



University of Stuttgart

Stuttgart Research Center Systems Biology (SRC SB)

Systems Biology Seminar Talk

„Computing precision
immunity to guide cancer
therapy“

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Medizinische Universität Innsbruck



Abstract:

Precision oncology approaches for patients with colorectal cancer (CRC) continue to lag behind other solid cancers. Functional precision oncology – a strategy that is based on perturbing primary tumor cells from cancer patients with drugs – could provide an alternate road forward to personalize treatment. We extend here this paradigm to measuring proteome activity landscapes by acquiring quantitative phosphoproteomic data from patient-derived organoids (PDOs). We show that kinase inhibitors induce inhibitor- and patient-specific off-target effects and pathway crosstalk. Reconstruction of the topologies of the kinase networks revealed that the signaling rewiring is modestly affected by mutations. Moreover, we show non-genetic heterogeneity of the PDOs and upregulation of stemness and differentiation genes by kinase inhibitors. Further, using imaging mass-cytometry-based profiling of the primary tumors we characterize the tumor microenvironment (TME) and determine spatial heterocellular crosstalk and tumor-immune cell interactions. Collectively, we provide a framework for inferring tumor cell intrinsic signaling and external signaling from the TME to inform precision (immuno)-oncology in CRC.

CV:

Since 2020: Director, Biocenter, Medical University of Innsbruck, Austria

Since 2010: Full professor for Bioinformatics, Medical University of Innsbruck, Austria

2003 – 2010: Full professor for Bioinformatics, Graz University of Technology, Graz, Austria

2000 – 2001: Visiting Scientist, The Institute for Genomic Research (TIGR), Rockville, MD/USA and National Institutes of Health, Bethesda, MD/USA

1999: Habilitation in Biomedical Engineering, Graz University of Technology

1997 – 1998: Postdoctoral Fellow, Department of Internal Medicine, Yale University, New Haven, CT/USA

1990 – 1995: PhD, Biomedical Engineering, Graz University of Technology, Graz, Austria

1984 – 1990: Biomedical Engineering, Graz University of Technology, Graz, Austria

Wednesday
June 14, 2023
10 a.m. – 11 a.m.

Lecture Hall 0.106
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