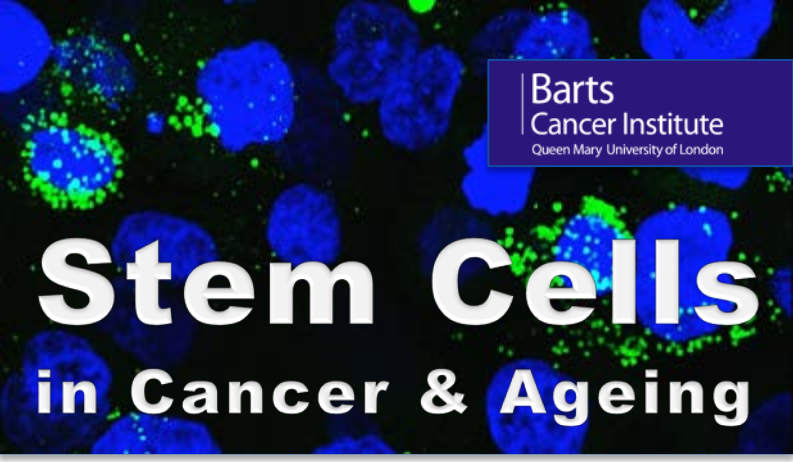


Why we focus on Stem Cells in Cancer & Ageing

Tumours are **heterogeneous** not only because of diverse subclones that arise during tumour development, but also because they are driven by functional heterogeneity within each subclone. So-called **cancer stem cells** are responsible for intraclonal heterogeneity. We and others have provided conclusive evidence down to the single cell that they represent the root of the disease by giving rise to all differentiated progenies within each cancer subclone.

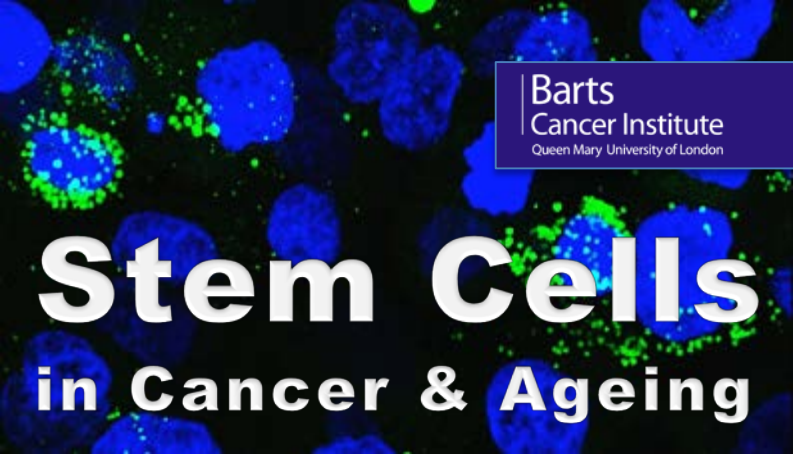
These cells also cause **metastases** after dissemination from the primary tumour; a source of disease relapse following treatment. Our recent data clearly demonstrate that current treatment strategies spare cancer stem cells, while novel approaches that include targeting of cancer stem cells are of significant clinical value and may eventually lead to curing patients.

What we do

- Novel approaches to study signalling pathways in cancer stem cells, allowing us to understand the distinct regulation of self-renewal, metabolism and chemoresistance in these highly tumorigenic cells.
- Developing cancer stem cell-centred precision medicine approaches that will be translated into the clinic.
- Studying epigenetic regulation of cancer stem cells.
- Studying the role metabolism in cancer stem cells.
- Identifying and study novel cancer stem cell targets as the basis for innovative immunotherapies.

Barts and The London
School of Medicine and Dentistry

www.bci.qmul.ac.uk



Key Publications

- Miranda-Lorenzo I, et al. Intracellular autofluorescence: a biomarker for epithelial cancer stem cells. Nat Methods. 2014 Sep 21. [Epub].
- Hermann PC, et al. Nicotine promotes initiation and progression of KRAS-induced pancreatic cancer via Gata6-dependent dedifferentiation of acinar cells in mice. Gastro. 2014 Aug 12. [Epub ahead of print].
- Balic A, et al. Chloroquine targets pancreatic cancer stem cells via inhibition of CXCR4 and hedgehog signaling. Mol Cancer Ther. 2014 Jul;13(7):1758-71.
- Lonardo E, et al. Metformin targets the metabolic achilles heel of human pancreatic cancer stem cells. PLoS One. 2013 Oct 18;8(10):e76518.
- Sainz B Jr, Heeschen C. Standing out from the crowd: cancer stem cells in hepatocellular carcinoma. Cancer Cell. 2013 Apr 15;23(4):431-3.
- Lonardo E et al. Pancreatic stellate cells form a niche for cancer stem cells and promote their self-renewal and invasiveness. Cell Cycle. 2012 Apr 1;11(7):1282-90.
- Lonardo E, et al. Nodal/Activin signaling drives self-renewal and tumorigenicity of pancreatic cancer stem cells and provides a target for combined drug therapy. Cell Stem Cell. 2011 Nov 4;9(5):433-46.
- Hermann PC, et al. Distinct populations of cancer stem cells determine tumor growth and metastatic activity in human pancreatic cancer. Cell Stem Cell. 2007 Sep 13;1(3):313-23.

Who does the research

Prof. Christopher Heeschen	Signalling in cancer stem cells
Dr. Alexandra Aicher	Immunotargeting of cancer stem cells
Dr. Patricia Sancho	Metabolism of cancer stem cells

Major Funders

- EU (CAM-PaC, MultiFun, EPC-TM)
- European Research Council
- Pancreatic Cancer Research Fund
- Cancer Research UK