

Foreword

Homeostasis involves a delicate interplay between generative and degenerative processes to maintain a stable internal environment. In biological systems, equilibrium is established and controlled through a series of negative feedback mechanisms driven by a range of signal transduction processes. Failures in these complex communication pathways result in instability leading to disease. Cancer represents a state of imbalance caused by an excess of cell proliferation. In contrast, neurodegeneration is a consequence of excessive cell loss in the nervous system. Both of these disorders exhort profound tolls on humanity and they have been subject to a great deal of research designed to ameliorate this suffering. For the most part, the topics have been viewed as distinct and rarely do opportunities arise for transdisciplinary discussions among experts in both fields. However, cancer and neurodegeneration represent *yin-yang* counterpoints in the regulation of cell growth, and it is reasonable to hypothesize that key regulatory events mediated by oncogenes and tumor suppressor genes in cancer may also affect neurodegenerative processes. This was the rationale for organizing the *Colloques Médecine et Recherche*, April 26, 2010 on the topic of *Two Faces of Evil: Cancer and Neurodegeneration*.

The presentations by the leaders of both fields were full of exciting unpublished data that reaffirmed the connection between the disciplines. Remarkably, genes that affect cell cycle progression and checkpoint control also play specific roles in postmitotic neurons that influence neurodegeneration. Many oncogenic signaling pathways have been expropriated to fulfill distinct functions in a range of biological situations. The complexity of the nervous system is such that evolution has usurped most molecular, biochemical and cellular regulatory mechanisms to support the formation, function and maintenance of neurons. The discussions at the meeting transcended traditional boundaries. Several new concepts were shared that will stimulate future research and perhaps contribute to better therapies for cancer patients as well as those struggling with the ravages of neurodegeneration.

Two Faces of Evil: Cancer and Neurodegeneration

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