled trial.	John M. Knox A.J. McKeever T.M. Meakin G. Bailey H. Cockcroft J.R. Shale D.J. Harrison T.W. Bolton C.E.	Thorax. Conference: British Thoracic Society Winter Meeting 2013. Westminster United Kingdom. Conference Publication: (var.pagings). 68(SUPPL. 3) (pp A16-A17), 2013. Date of Publication: December 2013.		Exclude	Not biologic
The effects of the novel SHIP1 activator AQX-1125 on allergen-induced responses in mild to moderate asthma.	Leaker B.R. O'Connor B.J. Barnes P.J. Chernoff D. Tam P. Neville J. Toews J. Stenton G.R. Harwig C. MacRury T. Mackenzie L.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2013. Philadelphia, PA United States. Conference Publication: (var.pagings). 187(MeetingAbstracts) (no pagination), 2013. Date of Publication: 2013.		Exclude	Not biologic
The effects of the novel SHIP1 activator AQX-1125 on allergen-induced responses in mild-to-moderate asthma	Leaker BR, Barnes PJ, O'Connor BJ, Ali FY, Tam P, Neville J, Mackenzie LF, MacRury T.	Clin Exp Allergy. 2014 Sep;44(9):1146-53. doi: 10.1111/cea.12370.	10.1111/cea.12370	Exclude	Not biologic
The ELSA trial: single versus combinatory effects of non-prohibited beta-2 agonists on skeletal muscle metabolism, cardio-pulmonary function and endurance performance-study protocol for a randomized 4-way balanced cross-over trial	Zügel M, Bizjak DA, Nussbaumer D, Winkert K, Takabayashi K, Kirsten J, Washington M, Treff G, Dreyhaupt J, Steeb L, Diel P, Parr MK, Steinacker JM, Persch H.	Trials. 2021 Dec 11;22(1):903. doi: 10.1186/s13063-021-05862-w.	10.1186/s13063-021-05862-w	Exclude	Not biologic
The extent of serum periostin reduction in asthma patients treated with lebrikizumab is related to baseline periostin levels: A pooled analysis of phase ii studies.	Choy D.F. Holweg C.T.J. Cai F. Arron J.R. Matthews J.G. Scheerens H.	Journal of Allergy and Clinical Immunology. Conference: 2016 Annual Meeting of the American Academy of Allergy, Asthma and Immunology, AAAAI 2016. Los Angeles, CA United States. Conference Publication: (var.pagings). 137(2 SUPPL. 1) (pp AB15), 2016. Date of Publication: February 2016.		Exclude	AHR not measured
The Impact of Food Histamine Intake on Asthma Activity: A Pilot Study	Vassilopoulou E, Konstantinou GN, Dimitriou A, Manios Y, Koumbi L, Papadopoulos NG.	Nutrients. 2020 Nov 5;12(11):3402. doi: 10.3390/nu12113402.	10.3390/nu12113402	Exclude	Not biologic
The influence of intravenous hydrocortisone on cytokine levels in children with asthma	Landstra AM, Kauffman HF, Marike Boezen H, van Aalderen WM, Zonderland J, Postma DS.	Pediatr Allergy Immunol. 2005 Jun;16(4):299-305. doi: 10.1111/j.1399-3038.2005.00282.x.	10.1111/j.1399-3038.2005.00282.x	Exclude	Not biologic
The Intriguing Role of Interleukin 13 in the Pathophysiology of Asthma	Marone G, Granata F, Pucino V, Pecoraro A, Heffler E, Loffredo S, Scadding GW, Varricchi G.	Front Pharmacol. 2019 Dec 6;10:1387. doi: 10.3389/fphar.2019.01387. eCollection 2019.	10.3389/fphar.2019.01387	Exclude	Review
The inverse agonist propranolol confers no corticosteroid-sparing activity in mild-to-moderate persistent asthma	Anderson WJ, Short PM, Williamson PA, Manoharan A, Lipworth BJ.	Clin Sci (Lond). 2014 Dec;127(11):635-43. doi: 10.1042/CS20140249.	10.1042/CS20140249	Exclude	Not biologic
The inverse agonist propranolol does not confer steroid-sparing activity in persistent asthma.	Anderson W. Short P. Williamson P. Manoharan A. Lipworth B.	European Respiratory Journal. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. Conference Publication: (var.pagings). 44(SUPPL. 58) (no pagination), 2014. Date of Publication: 01 Sep 2014.		Exclude	Not biologic
The long-acting beta2-agonist salmeterol xinafoate: effects on airway inflammation in asthma	Roberts JA, Bradding P, Britten KM, Walls AF, Wilson S, Gratziou C, Holgate ST, Howarth PH.	Eur Respir J. 1999 Aug;14(2):275-82. doi: 10.1034/j.1399-3003.1999.14b07.x.	10.1034/j.1399-3003.1999.14b07.x	Exclude	Not biologic
The Predicting Response to Inhaled Corticosteroid Efficacy (PRICE) trial	Martin RJ, Szefler SJ, King TS, Kraft M, Boushey HA, Chinchilli VM, Craig TJ, Dimango EA, Deykin A, Fahy JV, Israel E, Lazarus SC, Lemanske RF Jr, Leone FT, Pesola GR, Peters SP, Sorkness CA, Szwejbka LA, Wechsler ME; National Heart, Lung, and Blood Institute's Asthma Clinical Research Center.	J Allergy Clin Immunol. 2007 Jan;119(1):73-80. doi: 10.1016/j.jaci.2006.10.035.	10.1016/j.jaci.2006.10.035	Exclude	Not biologic
The role of leukotriene receptor antagonists in the treatment of chronic asthma in childhood	Warner JO.	Allergy. 2001;56 Suppl 66:22-9. doi: 10.1034/j.1398-9995.2001.00005.x.	10.1034/j.1398-9995.2001.00005.x	Exclude	Review
The role of oral magnesium supplements for the management of stable bronchial asthma: a systematic review and meta-analysis	Abuabat F, AlAlwan A, Masuadi E, Murad MH, Jahdali HA, Ferwana MS.	NPJ Prim Care Respir Med. 2019 Feb 18;29(1):4. doi: 10.1038/s41533-019-0116-z.	10.1038/s41533-019-0116-z	Exclude	Not biologic
The Sputum Transcriptome of Mild Atopic Asthma Following Bronchoprovocation and Inhaled Anti-TSLP Antibody Fragment Treatment.	Cabanski M. Xu H. Zhao X. Fernandez A. Khokhlovich E. Rowlands M. Schuhmann I. Grant S.S. Pertel P. Gauvreau G.M. O'Byrne P. Hohlfeld J.M. Vitaliti A. Obeidat M.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2021. Virtual. 203(9) (no pagination), 2021. Date of Publication: May 2021.	10.1164/ajrccm-conference.2021.TP112	Exclude	No relevant data
Tralokinumab for the treatment of severe, uncontrolled asthma: the ATMOSPHERE clinical development program	Panettieri RA Jr, Wang M, Braddock M, Bowen K, Colice G.	Immunotherapy. 2018 Mar 1;10(6):473-490. doi: 10.2217/imt-2017-0191. Epub 2018 Mar 14.	10.2217/imt-2017-0191	Exclude	Not RCT
Treatment of allergic rhinitis with theophylline : A double-blind, randomised, crossover study.	Sankaran P. Brockwell C. Clark A. Wilson A.M.	Thorax. Conference: British Thoracic Society Winter Meeting 2014. London United Kingdom. Conference Publication: (var.pagings). 69(SUPPL. 2) (pp A179), 2014. Date of Publication: December 2014.		Exclude	Not biologic
Treatment of childhood asthma with anti-immunoglobulin E antibody (omalizumab)	Milgrom H, Berger W, Nayak A, Gupta N, Pollard S, McAlary M, Taylor AF, Rohane P.	Pediatrics. 2001 Aug;108(2):E36. doi: 10.1542/peds.108.2.e36.	10.1542/peds.108.2.e36	Exclude	AHR not measured
Treatment with a peroxisomal proliferator activated receptor gamma agonist has a modest effect in the allergen challenge model in asthma: a randomised controlled trial	Richards DB, Bareille P, Lindo EL, Quinn D, Farrow SN.	Respir Med. 2010 May;104(5):668-74. doi: 10.1016/j.rmed.2009.11.006. Epub 2009 Nov 26.	10.1016/j.rmed.2009.11.006	Exclude	Not biologic
Understanding distinct RSV related wheezing phenotypes.	Mazur N. Bont L.	Pediatric Pulmonology. Conference: 13th International Congress on Pediatric Pulmonology. Bruges Belgium. Conference Publication: (var.pagings). 49(SUPPL. 37) (pp S12-S13), 2014. Date of Publication: September 2014.		Exclude	Review
Use of acid-suppressive drugs in pregnancy and the risk of childhood asthma: bidirectional crossover study using the general practice research database	Hak E, Mulder B, Schuiling-Veninga CC, de Vries TW, Jick SS.	Drug Saf. 2013 Nov;36(11):1097-104. doi: 10.1007/s40264-013-0093-z.	10.1007/s40264-013-0093-z	Exclude	Not biologic
Vitamin e (gamma tocopherol) reduces acute airway neutrophilia in mild asthmatics.	Hernandez M.L. Burbank A. Alexis N.E. Duran C.G. Bennett W.D. Jiang Q. Wang T. Zhou H. Peden D.	American Journal of Respiratory and Critical Care Medicine. Conference: American Thoracic Society International Conference, ATS 2017. Washington, DC United States. 195 (no pagination), 2017. Date of Publication: 2017.		Exclude	Not biologic
Vitamin E reduces airway granulocyte recruitment after inhaled endotoxin challenge in normal volunteers.	Hernandez M.L. Alexis N.E. Lay J.C. Zhou H. Jiang Q. Peden D.B.	Journal of Allergy and Clinical Immunology. Conference: 2012 Annual Meeting of the American Academy of Allergy, Asthma and Immunology, AAAAI 2012. Orlando, FL United States. Conference Publication: (var.pagings). 129(2 SUPPL. 1) (pp AB130), 2012. Date of Publication: February 2012.		Exclude	Not biologic
Vitamin E, γ-tocopherol, reduces airway neutrophil recruitment after inhaled endotoxin challenge in rats and in healthy volunteers	Hernandez ML, Wagner JG, Kala A, Mills K, Wells HB, Alexis NE, Lay JC, Jiang Q, Zhang H, Zhou H, Peden DB.	Free Radic Biol Med. 2013 Jul;60:56-62. doi: 10.1016/j.freeradbiomed.2013.02.001. Epub 2013 Feb 9.	10.1016/j.freeradbiomed.2013.02.001	Exclude	Not biologic
Weight-adjusted Intravenous Reslizumab in Severe Asthma with Inadequate Response to Fixed-Dose Subcutaneous Mepolizumab	Mukherjee M, Aleman Paramo F, Kjarsgaard M, Salter B, Nair G, LaVigne N, Radford K, Sehmi R, Nair P.	Am J Respir Crit Care Med. 2018 Jan 1;197(1):38-46. doi: 10.1164/rccm.201707-1323OC.	10.1164/rccm.201707-1323OC	Exclude	AHR not measured

