Cologne Evolution Colloquium

Joint Seminar with **Cologne Cancer Club**

Molecular Basis of Evolutionary Innovations

SFB 680

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Immune interactions predict cancer evolution

In recent years, novel therapies for treating cancer by means of a patient's own immune system have emerged. Checkpoint-blockade immunotherapies are designed to enable immune system cells to recognize and destroy cancer cells. The process of recognition is based on specific protein binding interactions between immune and cancer cells. Because these interactions depend on mutations in the cancer genome, immune recognition is also an evolutionary problem. I will present a new mathematical model of cancer evolution based on the fitness cost of tumor cells due to immune recognition. The model successfully predicts response to checkpoint-blockade immuno-therapy, as shown in patient cohorts with melanoma and lung cancer. Our results highlight evolutionary similarities between cancer and viral pathogens and suggest general concepts of predictive analysis in fast-evolving systems.

Wednesday, December 20, 2017, 16:00
University of Cologne
Institute for Theoretical Physics
Zülpicher Str. 77a (new building)
Seminar Room 0.03, Ground Floor

Hosted by Michael Hallek and Michael Lässig