CARDIFF UNIVERSITY PRIFYSGOL CAERDYDD
The European Cancer Stem Cell Research Institute
Newsletter
Autumn 2012

Cancer Stem Cells Hit the News

Major developments in the debate....

Cancer stem cells are defined as those cells within a tumour that can self-renew and drive tumorigenesis. These rare cancer stem cells have been isolated from a number of human tumours, including haematopoietic, brain, colon and breast cancers.
The cancer stem-cell concept has important implications for cancer therapy as doctors often successfully reduce the size of tumours through various therapies, but often patients then suffer a relapse and the tumour regrows. Our researchers believe that this happens because therapies fail to eradicate a small proportion of cells that drive tumour growth known as cancer stem cells. They believe that these are the cells that should be targeted to eliminate the tumour forever. Evidence for the existence of cancer stem cells has been weak, but now more separate groups of researchers working independently around the world have found direct evidence of cancer stem cells driving tumour growth in brain, gut and skin cancers backing this theory and published their findings in the journals, Nature and Science this summer;

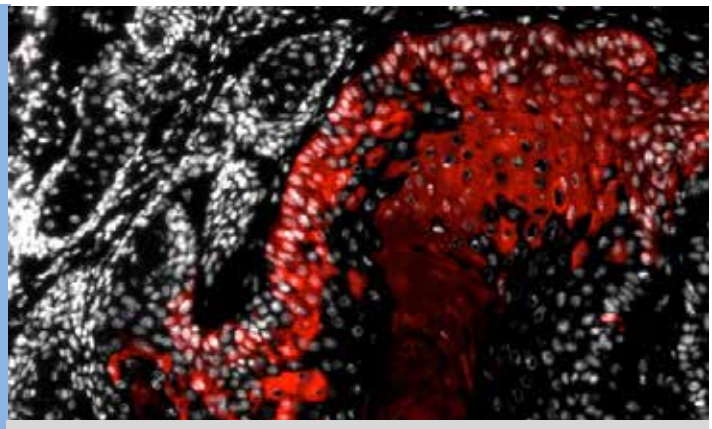
Chen J. *et al.* Nature (2012) - A restricted cell population propagates glioblastoma growth after chemotherapy. (http://dx.doi.org/10.1038/nature11287)

Driessens, G *et al.*, Nature (2012) - Defining the mode of tumour growth by clonal analysis. (http://dx.doi.org/10.1038/nature11344)

Schepers, A.G & Snippert H.J. *et al.* Science (2012) - Lineage Tracing Reveals Lgr5+ Stem Cell Activity in Mouse Intestinal Adenomas. (http://dx.doi.org/10.1126/science.1224676)

Gilbertson, R.J & Graham, T.A. Nature (2012) - Resolving the stemcell debate. (http:/dx.doi.org/10.1038/nature11480)

Baker, M. Nature (2012) - Cancer Stem Cells tracked. (http://dx.doi.org/10.1038/488013a)



For the first time, researchers can trace cell lineage within a growing tumour. In this skin tumour, the cells labelled red all arose from a single stem cell.

By G. Driessens (with permission)

These studies on mice appear to have confirmed the view that the growth of tumours is driven by cancer stem cells. The researchers claim to have resolved one of the biggest controversies in cancer research and say their work marks a "paradigm shift" in the field.

Although, it may be easier said than done, as these newly-identified cancer stem cells are very similar to healthy stem cells responsible for growing and renewing tissue in the body. Any therapy to target cancer stem cells may also destroy healthy tissues. So a priority for us now will be to see if there are important differences between normal and cancer stem cells so that therapies can distinguish between them. Re-confirmation that these cells exist is an important step in future cancer research.

It also allows us to clarify that our Institute is investigating these Cancer Stem Cells and not Embryonic Stem Cells per se - the latter are often in the news for political and religious reasons.

Hot off the Press

More to stimulate discussion:

Showing differences between normal stem cells and cancer stem cells:

“Context-dependent Action of Transforming Growth Factor β Family Members on Normal and Cancer Stem Cells”, Caja, Laia; Kahata, Kaoru; Moustakas, Aristidis; Current Pharmaceutical Design, Volume 18, Number 27, September 2012, pp. 4072-4086(15) http://dx.doi.org/10.2174/138161212802430459

“Sphere Culture of Murine Lung Cancer Cell Lines Are Enriched with Cancer Initiating Cells” Morrison, Brian; Steel, Jason; Morris, John.C; Plos One November 13 2012 http://dx.doi.org/ 10.1371/journal.pone.0049752

Support from Wales

We would like to say a Big "Thank you" to the growing list of supporters that now includes The Celtic Manor Resort, Tenby Tangent Ladies Club, Cancer Research & Genetics UK and more...

Fundraising has started to come in all shapes and sizes and we are very grateful for all donations received, the monies raised are being used to fund research directly and to get new equipment.
The Celtic Manor Resort supported us again at their "ISPS Handa" Wales Open Golf Tournament this year, with our banner stands proudly displayed in the foyer. Sir Terry Matthews, Patron of the European Cancer Stem Cell Research Institute and owner of the Celtic Manor resort, has said: "I am proud to be a patron of this pioneering work. This is world-leading research being conducted right here in South Wales and it is important it receives the funding needed."

