



What we can learn from a Mouse Model of Leukaemia

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Professor LC Chan is the Chair Professor and Head of the Department of Pathology, The University of Hong Kong. He obtained his undergraduate medical degree from the University of Cambridge, underwent specialist training in haematology in London and is a fellow of both the colleges of Pathology and of Medicine in UK and Hong Kong. His PhD thesis on "Cellular Origins of Human Leukemia" was under the supervision of Professor MF Greaves and he was one of two groups who first showed a new form of p190 BCR-ABL protein in Philadelphia positive leukemias. He joined HKU in 1989 as a Senior Lecturer in the Division of Haematology and developed cytogenetics and flow cytometry of human leukemia in the territory. Professor Chan's research interests are in chromosomal translocations in human leukemia and cellular and molecular pathways affecting proliferation and differentiation of normal and leukaemic stem cells.

The ability to recapitulate phenotypes of human diseases in mouse through gene targeting of mouse embryonic stem cells have provided insights into mechanisms of how genes affect cellular processes such as growth and development. Mouse models of human leukemia characterized by the presence of fusion genes are amongst the earliest human disease models of cancer to be reproduced. These animal models have contributed to our knowledge on the role of fusion genes in pathogenesis of leukemia in terms on the effect on transcriptional activating and repression pathways affecting proliferation and differentiation programs. In addition, it has been demonstrated for some fusion genes to cause the development of leukemia in mice, the collaboration of mutations affecting genes in signal transduction is necessary which is in agreement with findings in clinical samples from patients. Finally, mouse models are invaluable in the design and preclinical testing of molecular based targeted therapy either as single or in combination for the treatment of de novo and resistant disease.