Mouse models of human cancer and the need for more translational research

Martin Fenner, Gobbledygook

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One of the opening lectures this Saturday of the International Congress of Genetics was held by Mario Capecchi. His talked was entitled Modeling human disease in the mouse: from cancer to neuropsychiatric disorders. In the first half he described his mouse model of synovial sarcoma. Synovial sarcoma is an aggressive and often fatal soft tissue tumor. The pathogenesis of the disease is poorly understood, but synovial sarcoma is characterized by a t(X;18) translocation that creates a fusion of the SYT and SSX (SSX1, SX2 or SSX4) genes.

Early and ubiquitous expression of a SYT-SSX transgene is lethal in the mouse embryo, so Mario Capecchi's group created a mouse that expresses the fusion gene only at specific timepoints and only in skeletal muscle. Practically all mice develop tumors that resemble synovial sarcoma in human. This mouse model provides an attractive preclinical platform for new treatment strategies. Those interested in the full story can read the Cancer Cell paper (Haldar 2007) that was published last year.

Everybody has a different reason to be interested in research. It can be the curiousity to better understand a fundamental process, It can be the wish to create a business opportunity. It can be the determination to do something about climate change or poverty. Or it can be the desire to better help a patient with a disease that is difficult or impossible to treat. I trained as a medical doctor and currently spend most of my time treating patients with cancer. Just last week I was seeing a young patient with synovial sarcoma and lung metastasis. Understanding the biology of cancer is essential to find better treatment strategies and we have witnessed many positive examples for this.

This so-called translational research is unfortunately a wonderful concept that more often than not doesn't work in practice. Basic science often is poorly connected to clinical medicine, both on a personal and institutional level. But change is apparently underway, if you believe the cover story of the June 12 issue of Nature.

References

M HALDAR, J HANCOCK, C COFFIN, S LESSNICK, M CAPECCHI (2007). A Conditional Mouse Model of Synovial Sarcoma: Insights into a Myogenic Origin *Cancer Cell, 11* (4), 375-388 https://doi.org/10.1016/j.ccr.2007.01.016