








# A Comparative Study on Adipose-Derived Mesenchymal Stem Cells Secretome Delivery Using Microneedling and Fractional CO<sub>2</sub> Laser for Facial Skin Rejuvenation [Response to Letter]

Shannaz Nadia Yusharyahya <sup>1</sup>, Valdi Ven Japranata <sup>2</sup>, Irma Bernadette S Sitohang <sup>1</sup>, Lili Legiawati <sup>1</sup>, Endi Novianto <sup>1</sup>, Lis Surachmiati Suseno <sup>1</sup>, Karin Rachmani <sup>1</sup>

<sup>1</sup>Department of Dermatology and Venereology, Faculty of Medicine, Universitas Indonesia - Dr. Cipto Mangunkusumo Hospital, Jakarta Pusat, Indonesia; <sup>2</sup>Faculty of Medicine, Universitas Indonesia, Jakarta Pusat, Indonesia

Correspondence: Shannaz Nadia Yusharyahya, Department of Dermatology and Venereology, Faculty of Medicine, Universitas Indonesia - Dr. Cipto Mangunkusumo Hospital, Jalan Diponegoro Nomor 71, Kenari, Senen, Jakarta Pusat, 10430, Indonesia, Tel/Fax +62 21 31935383, Email nadiayusharyahya@yahoo.com

## Dear editor

We thank Ratih Rinendyaputri from National Research and Innovation Agency (BRIN), Indonesia, for the perceptive comments concerning our latest publication entitled “A comparative study on adipose-derived mesenchymal stem cells secretome delivery using microneedling and fractional CO<sub>2</sub> laser for facial skin rejuvenation” published in *Clinical, Cosmetic and Investigational Dermatology*. We solemnly appreciate any valuable input to our work for improvements in the future research, especially regarding stem cell products which have an immense potential in regenerative medicine. Through this article, we would like to address our replies to the concerns raised by the mentioned reader.

First, the reader argued that our clinical trial was established to demonstrate the efficacy and safety of adipose-derived mesenchymal stem cells (ADMSCs) secretome for skin rejuvenation in a dose-dependent manner. While we agree with the importance of secretome dosage for such purpose, as we have explicitly stated in the introduction of our manuscript, the study aims to investigate which administration method (microneedling or fractional CO<sub>2</sub>) is the best to deliver ADMSCs secretome for alleviating skin aging features.<sup>1</sup> Numerous previous studies have reported the effects of stem cell derivatives in the field of dermatology. For instance, a study by Kim et al showed that the conditioned growth medium of ADMSCs incorporated in cosmetic products may exert antiaging properties through collagen synthesis, damaged skin restoration, and dermal density increment.<sup>2</sup> Another research by Ahangar et al suggested that a vast repertoire of trophic factors contained in stem cell secretome may support wound repair through paracrine signaling, thus improving re-epithelization, promoting angiogenesis, and controlling inflammation in human skin.<sup>3</sup> Damayanti, Rusdiana, and Wathoni also conducted a literature review summarizing the utilization of mesenchymal stem cell secretome in dermatology, eg, protection against photoaging, accelerate hair growth, and treating psoriasis.<sup>4</sup> Given the massive prospects of stem cell secretome that have already been discovered, there will be no novelty in performing another clinical trial to explore the efficacy of ADMSCs secretome for the treatment of cutaneous senescence; hence, that is not an interest in our current study.

In addition, the reader emphasized the lack of characterization and protein concentrations of ADMSCs secretome used in our clinical trial. We acknowledge the imperative role of providing detailed delineation of study materials to ensure the replicability of our research. As per written descriptions in our latest paper, we performed quality analysis to our ADMSCs secretome, including the quantitative measurement of its protein contents. However, since our secretome is still prototype and yet to be registered for Intellectual Property Rights to date, we cannot provide the exact concentration

of growth factors, interleukins, and other proteins of the final manufactured product. This is also a part of the security measures which is undertaken to keep the manufacturer's information confidential and to prevent possible conflicts of interests.

In conclusion, the authors greatly value the reader's contribution to our previous work. We are looking forward to another constructive remarks for the betterment of our prospective projects.

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## Disclosure

The authors hereby declare that we have no competing conflicts of interests in this communication.

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