Table S3 Study design, inclusion and exclusion criteria of included trials

Study identifiers				Population and treatment			Study design	Key inclusion criteria	Key exclusion criteria
Biologic	Reference	Article title	Article / PubMed link	Population	Study duration (number of patients)	Treatment arm			
Omalizumab	Boulet et al 1997[18]	Inhibitory Effects of an Anti-IgE Antibody E25 on Allergen-induced Early Asthmatic Response	https://pubmed.ncbi.nlm.nih.gov/9196083/	Stable mild allergic asthma	10 weeks (n = 20)	Placebo rhuMAb-E25 (initial active drug at a dose of 2.0 mg/kg or placebo was administered; six subsequent doses of rhuMAb-E25 at 1.0 mg/kg or placebo)	Multicenter, randomized, double-blind, parallel-group, placebo-controlled trial consisting of 10 wk of study drug administration and 1 wk of follow-up.	All patients had a highly positive allergy skin-prick test to at least one common aeroallergen, an early asthmatic response (>=15% decrease in FEV1) on allergen inhalation in the laboratory, a forced expiratory volume in one second (FEV1,) >=70% predicted, and a methacholine provocative concentration causing a 20% fall in FEV1 (PC20) <=8 mg/ml. Allergens types: Birch, Horse, Weed, Grass, Ragweed, Cat, Mite	Exclusion criteria included history of anaphylaxis or significant medical illness other than mild allergic asthma, evidence of recently unstable asthma (emergency room visit in the previous 6 wk, intubation and mechanical ventilation for asthma in the past 12mo), respiratory infection or aeroallergenexposure (other than housedust mite) within the past 4 wk, smoking within the last 12 mo, a history of smoking >=10 pack-years and for women of childbearing potential, a lack of effective contraception. Patients were studied outside of relevant allergen seasons when asthma symptoms were absent or very mild.
Omalizumab	Fahy et al 1997[19]	The Effect of an Anti-IgE Monoclonal Antibody on the Early- and Late-Phase Responses to Allergen Inhalation in Asthmatic Subjects	https://pubmed.ncbi.nlm.nih.gov/9196082/	Mild asthma	9 weeks (n = 18)	Placebo IV rhuMAb-E25 IV (5 mg/ml) and placebo (rhuMAb-E25 excipient [150 mMNaCl, 10 mM acetate, pH 5.2]) were delivered by 5-min intravenous infusion (0.1 ml/kg) in a dose of 0.5 mg/kg for 9 visits.	Assessed the effects of 9 wk of treatment with rhuMAb-E25 in a parallel group, randomized, double-blind, placebo-controlled study of 19 allergic asthmatic patients.	History of mild asthma requiring treatment only with inhaled beta agonists, FEV1 >=70% predicted, bronchial hyperreactivity to methacholine, positive skin prick tests to house dust mite, cat pelt, or ryegrass, and serum IgE level <= 500 IU/ml.	Exclusion criteria were the use of corticosteroids or symptoms of an upper respiratory tract infection in the previous 6 wk, tobacco use, or a history of a significant medical illness other than asthma.
Omalizumab	Fahy et al 1999[20]	Effect of Aerosolized Anti-IgE (E25) on Airway Responses to Inhaled Allergen in Asthmatic Subjects	https://pubmed.ncbi.nlm.nih.gov/10471635/	Allergic asthma	8 weeks (n = 33)	Placebo E25 1mg E25 10mg	Randomized, placebo-controlled, parallel group clinical trial of the effects of 8 wk of once daily treatment with aerosolized E25 in two doses (1 mg and 10 mg) on the early and late phase responses to allergen challenge in allergic subjects with mild asthma	Asthma with FEV1 >= 70% predicted, bronchial hyperactivity to methacholine, serum IgE < 500 IU/mL, a positive skin prick test to aeroallergens (house dust mite, perennial ryegrass, birch, cat pelt, or horse hair) were studied.	Exclusion criteria were the use of any corticosteroids or symptoms of an upper or lower respiratory tract infection in the previous 6 wk, and history of tobacco use (any in the past 12 mo and total use >=10 pack-years).
Omalizumab	Noga et al 2003[21]	Immunological and Clinical Changes in Allergic Asthmatics following Treatment with Omalizumab	https://pubmed.ncbi.nlm.nih.gov/12759489/	Moderate to severe allergic asthma	52 weeks (n = 35)	Placebo SC Omalizumab SC (administration of at least 0.016 mg/ kg/IgE (IU/ml) every 4 weeks)	Sub-study of a large multi-centre randomised, double-blind, placebocontrolled, parallel-group trial	All patients had at least a 1-year history of allergic asthma, a positive skin prick test (SPT) to at least one of the tested allergens (Dermatophagoides farinae, Dermatophagoides pteronyssimus [house dust mite] cat or dog dander), specific IgE (CAP Pharmacia, Uppsala, Sweden), inhaled corticosteroids at doses equivalent to beclomethasone dipropionate requirement for treatment with 500–1,000 ug/day for at least 2 months and demonstrated a reversibility of 112% in FEV1 over the baseline value within 30 min after taking 200 ug of salbuterol.	NR
Omalizumab	Djukanovic et al 2004[22]	Effects of Treatment with Anti-immunoglobulin E Antibody Omalizumab on Airway Inflammation in Allergic Asthma	https://pubmed.ncbi.nlm.nih.gov/15172898/	Stable, mild to moderate asthma	16 weeks (n = 45)	Placebo Omalizumab SC (administration of at least 0.016 mg/ kg/IgE (IU/ml) every 4 weeks)	4-month, randomized, double-blind, placebo-controlled, parallel group study was conducted in five centers: University of California, San Francisco (San Francisco, CA); University of Southampton (Southampton, UK); National Jewish Medical and Research Center (Denver, CO); University of Wisconsin (Madison, WI); and Imperial College (London, UK). After a run-in period of 3 weeks, during which asthma activity and airway responsiveness were assessed to determine inclusion eligibility, patients were randomized to 16 weeks of treatment with either omalizumab or placebo. Patients were treated subcutaneously with omalizumab (150–300 mg every 4 weeks or 225–375 mg every 2 weeks) on the basis of the concentration of serum total IgE and patient body weight at baseline	Stable, mild to moderate asthma (defined by the criteria of the National Heart, Lung, and Blood Institute Expert Panel Report [23]) for at least 1 year; treatment with inhaled ß-agonists only; no acute exacerbations requiring rescue corticosteroid medication for at least 6 weeks before screening for the study; age, 18 to 50 years; total serum IgE of at least 30 to no more than 700 IU/ml; positive skin prick test for at least one common allergen (house dust mite, cockroach, dog, or cat); airway hyperresponsiveness as defined by a methacholine PC20 value (provocative concentration inducing a 20% drop in FEV1) of less than 8 mg/ml, and sputum eosinophilia of 2% or more of total nonsquamous cells.	NR - See some in inclusion
Omalizumab	Prieto et al 2006[23]	Effect of Omalizumab on Adenosine 5′-Monophosphate Responsiveness in Subjects with Allergic Asthma	https://pubmed.ncbi.nlm.nih.gov/16374021/	Mild to moderate persistent allergic asthma	12 weeks (n = 34)	Placebo SC Omalizumab SC (administration of at least 0.016 mg/ kg/IgE (IU/ml) every 4 weeks)	Randomized, double-blinded, placebo-controlled, parallel-group trial conducted in four centers in Spain. After a 5- to 9-day baseline period, patients were randomized to receive either omalizumab or placebo administered subcutaneously every 2 or 4 weeks over a 12-week period. The dose and dosing intervals were based on the subject's body weight and baseline serum IgE. This ensured for each patient a dose of at least 0.016 mg/kg per international unit per milliliter of IgE every 4 weeks. patients thus received 150–300 mg every 4 weeks or 225, 300 or 375 mg every 2 weeks. Trial personnel administered medication in a blinded fashion, which was maintained at each center by using a nontrial-related individual to prepare trial medication or placebo injections before administration.	Mild to moderate persistent allergic asthma; positive immediate responses (wheal diameter 6.3 mm) on skin prick testing to house dust mite allergens (Dermatophagoides pteronyssinus and Dermatophagoides farinae), dog, or cat; baseline FEV1 >= 80% of the predicted value and FEV 1 / FVCN >= 70%; total serum IgE >= 30 to < 700 IU/ml and body weight <= 150 kg to allow optimal dosing of omalizumab; treatment with inhaled short-acting beta2-agonists alone or with inhaled corticosteroids (ICS) in doses equivalent to 200–1,000 ug of beclomethasone dipropionate per day for >= 6 months prior to randomization; no specific immunotherapy within the past 3 months, and bronchoconstriction in response to both AMP and methacholine at screening. All patients were to be exposed to at least one of the perennial allergens to which they had a positive skin prick test result for the duration of the study. Asthma had to be stable, with no significant change in regular medication for >= 3 months prior to the screening visit. Females of childbearing potential had to use reliable contraceptives. None had chronic bronchitis, emphysema, allergic bronchopulmonary aspergillosis or respiratory tract infections during the 4 weeks before the study. No relevant concomitant diseases were present.	Pregnant or lactating women were excluded from participation. Unstable asthma
Omalizumab	Patel et al 2009[24]	Effects of Omalizumab (Xolair) on Airway Hyperresponsiveness	https://www.jacionline.org/article/S0091-6749(08)03442-8/fulltext	Mild allergic asthma	12 weeks (n = 18)	Placebo Omalizumab	Patients (FEV1 > 70%) were randomized to receive either omalizumab or placebo in a 2:1 fashion.	Not available (abstract)	Not available (abstract)
Omalizumab	van Rensen et al 2009[25]	Eosinophils in bronchial mucosa of asthmatics after allergen challenge: effect of anti-IgE treatment	https://pubmed.ncbi.nlm.nih.gov/19076931/	Asthma - type and severity not specified	12 weeks (n = 25)	Placebo SC Omalizumab SC (administration of at least 0.016 mg/ kg/IgE (IU/ml) every 4 weeks)	This study had a randomized, placebo-controlled, parallel, doubleblind design. Anti-IgE or placebo was administered for 12 weeks every 2 or 4 weeks. At baseline, after 8 and 12 weeks of treatment, PC20 methacholine was determined and sputum induced. Allergen challenge followed by a bronchoscopy at 24 h was performed at baseline and at 12 weeks.	All patients had a history of episodic chest tightness and wheezing and were only using short-acting b2-agonists on demand. All were atopic to house dust mite (HDM) and were having a total serum IgE between 30 and 700 IU/ml. The baseline forced expiratory volume in 1 s (FEV1) was >70% predicted (17) and all patients were hyper-responsive to inhaled methacholine [provocative concentration causing a 20% fall in FEV1 (PC20) <4 mg/ml] (18). The fall in FEV1 during the LAR following inhaled allergen was at least 15%. All patients were clinically stable and had no respiratory chest infection 2 weeks prior to the study.	NR - See some in inclusion
Omalizumab	Zielen et al 2013[26]	Omalizumab Protects against Allergen-Induced Bronchoconstriction in Allergic (Immunoglobulin E-Mediated) Asthma	https://pubmed.ncbi.nlm.nih.gov/22948442/	Allergic asthma	12-14 weeks (n = 50)	Placebo Omalizumab low IgE (30-300 IU/mL) Omalizumab high IgE (700-2000 IU/mL)	Multicenter, randomized, double-blind, parallel-group, placebo-controlled study of omalizumab in two groups of patients with different pretreatment IgE concentrations	Patients aged 18–65 years with a body weight of 40–150 kg were eligible if they had asthma, prebronchodilator FEV1 ≥ 65% predicted and had been asthma exacerbation-free for ≥ 4 weeks. Patients had to have had well-characterized skin reactivity to a specific allergen within 2 years before screening. At screening, patients had to demonstrate a 20% fall in FEV1 in response to methacholine at a provocative concentration ≤ 16 mg/ml and a 20% fall in FEV1 in response to an allergen at a cumulative PD20 in a bronchoprovocation test	Exclusion criteria included history of an asthma attack requiring a visit to an emergency room in the 6 weeks before or during screening, history of an asthma attack requiring treatment with intubation and mechanical ventilation in the 12 months before day 1 of the study, asthma exacerbation requiring treatment with oral or intravenous corticosteroids in the previous 3 months and history of intolerance to methacholine or ABP. Current active smokers with a smoking history of ≥ 5 pack-years or patients with elevated IgE due to suspected parasitosis were also excluded.
Omalizumab	Hendeles et al 2015[27]	Omalizumab Therapy for Asthma Patients with Poor Adherence to Inhaled Corticosteroids	https://pubmed.ncbi.nlm.nih.gov/25528738/	Persistent asthma	16 weeks per treatment period (n = 17) (cross-over study)	Placebo SC Omalizumab SC (mean [SD]: 313 [38] mg, range: 300-375 mg; administration every 2 or 4 weeks)	Randomized, double-blind, three-period, placebo-controlled, crossover study	Study included patients (ages 6–26 yr) with persistent asthma for whom ICS were prescribed for at least 3 months, either alone or in combination with a long-acting ß2-agonist or leukotriene modifier. They had poor asthma control (defined by any of the following: FEV1 < 80% predicted, short- acting ß-agonist use > 3 times/wk, nocturnal symptoms > 2 times/mo, exercise-induced bronchospasm from activities of daily living, unscheduled physician visits or hospitalization for asthma, or > 1 prednisone burst in previous 3 months). Other inclusion criteria were a pharmacy prescription refill history of < 50% of prescribed doses of ICS for ≥ 3 months; sensitization to one or more indoor allergens or outdoor alternaria; total IgE of 30 to 700 IU/ml for patients ≥ 12 years or up to 1,300 IU/ml for those 6 to 12 years; baseline FEV1 ≥ 60% predicted; and a 20% decrease in FEV1 after inhaling ≤ 60 mg/ml of AMP (i.e., PC20 FEV1 ≤ 60 mg/ml).	Patients were excluded if they had smoked in the past 12 months or had a smoking history of > 10 pack years, were pregnant or lactating, had a respiratory tract infection in the past 6 weeks, or had an omalizumab dosage requirement > 375 mg every 2 weeks.
Mepolizumab	Leckie et al 2000[28]	Effects of an interleukin-5 blocking monoclonal antibody on eosinophils, airway hyper-responsiveness, and the late asthmatic response	https://pubmed.ncbi.nlm.nih.gov/11191542/	Mild allergic asthma	16 weeks (n = 24)	Placebo IV humanised (IgG-k) mAb to IL-5 - dose 2.5 mg/kg IV humanised (IgG-k) mAb to IL-5 - dose 10.0 mg/kg IV	This study was a double-blind, randomised, placebocontrolled, single dose, parallel group study in three centres.	Mild allergic asthma (as defined by the American Thoracic Society) and a history of episodic wheeze and shortness of breath. The patients were atopic, as defined by positive skin tests in response to common airborne allergens (Dermatophagoides pteronyssinus, mixed grass pollen, and cat hair) and were maintained on shortacting inhaled beta2-agonist treatment as required. Patients had neither worsening asthma nor a respiratory infection in the preceding 6 weeks. FEV1 at baseline was at least 70% of the predicted value and there was a documented airway hyper-responsiveness to histamine, with a provocation concentration causing a 20% reduction in FEV1 (PC20) <8 mg/mL. Patients had documented early and late asthmatic responses (defined as a >=15% reduction in FEV1 on at least three occasions between 4 and 10 h after allergen) to inhaled incremental allergen challenge between 3 and 6 weeks before the study treatment was given.	NR - See some in inclusion
Mepolizumab	Flood-Page et al 2003[29]	Eosinophil's Role Remains Uncertain as Anti-Interleukin-5 only Partially Depletes Numbers in Asthmatic Airway	https://pubmed.ncbi.nlm.nih.gov/12406833/	Mild asthma	20 weeks (n = 24)	Placebo IV Mepolizumab 750mg IV (three doses Q4W)	This was a two-center, double-blind, placebo-controlled, parallel-group study based at the Royal Brompton and London Chest Hospitals.	Mild asthma with a FEV1 of 70% or more of predicted, all were atopic, as defined by a positive skin prick test to one or more aeroallergen. All were well controlled with short-acting beta2-agonists, with no use of corticosteroids or other antiinflammatory drugs in the preceding 8 weeks. All volunteers gave a clear history of asthma, demonstrated airway hyperresponsiveness with a PC20 to histamine of 4.0 mg/ml of less and were nonsmokers	NR - See some in inclusion
Mepolizumab	Haldar et al 2009[30]	Mepolizumab and Exacerbations of Refractory Eosinophilic Asthma	https://pubmed.ncbi.nlm.nih.gov/19264686/	Refractory eosinophilic asthma	50 weeks (n = 61)	Placebo IV Mepolizumab 750mg IV Q4W	The study was a single-center, randomized, double-blind, placebo-controlled, parallel-group clinical trial	Clinical diagnosis of asthma that was supported by one or more of the following criteria: variability in the maximum diurnal peak expiratory flow of more than 20% over the course of 14 days, an increase in FEV1 of more than 15% after inhalation of 200 ug of albuterol, and a 20% reduction in FEV1 in response to a provocative concentration of inhaled methacholine (PC20) of less than 8 mg per milliliter. Inclusion criteria were a diagnosis of refractory asthma according to American Thoracic Society criteria,13 a sputum eosinophil percentage of more than 3% on at least one occasion in the previous 2 years despite high-dose corticosteroid treatment, and at least two exacerbations requiring rescue prednisolone treatment in the previous 12 months. Additional criteria for inclusion were stable treatment requirements and an absence of exacerbations for more than 6 weeks before enrollment in the study.	Exclusion criteria were current smoking, serologic evidence of a parasitic infection, a serious coexisting illness, the possibility of conception, and poor adherence to treatment.

