Cologne Evolution Colloquium

Phillip Altrock

Moffitt Cancer Centre

CRC 1310 Predictability in Evolution

Interactions among T-cells can quantify success of anti-CD19 CAR T-cell therapy

Recent clinical advances have led to multiple new cancer immunotherapies. Chimeric Antigen Receptor (CAR) T-cell therapy targets CD19+ lymphoma (B) cells, e.g. in refractory non-Hodgkins Lymphoma. This therapy relies on expansion of engineered CAR T-cells in order to kill tumor cells. We gain quantitative understanding of the T- and B-cell population dynamics using dynamical systems and statistical mechanics approaches, in combination with statistical analyses of clinical data. Our approach is used to recapitulate patient response rates observed in clinical trials (ZUMA-1), and to propose testable treatment alterations. We can predict probability and expected time of cure, and patient specific cure rates, depending on the clinically achievable CAR T to normal T-cell ratio, or on tumor burden and growth rate. These predictions can be used to inform future clinical decision making and improve treatment outcomes based on measurable patient parameters.

Friday, June 28, 2019, 15:00
Institute for Biological Physics, Zülpicher Str. 77a
Seminar Room 0.01, Ground Floor

Hosted by Johannes Berg