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To,

Date: September 20th 2021

Prof. Virander S. Chauhan
Chairman, Sun Pharma Science Foundation

Subject: Nomination of Shubhi Pandey for the Sun Pharma Research Scholar Award, 2021

Dear Prof. Chauhan,

It is my distinct pleasure to nominate Ms. Shubhi Pandey for the Sun Pharma Research Scholar Award, 2021 in Biomedical Sciences. Shubhi is a 5th year Ph.D. student in the Department of Biological Sciences and Bioengineering at the Indian Institute of Technology, Kanpur.

Shubhi's research work is focused primarily on understanding the activation and signaling of two distinct seven transmembrane receptors (7TMR) namely, C5aR1 and C5aR2. Both of these receptors are activated by a common natural agonist called complement C5a, which is an essential component of the complement cascade playing critical roles in body's immune response. While C5aR1 belongs to the largest family of cell surface receptors known as G protein-coupled receptors (GPCRs) and signals through heterotrimeric G-proteins, C5aR2 does not couple to G-proteins and it has been classified as a "silent" or "non-signaling" receptor. During her Ph.D. thesis, Shubhi has discovered that C5aR2 in fact couples to, and signals through, an alternative mechanism mediated by β-arrestins. Using a comprehensive approach encompassing biochemical, structural and cellular methods, Shubhi has established C5aR2 as an exclusively β-arrestin-coupled 7TMR that represents one of the very first examples of a naturally-occurring signaling-biased receptor in the human genome. This discovery changes the general paradigm in the field that all 7TMRs must couple to G-proteins, and offers a novel framework to understand structural and functional diversity encoded by the 7TM architecture.

The research findings arising from Shubhi's Ph.D. work have been published as two different papers in the *Journal of Biological Chemistry (2019)* and *Molecular Cell (2021)*, and Shubhi is joint 1st author in these papers. In addition, Shubhi has also contributed to multiple other collaborative research projects in the laboratory, and coauthored publications in *Nature*, *Cell Reports*, *EMBO Reports*, and *Science Advances*. Moreover, she has also published review articles and invited perspectives in *Trends in Biochemical Sciences, Trends in Cell Biology, Cell Host and Microbe,* and *Molecular Cell*.

Overall, Shubhi has emerged as an exemplary Ph.D. student in our department and a poster child of our graduate program, and I nominate her for the *Sun Pharma Research Scholar Award, 2021 in Biomedical Sciences* with my highest possible recommendation. I sincerely hope that the committee decides favorably on Shubhi's application for this timely and most well-deserved recognition.

Please feel free to contact me for any additional information.

Sincerely,

Arun Kumar Shukla

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Associate Professor
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