Benralizumab	Gauvreau et al 2021[41]	The Effect of Benralizumab On Allergen-Induced Responses In Subjects With Mild Allergic Asthma	https://doi.org/10.1016/j.jaci.2020.12.563.	Mild Allergic Asthma	9 weeks (n = 46)	Placebo Benralizumab 30 mg SC Q4W	Patients were randomized to benralizumab or placebo	Not available (abstract)	Not available (abstract)
Tezepelumab	Gauvreau et al 2014[42]	Effects of an Anti-TSLP Antibody on Allergen-Induced Asthmatic Responses	https://www.nejm.org/doi/full/10.1056/nejmoa1402895.	Mild allergic asthma	12 weeks (n = 31)	Placebo IV Tezepelumab (AMG 157) 700 mg IV 93 doses)	We conducted this proof-of-concept, randomized, double-blind, placebo-controlled study at five centers in Canada.	Eligible patients were nonsmoking men and women, 18 to 60 years of age, with mild, stable atopic asthma, as confirmed by positive results on a skinprick test,; a forced expiratory volume in 1 second (FEV1) of 70% or more of the predicted value; and airway hyperresponsiveness. For allergens with seasonal variation, patients were tested out of season for pollens affecting their asthma; all patients had no other lung disease. No asthma-controller treatments were allowed during the study, although the use of inhaled short-acting β2-agonists as rescue treatment administered fewer than 2 days per week was permitted. All other asthma medications were discontinued at least 4 weeks before enrollment. Patients were excluded from the study if they had worsening of asthma, respiratory related visits to the emergency department within 6 weeks before study enrollment, previous use of AMG 157, or known sensitivity to any AMG 157 excipients.	Patients were excluded from the study if they had worsening of asthma, respiratory-related visits to the emergency department within 6 weeks before study enrollment, previous use of AMG 157, or known sensitivity to any AMG 157 excipients.
Tezepelumab	Diver et al 2021[36]	Effect of tezepelumab on airway inflammatory cells, remodelling, and hyperresponsiveness in patients with moderate-to-severe uncontrolled asthma (CASCADE): a double-blind, randomised, placebo-controlled, phase 2 trial	https://pubmed.ncbi.nlm.nih.gov/34256031/	Uncontrolled, moderate-to-severe asthma	28 weeks (n = 99)	Placebo SC Tezepelumab 210mg SC Q4W	CASCADE was an exploratory, double-blind, randomised, placebo-controlled, parallel-group, phase 2 study. Potential participants were screened at 27 centres	• Male or female, aged 18–75 years, weight ≥ 40 kg at visit 1 • Documented physician-diagnosed asthma for ≥12months before visit 1 • Physician-prescribed asthma controller medication with medium- or high-dose ICS for at least 12 months before visit 1 (as per GINA 2018 guidelines) • Documented use of at least one additional maintenance asthma controller medication (e.g. LABA, LTRA, theophylline or LAMA) for at least 3 months before visit 1 • Predicted normal value for morning prebronchodilator FEV1 > 50% and > 1 L at visit 1 or visit 2 • Documented historical FEV1 reversibility of ≥12% and ≥ 200 mL in the 12 months before visit 1 or at visit 2 • ACQ-6 score ≥ 1.5 at visit 1 or visit 2	• Any clinically important pulmonary disease, other than asthma, associated with high peripheral eosinophil counts • Any disorder that could, in the opinion of the investigator, affect the safety of the patient or influence the study findings • Exacerbation resulting in hospitalization or requiring OCS within 6 weeks of enrolment; more than three asthma exacerbations requiring OCS or hospitalization in the 12 months before visit 1; or exacerbation requiring intubation or admission to the ICU in the year before enrolment • Any clinically significant infection requiring antibiotic or antiviral treatment within 2 weeks of visit 1 or during the run-in period • Helminth or parasitic infection diagnosed within 6 months of visit 1 that has not been treated with, or is unresponsive to, standard-of-care therapy • History of cancer, HIV or hepatitis B or C • Current smokers or patients with a smoking history of ≥ 10 pack-years • Use of any marked or investigational biologic agent within 4 months or 5 half-lives of visit 1, or any investigational non-biologic agent within 30 days or 5 half-lives of visit 1 • Use of any immunosuppressive medication within 12 weeks of randomization • History of anaphylaxis after biologic therapy • Pregnant, breastfeeding or lactating
Tezepelumab	Sverrild et al 2021[44]	The effect of tezepelumab on airway hyperresponsiveness to mannitol in asthma (UPSTREAM)	https://pubmed.ncbi.nlm.nih.gov/34049943/	Uncontrolled asthma	12 weeks (n = 40)	Placebo IV Tezepelumab 700 mg IV Q4W	Double-blind, placebo-controlled randomised trial of adults with uncontrolled asthma.	Eligible participants were non-smoking adults between the ages of 18 and 75 years old with uncontrolled asthma (ACQ-6 score >1) and AHR to inhaled mannitol baseline (provoking dose of mannitol causing a 15% reduction in FEV1 (PD15) ≤315 mg) despite any stable doses of ICS. Second-line controllers (leukotriene-modifiers, long-acting beta2-agonists, and long-acting muscarinic antagonists) were allowed, but treatment with oral corticosteroids (12 weeks prior to inclusion), immunosuppressive drugs or biologics (4 months prior to inclusion) were not. Patients were included independent of their levels of blood eosinophils or atopic status, had to demonstrate acceptable inhaler, and spirometry techniques as well as ≥70% compliance with their usual asthma controller during screening.	A full list of inclusion and exclusion criteria, and medications withheld before testing are available in the Supplementary Appendix.
Lebrikizumab	Scheerens et al 2014[35]	The effects of lebrikizumab in patients with mild asthma following whole lung allergen challenge	https://pubmed.ncbi.nlm.nih.gov/24131334/	Mild allergic asthma	12 week treatment period but allergen and MCh challenges done before and after study weeks (n = 29)	Placebo Lebrikizumab 5 mg/kg Q4W	phase II, multi-centre, randomized, double-blind, parallel-group, placebo-controlled trial was designed to evaluate safety and efficacy of lebrikizumab compared with placebo in reducing the airway reaction to an inhaled aeroallergen solution in adult patients with mild allergic asthma. (6 US study sites)	Allergic asthma diagnosed for ≥ 6 months, which was being treated with only intermittent short-acting inhaled b2-adrenergic agonists, and had a normal chest X-ray ≤ 2 years prior to screening. At screening, eligible patients had a positive skin test (≥ 3 mm over negative control) for at least one of the following allergens: house dust mite, cat dander, ragweed, and had a FEV1 of ≥ 70% of predicted, showed both an early asthmatic response (EAR) of ≥ 20% reduction in FEV1 5–30 min following allergen challenge, and a late asthmatic response (LAR) of ≥ 15% reduction in FEV1 2–8 h following allergen challenge, and had a PC20 < 8 mg/mL, defined as the provocative methacholine concentration that caused a > 20% fall in FEV1 from the saline-alone value.	Subjects were excluded from participation if they required daily controller medication for asthma, had a history of hypersensitivity to study drug or to drugs with similar chemical structure or ingredients, had a documented medical history of anaphylaxis, had lung disease other than mild allergic asthma, had significant concurrent medical illness other than asthma, had clinically significant laboratory or electrocardiogram abnormalities at screening, had smoked in the previous 6 months or had a history of smoking more than 10-pack years, had a history of helminthic infections, or had a history of drug or alcohol abuse. Use of the following medications was not allowed during the time period specified prior to screening or during screening or the first 16 weeks of the study: oral or inhaled corticosteroids (6 weeks prior to screening), nedocromil sodium or disodium cromoglycate (6 weeks prior to screening), methylxanthines (2 days prior to screening), leukotriene receptor antagonists (4 weeks prior to screening), inhaled long-acting β2-adrenergic agonists (4 weeks prior to screening), or any other nonsystemic steroid immunosuppressive medication.
Tralokinumab	Russell et al 2018[34]	Effect of tralokinumab, an interleukin-13 neutralising monoclonal antibody, on eosinophilic airway inflammation in uncontrolled moderate-to-severe asthma (MESOS): a multicentre, double-blind, randomised, placebo-controlled phase 2 trial	https://pubmed.ncbi.nlm.nih.gov/29793857/	Inadequately controlled moderate to severe asthma	12 weeks (n = 79)	Placebo SC Tralokinumab 300mg SC Q2W	multicentre, double-blind, randomised, placebocontrolled, 12-week phase 2 trial, we recruited participants from 15 centres in the UK, Denmark, and Canada	Documented history of physiciandiagnosed asthma for 12 months or more, requiring treatment with inhaled corticosteroids (≥250 μg/day of fluticasone or equivalent) at a stable dose with or without other asthma controller medications. All participants were required to be exacerbation free for 6 weeks or more before enrolment, and to have had no more than three asthma exacerbations requiring treatment with oral corticosteroids in the preceding 12 months. Furthermore, all participants had post-bronchodilator FEV1 reversibility of 12% or more and 200 mL or more, and evidence of uncontrolled asthma (defined by an Asthma Control Questionnaire [ACQ]-6 score ≥1.5) during the run-in period.	We excluded participants receiving regular systemic corticosteroids or biologics, current smokers and past smokers of more than 10 pack-years, and participants with clinically significant comorbidities. Criteria for withdrawal from the trial were defined a priori, and included withdrawal of consent, pregnancy, and the occurrence of an adverse event for which continued exposure to treatment could be detrimental to the participant.
Tocilizumab	Revez et al 2019[37]	Effects of interleukin-6 receptor blockade on allergen induced airway responses in mild asthmatics	https://pubmed.ncbi.nlm.nih.gov/31223480/	Mild, stable allergic asthma as well as rs2228145:AC or CC genotype	Completing the study could take 5-10 weeks (n = 11)	Placebo Tocilizumab 8 mg/kg IV (single dose)	Proof-of-concept, randomised, doubleblind, parallel-group, placebo-controlled study. Patients who completed the baseline phase of the trial and remained eligible to continue were the subset confirmed to have the rs2228145:AC or CC genotype, as well as mild, stable allergic asthma	Patients invited to participate in the trial were men or women who, in previous studies or in response to media appeals, reported being 18–65 years of age, non-smokers, of general good health and with a history of asthma that did not require regular treatment with corticosteroids.	NR
Efalizumab	Gauvreau et al 2003[45]	The effects of an anti-CD11a mAb, efalizumab, on allergen-induced airway responses and airway inflammation in subjects with atopic asthma	https://pubmed.ncbi.nlm.nih.gov/12897739/	Mild Allergic Asthma	8 weeks (n = 35)	Placebo SC Efalizumab SC (0.7 mg/kg conditioning dose followed by 7 weekly doses of 2.0 mg/kg)	Multicenter, double-blinded, placebo-controlled (2 efalizumab: 1 placebo), randomized, parallel group study was carried out	Inclusion criteria required patients to be nonsmokers with mild atopic asthma, free of other lung disease, and no history of recurrent bacterial, viral, or fungal infection. Although efalizumab would be anticipated to have beneficial effects in severe asthma, patients with mild asthma were recruited for allergen inhalation and subsequent evaluation of the allergen-induced airway inflammation. patients were required to have stable asthma with FEV1 greater than 70% of predicted on all study days before allergen challenges, baseline methacholine PC20 of 16 mg/mL or less, to use no regular asthma medication during the study other than infrequent (less than twice weekly) inhaled β2-agonist, which was withheld for 8 hours before each visit, to have no exposure to sensitizing allergens apart from house dust mite, to have no asthma exacerbations or respiratory tract infections for 4 weeks before entering the study, and to refrain from rigorous exercise, tea, or coffee in the morning before visits to the laboratory.	NR - See some in inclusion
Etanercept (anti-TNF-α fusion protein)	Berry et al 2006[39]	Evidence of a Role of Tumor Necrosis Factor α in Refractory Asthma	https://pubmed.ncbi.nlm.nih.gov/16481637/	Mild-to-Moderate asthma; refractory asthma	10 weeks (n = 30)	Placebo SC twice weekly Mild-to-moderate: Etanercept 25mg SC twice weekly Refractory: Etanercept 25mg SC twice weekly	randomized, double-blind, crossover study comparing the effect of 10 weeks of treatment with etanercept at the dose used in a previously reported uncontrolled study and placebo	Patients with asthma had clinical features consistent with the presence of asthma and at least one of the following objective measures of airway hyperresponsiveness and variable airflow obstruction: The concentration of methacholine required to provoke a 20 percent decrease (PC20) in the forced expiratory volume in one second (FEV1) was less than 8 mg per milliliter, the FEV1 increased by at least 15 percent after the inhalation of 200 μg of albuterol, or the variation in peak flow, expressed as a percentage of the mean, exceeded 20 percent over a period of 14 days. All patients classified as having mild-to-moderate asthma met the Global Initiative for Asthma criteria for intermittent or mild persistent asthma. All patients with refractory asthma met the Global Initiative for Asthma criteria for severe persistent asthma, and met at least one major and two minor criteria for refractory asthma and were considered to be compliant with treatment.	Excluded patients who were thought to be symptomatic because of uncontrolled coexisting conditions such as rhinitis and gastroesophageal reflux disease. Patients were also excluded if they had any of the following: recent contact with a patient with pulmonary tuberculosis, a personal history of tuberculosis, any radiologic features suggestive of current or previous tuberculosis, or a grade III or IV tuberculin (Heaf) test.
Etanercept (anti-TNF-α fusion protein)	Rouhani et al 2005[40]	Effect of tumor necrosis factor antagonism on allergen-mediated asthmatic airway inflammation	https://pubmed.ncbi.nlm.nih.gov/16085230/	Mild intermitttent or mild/moderate persistent asthma (allergic)	2 weeks (n = 21)	Placebo Etanercept	Randomized, double-blind, placebo-controlled study. was performed. Participants were randomized to receive four doses of either TNFR:Fc or placebo 25 mg subcutaneously, twice per week for 2 weeks	Allergy was defined by skin test reactivity to cat dander, Dermatophagoides farinae, short ragweed, or Timothy grass using a Multi-Test IIs applicator. Allergic asthma was established by reversible airflow obstruction, FEV1 70% of predicted, medications limited to inhaled beta-agonists, and both early and late phase responses to inhalational allergen challenge. Patients had mild intermittent or mild/moderate persistent asthma.	NR
Pitrakinra (anti-IL-4RA: IL-4 variant)	Wenzel et al 2007[43]	Effect of an interleukin-4 variant on late phase asthmatic response to allergen challenge in asthmatic patients: results of two phase 2a studies	https://pubmed.ncbi.nlm.nih.gov/17950857/	Atopic asthma - study 1	4 weeks (n = 56)	Placebo SC Pitrakinra SC	Two independent randomised, double-blind, placebo-controlled, parallel group phase 2a clinical trials	Patients with asthma were included if they had a baseline forced expiratory volume in 1 s (FEV1) of 70% or more of predicted, needed regular or as required use of β-agonists, and showed a late phase response (≥15% drop in FEV1 between 4–10 h) to allergen challenge at screening. They must have been on a stable regimen of medications for asthma for 1 month or more, and could not have had systemic immunosuppressive therapy within 1 month of screening. Additionally, patients were screened for airways reactivity. In study 1, patients were required to have a PC20 (provocative concentration that causes a 20% fall in FEV1 from the saline alone value) to methacholine of less than 8 mg/mL and in study 2, participants were required to have a PC20 to adenosine monophosphate of more than 3.125 mg/mL.	Individuals were excluded if they had any medical condition that would preclude allergen challenge, had a greater than 10 pack-year smoking history, or had smoked in the 3 months before screening. Patients were also excluded if they had received any corticosteroid medications (systemic or inhaled) in the month before screening. Participants were to continue their non-steroidal concomitant treatments without change during the study. No participants used leukotrienereceptor antagonists while on study.
Pitrakinra (anti-IL-4RA: IL-4 variant)				Atopic asthma - study 2		Placebo nebulisation (inhlaed) Pitrakinra nebulisation (inhaled)			
IMA-638 (anti-IL-13 mAb)	Gauvreau et al 2011[42]	Effects of Interleukin-13 Blockade on Allergen-Induced Airway Responses in Mild Atopic Asthma	https://pubmed.ncbi.nlm.nih.gov/21057005/	Mild Atopic Stable Asthma	5 weeks (n = 56 overall, n = 27 for IMA-638 study)	Placebo IMA-638	Two clinical trials were conducted at four study centers. Each trial was designed as double-blind, randomized, placebo-controlled, and with parallel groups, and each compared treatment with a humanized IL-13 antibody (either IMA-638 or IMA-026, 2 mg/kg) to treatment with placebo	Patients were nonsmoking, 18 to 60 years old, with body weight between 50 and 115 kg. FEV1 was at least 70% of predicted and the provocative concentration of methacholine causing a 20% fall in FEV1 (methacholine PC20) was not more than 16 mg/ml. Patients had no other lung disease, no self-reported lower respiratory tract infection or worsening of asthma for 4 weeks before screening, and avoided exposure to sensitizing allergens apart from house dust mite.	Patients were not currently using inhaled corticosteroids and used no asthma medication with the exception of infrequently inhaled beta2-agonist, which was withheld for 8 hours before spirometry. Rigorous exercise and caffeinated beverages were avoided before laboratory visits.
Anti-M1 Prime (MEMP1972a) Mab	Gauvreau et al 2012[43]	Effect Of An Anti-M1 Prime Monoclonal Antibody, MEMP1972A,In A Phase II Proof-Of-Activity Allergen Challenge Study In PatientsWith Mild Asthma	https://www.atsjournals.org/doi/pdf/10.1164/ajrccm-conference.2012.185.1_MeetingAbstracts.A6793	Mild asthma	12 weeks (n = 28)	Placebo IV MEMP1972a IV 5mg/kg Q4W	Randomized, double-blind, placebo-controlled, multicenter study	Not available (abstract)	Not available (abstract)

