"Regional and species specializations in the psychic cell: new insights into higher cortical functions"

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Place: Seminar Room (J308), School of Engineering Science J-Wing
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All are welcome to attend!

Abstract
Marked differences in pyramidal cell structure in different cortical areas of the primate cerebral cortex, and between corresponding cortical regions in different primate species, are likely to result from different evolutionary trends, ontogeny, development and adult experience. Behavioral advantages endowed by specialization in pyramidal cell structure, by influencing the functional capacity of individual neurons and the computational power of the circuits they comprise, are likely to act as important selective pressures during the evolution of species. The extent of phenotypic variation in pyramidal cell structure in the cerebral cortex of the macaque monkey will be discussed, including areas involved in diverse functions such as vision, somatosensation, locomotion, visceral control, emotion and cognition. The structure of these neurons is compared between corresponding (if not homologous) cortical areas in the galago (bush baby), marmoset monkey, owl monkey, vervet monkey (guenon), baboon and human and related to differences in the size of the cerebral cortex in these different species. Particular attention is focused on how the cortical pyramidal cell phenotype has changed during primate evolution. Based on these observations, several new models are presented related to specialization in cortical circuitry during the expansion of the cerebrum.