

# Network Pharmacology and Molecular Docking Identify the Potential Mechanism and Therapeutic Role of *Scutellaria baicalensis* in Alzheimer's Disease [Letter]

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## Dear editor

We congratulate Peng and Zhou for successfully publishing their article “Network Pharmacology and Molecular Docking Identify the Potential Mechanism and Therapeutic Role of *Scutellaria baicalensis* in Alzheimer's Disease”.<sup>1</sup> This study explores the possible mechanisms by which *Scutellaria baicalensis* protects against Alzheimer's disease using network pharmacology and molecular docking approaches. *Scutellaria baicalensis* is a Chinese herbal medicine containing various active chemical components, mainly flavonoids. Flavonoids such as baicalin, wogonoside, and their aglycones baicalein and wogonin are the major bioactive compounds extracted from the roots of *Scutellaria baicalensis*.<sup>2</sup> These flavonoids have been reported to possess various pharmacological functions, including anti-cancer, hepatoprotection, antibacterial and antiviral, antioxidant, anticonvulsant, and neuroprotective effects.<sup>2</sup> The findings and drug design discussed in this article are interesting and worth further exploration.

In this study, screening of three target genes (SRC, PIK3R1, and STAT3) in Alzheimer's disease against the bioactive compound *Scutellaria baicalensis* was conducted using degree centrality (Degree, Betweenness, and Closeness) and a heat map of the dataset in the STRING database, which was then imported into Cytoscape 3.8.2 software. The results of molecular docking analysis also suggest that compounds Baicalein, Wogonin, and 5,2'-Dihydroxy-6,7,8-trimethoxyflavone from *Scutellaria baicalensis* are crucial in intervening in Alzheimer's disease by effectively binding to SRC, PIK3R1, and STAT3. These molecular docking results have also been confirmed in vitro regarding the potential of bioactive compounds from *Scutellaria baicalensis* to inhibit the expression of SRC, PIK3R1, and STAT3 in Neuro 2A cells. However, molecular docking in this study did not conduct molecular dynamic simulations (MDs). MDs can be used to predict the stability of the formed complexes between Baicalein, Wogonin, and 5,2'-Dihydroxy-6,7,8-trimethoxyflavone from *Scutellaria baicalensis* with SRC, PIK3R1, and STAT3 proteins, thus identifying the most effective compounds in inhibiting target activity.<sup>3</sup>

Additionally, to enhance the understanding of the potential mechanism and therapeutic role of *Scutellaria baicalensis* in Alzheimer's Disease, we recommend conducting future in vivo studies using a rat model to measure learning and memory abilities using Radial Arm Maze (RAM) tools and observe the morphological changes of the rat hippocampus using immunohistochemistry.<sup>4,5</sup> These in vivo tests can provide insights into how the bioactive compounds of *Scutellaria baicalensis* may improve learning and memory abilities and reduce damage to hippocampal neurons to prevent Alzheimer's disease.<sup>5</sup> Overall, we congratulate all authors who have provided important information regarding offering

bioactive compounds for *Scutellaria baicalensis* prospective therapeutic efficacy against Alzheimer's disease, presenting valuable insights for subsequent clinical drug advancement.

## Disclosure

The authors have disclosed no conflicts of interest in this communication.

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