

Personal Statement for the CUHK Convocation Outstanding Creativity Awards for the  
Natural Sciences

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Traditional training in medical school focuses on what we know about the body and diseases, while much less emphasis is placed on methodologies for working out mechanisms underlying biological phenomena. Given the exceedingly broad nature of medicine, it is practically impossible for a standard five-year medical course to cover both the knowledge needed for clinical practice and rigorous training in scientific research. However, there are never-ending lists of problems in medicine awaiting solutions from research.

In view of the limitations of medical school training, I chose to take a gap between my pre-clinical and clinical years to pursue graduate studies, in order to develop my problem solving ability in the hope that in addition to clinical work I will also contribute to the field through research. At the Chinese University of Hong Kong (CUHK), after preclinical studies I spent a year in Professor W.H. Yung's lab, where I acquired basics of designing and performing experiments. After that, with recommendation and support from CUHK professors, I moved to University College London (UCL) to pursue a PhD in neuroscience.

At UCL I joined the visual neuroscience lab led by Dr. Thomas Mrsic-Flogel, when the lab was just starting. During my PhD studies, together with my colleagues, especially Dr. Sonja Hofer, I developed a new experimental approach utilizing optical, electrophysiological and image registration techniques for addressing a fundamental question in neuroscience – how the pattern of connections between neurons relate to their functions (e.g. features that individual neuron detects in the visual field). With the technical advancement, we have successfully uncovered the functional specificities of synaptic connections between neurons in the visual cortex (Ko and Hofer *et al.*, Nature 2011; Hofer and Ko *et al.*, Nature Neuroscience 2011). In a following up work, together with a very talented PhD student Lee Cossell, we have also investigated the potential mechanism underlying the emergence of functionally specific connection patterns in the cortex (Ko and Cossell *et al.*, Nature 2013).

While at UCL I had kept in touch with Prof WH Yung, and contributed intellectually to research projects in his lab that led to two publications on neuropharmacology and Parkinsonism (Huang *et al.* Experimental Neurology 2012; Li *et al.*, Neuron 2012). Ever since returning to Hong Kong, apart from studying clinical medicine I have been actively involved in research projects locally. At the moment I am working with Professor Vincent

Mok, Professor W.H. Yung, Professor Y. Ke of the Faculty of Medicine, in collaboration with Professor S.C. Chen of the Faculty of Engineering, on setting up optical imaging systems that will allow us to tackle problems relating to the basic physiology of visual, motor system and their diseases.

I greatly enjoyed doing all these work, and my study experience has enabled me to develop problem solving skills which I believe in the long run will enable me to develop into a better doctor. After graduation, I wish to start my own laboratory and continue to contribute by performing research work in neuroscience and neurology.