

Professor Jon Frampton

Professor of Stem Cell Biology

School of Immunity and Infection

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About

Jon Frampton is a stem cell biologist. His primary area of interest is in how stem cells operate in adults. Jon's research involves examining the processes that regulate stem cells to determine how these fail during ageing or as part of disease processes, especially in cancer.

The principle focus is on bone marrow stem cells that give rise to our blood cells. Understanding this system has great potential in the treatment of blood cell cancers (leukaemia). Jon's interests also involve investigation of another stem cell type present in the bone marrow, namely the mesenchymal stem cells.

These cells help to provide the structure of the bone itself but additionally perform roles elsewhere in the body, perhaps surprisingly contributing both to lessening tissue injury, for example in the heart after a heart attack, and in some circumstances adding to the progression of a disease, for example in the development of liver fibrosis resulting from excessive alcohol consumption.

In the longer term, understanding the properties and roles of mesenchymal stem cells may lead to novel therapeutic applications as diverse as enhancing the body's own repair mechanisms or preventing damaging cellular processes that accentuate an underlying chronic condition.

Biography

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Teaching

Teaching Activity

A range of lectures on aspects of stem cell biology, the regulation of gene expression, and modeling of gene function and disease using genetically modified mice. These include stem cell courses for BMedSc and MRes (Molecular Medicine), and one-off lectures for a number of MBChB, MSc and BSc courses.

Supervise several PhD students, and run a small programme of stem cell focused studentships.

Teaching Programmes

Biomedical Sciences 3

Research

Studies on the regulation of haemopoietic stem cell self-renewal and differentiation through the control of gene expression, with a particular focus on c-Myb because of its central role in coordinating signaling and gene expression

Investigating how transcription factors underlie the development of haematological disease with stem cell characteristics, including myeloproliferative disorders and myeloid and lymphoid leukaemias

Characterisation of human cardiac stem cells

Investigation of mechanisms regulating proliferation and genomic stability in embryonic stem cells

Studies on mesenchymal stem cell function

Investigation of processes controlling stem cell migration to damaged tissues

Other activities

- Director of the Stem Cell Centre (BUSCC)
- Head of Research Development in MDS
- Development of the MDS Technology Hub
- Member of the MDS Strategic Research Committee
- Member of the School of Immunity and Infection Executive Board and Strategic Research Committee
- Member of the MDS/LES cross-college liaison group
- Member of the UK stem cell network Scientific Advisory Committee
- Member of the grant committee panels for the BBSRC and MRC TSCR

Publications

García, P., Berlanga, O., Watson, R. and Frampton, J. (2005) Generation of a conditional allele of the B-myb gene. *Genesis*, 43, 189-195.

García, P. and Frampton, J. (2006) The transcription factor B-Myb is essential for S phase progression and genomic stability in both diploid and polyploid megakaryocytes. *J. Cell Sci.*, 119, 1483-1493.

Vegiopoulos, A., García, P., Emambokus, N. and Frampton, J. (2006) Coordination of erythropoiesis by the transcription factor c-Myb. *Blood*, 107, 4703-4710.

Hess, J.L., Bittner, C.B., Zeisig, D.T., Bach, C., Fuchs, U., Borkhardt, A., Frampton, J. and Slany, R. (2006) c-Myb is an essential downstream target for homeobox mediated transformation of hematopoietic cells. *Blood*, 108, 297-304.

Ross, E.A., Freeman, S., Zhao, Y., Dhanjal, T.S., Ross, E.J., Lax, S., Ahmed, Z., Zheng Hou, T., Kalia, N., Egginton, S., Nash, G., Watson, S.P., Frampton, J. and Buckley, C.D. (2008) A novel role for PECAM-1 (CD31) in regulating haematopoietic progenitor cell compartmentalization between the peripheral blood and bone marrow. *PLoS One*, 3, e2338.

García P. and Frampton, J. (2008) Hematopoietic lineage commitment: miRNAs add specificity to a widely expressed transcription factor. *Dev Cell*, 14, 815-816.

García, P., Clarke, M.L., Vegiopoulos, A., Berlanga, O., Camelo, A., Lorvellec, M. and Frampton, J. (2009) Reduction of c-Myb activity compromises normal hematopoietic stem cells and leads to a myeloproliferative phenotype with a novel stem cell basis. *EMBO J.*, 28, 1492-1504.

Kavanagh, D.P., Durant, L.E., Crosby, H.A., Lalor, P.F., Frampton, J., Adams D.H. and Kalia, N. (2009) Haematopoietic stem cell recruitment to injured murine liver sinusoids depends on $\alpha_4\beta_1$ integrin / VCAM-1 interaction. *Gut*, In press.

