Next generation polyfunctional probes for chemical biology

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**Summary**

This 4-year Industrial CASE PhD studentship is funded by GlaxoSmithKline and EPSRC, and is open to all residents of the EU/EEA and Switzerland. The project would ideally suit an outstanding Masters level chemist, medicinal chemist or chemical biologist, with research experience in synthetic chemistry and/or chemical biology, and a strong interest in developing and applying chemical probes for biological systems.

Recent innovations in chemical probe design and synthesis offer radically new paradigms to control protein function in space and time, extending far beyond the traditional model of ‘one drug one protein’ inhibitors. Discoveries in protein homeostasis and bioconjugation chemistry have led to probes which can directly modify proteins in living systems, alter protein stability or localisation, and modulate drug targets without the requirement for biochemical inhibition.

As the student on this project, you will be at the centre of a collaboration between scientists at Imperial, GSK and Cellzome, interacting with internationally leading groups in the field of chemical probes and protein modification. You will design, synthesise and apply new polyfunctional probes with the capacity to modulate drug targets with exquisite spatiotemporal precision, exploiting photoactivated switching and conjugation, in-cell probe assembly, and multivalent ligands which can ‘rewire’ protein complexes to generate novel functions from pre-existing cellular components.

You will receive training in all relevant aspects of chemical synthesis, protein chemistry, cell biology, proteomics, etc., through the combined expertise of Imperial and GSK. You will also benefit from membership of the Imperial Institute of Chemical Biology Centre for Doctoral Training, and opportunities to collaborate with scientists working at the Francis Crick Institute, through the GSK and Tate group satellite labs based at the Crick.