Anti-TSLP Fragment CSJ117	Gauvreau et al 2020[43]	Efficacy and Safety of an Inhaled Anti-TSLP Antibody Fragment in Adults with Mild Atopic Asthma	https://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2020.201.1_MeetingAbstracts.A4207	Mild Atopic Asthma	12 weeks (n = 28)	Placebo CSJ117	Proof-of-concept, randomized, double-blind, placebo-controlled study of 28 mild, atopic asthma patients.	Not available (abstract)	Not available (abstract)
rh-PAF-AH	Henig et al 2000[25]	Effect of Recombinant Human Platelet-activating Factor-Acetylhydrolase on Allergen-induced Asthmatic Responses	https://pubmed.ncbi.nlm.nih.gov/10934081/	Mild Atopic Asthma	5-7 week treatment period (n = 14)	Placebo IV rh-PAF-AH 1mg/kg IV	Randomized, double-blind, placebo-controlled, two-period crossover study	Patients had a history of wheezing or chest tightness, and asthma was previously diagnosed by a physician. patients were clinically stable in the 2 mo prior to the study, had no other major medical conditions, controlled their symptoms with short-acting b-agonists alone, and were atopic. Inhaled sympathomimetics and caffeinated beverages were withheld for at least 8 h prior to each study visit.	Females of childbearing age not using an acceptable form of contraception, tobacco smokers, and patients with abnormalities in baseline serum hematologic or chemistry studies or electrocardiogram (ECG) were excluded.
Ro-24-7472 (rIL-12)	Bryan et al 2000[26]	Effects of recombinant human interleukin-12 on eosinophils, airway hyper-responsiveness, and the late asthmatic response	https://pubmed.ncbi.nlm.nih.gov/11191543/	Mild allergic asthma	4 weeks (n = 39)	Placebo SC human rIL-17 SC (Ro-24-7472), weekly increasing dose of 0.1. 0.25, 0.5 ug/kg	Double-blind, randomised, parallel group clinical study, in which patients with mild allergic asthma	We studied 39 adults with allergic asthma. The inclusion criteria were a history of mild asthma requiring inhaled beta 2-agonists only, forced expiratory volume in 1 s (FEV1) 70% or more of predicted normal, a positive allergen skin-prick test, no use of corticosteroids for the previous month, no tobacco smoking within the past 5 years, provocative concentration of histamine 8 mg/mL, and early and late responses to inhaled allergen.	Exclusion criteria were symptoms of an upper-respiratory tract infection in the previous 2 weeks, allergy to grass pollen during the pollen season, and a history of a medical illness other than asthma.
Anti-OX40 ligand (mAb)	Gauvreau et al 2014[27]	OX40L blockade and allergen-induced airway responses in subjects with mild asthma	https://pubmed.ncbi.nlm.nih.gov/24224471/	Mild Atopic Asthma	12 weeks (n = 28)	Placebo IV Anti-OX40 ligand IV	This Phase II, double-blind, placebo-controlled, randomized, parallel-group study, conducted in 5 sites in Canada.	A history of episodic wheeze and shortness of breath were recruited for a clinical trial. Patients were screened for the following inclusion and exclusion criteria; nonsmoking, 18–65 years old, with body weight between 50 and 125 kg, forced expiratory volume in 1 s (FEV1) ≥70% of predicted and the provocative concentration of methacholine causing a 20% fall in FEV1 (methacholine PC20) ≤16 mg/mL. Reversibility was not tested, as lung function was nearly normal. patients had no other lung disease, no self-reported lower respiratory tract infection or worsening of asthma for 8 weeks before screening. Sensitizing allergens were avoided with the exception of house dust mite. Patients allergic to pollens were tested out of season. Patients were steroid naive and did not use any asthma medications with the exception of infrequently inhaled short-acting beta2-agonist, which was withheld for at least 8 h before spirometry. Rigorous exercise and caffeinated beverages were avoided before laboratory visits.	NR - See some in inclusion

