INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
PhD-17 SHORT ABSTRACT OF THESIS

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Programme of Study	:	Ph.D.
Thesis Title	:	Development of Inhibitors for Immunosuppressive Indoleamine 2,3-dioxygenase 1 Enzyme
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SHORT ABSTRACT

This thesis titled as "***Development of Inhibitors for Immunosuppressive Indoleamine 2,3-dioxygenase 1 Enzyme***" focused on developing small molecule for robust and selective inhibition of IDO1. We have explored the therapeutic potential of our synthesised inhibitors for the immunotherapeutic treatment of various diseases, especially cancer. We also induced photopharmacology by synthesizing stimuli sensitive prodrugs. The entire work is arranged into four chapters as mentioned below.

Chapter 1 introduces the immunosuppressive Indoleamine 2,3-dioxygenase 1 enzyme and its enzymatic role. It also deals with different types of reported IDO1 inhibitors.

Chapter 2 elaborates on how dichloroquinoline-based IDO1 inhibitors target both apo-IDO1 and free heme, thereby demonstrating the dual-action nature of these inhibitors for IDO1 activity.

Chapter 3 primarily focuses on tryptamine-based azole derivatives linked to a photo-sensitive linker, forming a prodrug. This prodrug releases the drug on photoirradiation, showing potent inhibition.

Chapter 4 corroborates how a spiropyran (inactive form) in presence of both external stimuli (light) as well as internal stimuli (pH) converts to merocyanine (active form), hence inhibiting apo-IDO1 as well as binding to free heme. Thereby, inhibiting the tryptophan metabolism through dual mechanism.