A Holistic Evolutionary Approach to Cancer Study

Ying Xu

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CURRENT RESEARCH

Understanding the root causes, drivers and mechanisms of cancer

Despite over forty years of very intensive studies since the inception of the "War on Cancer" in 1972, we have yet to produce enough of an understanding about the disease and offer highly effective treatments for many cancer cases, particularly when a cancer reaches an advanced stage. Mainstream medicine has been treating cancer by killing cancer cells through recognizing characteristics of such cells, in addition to their surgical removal. Such a strategy often suffers from drug resistance and cancer recurrence after the initial period of effectiveness, typically ranging from a few months to a year or two. A fundamental reason for this ineffectiveness is that the vast majority of the current treatments aim to kill dividing cells rather than stopping the conditions that lead to rapid cell division, or the development of a cancer. This is true even for cancers whose causes are believed to be understood. For example, it is believed that chronic myelogenous leukemia (CML) is solely caused by the Philadelphia chromosome; and drugs have been designed to stop the activation of the mutated genes. And yet relapses of the illness often happen.

Dr. Ying Xu, of the University of Georgia, takes an alternative perspective on tackling cancer. He applies the general principle of Darwin's Theory of Evolution when studying cancer initiation and progression, which can be summarized as: organisms evolve to adapt to or overcome stresses induced by (unfamiliar) changes in their living environments, through selecting certain genomic mutations. He posits that (sporadic) cancers follow the same principle, and is trying to understand what stresses have been induced in the living microenvironments of the affected cells, which are...

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AFFILIATION

University of Georgia

EDUCATION

- Ph.D., in Computer Science, 1991 , University of Colorado at Boulder

AWARDS

- Editor-in-Chief, IEEE/ACM Transaction on Computational Biology and Bioinformatics (TCBB) , (2013 - 2017)
- Elected Fellow of American Association for the Advancement of Science, 2007
- Distinguished Scholar Award, Georgia Cancer Coalition, 2003
- National FLC (Federal Laboratory Consortium) Award of Excellence in Technology Transfer, 2003
- R&D100 Award, presented by R&D Magazine in recognition of this year's 100 most significant technological innovations, for the development of PROSPECT software package, 2001

RESEARCH AREAS

Life Science, Genomics / Congenital, Oncology / Cancer, Oncology / Cancer

FUNDING REQUEST

Your contributions will support the continued research of Dr. Ying Xu, of the University of Georgia, as he works towards a fundamentally new understanding about the roots of cancer. Donations will fund the necessary costs for personnel. Ideally, Dr. Xu could bring on three postdocs to his team at $90K each per year. In choosing to donate you would play a role in supporting future scientist's educations while finding ways to treat cancer at the root level.