Table S4 Summary of extracted baseline data

Study identifiers				Population and treatment			Number of patients	Age		Sex		Blood eosinophil count (cells per µL)		Sputum eosinophil count (% or cells/g)		Total IgE (IU/L)		FVC		FEV$_1$ (L)		FEV$_1$/FVC (%)		FEV$_1$ (% Predicted)		OCS users		SABA / LABA users		OCS dose at entry		ICS dose at entry		Number of exacerbations in the past 12 months		Time since asthma diagnosis / Disease duration (years)		Smoking history, n (%)		Height (m)		Weight (kg)		Body-mass index (kg/m^2)		FENO (ppb)		Metacholine PC$_{20}$ (mg/ml)		AMP PC$_{20}$ (mg/ml)		Acetylcholine PC$_{20}$ (mg/ml)		Histamine PC$_{20}$ (mg/ml)		Other - PC$_{20}$ (PAU/ml)	
Biologic	Reference	Article title	Article / PubMed link	Population	Study duration (number of patients)	Treatment arm	(n)	Mean	SD	n	%	Mean	SD	Mean (or median)	SD (or range)	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	n	%	n	%	Mean	SD	Mean	SD	Mean	SD	Mean / Median	SD / Range	Never	Ex-smoker	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Omalizumab	Boulet et al 1997[48]	Inhibitory Effects of an Anti-IgE Antibody E25 on Allergen-induced Early Asthmatic Response	https://pubmed.ncbi.nlm.nih.gov/9160683/	Stable mild allergic asthma	10 weeks (n = 20)	Placebo	9	27	8.4	Male: 5 Female: 4	Male: 55.6 Female: 44.4	NR	NR	NR	NR	1808	3382	NR	NR	3.6	0.6	NR	NR	94.8	11.8	NR	NR	All patients required only an inhaled beta2-agonist to control their asthma		NR	NR	NR	NR	NR	NR	See exclusion criteria - no smokers included in study		1.71	8.0	66.5	10.5	NR	NR	NR	NR	0.85	NR	NR	NR	NR	NR	NR	NR	200	NR
						rhuMAb-E25 (initial active drug at a dose of 2.0 mg/kg or placebo was administered; six subsequent doses of rhuMAb-E25 at 1.0 mg/kg or placebo)	11	27	8.2	Male: 7 Female: 4	Male: 63.6 Female: 36.4	NR	NR	NR	NR	616	487	NR	NR	3.4	0.6	NR	NR	89.5	10.3	NR	NR			NR	NR	NR	NR							1.70	7.0	72.4	13.9	NR	NR	NR	NR	0.65	NR	NR	NR	NR	NR	NR	NR	140	NR
Omalizumab	Fahy et al 1997[49]	The Effect of an Anti-IgE Monoclonal Antibody on the Early- and Late-Phase Responses to Allergen Inhalation in Asthmatic Subjects	https://pubmed.ncbi.nlm.nih.gov/9160683/	Mild asthma	9 weeks (n = 18)	Placebo IV	9	32	5	NR	NR	NR	NR	2.9% [n=7]	0.5–14.5	170	153	NR	NR	3.3	0.6	NR	NR	94	12	NR	NR	All patients required only an inhaled beta2-agonist to control their asthma		NR	NR	Corticosteroid use in preceding 6 weeks was an exclusion criterion		NR	NR	See exclusion criteria - no smokers included in study		NR	NR	78	18	NR	NR	NR	NR	0.80	0.91	NR	NR	NR	NR	NR	NR	NR	NR
						rhuMAb-E25 IV (5 mg/ml) and placebo (rhuMAb-E25 excipient [150 mMNaCl, 10 mM acetate, pH 5.2]) were delivered by 5-min intravenous infusion (0.1 ml/kg) in a dose of 0.5 mg/kg for 9 visits.	9	31	9	NR	NR	NR	NR	3.7% [n=8]	0.0–11.1	113	70	NR	NR	3.5	0.6	NR	NR	95	10	NR	NR			NR	NR							NR	NR	NR	NR			NR	NR	79	16	NR	NR	NR	NR	0.44	0.62	NR	NR	NR	NR	NR	NR	NR	NR
Omalizumab	Fahy et al 1999[50]	Effect of Aerosolized Anti-IgE (E25) on Airway Responses to Inhaled Allergen in Asthmatic Subjects	https://pubmed.ncbi.nlm.nih.gov/10674695/	Allergic asthma	8 weeks (n = 33)	Placebo	9	28	8	NR	NR	NR	NR	NR	NR	208	171	NR	NR	3.1	0.6	NR	NR	81	14	NR	NR	NR	NR	NR	NR	Corticosteroid use in preceding 6 weeks was an exclusion criterion		NR	NR	See exclusion criteria - no smokers included in study		NR	NR	72	16	NR	NR	NR	NR	0.8	0.3–2.4	NR	NR	NR	NR	NR	NR	NR	NR
						E25 1mg	12	28	8	NR	NR	NR	NR	NR	NR	250	141	NR	NR	3.4	1.1	NR	NR	83	20	NR	NR	NR	NR	NR	NR			NR	NR	NR	NR					NR	NR	73	20	NR	NR	NR	NR	1.4	0.7–2.6	NR	NR	NR	NR	NR	NR	NR	NR
						E25 10mg	10	30	NR	NR	NR	NR	NR	NR	NR	226	153	NR	NR	3.4	0.9	NR	NR	84	14	NR	NR	NR	NR	NR	NR			NR	NR	NR	NR					NR	NR	88	21	NR	NR	NR	NR	1.1	0.5–2.5	NR	NR	NR	NR	NR	NR	NR	NR
Omalizumab	Noga et al 2003[51]	Immunological and Clinical Changes in Allergic Asthmatics following Treatment with Omalizumab	https://pubmed.ncbi.nlm.nih.gov/12750488/	Moderate to severe allergic asthma	52 weeks (n = 35)	Placebo SC	17	36	23–61	Male: 12 Female: 5	Male: 70.6 Female: 29.4	NR	NR	NR	NR	148	45–683	NR	NR	NR	NR	NR	NR	80	57–108	NR	NR	NR	NR	NR	NR	All patients had inhaled corticosteroids at doses equivalent to beclomethasone dipropionate requirement for treatment with 500–1,000 ug/day for at least 2 months		NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.99	0.32–2.0	NR	NR	NR	NR
						Omalizumab SC (administration of at least 0.016 mg/ kg/IgE [IU/ml) every 4 weeks)	18	37	26–59	Male: 7 Female: 11	Male: 38.9 Female: 61.1	NR	NR	NR	NR	183	21–483	NR	NR	NR	NR	NR	NR	79	41–103	NR	NR	NR	NR			NR	NR			NR	NR	NR	NR					NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.0	0.29–2.5	NR	NR	NR	NR
Omalizumab	Djukanovic et al 2004[52]	Effects of Treatment with Anti-Immunoglobulin E Antibody Omalizumab on Airway Inflammation in Allergic Asthma	https://pubmed.ncbi.nlm.nih.gov/15172898/	Stable, mild to moderate asthma	16 weeks (n = 45)	Placebo	23	26	20–48	Female: 8	35	NR	NR	8.5% [n=22]	NR	141	38–500	NR	NR	3.35	0.68	NR	NR	86	13.6	NR	NR	All patients required treatment with an inhaled beta2-agonist only		NR	NR	Patients with acute exacerbations requiring rescue corticosteroid medication in 16 weeks before screening were excluded		NR	NR	Duration: 20yr	2–40	20 (87)	3 (13)	NR	NR	NR	NR	NR	NR	NR	NR	0.54	0.5–3.65	NR	NR	NR	NR	NR	NR
						Omalizumab SC (administration of at least 0.016 mg/ kg/IgE [IU/ml) every 4 weeks)	22	26	19–44	Female: 16	73	NR	NR	6.6% [n=21]	NR	155.5	27–808	NR	NR	3.04	0.45	NR	NR	84	9.4	NR	NR			NR	NR					NR	NR	Duration: 14yr	2–40	18 (82)	4 (18)	NR	NR	NR	NR	NR	NR	NR	NR	1.01	0.11–8.5	NR	NR	NR	NR	NR	NR
Omalizumab	Prieto et al 2006[25]	Effect of Omalizumab on Adenosine 5'-Monophosphate Responsiveness in Subjects with Allergic Asthma	https://pubmed.ncbi.nlm.nih.gov/16574810/	Mild to moderate persistent allergic asthma	12 weeks (n = 34)	Placebo SC	16	30	25–35	Male: 9 Female: 7	Male: 56.3 Female: 43.8	NR	NR	NR	NR	227.0	147.2–350.0	NR	NR	NR	NR	80.1	77.0–83.3	101.4	94.9–107.9	NR	NR	No patients were receiving any regular medication for asthma other than ICS and/or occasionally short–acting inhaled beta2 –agonists		n = 14; 465ug/day	320–630	NR	NR	NR	NR									All non-smoking but smoking history not specified		NR	NR	NR	NR	NR	NR	NR	NR	2.13	1.48–3.07	31.20	18.59–52.37	NR	NR	NR	NR
						Omalizumab SC (administration of at least 0.016 mg/ kg/IgE [IU/ml) every 4 weeks)	18	32	27–37	Male: 7 Female: 11	Male: 38.9 Female: 61.1	NR	NR	NR	NR	171.4	109.6–267.3	NR	NR	NR	NR	79.9	75.7–84.1	100.0	92.3–107.7					NR	NR			n = 16; 412ug/day	278–545	NR	NR	NR	NR											NR	NR	NR	NR	NR	NR	NR	NR	1.27	0.82–1.98	14.32	9.72–21.12	NR	NR	NR	NR
Omalizumab	Patel et al 2009[26]	Effects of Omalizumab (Xolair) on Airway Hyperresponsiveness	https://www.jacionline.org/article/S0091-6749(08)02342-8/fulltext	Mild allergic asthma	12 weeks (n = 18)	Placebo	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
						Omalizumab	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Omalizumab	van Rensen et al 2009[27]	Eosinophils in bronchial mucosa of asthmatics after allergen challenge: effect of anti-IgE treatment	https://pubmed.ncbi.nlm.nih.gov/19079931/	Asthma - type and severity not specified	12 weeks (n = 25)	Placebo SC	13	21	19–29	Female: 10	77	NR	NR	2.2% [n=9]	0.4–10.2	321	35–593	NR	NR	NR	NR	NR	NR	88.8	72–114	NR	NR	All patients were only using short-acting beta2-agonist on demand		NR	NR	NR	NR	NR	NR			NR	NR	9.0	4–22	12 (92)	1 (8)	NR	NR	NR	NR	NR	NR	NR	NR	1.02	1.93	NR	NR	NR	NR
						Omalizumab SC (administration of at least 0.016 mg/ kg/IgE [IU/ml) every 4 weeks)	12	20.5	18–24	Female: 12	100	NR	NR	4.0% [n=9]	0.2–28.0	154	51–674	NR	NR	NR	NR	NR	NR	96.0	82–115					NR	NR			NR	NR	NR	NR			NR	NR	10.5	1–19	11 (92)	1 (8)	NR	NR	NR	NR	NR	NR	NR	NR	0.48	1.61	NR	NR	NR	NR
