Indian Association for the Cultivation of Science

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Sub: Justification of Nomination of Dr. Krishnananda Chattopadhyay for Sun Pharma Research Award 2023.

I am happy to nominate Dr. Krishnananda Chattopadhyay [Chief Scientist and Head, Structural Biology and Bioinformatics Division, CSIR- Indian Institute of Chemical Biology (IICB), Kolkata, India] for the Sun Pharma Research Award 2023 in Medical Sciences-Basic Research.

After joining CSIR-IICB in Dec 2006, Dr. Chattopadhyay initiated an interdisciplinary biophysics laboratory and studied complex problems of disease biology using a combination of biochemistry, cellular and molecular biology and biological spectroscopy at the ensemble and single molecule resolution. In this process, his group learnt not only the intricate details of experimentations, data analyses and mathematical modeling of spectroscopy, but also the applications of fundamental polymer physics; chemistry of fluorophore conjugation; protein chemistry and microscopy. The interdisciplinary nature of his research has been reflected in his publication list, which includes not only major biology journals, like eLife, Communications Biology, ACS Chemical Biology and Journal of Biological Chemistry, but also high impact chemistry and materials science journals, like ACS Applied Materials and Interfaces, Langmuir and Journal of Physical Chemistry. I note that a highlight article of one his papers has been written by a senior editor of the journal Nature.

I have been particularly impressed by his work on the early stages of protein aggregation in the context of neurodegenerative diseases. For their studies on neurodegeneration, his group has used Parkinson's Disease (PD) and ALS as models.

It is well known that the aggregation of related proteins (for example, Alpha Synuclein in PD) eventually leads to fibril formation. Since the fibrils are well characterized by spectroscopy and structural biology, they have been targeted by many academic and industrial research groups for therapeutic discovery and development efforts, which unfortunately yield no cure. After joining in CSIR-IICB on Dec 2006, Dr. Chattopadhyay took up a high risk project to study the early stages of the aggregation, which was completely unexplored at that time. Because of the heterogeneity and transient nature of the intermediates which populate minimally at the early stage, there was no structure available and no systematic drug development was attempted. In the last decades, Dr. Chattopadhyay's group developed a working model of the early stage of Alpha Synuclein aggregation, generated experimental proof of concepts and eventually provided the first structure of a non-toxic intermediate, which they populated by targeting a specific amino acid. In addition, his group provided the first time understanding of how different mutants of SOD1 can be related to severity of ALS.

I strongly believe that due to his outstanding contributions in basic research related to medical sciences Dr. Chattopadhyay deserves the highly prestigious Sun Pharma Award for 2023.

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