Professor Owen Sansom

CURRENT POSITIONS

- Director, Cancer Research UK Scotland Institute, Glasgow, UK
- Director, MRC National Mouse Genetics Network, UK
- Co-Director of Cancer Research UK Scotland Centre, UK
- Colorectal Cancer and Wnt Signalling Senior Group Leader, CRUK Scotland Institute, Glasgow, UK

QUALIFICATIONS

09/1993–06/1996	B.Sc. (Hons. 1st) Genetics	University of Nottingham, UK
10/1996–10/1997	MRes Biology	University of Manchester, UK
10/1997–06/2001	PhD (Cancer Biology)	University of Edinburgh, UK

PUBLICATIONS

ORCiD: 0000-0001-9540-3010

Total peer-reviewed publications: 382 (including 54 reviews)

HONOURS and AWARDS

2007	BACR/AstraZeneca Young Scientist Frank Rose Award
2012	CRUK Future Leaders in Cancer Research Prize
2012	Fellow of the Royal Society of Edinburgh
2014	Interviewed for A Model for Life in *Disease Models & Mechanisms*. Aug; 7(8): 937-40. doi: 10.1242/dmm.017350
2017	Fellow of The Academy of Medical Sciences
2019	Honorary Fellow of the Royal College of Physicians and Surgeons of Glasgow (Hon FRCPS (Glasg))
2024	EMBO membership

RESEARCH INTERESTS

My laboratory focuses on the role of Wnt signalling in intestinal homeostasis, regeneration and cancer. Much of our work has investigated how the requirement for Wnt signalling target genes alters during regeneration and cancer. Thus, my laboratory has shown that Wnt signalling drives both regeneration and cancer through the c-Myc transcription factor. We have shown the basic biology of why

MTOR is a limiting factor downstream of Wnt signalling activation via the control of translational elongation. It is interesting to note that both MYC reduction and MTORC1 inhibition (via rapamycin) are two 'bona fide' ways to increase lifespan.

Through lineage tracing experiments we have shown that Lgr5+ intestinal stem cells act as a very efficient cell of origin for CRC. Non-stem cells can be transformed, but that requires additional factors such as inflammation and/or additional oncogenic mutations. We are able to transduce stem cells ex vivo using lentiviral vectors. We also have Cre lines that target stem cells and differentiated cells that allow us to test the relative transformation of different populations both in vivo and in vitro. More recently we have CRISPR technology up and running in vitro.

Our work necessitates us to closely examine the normal intestine and we have investigated how homeostasis, mutational load, clonogenicity, clonal dominance / stem cell competition are altered by the genes that are commonly altered in colon cancer and by drugs targeting these pathways. We have considerable experience therefore in seeing how these mutations alter stem cell properties and expression through stem cell sorting.

More recently we have also optimised intestinal 'ex vivo' approaches (the so-called organoid models) and have a bank of mouse-derived lines from wild type crypts to adenoma and adenocarcinoma. We have used these organoids to examine clonal dominance in vitro and long term clonogenic capacity. The ability to manipulate these in vitro (lentiviral, CRISPR) and then transplant in vivo also gives us the ability to test the consequences of gene manipulation in vivo.

LEARNED SOCIETIES & EDITORIAL BOARDS

American Association for Cancer Research
British Association for Cancer Research
Disease Models & Mechanisms
EMBO Molecular Medicine

CURRENT COMMITTEES AND PROFESSIONAL BODIES

2024	Cancer Research Horizons Functional Genomics Centre Triage Panel
2022	Prostate Cancer UK, Scientific Advisory Board
2021-2024	Pancretic Cancer UK, Preclinical Steering Committee
2021	Board of UKRI SiPF Living Laboratory STAR Project
2020	iOnctura, Scientific Advisory Board
2019	Beatson Cancer Charity, Strategic Advisory Council

2019	Lead, & Head Colorectal Cancer Stratified Medicine Network (ACRCelerate)
2019	Wellcome Centre for Human Genetics, Oxford Scientific Advisory Board
2019	Vice Chair of the NCRI annual conference, Glasgow, UK
2015	AstraZeneca and Medimmune Immunoncology and Small Molecule Advisory Board
2015	Cancer Research Technology Development Laboratory Advisory Board
2013	Centre of Excellence in Translational Cancer Biology, Academy of Finland
2012	MRC Toxicology Unit Advisory Board, Leicester, UK
2012	CRUK Pancreatic Cancer Strategy Panel

CURRENT GRANT FUNDING

01/08/24–31/01/25 The Mark Foundation Aspire I ***"****Defining the origin, evolution and therapeutic vulnerabilities of metaplastic colorectal cancer"*

01/07/21–30/06/26 CRUK Scotland Institute Core Group Leader grant ***"****Colorectal cancer and WNT signalling"*. DRCQQR-May21\100002

01/01/23-31/12/26 MRC Project Grant *"Validating an in vivo β-Catenin DamID-seq system and illuminating b-Catenin targets in steatosis and hepatocellular carcinoma"*, PI: K. Kaji (University of Edinburgh). MR/X000877/1

01/04/22-31/03/27 MRC National Mouse Genetics Network Director's Core Award. MC_PC_21039

01/01/23-31/12/27 CRUK Discovery Programme Award *"Stem Cells and adaptive molecular phenotype in colorectal cancer",* PI: S. Leedham (University of Oxford). DRCNPG-Jun22/100002

01/04/23-31/03/28 CRUK Discovery Programme Award *"Reprogramming neutrophils to reinvigorate the immunosuppressed HCC microenvironment"* Joint lead with D. Mann (Newcastle University). DRCRPG-Nov22/100007

01/01/24-31/12/29 MRC Programme Grant "*Targeting inhibitory kappa B alpha (IKKalpha): a new treatment paradigm for inflammatory-driven cancers*, PI: S. Mckay (University of Strathclyde). MR/Y015479/1

01/01/24-31/12/29 BBSRC Engineering Biolog Mission Hubs "*Engineered genetic control systems for advanced therapeutics*", PI: S. Prosser (University of Edinburgh). BB/Y008545/1