Omalizumab	Zielen et al 2013[28]	Omalizumab Protects against Allergen-Induced Bronchoconstriction in Allergic (Immunoglobulin E-Mediated) Asthma	https://pubmed.ncbi.nlm.nih.gov/22648642/	Allergic asthma	12-14 weeks (n = 50)	Placebo	16	34	10.4	Male: 9 Female: 7	Male: 56 Female: 44	NR	NR	NR	NR	NR	NR	NR	NR	3.3	0.85	NR	NR	96.6	15.4	NR	NR	ICS: 7	44	NR	NR	271.4 ug	NR	NR	NR	NR	NR					NR	NR	76.5	16.7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
						Omalizumab low IgE (30-300 IU/mL)	18	36	11.9	Male: 13 Female: 5	Male: 72 Female: 28	NR	NR	NR	NR	NR	NR	NR	NR	3.5	0.82	NR	NR	94.2	17.1	NR	NR	ICS: 8	44	NR	NR	262.5 ug	NR	NR	NR	NR	NR					NR	NR	83.6	14.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
						Omalizumab high IgE (700-2000 IU/mL)	16	29	11.0	Male: 6 Female: 10	Male: 37.5 Female: 62.5	NR	NR	NR	NR	NR	NR	NR	NR	2.4	0.75	NR	NR	97.8	12.5	NR	NR	ICS: 7	44	NR	NR	314.3 ug	NR	NR	NR	NR	NR					NR	NR	76.6	16.4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Omalizumab	Hendeles et al 2015[29]	Omalizumab Therapy for Asthma Patients with Poor Adherence to Inhaled Corticosteroids	https://pubmed.ncbi.nlm.nih.gov/25528738/	Persistent asthma	16 weeks per treatment period (n = 17) Cross-over study	Placebo SC	15 (17 were randomized, 15 completed both treatment periods)	16.4	5.5	Male: 7 Female: 10	Male: 41.2 Female: 58.8	NR	NR	NR	NR	427	275	NR	NR	NR	NR	NR	NR	83.7	11.8	NR	NR	NR	NR	NR	NR	ICS refills in 12m prior to entry measured		NR	NR	NR	NR	NR	NR	See exclusion criteria - no smokers included in study		NR	NR	63.0	20.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	14.1	10.8, 18.4	NR	NR	NR	NR
						Omalizumab SC [mean [SD]: 313 [38] mg, range 300-375 mg; administration every 2 or 4 weeks)																																																						
Mepolizumab	Leckie et al 2000[30]	Effects of an interleukin-5 blocking monoclonal antibody on eosinophils, airway hyper-responsiveness, and the late asthmatic response	https://pubmed.ncbi.nlm.nih.gov/11191543/	Mild allergic asthma	16 weeks (n = 24)	Placebo IV	8	25.6	4.1	8	100	0.38	0.15	11.1	11.5	NR	NR	NR	NR	NR	NR	NR	NR	93	9.6	NR	NR	All patients maintained on short acting inhaled beta2-agonist		NR	NR	NR	NR	NR	NR									All non-smoking men but smoking history not specified		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.9	0.4	NR	NR
						humanised (IgG-k) mAb to IL-5 - dose 2.5 mg/kg IV	8	30.0	8.0	8	100	0.20	0.0	13.2	11.1	NR	NR	NR	NR	NR	NR	90.3	10.4	NR	NR			NR	NR	NR	NR													NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.8	1.4	NR	NR
						humanised (IgG-k) mAb to IL-5 - dose 10.0 mg/kg IV	8	28.0	4.3	8	100	0.30	0.12	13.1	10.0	NR	NR	NR	NR	NR	NR	82.0	7	NR	NR			NR	NS	NR	NR													NS	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.8	2.1	NR	NR
Mepolizumab	Flood-Page et al 2003[31]	Eosinophil's Role Remains Uncertain as Anti–Interleukin-5 only Partially Depletes Numbers in Asthmatic Airway	https://pubmed.ncbi.nlm.nih.gov/12490487/	Mild asthma	20 weeks (n = 24)	Placebo IV	13	30	20–52	Male: 8 Female: 5	Male: 61.5 Female: 38.5	0.4	0.1–0.6	NR	NR	NR	NR	NR	NR	3.1	1.8–5.25	NR	NR	80.0	71–106	NR	NR	All patients maintained on short acting inhaled beta2-agonist		NR	NR	No use of corticosteroids in preceding 6 weeks										All non-smoking but smoking history not specified		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.59	0.39–2.42	NR	NR
						Mepolizumab 750mg IV (three doses QAW)	11	31	20–53	Male: 9 Female: 2	Male: 81.8 Female: 18.2	0.27	0.1–1.2	NR	NR	NR	NR	NR	NR	3.05	2.55–4.85	NR	NR	87.0	71–109	NR	NR			NR	NR															NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.75	0.35–3.97	NR	NR
Mepolizumab	Haldar et al 2009[32]	Mepolizumab and Exacerbations of Refractory Eosinophilic Asthma	https://pubmed.ncbi.nlm.nih.gov/19542486/	Refractory eosinophilic asthma	50 weeks (n = 61)	Placebo IV	32	50	24–72	Male: 18 Female: 14	Male: 56.3 Female: 43.8	0.35	0.30	5.46%	0.75	195	2.64	NR	NR	NR	NR	67.7	13.5	77.6	24.1	NR	53.1	NR	90.6	10mg	2–40	1711	1000–4000 (range)	5	NR	26	2–57	Current smoking excluded but smoking history not specified		NR	NR	NR	NR	29.2	5.9	35.5	0.40	1.1 (N = 18)	1.1	NR	NR	NR	NR	NR	NR	NR	NR
						Mepolizumab 750mg IV QAW	29	48	21–63	Male: 14 Female: 15	Male: 48.3 Female: 51.7	0.32	0.38	6.84%	0.64	177.8	2.47	NR	NR	NR	NR	72.2	9.6	78.1	20.9	NR	57.1	NR	92.9	9mg	5–20	2038	1000–4000 (range)	5.5	NR	26	2–53			NR	NR	NR	NR	29.4	7.3	44.4	0.40	0.6 (N = 16)	1.24	NR	NR	NR	NR	NR	NR	NR	NR
Benralizumab	Gauvreau et al 2021[33]	The Effect of Benralizumab On Allergen-Induced Responses in Subjects With Mild Allergic Asthma	https://doi.org/10.1016/j.jaci.2020.12.563	Mild Allergic Asthma	9 weeks (n = 46)	Placebo	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR					NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
						Benralizumab 30 mg SC QAW	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR					NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tezepelumab	Gauvreau et al 2014[34]	Effects of an Anti-TSLP Antibody on Allergen-Induced Asthmatic Responses	https://www.nejm.org/doi/full/10.1056/nejmoa1402895	Mild allergic asthma	12 weeks (n = 31)	Placebo IV	15	31.5	2.9	Female: 11	73	281.1	57.2	4.7	2.2	NR	NR	NR	NR	3.35	0.19	NR	NR	97.6	3.9	NR	NR	Patients did not use asthma medications with the exception of infrequently inhaled short-acting beta2-agonist		NR	NR	NR	NR	NR	NR									Patients were non-smoking but smoking history not specified		NR	NR	NR	NR	26.5	1.1	58.9	14.3	1.87	0.97–3.61	NR	NR	NR	NR	NR	NR	NR	NR
						Tezepelumab (AMG 157) 700 mg IV (2 doses)	16	30.8	2.7	Female: 10	62	296.5	40.2	4.1	2.3	NR	NR	NR	NR	3.37	0.20	NR	NR	95.4	3.3	NR	NR			NR	NR	NR	NR	NR	NR											NR	NR	NR	NR	24.9	0.7	42.3	4.3	1.31	0.48–3.64	NR	NR	NR	NR	NR	NR	NR	NR
Tezepelumab	Diver et al 2021[35]	Effect of tezepelumab on airway inflammatory cells, remodelling, and hyperresponsiveness in patients with moderate-to-severe uncontrolled asthma (CASCADE): a double-blind, randomised, placebo-controlled, phase 2 trial	https://pubmed.ncbi.nlm.nih.gov/34256031/	Uncontrolled, moderate-to-severe asthma	28 weeks (n = 99)	Placebo SC	51	50.5	14.3	Female: 25	49	269	167	NR	NR	131.9	66.5–272.7	NR	NR	2.31	0.54	62.0	10.0	69.2	12.2	1	2	See inclusion LABA use Placebo: 33 (65%) Teze: 33 (69%)		See inclusion		Medium 17 (33%) High 33 (65%)*		Baseline table info: by 0, 1, 2, 3 exacerbations but little other studies recording this		NR	NR	34 (67%)	17 (33%)	NR	NR	NR	NR	28.4	6.4	30.7	20.3	NR	NR	NR	NR	NR	NR	NR	NR	263-2	225-1
						Tezepelumab 210mg SC QAW	48	49.9	13.2	Female: 33	69	292	204	NR	NR	96.4	14.5–422.3	NR	NR	2.18	0.68	63.8	9.5	68.9	13.4	1	2					Medium 21 (44%) High 27 (56%)				NR	NR	35 (73%)	13 (27%)	NR	NR	NR	NR	30.2	5.7	29.9	38.0	NR	NR	NR	NR	NR	NR	NR	NR	241-6	243-3
Tezepelumab	Swerdlow et al 2021[36]	The effect of tezepelumab on airway hyperresponsiveness to mannitol in asthma (UPSTREAM)	https://pubmed.ncbi.nlm.nih.gov/34049963/	Uncontrolled asthma	12 weeks (n = 40)	Placebo IV	20	40	15	Female: 12	60	0.213	0.06–0.82	NR	NR	100	9–764	NR	NR	2.94	0.55	73	7	82.8	10.2	NR	NR	Long-acting beta2-agonists were allowed. LABA use - Placebo: 15 (79%); Teze: 16 (80%)		NR	NR	ICS-equivalent budesonide dose (ug) 1389 (668)				NR	NR	NR	NR	NR	NR	4 (20%)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	70	4, 297
						Tezepelumab 700 mg IV QAW	20	42	20	Female: 11	55	0.214	0.06–0.72	NR	NR	97	4–1370	NR	NR	3.28	0.83	74	7	94.0	15.0	NR	NR					ICS-equivalent budesonide dose (ug) 1130 (715)				NR	NR	NR	NR	NR	NR	7 (35%)	NS	NR	NR	NR	NR	26.5	4.3	26	5–140	NR	NR	NR	NR	NR	NR	NR	NR	135	23, 279

