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Director and J. C. Bose National Fellow

31st August 2024

Nomination of Dr. Basker Sundararaju for Sun Pharma Research Award (Pharmaceutical Sciences)

---Justification---

Dr. Sundararaju joined the faculty of the Department of Chemistry in October 2013. He initiated his research on catalysis organic synthesis and late-stage derivatization of pharmaceuticals using first-row late transition metals, a topic of intense contemporary interest in medicinal chemistry and drug development. He has since published 63 research papers of commendable quality from IITK and 81 articles in his overall career. His work is cited immensely, 4900 times so far with a H-index of over 38. He has quickly risen to be known and recognized in the area, both nationally and internationally. He is an editorial board member of prestigious journals and is also an associate editor a Wiley Journal as well. For his independent work, he has been recognized by several awards; one of the notable ones is the Merck Young Scientist Award for 2019. It may be noted that he was one of the top 3 finalists for Scopus Young Scientist award in 2019, and was also shortlisted as one of the finalists for 2020 Swarnajayanthi fellowship. He has recently been awarded CRSI Bronze medal in 2023. He has also been admitted as a Fellow of Royal Society of Chemistry (FRSC) for his outstanding contributions recently.

C-H activation is a transformative technique in medicinal chemistry that enables the direct modification of carbon-hydrogen bonds using transition metal catalysts. This approach simplifies the synthesis of complex molecules by avoiding the need for pre-functionalized intermediates. It allows for the introduction of diverse functional groups into drug-like compounds, facilitating the development of new drugs with enhanced efficacy and specificity. Additionally, C-H activation supports the late-stage functionalization of existing drugs, streamlining the optimization process. This transformative techniques have promise quick study of structure-activity relationships (SAR), creation of oxidized metabolites, blockage of metabolic hot zones, and the preparation of biological probes. In this regard, Dr. Basker Sundararaju has developed new catalytic approaches for rapid access to small compounds in one step using C-H bond functionalizations based on earth-abundant metals. His initial success on this topic drove him to broaden his horizons to include selective introduction vital functional group such as amine, methyl groups through late-stage functionalization of drug molecules in addition to introduce the isotopically-labelled carboxylic acids at a selective position of various drug molecules. Systematic efforts have allowed him develop the chiral version of the catalyst for asymmetric dearomatization of 2D-flat aromatic molecules into 3D chiral molecules that have a huge potential in drug discovery as such molecular structures are never explored in medicinal chemistry. He has recently developed a method for chemical route to homologate the terpenes into higher versions (up to 45 carbon extension) using the in-house developed catalytic system that mimics biomimetic terpenol synthesis. His relentless search for small molecules and organometallic compounds has led to the discovery of novel small molecules with excellent anticancer activities in the range of 1-3 μg/mL and has the potential to be fine tuned into nano molar level. In addition, he has been involved in a variety of other research activities such as late-stage therapeutic modification *via* biomass-valorization, recycling of plastic waste into fine chemicals, conversion of C1 and C2 alcohols into bio-fuels, while leading the improvement in resource economy.

Suffice it to say that he has carved a niche for himself in the area to be known world over. In my candid opinion, he eminently deserves being considered for Sun Pharma Research Award.

I sincerely hope that his credentials will receive due consideration.

(J. N. Moorthy)