The ladies from the Tenby Tangent club recently came to visit Professor Clarke to deliver a cheque for £5000 in person and take a tour of the laboratories. The Club's links with Professor Clarke go back more than eight years. Club member Ruth Webb had read some of the national media coverage of his breakthrough in identifying MBD2 – a protein which may be 'hijacked' by cancer cells to shutdown normal defensive mechanisms and so allow cancers to grow.
Many of the Tangent Club members know people affected by cancer and they decided on another three-mile walk through the town last year. Averil Upham from the Tangent ladies club said: "The weather was terrible, with heavy winds and rain. However, about 150 of us of all ages turned out, including mothers pushing prams. It was a fun event, despite the rain."

Mr Nick Phillips from Cancer Research Genetics UK has also generously supported the Institute and we hope to name a tissue culture lab in the new Hadyn Ellis Building.

Anna Calnan has raised funds for Bowel Cancer Research by running the Cardiff Half Marathon and co-ordinating a bake sale. Anna, who works in Cardiff University's School of Biosciences' Undergraduate Office, completed the Cardiff Half Marathon on Sunday 14th October 2012. She very generously decided to run the half marathon in support of Dr Lee Parry's research into bowel cancer, a cause close to her heart. This is the first time that Anna had run the half marathon and, despite an injury, she managed to complete the course in 2 hours and 21 minutes! Every penny raised will be used to support the young scientist who is carrying out cutting-edge research here looking to identify biological targets in bowel cancer against which new drugs can be designed. Targeting the tumours specifically will dramatically reduce side effects and should help prevent recurrence.

To find out more about opportunities to support the Institute please contact the Development and Alumni Relations Division on +44(0) 29 2087 6473 (Deri House, 2-4 Park Grove, Cardiff, CF10 3PA) or https://www.cardiffnetwork.cf.ac.uk/give.

As a fully registered charity (ID. 1136855) we ensure that every penny goes straight to the cause chosen by donors; no element of any donation we receive is used to pay for marketing or administration.

Did you know? Facts about Bowel Cancer

- Bowel cancer is the third most common cancer in the world
- It is the second leading cause of cancer-related death in the UK
- Every day, over 100 people are newly diagnosed, with 35,000 people diagnosed every year in the UK alone
- Every thirty minutes, someone dies from bowel cancer in the UK - over 16,000 each year
- Even though survival rates are increasing, only around half of patients will survive for greater than 10 years after diagnosis.

New Advisory Board Appointees

Lord Neil Kinnock and Sir Martin Evans join the team of Advisory Board members for ECSCRI.

The Advisory Board of the European Cancer Stem Cell Research Institute welcomes the addition of two prestigious individuals: Lord Neil Kinnock and Professor Sir Martin Evans. The Advisory Board will be a group of leading figures that not only take an interest in the Institute and promote its activities and encourage others to learn more about it.

It is not just the ECSCRI they have in common, Lord Kinnock was 21st President of Cardiff University (1998-2009) and was recognised for the outstanding contribution he had made when succeeded by Sir Martin in November 2009, this position is the most senior of the University's honorary officers.

Lord Neil Kinnock first studied at the University in the 1960s. Cardiff University is also where Lord Kinnock met his wife Glenys Kinnock, where he had his first taste of political leadership as President of the Students' Union and where, in the eleven years as President he gained enormous pleasure in overseeing the international recognition won by University staff and students. Those outside Cardiff will know Lord Kinnock as a prominent politician both at Westminster and now in Brussels.

Professor Sir Martin Evans, FRS won the Nobel Prize for Medicine in 2007 - the most prestigious honour in world science - for a breakthrough which is transforming modern medical science. Sir Martin was the first scientist to identify embryonic stem cells, which can be adapted for a wide variety of medical purposes. His discoveries are now being applied in virtually all areas of biomedicine – from basic research to the development of new therapies. Sir Martin is heralded worldwide as "the father of stem cell research" and named as one of "ten Britons who have shaped our world."

Hadyn Ellis Building Update

Even as it progresses it's winning awards!

BAM construction has hit all it's targets and won safety awards. But it has now won the BREEM award for higher education. BREEAM sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance.

(Stephen Duddridge (ESTAT) on left & Justin Price (BAM) with the Award).

The Hadyn Ellis Building as it is at the moment (still under construction) – to show scale - next door on the left is the front entrance to the School of Optometry and Vision Sciences.

Conference Update:

Dr Matthew Smalley (ECSCRI)

organised this major and very successful Mammary Gland Biology Gordon Research Conference in June 2012. He commented that although it was hard work, it was very enjoyable and always great to catch up with colleagues and collaborators to exchange ideas and new data (pictured here on the left with a small celebratory cake at the last dinner!)

Our Conference

A date for your diaries!

Our Institute's inaugural conference will be held at The Celtic Manor Resort from 24th to 26th July 2013.

The conference will be dedicated to the theme of Cancer Stem Cells and will aim to address how the cancer stem cell concept might be used to target cancer and in the long term improve the prognosis for patients and develop new cancer therapies which will make a real difference to the lives of patients.

We have speakers coming from all over the world, who are the top in this field and it aims to be a very interactive conference with delegate participation during talks to networking at poster sessions and a golf tournament!

Bring your lab and escape to the beautiful welsh countryside for a scientific retreat?

Join us and share your latest research.

Contact us by Email: EuropeanCancerStemCell@cf.ac.uk or Phone: +44 (0)2920 874 089

Support Us and Help Us Change Lives