



INDIAN INSTITUTE OF TECHNOLOGY KANPUR
भारतीय प्रौद्योगिकी संस्थान कानपुर
Department of Chemistry, Kanpur – 208016 Uttar Pradesh, India

July 28, 2024

To
Sun Pharma Science Foundation,

Dear Selection committee,
Sun Pharma Science Scholar Fellowship,

I would like to nominate Mrs. Sai Kumari Vechalapu for the Sun Pharma Science Scholar Fellowship. She has submitted the research project exploring the iron-complex inducing intracellular ROS and triggering intrinsic apoptosis pathway for preventing cancer cells growth which is published in iScience, 2024.

In this work, iron complexation and subsequent intracellular ROS generation could induce intrinsic apoptosis pathway selectively to prevent cancer cell proliferation. Interestingly, iron mediated lipid peroxide accumulation is established to induce a regulated cell death mechanism called ferroptosis. In our system, despite the accumulation of lipid peroxides, we provide evidence that the level is not sufficient to activate ferroptosis or DNA damage in cells. However, the elevated levels of ROS was found to disturb mitochondrial redox homeostasis and damage the membrane for the release of mt-cytochrome 450 to the cytoplasm. The release of Cyt450 to cytoplasm is known to coordinate the intrinsic apoptosis activation via caspase cascade triggering PARP-1 cleavage resulting apoptosis induction in cells.

This is well orchestrated work where we were able to identify new iron complexes acting in preventing the cancer cells growth at sub micromolar concentrations. We systematically investigated to track the mechanism of action of a couple of iron complexes in preventing the proliferation of cancer cells.

Sincerely,

Dharmaraja Allimuthu, Assistant Professor of Chemistry

Telephone: +91-512-259-2086

Fax: +91-512-259-7436

E-mail: atdharma@iitk.ac.in