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To,
The Office of Sun Pharma Science Foundation
New Delhi – 110001 (India)

Subject: Justification for sponsoring the nomination

Dear Sir/Madam:

I am delighted to nominate my younger colleague Prof. Debabrata Maiti for Sun Pharma Science Foundation Research Awards under "**Pharmaceutical Sciences**". Here is my justification for sponsoring the nomination of Prof. Maiti.

Nature has developed several fascinating enzymatic pathways for proximal and distal site selective C–H functionalizations to create diverse bioactive molecules. In the realm of practical chemistry, synthetic endeavours can be attained for the proximal, albeit it falters for distal target locations. Prof. Maiti has established himself among world's leading scientists in catalyst design for transforming organic molecules via C-H functionalization to prepare bio-active natural products, drug molecules and materials in step and atom-economic fashion. These conceptual developments have significantly impacted materials research, agrochemicals and pharmaceuticals industry. In this regard, the nominee is committed to harness diverse strategies to mimic Nature's proficiency to surpass the challenges associated with specific distal C–H functionalizations.

Alongside this, the nominee has successfully developed various metallo-enzymatic approaches towards organo-synthetic scenario. In this regard, the utilization of "eco-friendly" metal, iron (Fe) has been explored to construct metallo-enzyme. Halogenation reactions occur during biosynthesis of more than 4000 natural products that display biological activity of pharmacological interest including anticancer, antibacterial, antiviral, antifungal, and anti-inflammatory activities. The nominee and his team have already established metal mediated halogenations by vanadium oxoperoxo species and direct halogenation by non-heme biomimetic iron-oxo complexes. In recent times, the nominee is pursuing research fields of artificial metallo-enzymatic methodologis. Currently, he has established evolution of strept(avidin)-based artificial metalloenzymes in organometallic catalysis and focusing to expertise in this field.

Besides, the nominee has worked on diverse fields starting from metal-mediated defunctionalizations, photocatalysis, lignin valorization, heterocycle synthesis, and olefin functionalization. He has excelled in these domains, filed 12 patents and established himself in the international arena by publishing in top-tier journals. Olefin nitration is one of the most exciting works at an early stage of his

independent career. Later he worked on *ortho*-olefination of unactivated terminal olefins for the first time. Subsequently, nominee's group took a momentous lead in the area of distal *meta*- and *para*-C–H functionalization. The nominee has contributed several high-quality works in this domain. Of them the most exciting recent works include selective *meta* functionalization of arenes with a spacer up to 20 atoms between the target C–H bond and the coordinating heteroatom of the directing group and distal aliphatic C–H functionalization. Of course, with the *para*-functionalization project the group pioneers the first ever *para*-template in 2015. These fundamental and industry application oriented development has been instrumental in providing reliable and scalable synthesis of target drug molecules and their derivatization in Pharmaceutical Sciences.

Additionally, nominee's group have developed new methods to construct biologically active heterocyclic core and drug derivatives. The nominee has been closely working with research-focused companies aiming at new drug discovery, agrochemicals and materials. Based on his recent discovery on distal C–H functionalization, "Maiti-Bera-Modak Auxiliary" is now commercially available from Sigma-Aldrich (product number 798193) and "Maiti-Bag Auxiliary" from TCI.

Prof. Maiti has already published over 190 manuscripts with 9630 citations and h-index of 56. I wish him all the success. I sincerely hope you will find Prof. Maiti suitable for Sun Pharma Science Foundation Research Awards under "Pharmaceutical Sciences".

[September 28, 2021]

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