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Abstract for an Invited Paper
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**Towards a Quantitative Endogenous Network Theory of Cancer Genesis and Progression: beyond
“cancer as diseases of genome”¹**

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There has been a tremendous progress in cancer research. However, it appears the current dominant cancer research framework of regarding cancer as diseases of genome leads impasse. Naturally questions have been asked that whether it is possible to develop alternative frameworks such that they can connect both to mutations and other genetic/genomic effects and to environmental factors. Furthermore, such framework can be made quantitative and with predictions experimentally testable. In this talk, I will present a positive answer to this calling. I will explain on our construction of endogenous network theory based on molecular-cellular agencies as dynamical variable. Such cancer theory explicitly demonstrates a profound connection to many fundamental concepts in physics, as such stochastic non-equilibrium processes, “energy” landscape, metastability, etc. It suggests that beneath cancer’s daunting complexity may lie a simplicity that gives grounds for hope. The rationales behind such theory, its predictions, and its initial experimental verifications will be presented.

References:

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- [3] Orders of Magnitude Change in Phenotype Rate Caused by Mutations. P. Ao, *Cellular Oncology* (2007) **29**: 67-69. http://arxiv.org/PS_cache/arxiv/pdf/0704/0704.0429v1.pdf

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