THE UNIVERSITY of EDINBURGH
School of Engineering

IMP seminar

12:30-13:30 on **16th June 2023** | **HBB_Classroom 4**

Controllable activation of platinum anticancer prodrugs in vivo

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ABSTRACT

Despite the broad clinical applications of platinum-based anticancer drugs including cisplatin, their side effects and resistance issues have encouraged researchers to look for novel metal-based anticancer complexes. Non-traditional platinum compounds especially Pt(IV) complexes have been extensively studied and they hold great promise to be further developed as the next-generation platinum drugs. Selective activation of prodrugs within a tumour is particularly attractive because of their low damage to normal tissue. In this lecture, I will introduce the design, photoactivation mechanism, and antitumor activity of visible light-activatable Pt(IV) prodrugs. These small-molecule prodrugs have controllable activation properties: they are shown to be inert in the dark but under short-period irradiation with low intensity of visible light, and without the need for any external catalyst, the prodrugs are rapidly reduced. The prodrugs display superior antitumor activity both in vitro and in vivo in human carcinoma models. I will also introduce our recent progress in the delivery of platinum drugs and novel types of multifunctional platinum prodrugs. The controllable activation property and superior antitumor activity of these prodrugs may suggest a novel strategy for the design of next-generation platinum prodrugs to reduce the adverse effects and conquer the drug resistance associated with traditional platinum chemotherapy.

SPEAKER

Prof. Zhu is an Associate Professor at the Department of Chemistry, City Uni. of Hong Kong (CityU). He received his B.Sc. in Chemistry from Peking Uni. and Ph.D. in Biological Chemistry from the Uni. of Pittsburgh. He gained further experience through his postdoctoral research at the Massachusetts Institute of Technology (MIT) before joining the faculty at CityU. His research interests lie at the interface of chemistry and biology, focusing on anticancer drug development and mechanism. His current research projects include the development of stimuli-responsive anticancer prodrugs, the synthesis and biological evaluation of novel metal-based anticancer agents, and the development of cancer-specific nanomedicine to conquer cisplatin resistance. His contributions have been extensively published in prestigious journals such as Nature series, Science Advances, Chem, JACS, Angew, and PNAS. He has been selected as a member of various committees such as the Asian Biological Inorganic Chemistry (AsBIC) Steering Committee, and serves as a board member of Journal of Biological Inorganic Chemistry and Journal of Inorganic Biochemistry, in recognition of his outstanding research contributions and leadership in the field of bioinorganic chemistry. Prof. Zhu has also been recognized through several prestigious awards and honours.