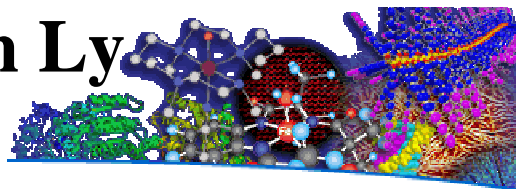


Youngstown State University Chemistry Seminar Program - Winter/Spring 2006

Friday January 27th (3:15)
Our 12th Seminar of 2005-6



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***“New Research Opportunities
at the
Chemistry-Biology Interface”***

Abstract

Biological and biomedical research has gone through a major transition in the last ten years, largely driven by the massive quantity of genomic sequence information and the development of new technologies to exploit its use. Along with this genomic effort emerged new and exciting areas of research, and new hypothesis on the mechanism of genetic diseases. The talk will outline our effort to address a fundamental question concerning the cellular origin of cancer—that is, do cancers arise from stem cells? Cancer is a disease of unregulated cell proliferation and aberrant morphogenesis that is thought to arise from a series of accumulated genetic mutations. Despite recent advances in the detection and treatment of cancer, mortality from this disease remains high because current therapies are limited by the emergence of resistant cells. As a result, metastatic cancer remains largely an incurable disease by current treatment strategies. The failure to eradicate cancer could be attributed in part to the long-standing conjectures (upon which most of the existing cancer therapies were developed) that (i) most cancer cells arise from somatic cells and (ii) most cancer cells are capable of forming tumors. This view, however, has been challenged by a recent series of findings, which showed that only a small fraction (less than 1%) of the cancer cell population is capable of forming new tumors. Interestingly, these rare tumorigenic cells were found to possess the characteristic features of stem cells from the same tissue origin. These findings raise an important question—do certain cancers arise from stem cells? However, before this and related questions could answered, new tools and technologies must be developed to manipulate the genetic information in stem cells since the existing technologies, which were designed for somatic cells, are not effective with stem cells. The talk will describe our recent progress toward developing these technologies.

