

Stem cells and cancer: Scientists investigate a fine balancing act

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Speaking today at the UK National Stem Cell Network Annual Science Meeting in Edinburgh, Professor Silvia Marino shows how the mechanisms normally involved in balancing different functions of stem cells may also contribute to cancer. Her team from Barts and the London School of Medicine and Dentistry is currently delving into these mechanisms to understand how stem cells are normally regulated and what role they may play in malignant brain tumours.

This work has been funded by Cancer Research UK, Oncosuisse, Barts and the London Charity, Ali's Dream and Charlie's Challenge.

Professor Marino said: "Stem cells are present in the adult brain where they normally play a role in repair and regeneration. We want to know whether brain cancer can originate from problems in the regulation of these cells. Moreover, it is becoming increasingly clear that tumours maintain themselves with mechanisms similar to the ones used by stem cells. We want to understand whether differences can be identified between normal stem cells and cancer stem cells. If this is the case, new drugs can be developed to specifically kill the cells maintaining and propagating the tumour without harming normal stem cells."

In the body it is vital that a balance is struck between maintaining numbers of stem cells with making new stem cell derived tissues. This is important in embryonic development and also in preserving healthy adult tissues. If the balance is wrong then disease can arise. Cancer can result from stem cells dividing too much, leading to an excess of new cells. But

if stem cells do not divide to replenish the stocks for renewal and repair then the result can be ageing and possibly degenerative diseases.

Professor Marino's group works to identify the mechanisms involved in maintaining this balance and assess whether similar mechanisms can possibly contribute to the formation and maintenance of malignant brain tumours. For example, research to date shows that a gene called Bmi1 is important for maintaining stocks of stem cells and without it the stocks of stem cells are depleted. And importantly this gene is overactive in various cancers including brain tumours.

Source: Biotechnology and Biological Sciences Research Council

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