



# BIOLOGY COLLOQUIUM

Friday, 16 May 2014 | 4pm | DBS Conference Room 1

Hosted by A/P Christoph Winkler

## Unravelling the Hedgehog Signalling Pathway in Zebrafish



**By Philip Ingham**

Lee Kong Chian School of Medicine and A\*STAR  
Institute of Molecular and Cell Biology, Singapore

Originally discovered in the fruit-fly *Drosophila*, Hedgehog (Hh) signalling proteins are now recognized as fundamental regulators of embryonic development and tissue homeostasis in most animals, from annelids and arthropods to mammals. Understanding how cells respond to Hh signals has significant clinical relevance: inappropriate activation of the pathway underlies a number of tumours, notably basal cell carcinoma (BCC) and medulloblastoma, whereas controlled pathway activation can be used to direct the differentiation of stem cells into various cell types of potential therapeutic utility. Despite extensive analyses over the past two decades, understanding of the mechanism of Hh signal transduction, especially in vertebrates, is still far from complete. Much of the current picture is based on tissue culture assays, which by their nature cannot accurately recapitulate the complexities of the intact organism. To circumvent this limitation, we use the zebrafish embryo as a robust and tractable *in vivo* assay system for Hh pathway activity. This approach is greatly facilitated by the recent development of methods for targeted gene inactivation in this organism. Our recent studies have shed new light on the role of the kinesin family member Kif7 and the G-protein coupled receptor kinase GRK2 in Hh signaling.