



Emerging Topics in Biological Networks and Systems Biology

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Precision Systems Cancer Medicine

Abstract:

Making cancer care more effective, safe and individually optimized is a central aim for cancer researchers and oncologists worldwide. A common strategy to achieve this is based on sequencing tumor genomes with the aim to identify oncogenic driver mutations whose effects could be blocked by specific drugs with a predicted therapeutic gain. Our precision medicine strategy is based on the integration of genomic, transcriptomic and proteomic profiling data as well as insights from direct high-throughput testing of ex vivo efficacies of a panel of cancer drugs (n=460) on patient-derived cancer cells. This approach was started in acute myeloid leukemias and other hematological malignances (Pemovska et al., 2013) at FIMM/UH, and is now being expanded to solid tumors. This approach can help to reposition existing cancer drugs to new indications, prioritize emerging drugs for clinical testing in molecularly defined subgroups of patients, identify biomarkers and mechanisms of action of drugs as well as help to design tailored drugs and drug combinations for precision patient treatment in the clinic.

About:

Olli Kallioniemi, M.D., Ph.D. is Director of the Science for Life Laboratory (www.SciLifeLab.se) as well as professor in Molecular Precision Medicine at the Karolinska Institutet. During 2007-2015, he was the founding director of FIMM – the Institute for Molecular Medicine Finland (www.fimm.fi) at the University of Helsinki in partnership with the EMBL. Prof. Kallioniemi's group is active in individualized systems medicine of cancer, with a focus on translational research to improve diagnostics and therapy of leukemias as well as other cancers. Olli Kallioniemi is an author of 358 publications and co-inventor of 21 patents. He is a member of EMBO, the National Academy of Sciences (Finland), European Academy of Cancer Sciences as well as the Nobel Assembly.