Lebrikizumab	Scheerens et al 2014[35]	The effects of lebrikizumab in patients with mild asthma following whole lung allergen challenge	https://pubmed.ncbi.nlm.nih.gov/24131304/	Mild allergic asthma	12 week treatment period but allergen and MCh challenges done before and after study weeks (n = 29)	Placebo	16	32	11	Male: 9 Female: 7	Male: 56.3 Female: 43.8	0.264	0.182	NR	NR	239	197	NR	NR	NR	NR	NR	NR	82.4	8.9	NR	NR	All patients were being treated with only intermittent short acting inhaled beta2-agonists		NR	NR	ICS use in the 6 weeks before screening was an exclusion criterion		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	MCh challenge performed at screening and Week 13, but baseline PC20 not specified		NR	NR	NR	NR	NR	NR	NR	NR
						Lebrikizumab 5 mg/kg Q4W	13	36	11	Male: 6 Female: 7	Male: 46.2 Female: 53.8	0.258	0.169	NR	NR	309	448	NR	NR	NR	NR	NR	NR	84.3	13.6	NR	NR			NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR
Tralokinumab	Russell et al 2018[36]	Effect of tralokinumab, an interleukin-13 neutralising monoclonal antibody, on eosinophilic airway inflammation in uncontrolled moderate-to-severe asthma (MESOS): a multicentre, double-blind, randomised, placebo-controlled phase 2 trial	https://pubmed.ncbi.nlm.nih.gov/29793857/	Inadequately controlled moderate to severe asthma	12 weeks (n = 79)	Placebo SC	40	50.1	14.2	Male: 20 Female: 20	Male: 50 Female: 50	0.27×10^9/L	0.14×10^9/L	0.50×10^6/g (8.1%) [n=17]	1.34×10^9/L (17.8%)	420	778	3.73	0.91	2.37	0.62	NR	NR	NR	NR	NR	NR	34	85	NR	NR	Tralo Placebo Low: 12 (31%) 12 (30%) Medium: 10 (26%) 10 (25%) High: 17 (44%) 18 (45%)		Tralo Placebo 0: 25 (64%) 26 (65%) 1: 8 (21%) 11 (28%) 2: 5 (13%) 3 (8%) 3: 1 (3%) 0 (0%)		NR	NR	25 (63)	15 (38)	NR	NR	NR	NR	27.8	5.5	32·23	24·82	5.02 (n = 19)	6.4	NR	NR	NR	NR	NR	NR	NR	NR
						Tralokinumab 300mg SC Q2W	39	47.1	14.2	Male: 16 Female: 23	Male: 41 Female: 59	0.30×10^9/L	0.19×10^9/L	0.51×10^6/g (11.0%) [n=16]	1.02×10^9/L (14.5%)	534	798	3.74	1.08	2.46	0.79	NR	NR	NR	NR	NR	NR	32	82	NR	NR					NR	NR	25 (64)	14 (36)	NR	NR	NR	NR	28.4	5.7	39·54	30·05	3.00 (n = 20)	5.08	NR	NR	NR	NR	NR	NR	NR	NR
Tocilizumab	Revez et al 2019[37]	Effects of interleukin-6 receptor blockade on allergen induced airway responses in mild asthmatics	https://pubmed.ncbi.nlm.nih.gov/31223480/	Mild, stable allergic asthma as well as rs2228145:AC or CC genotype	Completing the study could take 5-10 weeks (n = 11)	Placebo	5	29	12.6	Female: 4	80	NR	NR	0.4% [baseline, 24h before allergen	1.0%	NR	NR	NR	NR	2.8	0.4	NR	NR	92.2	5.9	Subjects did not require regular treatment with corticosteroids		NR	NR	NR	NR	Patients did not require regular treatment with corticosteroids		NR	NR	NR	NR	Patients were non-smoking but smoking history not specified		NR	NR	NR	NR	25.5	3.8	NR	NR	2.9 [baseline, 24h before allergen	2.1	NR	NR	NR	NR	NR	NR	NR	NR
						Tocilizumab 8 mg/kg IV (single dose)	6	35	7.6	Female: 4	67	NR	NR	0.7% [baseline, 24h before allergen	1.3%	NR	NR	NR	NR	2.8	0.8	NR	NR	90.7	10.0			NR	NR	NR	NR			NR	NR	NR	NR			NR	NR	NR	NR	25	4.0	NR	NR	6.1 [baseline, 24h before allergen	5.03	NR	NR	NR	NR	NR	NR	NR	NR
Efalizumab	Gauvreau et al 2003[38]	The effects of an anti-CD11a mAb, efalizumab, on allergen-induced airway responses and airway inflammation in subjects with atopic asthma	https://pubmed.ncbi.nlm.nih.gov/12897739/	Mild Allergic Asthma	8 weeks (n = 35)	Placebo SC	11	age 18 to 60 years old (mean, 31 years old),		Male: 23 Female: 12	Male: 65.7 Female: 34.3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Patients had only infrequent use of an inhaled beta2-agonist to control their asthma, otherwise no regular asthma meds		NR	NR	NR	NR	NR	NR	NR	NR	Patients were non-smoking but smoking history not specified		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
						Efalizumab SC (0.7 mg/kg conditioning dose followed by 7 weekly doses of 2.0 mg/kg)	24					NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Etanercept (anti-TNF-α fusion protein)	Berry et al 2006[39]	Evidence of a Role of Tumor Necrosis Factor α in Refractory Asthma	https://pubmed.ncbi.nlm.nih.gov/16481637/	Mild-to-Moderate asthma; refractory asthma	10 weeks (n = 30)	Placebo SC twice weekly	10	38	23–49	Male: 4 Female: 6	Male: 40 Female: 60	NR	NR	0.3%	0.2% (log SD)	16	0.6 (log SD)	3.12	0.9	3.8	0.4	80	25	97	18	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NA	NA	All patients were currently non-smokers, with a smoking history of less than 5 pack-years		NR	NR	NR	NR	NR	NR	16.5	0.2	>16	NR	NR	NR	NR	NR	NR	NR	NR	NR
						Mild-to-moderate: Etanercept 25mg SC twice weekly	10	42	18–72	Male: 5 Female: 5	Male: 50 Female: 50	NR	NR	4.1%	0.7% (log SD)	172	1.1 (log SD)	NR	NR	3.7	0.9	78	21	94	23	0	0	NR	NR	NR	NR	NR	NR	NR	NR	14	1–36			NR	NR	NR	NR	NR	NR	34.2	0.3	0.4	0.6	NR	NR	NR	NR	NR	NR	NR	NR
						Refractory: Etanercept 25mg SC twice weekly	10	49	25–59	Male: 4 Female: 6	Male: 40 Female: 60	NR	NR	5.6%	0.8% (log SD)	77	0.9 (log SD)	2.94	1.0	2.4	0.7	65	17	62	21	7	70	10	100	NR	NR	NR	NR	NR	NR	16	1–58			NR	NR	NR	NR	NR	NR	41.8	0.2	0.14	0.1	NR	NR	NR	NR	NR	NR	NR	NR
Etanercept (anti-TNF-α fusion protein)	Rouhani et al 2005[40]	Effect of tumor necrosis factor antagonism on allergen-mediated asthmatic airway inflammation	https://pubmed.ncbi.nlm.nih.gov/16085220/	Mild intermittent or mild/moderate persistent asthma (allergic)	2 weeks (n = 21)	Placebo	9	23	21–40	Male: 2 Female: 7	Male: 22 Female: 78	0.19 k/uL	0.05–1.07	NR	NR	NR	NR	NR	NR	3.06	2.13–4.17	NR	NR	96	79–116	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	PD20 0.06	0.001–0.4	NR	NR	NR	NR	NR	NR	NR	NR
						Etanercept	12	27	20–54	Male: 8 Female: 4	Male: 67 Female: 33	0.25 k/uL	0.04–0.54	NR	NR	NR	NR	NR	NR	3.29	2.67–4.71	NR	NR	92	70–114	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	PD20 0.07	0.006–0.3	NR	NR	NR	NR	NR	NR	NR	NR
Pitrakinra (anti-IL-4RA: IL-4 variant)	Wenzel et al 2007[41]	Effect of an interleukin-4 variant on late phase asthmatic response to allergen challenge in asthmatic patients: results of two phase 2a studies	https://pubmed.ncbi.nlm.nih.gov/17950857/	Atopic asthma - study 1	4 weeks (n = 56)	Placebo SC	12	30	9	Male: 7 Female: 5	Male: 58.3 Female: 41.7	NR	NR	10% of non-squamous cells	NR	NR	NR	NR	NR	3.7	0.77	NR	NR	100%	20	NR	NR	All patients needed regular or as required use of beta-agonists		NR	NR	ICS use in month before screening was an exclusion criterion		NR	NR	NR	NR	All patients were currently non-smokers, with a smoking history of no greater than 10 pack-years, and with no smoking in the 3 months before screening		NR	NR	NR	NR	NR	NR	NR	NR	1.84	1.92	NR	NR	NR	NR	NR	NR	NR	NR
						Pitrakinra SC	12	31	10	Male: 5 Female: 7	Male: 41.7 Female: 58.3	NR	NR	11% of non-squamous cells	NR	NR	NR	NR	NR	3.72	1.01	NR	NR	102%	13	NR	NR			NR	NR			NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	1.37	1.51	NR	NR	NR	NR	NR	NR	NR	NR
Pitrakinra (anti-IL-4RA: IL-4 variant)				Atopic asthma - study 2		Placebo nebulisation (inhlaed)	16	29	8	Male: 7 Female: 8	Male: 46.7 Female: 53.3	NR	NR	NR	NR	459	399	NR	NR	3.52	1.05	NR	NR	96%	18	NR	NR	All patients needed regular All patients needed regular or as required use of beta-agonists		NR	NR			NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	34.5	44.3	NR	NR	NR	NR	NR	NR
						Pitrakinra nebulisation (inhaled)	16	25	5	Male: 12 Female: 3	Male: 80 Female: 20	NR	NR	NR	NR	315	303	NR	NR	4.09	1.02	NR	NR	99%	15	NR	NR			NR	NR			NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	16.6	13.6	NR	NR	NR	NR	NR	NR
IMA-638 (anti-IL-13 mAb)	Gauvreau et al 2011[42]	Effects of Interleukin-13 Blockade on Allergen-induced Airway Responses in Mild Atopic Asthma	https://pubmed.ncbi.nlm.nih.gov/21057005/	Mild Atopic Stable Asthma	5 weeks (n = 56 overall, n = 27 for IMA-638 study)	Placebo	13	32.3	3.2	Male: 5 Female: 8	Male: 38.5 Female: 61.5	NR	NR	2% (estimated from graph)	0.5% (estimated from graph)	NR	NR	NR	NR	NR	NR	NR	NR	87.1	2.5	NR	NR	Patients were not using ICS or other asthma meds, only infrequent use of an inhaled beta2-agonist to control their asthma		NR	NR	Patients were not currently using ICS		NR	NR	NR	NR	Patients were non-smoking but smoking history not specified		NR	NR	NR	NR	NR	NR	NR	NR	2.7	NR	NR	NR	NR	NR	NR	NR	NR	NR
						IMA-638	14	26.1	1.7	Male: 7 Female: 7	Male: 50 Female: 50	NR	NR	6% (estimated from graph)	2% (estimated from graph)	NR	NR	NR	NR	NR	NR	NR	NR	93.0	3.4	NR	NR			NR	NR			NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	1.3	NR	NR	NR	NR	NR	NR	NR	NR	NR
Anti-M1 Prime (MEMP1972a) Mab	Gauvreau et al 2012[43]	Effect Of An Anti-M1 Prime Monoclonal Antibody, MEMP1972A,In A Phase II Proof-Of-Activity Allergen Challenge Study In PatientsWith Mild Asthma	https://www.atsjournals.org/doi/pdf/10.1164/ajrccm-conference.2012.185.1_MeetingAbstracts.A6793	Mild asthma	12 weeks (n = 28)	Placebo IV	13	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
						MEMP1972a IV 5mg/kg Q4W	15	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Anti-TSLP Fragment CSJ117	Gauvreau et al 2020[44]	Efficacy and Safety of an Inhaled Anti-TSLP Antibody Fragment in Adults with Mild Atopic Asthma	https://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2020.201.1_MeetingAbstracts.A4207	Mild Atopic Asthma	12 weeks (n = 28)	Placebo	13	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
						CSJ117	15	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
rh-PAF-AH	Henig et al 2000[45]	Effect of Recombinant Human Platelet-activating Factor-Acetylhydrolase on Allergen-induced Asthmatic Responses	https://pubmed.ncbi.nlm.nih.gov/10934081/	Mild Atopic Asthma	5-7 week treatment period (n = 14)	Placebo IV	NR	NR	NR	Male: 9 Female: 5	Male: 64.3 Female: 35.7	NR	NR	NR	NR	NR	NR	NR	NR	3.2	0.2	NR	NR	79.7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
						rh-PAF-AH 1mg/kg IV	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR			NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ro-24-7472 (rIL-12)	Bryan et al 2000[46]	Effects of recombinant human interleukin-12 on eosinophils, airway hyper-responsiveness, and the late asthmatic response	https://pubmed.ncbi.nlm.nih.gov/11191543/	Mild allergic asthma	4 weeks (n = 39)	Placebo SC	20	26.4	5.3	Male: 15 Female: 5	Male: 75 Female: 25	NR	NR	NR	NR	241	149	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	All patients required treatment with an inhaled beta2-agonist only		NR	NR	Corticosteroid use in the previous month was an exclusion criterion		NR	NR	NR	NR	NR	NR	174.3	8.5	74.4	11.7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.57 (0.35–0.80)		NR	NR
						human rIL-17 SC (Ro-24-7472), weekly increasing dose of 0.1. 0.25, 0.5 ug/kg	19	25.8	7.5	Male: 12 Female: 7	Male: 63.2 Female: 36.8	NR	NR	NR	NR	440	433	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			NR	NR			NR	NR	NR	NR	NR	NR	174.2	10.1	76.1	14.8	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.75 (0.42–1.08)		NR	NR
Anti-OX40 ligand (mAb)	Gauvreau et al 2014[47]	OX40L blockade and allergen-induced airway responses in subjects with mild asthma	https://pubmed.ncbi.nlm.nih.gov/24224471/	Mild Atopic Asthma	12 weeks (n = 28)	Placebo IV	14	33.9	12.0	Male: 7 Female: 7	Male: 50 Female: 50	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	84.9	14.7	NR	NR	Patients had only infrequent use of an inhaled beta2-agonist to control their asthma, otherwise were steroid naïve		NR	NR	Patients were steroid-naïve		NR	NR	NR	NR	Patients were non-smoking but smoking history not specified		NR	NR	NR	NR	NR	NR	NR	NR	0.79	0.05–13.5	NR	NR	NR	NR	NR	NR	NR	NR
						Anti-OX40 ligand IV	14	33.4	13.3	Male: 8 Female :6	Male: 57.1 Female: 42.9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	91.7	11.4	NR	NR			NR	NR			NR	NR	NR	NR			NR	NR	NR	NR	NR	NR	NR	NR	1.62	0.3–11.6	NR	NR	NR	NR	NR	NR	NR	NR

