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Signed Justification for sponsoring the nomination:

Insulin signaling is not fully known. Any deregulation in signaling by kinases and phosphatases causes insulin resistant diabetes. It is essential to elucidate the network in the transduction cascade to understand the interactions of all the kinases and phosphatases to eventually understand the regulation of insulin resistance. Consistent original and highly cited scientific contributions of Professor Chinmoy Dey over the last 15 years in the challenging area of insulin signaling and insulin resistance in neurons and its emerging implications for Alzheimer's disease (AD) are Nationally and Internationally acclaimed. This was so fundamentally game changing, that one of the papers (***Neuropharmacol.*** 60, 910; Citation 225 on 05.07.23) was cited by **Dr. James Watson (Nobel Laureate)** in his lecture on "60 years of discovery of DNA structure" at University of California, Los Angeles, during March, 2013 followed by publication in The Lancet, 2014, 383: 841. Dr. Dey has demonstrated neuronal insulin signaling as a web, woven through the threads of kinases and phosphatases results in a tight control of complicated network. In this process he has shown the neuronal insulin-signaling is fundamentally different than other insulin sensitive tissues. His major contributions are, **(1)** uncovering the cross-talks between kinases and phosphatases in regulating neuronal insulin signaling and insulin resistance (***Cell. Mol. Life Sci.*** 2021; ***Cell Commun. Signal.*** 2022; ***FEBS J.*** 2022); **(2)** demonstration of strong association of impaired insulin signalling in brain with AD (***Cell Commun. Signal.*** 2023; ***Neuropharmacol.*** 2011); **(3)** determining the role of isoform specific kinases and phosphatases in regulating neuronal insulin signaling, insulin resistance and AD (***Cell. Mol. Life Sci.*** 2021; ***Cell Commun. Signal.*** 2022; ***FEBS J.*** 2022); and **(4)** repurposing of drug Metformin for ameliorating neuronal insulin resistance in AD (***Neuropharmacol.*** 2011).

Understanding the role of each component of the network of neuronal insulin signaling might solve the progression of neuronal insulin resistance which could also reduce the risk of neurodegenerative disorders, like Alzheimer's disease. 30% of intracellular proteins are substrates for these enzymes (Nat. Cell Biol. 1995: 1043). A single family of human genome represents approximately 22% protein kinases (www.nyas.org Nov 30, 2004). There are currently 475 drugs (~34% of all drugs approved by the FDA) including block buster drugs like Gleevek and Iressa (*www.nyas.org Nov 30, 2004*), that act on 108 unique targets of kinase/phosphatase signaling. Some of these kinases and phosphatases of neuronal insulin signaling can be considered as possible drug targets, like Akt isoform specific drug(s), PHLPP isoform specific drug(s) or PP2Cα or PP1γ isoform specific drug(s), since drugs of isoform specificity are latest rational choice (Sci Rep. 2019, 9, 13868; Sci Rep. 2020, 10, 134; J. Med. Chem. 2015, 58, 7611; Genomics, 2020, 112, 647; Cell, 2006, 125, 647). Dr. Dey has painstakingly chiseled out these isoforms of kinases and phosphatases. It could be possible that targeting either kinases or phosphatases or both will not

only overcome insulin resistance but will be beneficial for the neurodegenerative disorders, in future.

Therefore, I am nominating Prof. Chinmoy Sankar Dey, Kusuma School of Biological Sciences, Indian Institute of Technology-Delhi for the Sun Pharma Research Award 2023 in Medical Sciences (Basic Research). Dr. Dey's seminal research work is extremely important for the country, because India is considered to be the diabetes capital of the world. The fundamental knowledge of insulin resistant diabetes and AD, needless to say, goes way beyond the border of the country. His work published in very high impact international journal has created newer possibilities, if taken forward successfully, will help relieving the burden of diabetes and AD.

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