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In silico oncology- Computational horizons in cancer systems biology and multi-scale cancer modeling

We have developed a multi-scale platform for predictions of the effects of mutations on oncogene activation through a combination of molecular, biophysical, and cellular models. We combine the specificity of molecular modeling with the power of network models to predict the molecular mechanisms that lead to activation of pathways. We also employ spatial and stochastic models to describe how the effects of the tumor microenvironment can lead to oncogenic signals through non-canonical pathways. We will describe the applications of these models in the clinical contexts of non-small-cell lung cancer, neuroblastoma and hepatocellular carcinoma. This work is funded by the US National Institutes of Health and the EU.

Biography

Ravi Radhakrishnan is a Professor of Bioengineering, Biochemistry & Biophysics and Chemical and Bio-molecular engineering at the University of Pennsylvania. His expertise is in chemical physics, statistical mechanics and computational biology. His laboratory is currently funded primarily by grants from US National Science Foundation, National Institutes of Health and European Commission and focuses its research on the biophysics of single molecules and cell membranes and signaling mechanisms in cancer. Through his work, he has pioneered novel discovery platforms in *in silico* oncology and *in silico* pharmacology. He has authored over 100 articles in leading peer reviewed journals and serves as a referee for over 50 leading journals, publishers and federal funding agencies. He also serves as an Editorial Board Member and Associate Editor for 5 journals and also regularly serves as a Panelist and Study Section member for National Science Foundation, National Institutes of Health and several Federal Science Foundation's in the EU. He is a Fellow of the American Institute of Medical and Biological Engineering.

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