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A Synergistic strategy of cancer therapies: The scientific foundations and clinical opportunities

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Abstract

We have developed scientific foundations for cancer diagnosis, therapy and prognosis for cancer patients, using a computational algorithm, which reduces the dimensionality of high-throughput cancer data sets into a clear network structure, called a target network of biomarkers. Because of the robust and efficient algorithm, our target networks are simpler and smaller than current industrial results. Consequently, our target networks may serve as effective signatures for diagnosis, therapy and prognosis of cancer patients. We have also developed a multi-target and multi-component drug/therapy design algorithm for target networks. This novel algorithm will enable not only better drug discovery, but also evaluation of herbal medicine and alternative therapy, or environmental and nutritional impacts. Furthermore, imaging of the tumor is correlated with the time series of gene-expression microarrays as a validation mechanism. Based on the above, some clinical opportunities will be discussed.

Biography

Chen received his PhD from the University of Maryland in 1970. He has held academic and administrative positions at several universities: Indiana/Purdue University, University of North Carolina/Charlotte, University of Florida and University of Missouri. He served as Program Director at the National Science Foundation 1991-1995, where he initiated the NSF/DARPA/NASA Digital Libraries Initiative, which impacted the development of Internet-based economy and society in the US. Since 1998, he has focused on research of computational biology. Currently, he is the Director of Systems Biology at the University of Florida, and member of UF Health Cancer Center and McKnight Brain Institute..