Table S5 Summary of extracted outcomes data

Where + indicates the biologic reduced EAR, LAR or AHR; – indicates the biologic had no effect on EAR, LAR or AHR
ND; not determined

Notes	Study Identifiers					EAR		LAR		AHR		
	Biologic	Reference	Article title	Citation	Article / PubMed link	Response	*p* value	Response	*p* value	Stimuli	Response	*p* value
Allergen challenge	Omalizumab	Boulet et al 1997[18]	Inhibitory Effects of an Anti-IgE Antibody E25 on Allergen-induced Early Asthmatic Response	Boulet LP et al. Am J Respir Crit Care Med 1997;155:1835–40.	https://pubmed.ncbi.nlm.nih.gov/9196083/	+	≤ 0.002	ND		MCh	+	< 0.05
Allergen challenge	Omalizumab	Fahy et al 1997[19]	The Effect of an Anti-IgE Monoclonal Antibody on the Early- and Late-Phase Responses to Allergen Inhalation in Asthmatic Subjects	Fahy JV et al. Am J Respir Crit Care Med 1997;155:1828–34.	https://pubmed.ncbi.nlm.nih.gov/9196082/	+	< 0.02	+	< 0.02	MCh	–	ns (NR)
Aerosolized E25 allergen challenge	Omalizumab	Fahy et al 1999[20]	Effect of Aerosolized Anti-IgE (E25) on Airway Responses to Inhaled Allergen in Asthmatic Subjects	Fahy JV et al. Am J Respir Crit Care Med 1999;160:1023-1027.	https://pubmed.ncbi.nlm.nih.gov/10471635/	–	ns (NR)	–	ns (NR)	MCh	–	ns (NR)
	Omalizumab	Noga et al 2003[21]	Immunological and Clinical Changes in Allergic Asthmatics following Treatment with Omalizumab	Noga O et al. Int Arch Allergy Immunol 2003;131:46–52.	https://pubmed.ncbi.nlm.nih.gov/12759489/	ND		ND		ACh	+	< 0.05
	Omalizumab	Djukanovic et al 2004[22]	Effects of Treatment with Anti-immunoglobulin E Antibody Omalizumab on Airway Inflammation in Allergic Asthma	Djukanović R et al. Am J Respir Crit Care Med 2004;170;583–93.	https://pubmed.ncbi.nlm.nih.gov/15172898/	ND		ND		MCh	–	0.14
	Omalizumab	Prieto et al 2006[23]	Effect of Omalizumab on Adenosine 5'-Monophosphate Responsiveness in Subjects with Allergic Asthma	Prieto L et al. Int Arch Allergy Immunol 2006;139:122–31.	https://pubmed.ncbi.nlm.nih.gov/16374021/	ND		ND		AMP/MCh	–	0.24/0.11
	Omalizumab	Patel et al 2009[24]	Effects of Omalizumab (Xolair) on Airway Hyperresponsiveness	Patel BM et al. J Allergy Clin Immunol 2009;123:S263 (Abstract)	https://www.jacionline.org/article/S0091-6749(08)03442-8/fulltext	ND		ND		MCh	–	ns (NR)
Allergen challenge	Omalizumab	van Rensen et al 2009[25]	Eosinophils in bronchial mucosa of asthmatics after allergen challenge: effect of anti-IgE treatment	van Rensen ELJ et al. Allergy 2009;64:72–80.	https://pubmed.ncbi.nlm.nih.gov/19076931/	+	0.002	+	0.000	MCh	–	> 0.18
	Omalizumab	Zielen et al 2013[26]	Omalizumab Protects against Allergen-Induced Bronchoconstriction in Allergic (Immunoglobulin E-Mediated) Asthma	Zielen S et al. Int Arch Allergy Immunol 2013;160:102-10.	https://pubmed.ncbi.nlm.nih.gov/22948442/	+	p = 0.087 and p < 0.001 for group 1 and 2, respectively	ND		ND	ND	
	Omalizumab	Hendeles et al 2015[27]	Omalizumab Therapy for Asthma Patients with Poor Adherence to Inhaled Corticosteroids	Hendeles L et al. Ann Allergy Asthma Immunol 2015;114:58-62.	https://pubmed.ncbi.nlm.nih.gov/25528738/	ND		ND		AMP	+	0.022
Allergen challenge	Mepolizumab	Leckie et al 2000[28]	Effects of an interleukin-5 blocking monoclonal antibody on eosinophils, airway hyper-responsiveness, and the late asthmatic response	Leckie MJ et al. Lancet 2000;356:2144–48.	https://pubmed.ncbi.nlm.nih.gov/11191542/	–	0.1610/0.2654	–	0.5050/1.0000	His	–	0.9248/1.0000
	Mepolizumab	Flood-Page et al 2003[29]	Eosinophil's Role Remains Uncertain as Anti–Interleukin-5 only Partially Depletes Numbers in Asthmatic Airway	Flood-Page PT et al. Am J Respir Crit Care Med 2003;167:199–204.	https://pubmed.ncbi.nlm.nih.gov/12406833/	ND		ND		His	–	0.49
	Mepolizumab	Haldar et al 2009[30]	Mepolizumab and Exacerbations of Refractory Eosinophilic Asthma	Haldar P et al. N Engl J Med 2009;360:973–84.	https://pubmed.ncbi.nlm.nih.gov/19264686/	ND		ND		MCh	–	0.70
Abstract, allergen challenge	Benralizumab	Gauvreau et al 2021[31]	The Effect of Benralizumab On Allergen-Induced Responses In Subjects With Mild Allergic Asthma	Gauvreau GM et al. J Allergy Clin Immunol Pract 2021;147:AB157.	https://doi.org/10.1016/j.jaci.2020.12.563	ND		–	NR	ND	ND	
Allergen challenge	Tezepelumab	Gauvreau et al 2014[32]	Effects of an Anti-TSLP Antibody on Allergen-Induced Asthmatic Responses	Gauvreau GM et al. N Engl J Med 2014;370:2102–10.	https://www.nejm.org/doi/full/10.1056/nejmoa1402895	+	< 0.05	+	< 0.05	MCh	+	0.04
	Tezepelumab	Diver et al 2021[33]	Effect of tezepelumab on airway inflammatory cells, remodelling, and hyperresponsiveness in patients with moderate-to-severe uncontrolled asthma (CASCADE): a double-blind, randomised, placebo-controlled, phase 2 trial	Diver S et al. Lancet Respir Med 2021;9:1299–1312.	https://pubmed.ncbi.nlm.nih.gov/34256031/	ND		ND		Man	+	0.030
	Tezepelumab	Sverrild et al 2021[34]	The effect of tezepelumab on airway hyperresponsiveness to mannitol in asthma (UPSTREAM)	Sverrild A et al. Eur Respir J 2021;59:2101296	https://pubmed.ncbi.nlm.nih.gov/34049943/	ND		ND		Man	+	0.04
Allergen challenge	Lebrikizumab	Scheerens et al 2014[35]	The effects of lebrikizumab in patients with mild asthma following whole lung allergen challenge	Scheerens H et al. Clin Exp Allergy 2014;44:38–46.	https://pubmed.ncbi.nlm.nih.gov/24131304/	–	ns (NR)	–	ns (NR)	MCh	–	ns (NR)
	Tralokinumab	Russell et al 2018[36]	Effect of tralokinumab, an interleukin-13 neutralising monoclonal antibody, on eosinophilic airway inflammation in uncontrolled moderate-to-severe asthma (MESOS): a multicentre, double-blind, randomised, placebo-controlled	Russell RJ et al. Lancet Respir Med 2018;6:499–510.	https://pubmed.ncbi.nlm.nih.gov/29793857/	ND		ND		MCh	–	0.74
Allergen challenge	Tocilizumab	Revez et al 2019[37]	Effects of interleukin-6 receptor blockade on allergen induced airway responses in mild asthmatics	Revez JA et al. Clin Trans Immunol 2019;8:e1044.	https://pubmed.ncbi.nlm.nih.gov/31223480/	–	0.741	–	0.697	MCh	–	0.676
	Efalizumab	Gauvreau et al 2003[38]	The effects of an anti-CD11a mAb, efalizumab, on allergen-induced airway responses and airway inflammation in subjects with atopic asthma	Gauvreau GM et al. J Allergy Clin Immunol 2003;112:331–8.	https://pubmed.ncbi.nlm.nih.gov/12897739/	–	> 0.05	–	0.098	MCh	–	> 0.05
Allergen challenge	Etanercept (anti-TNF-α fusion protein)	Berry et al 2006[39]	Evidence of a Role of Tumor Necrosis Factor α in Refractory Asthma	Berry MA et al. N Engl J Med 2006;354:697–708.	https://pubmed.ncbi.nlm.nih.gov/16481637/	ND		ND		MCh	+	0.05
	Etanercept (anti-TNF-α fusion protein)	Rouhani et al 2005[40]	Effect of tumor necrosis factor antagonism on allergen-mediated asthmatic airway inflammation	Rouhani FN et al. Respir Med 2005;99:1175-82	https://pubmed.ncbi.nlm.nih.gov/16085220/	ND		ND		MCh	–	0.4
Subcutaneous / inhaled	Pitrakinra (anti-IL-4RA: IL-4 variant)	Wenzel et al 2007[41]	Effect of an interleukin-4 variant on late phase asthmatic response to allergen challenge in asthmatic patients: results of two phase 2a studies	Wenzel S et al. Lancet 2007;370:1422–31.	https://pubmed.ncbi.nlm.nih.gov/17950857/	–/–	0.56/0.94	–/+	0.068/0.0001	MCh, AMP	–/–	0.234/0.128
Allergen challenge	IMA-638 (anti-IL-13 mAb)	Gauvreau et al 2011[42]	Effects of Interleukin-13 Blockade on Allergen-induced Airway Responses in Mild Atopic Asthma	Gauvreau GM et al. Am J Respir Crit Care Med 2011;183:1007–14.	https://pubmed.ncbi.nlm.nih.gov/21057005/	–	0.39	–	0.27	MCh	–	ns (NR)
Abstract, allergen challenge	Anti-M1 Prime (MEMP1972a) Mab	Gauvreau et al 2012[43]	Effect Of An Anti-M1 Prime Monoclonal Antibody, MEMP1972A,In A Phase II Proof-Of-Activity Allergen Challenge Study In PatientsWith Mild Asthma	Gauvreau G et al. Am J Respir Crit Care Med 2012;185:A6793	https://www.atsjournals.org/doi/pdf/10.1164/ajrccm-conference.2012.185.1_MeetingAbstracts.A6793	+	0.046	–	0.21	MCh	–	ns (NR)
Abstract, allergen challenge	Anti-TSLP Fragment CSJ117	Gauvreau et al 2020[44]	Efficacy and Safety of an Inhaled Anti-TSLP Antibody Fragment in Adults with Mild Atopic Asthma	Gauvreau G et al. Am J Respir Crit Care Med 2020;201:A4207 (Abstract).	https://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2020.201.1_MeetingAbstracts.A4207	–	0.097	+	0.008	ND	ND	
Allergen challenge	rh-PAF-AH	Henig et al 2000[45]	Effect of Recombinant Human Platelet-activating Factor-Acetylhydrolase on Allergen-induced Asthmatic Responses	Henig NR et al. Am J Respir Crit Care Med 2000;162:523-527.	https://pubmed.ncbi.nlm.nih.gov/10934081/	–	ns (NR)	–	ns (NR)	ND	ND	
Allergen challenge	Ro-24-7472 (rIL-12)	Bryan et al 2000[46]	Effects of recombinant human interleukin-12 on eosinophils, airway hyper-responsiveness, and the late asthmatic response	Bryan SA et al. Lancet 2000;356:2149–53.	https://pubmed.ncbi.nlm.nih.gov/11191543/	ND		–	0.67	His	–	0.47
Allergen challenge	Anti-OX40 ligand (mAb)	Gauvreau et al 2014[47]	OX40L blockade and allergen-induced airway responses in subjects with mild asthma	Gauvreau GM et al. Clin Exp Allergy 2014;44:29–37.	https://pubmed.ncbi.nlm.nih.gov/24224471/	–	> 0.05	–	> 0.05	MCh	–	> 0.05

Reference	Study	Biologic	Outcome	D1	D2	D3	D4	D5	Overall
Boulet et al 1997[18]	NA	Omalizumab	EAR, LAR, AHR	+	+	+	+	!	!
Fahy et al 1997[19]	NA	Omalizumab	EAR, LAR, AHR	+	+	+	+	!	!
Fahy et al 1999[20]	NA	Omalizumab	EAR, LAR, AHR	+	+	+	+	!	!
Noga et al 2003[21]	NA	Omalizumab	AHR	+	+	+	+	!	!
Djukanovic et al 2004[22]	NA	Omalizumab	AHR	+	+	+	+	!	!
Prieto et al 2006[23]	NA	Omalizumab	AHR	+	+	+	+	!	!
Patel et al 2009[24]	NA	Omalizumab	AHR	+	+	+	+	!	!
van Rensen et al 2009[25]	NA	Omalizumab	EAR, LAR, AHR	+	+	+	+	!	!
Zielen et al 2013[26]	NA	Omalizumab	EAR	+	+	+	+	!	!
Hendeles et al 2015[27]	NA	Omalizumab	AHR	+	+	+	+	!	!
Leckie et al 2000[28]	NA	Mepolizumab	EAR, LAR, AHR	+	+	+	+	!	!
Flood-Page et al 2003[29]	NA	Mepolizumab	AHR	+	+	+	+	!	!
Haldar et al 2009[30]	NA	Mepolizumab	AHR	+	+	+	+	!	!
Gauvreau et al 2021[31]	NA	Benralizumab	LAR	+	+	+	+	!	!
Gauvreau et al 2014[32]	NA	Tezepelumab	EAR, LAR, AHR	+	+	+	+	+	+
Diver et al 2021[33]	CASCADE	Tezepelumab	AHR	+	+	+	+	+	+
Sverrild et al 2021[34]	UPSTREAM	Tezepelumab	AHR	+	+	+	+	+	+
Scheerens et al 2014[35]	NA	Leprikizumab	EAR, LAR, AHR	+	+	+	+	+	+
Russell et al 2018[36]	MESOS	Tralokinumab	AHR	+	+	+	+	+	+
Revez et al 2019[37]	NA	Tocilizumab	EAR, LAR, AHR	+	+	+	+	+	+
Gauvreau et al 2003[38]	NA	Efalizumab	EAR, LAR, AHR	+	+	+	+	!	!
Berry et al 2006[39]	NA	Etanercept	AHR	+	+	+	+	+	+
Rouhani et al 2005[40]	NA	Etanercept	AHR	+	+	+	+	!	!
Wenzel et al 2007[41]	NA	Pitrakinra	EAR, LAR, AHR	+	+	+	+	+	+
Gauvreau et al 2011[42]	NA	IMA-638	EAR, LAR, AHR	+	+	+	+	+	+
Gauvreau et al 2012[43]	NA	MEMP1972a	EAR, LAR, AHR	+	+	+	+	+	+
Gauvreau et al 2020[44]	NA	CSJ117	EAR, LAR	+	+	+	+	!	!
Henig et al 2000[45]	NA	rhPAF-AH	EAR, LAR	+	+	+	+	!	!
Bryan et al 2000[46]	NA	Ro-24-7472	LAR, AHR	+	+	+	+	!	!
Gauvreau et al 2014[47]	NA	Anti-OX40	EAR, LAR, AHR	+	+	+	+	+	+

+ Low risk
! Some concerns
− High risk

D1 Randomization process
D2 Deviations from the intended interventions
D3 Missing outcome data
D4 Measurement of the outcome
D5 Selection of the reported result

Figure S1 Risk of bias. Risk of bias was assessed using the revised Cochrane risk-of-bias tool for randomized trials

Abbreviations: AHR, airway hyperresponsiveness; EAR, early allergic response; ID, identifier; LAR, late allergic response; NA, not applicable; rhPAF-AH, recombinant human platelet-activating factor acetylhydrolase.