Targeting aneuploidy for cancer therapy

Madrid, February 18th, 2011 – Errors during chromosome segregation lead to a chromosome imbalance condition called aneuploidy. Many research efforts have been dedicated in recent years to addressing the question of whether aneuploidy is a cause or a consequence of tumourigenesis. Evidence exists that supports both possibilities and to what extent aneuploidy contributes to tumour development remains controversial. However, whether aneuploidy can be targeted for cancer therapy has received much less attention.

Eusebio Manchado and Marcos Malumbres from the Cell Division and Cancer Group at the Spanish National Cancer Research Center (CNIO), now discuss the therapeutic possibilities of targeting aneuploidy for cancer therapy in the current issue of the prestigious journal Cell.

Earlier work in yeast or mammalian cells, mostly from Angelika Amon’s group (David H. Koch Institute for Integrative Cancer Research and Howard Hughes Medical Institute, Massachusetts Institute of Technology, Cambridge, USA), indicated that just one extra chromosome results in important proliferative defects as well as metabolic and energetic aberrations. The cellular stress generated by these defects results in an increased sensitivity to small molecules that target proteotoxic and energy stress in the cell, making these treatments specific against aneuploid tumour cells. Whether these drugs might synergise with microtubule poisons or mitotic checkpoint abrogators is also
highlighted in the text by Manchado and Malumbres. It will be therefore crucial in the future to further explore these or other therapeutic opportunities opened by the energy and proteotoxic stress present in aneuploid cells.

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