

To,

Sun Pharma Research Foundation

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Date: 11 July 2024

Statement from Applicant:

I am applying for the Sun Pharma Science Foundation Research Award 2024 based on the contributions made in developing first-in-class new chemical entities as potential drugs for treating inflammatory bowel diseases (IBDs). A classical "biomimicry-based drug discovery" approach has been utilized to generate novel synthetic drug candidates for the treatment of IBDs.

In this work, my collaborators and I focused on identifying microbial metabolites that trigger the overexpression of tight junction proteins in gut epithelial cells to restore barrier function. They targeted the aryl hydrocarbon receptor (AhR)/Cyp1A1/Nrf2 pathway and showed mild activation of AhR by a gut microbial metabolite, urolithin-A, and its mimics, which restores the gut barrier. However, natural gut metabolite does not have drug-like properties; therefore, a synthetic analog has been developed through a targeted medicinal chemistry approach, which was far more efficient than natural metabolite. Furthermore, my lab has done three rounds of medicinal chemistry to identify four lead compounds that exhibited optimal safety and toxicity profiles in an IND-enabling study (unpublished work). Based on this invention, our team will file an Investigative New Drug (IND) application to the US-FDA to start the Phase I clinical trials in the coming years.

I have conceptualized the idea in this work and led the entire medicinal chemistry efforts and in vitro studies. My collaborator, Dr. Venkatakrishna Rao Jala from the University of Louisville, USA, has tested these compounds in preclinical IBD models.

I hereby confirm that based on this work, thus far, I have not received any fellowship/award. The first nomination for this work is the Sun Pharma Science Foundation Research Award 2024.

With best wishes,



Praveen Kumar Vemula

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