Universität Basel

Research Project

MERiC

Third-party funded project

Project title MERiC
Principal Investigator(s) Hall, Michael N. ;
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Organisation / Research unit
Departement Biozentrum / Biochemistry (Hall)
Department
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Status Completed

Cancer is a major health problem due to the failure of current therapies to effectively eradicate the disease.ă Extensive research over decades has led to the development of therapies that target cancer-specific signaling pathways.ă However, tumors escape such therapies by activating compensatory signaling pathways, a process referred to as 'evasive resistance'.ă The identities of the alternative signaling pathways and functional interconnections that underlie evasive resistance remain widely unknown.ă Elucidating mechanisms of evasive resistance is currently the major challenge in cancer research.ă We will integrate cutting-edge clinical, molecular, and computational sciences in a pioneering project to understand the signaling defects that enable tumors to evade therapy.ă With its synergistic, interdisciplinary approach, the proposed project is, to our knowledge, unique in Europe and possibly worldwide.

Within the framework of rigorously designed clinical studies, a clinician (PI: M. Heim) will provide basic research scientists with hepatocellular carcinoma (HCC) tissue isolated before therapy, during treatment, or at the time of tumor progression.ă HCC is chosen as the focal cancer based on medical importance, accessibility to repeated sampling, and ethical considerations.ă The tumor tissue will be obtained by needle biopsy and immediately snap frozen to preserve in vivo tumor properties.ă The basic research scientists (PIs: G. Christofori and M. Hall) and a computational biologist (PI: N. Beerenwinkel) will apply high- and low-throughput experimental and computational methods to determine, characterize, and model the underlying signaling defects.ă Importantly, using longitudinal clinical samples in combination with mouse and cellular HCC model systems, we will define treatment-related changes in cell signaling that allow tumors to circumvent therapy.ă This process will be iterative such that changes in treatment strategies will again be monitored in the same patient or experimental model.ă Insights gained will (i) reveal molecular pathomechanisms in oncogenesis, (ii) identify novel drug targets and predictive biomarkers, and (iii) lead to the rational design of personalized medicine that ultimately benefits patients by increasing therapeutic effectiveness and reducing side effects and financial burden.ă In aggregate, this innovative, comprehensive endeavor will elucidate mechanisms of evasive resistance and will ultimately improve cancer diagnosis, treatment and clinical outcome.

Financed by
Commission of the European Union

Add publication

Add documents

Specify cooperation partners

ID	Kreditinhaber	Kooperationspartner	Institution	Laufzeit - von	Laufzeit - bis
3401740	Hall, Michael N.	Christofori, Gerhard, Prof.	Department of Biomedicine, University of Basel	01.01.2014	31.12.2018
3401741	Hall, Michael N.	Heim, Markus, Prof.	University Hospital, Basel	01.01.2014	31.12.2018