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To the committee (Sun Pharma Science Foundation Research Awards)

It is with great pleasure and enthusiasm that I nominate Dr. Ankit Rai for the Sun Pharma Science Foundation Research Award for Basic Research in Medical Sciences. Ankit has worked in my group in 2015-2021, after a very successful PhD in the laboratory of Dr. Dulal Panda at the Indian Institute of Technology Bombay, where he studied the interaction of cancer drugs with microtubules and the mechanisms of cell resistance to these drugs.

After joining my laboratory, Ankit initiated an innovative research direction – investigation of molecular mechanism underlying the action of microtubule-binding cancer drugs by combining in vitro reconstitution assays with direct visualization of drug-microtubule interactions in real time using high-resolution microscopy, including single-molecule imaging. Ankit has made the surprising discovery (published in **Nature Materials**, with Ankit as the first author) that the extensively studied microtubule-stabilizing cancer drug Taxol can specifically bind to microtubule ends when microtubule growth is perturbed, stabilize these ends but prevent their closure into tubes. Microtubule polymers grown in the presence of Taxol thus contain stable “holes” in their regular lattice. An interesting therapeutically relevant implication of these findings is the unexpected cooperativity between microtubule destabilising and stabilising compounds in their ability to inhibit cancer cell growth. Subsequently, Ankit has shown that microtubule lattice defects induced by Taxol and related drugs can exert effects that can propagate over long distances and affect the dynamic state of the microtubule end. This study, which was published in **Proc. Natl. Acad. Sci. USA**, with Ankit as the first author, fundamentally affects our thinking on how microtubule dynamics is regulated and helps to explain the enigmatic phenomenon of microtubule aging. Ankit has also strongly contributed to a large study that revealed the function of kinesin KIF21B, a protein controlling microtubule networks in immune and neuronal cells (published in **eLife**, with Ankit as a shared first author). Furthermore, Ankit has participated in various collaborative projects leading to eight additional published papers, to which Ankit has made very substantial experimental and conceptual contributions. Altogether, Ankit is an outstanding young scientist – highly intelligent,

thoughtful, experimentally skilled, creative and productive. He is therefore a very strong candidate for the Sun Pharma Science Foundation Research Award.

With best regards,

Prof. Dr. Anna Akhmanova

Elected Member of the European Molecular Biology Organization (EMBO)

Elected Member the Royal Netherlands Academy of Arts and Sciences (KNAW)