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Andreas Weinhausel

Austrian Institute of Technology GmbH, Austria

Immunomics using protein and peptide microarrays for (cancer) biomarker development

An estimated 2.7 million new cancer cases and 7.6 million cancer related deaths were reported worldwide in 2008 and incidences are increasing. It is well accepted that early cancer diagnosis can improve survival, thus there is a great need and anticipation to identify novel biomarkers for cancer diagnosis at the earliest possible stage, which can ideally be integrated in minimal-invasive diagnostic assays. Cancer onset and progression produces mutated or aberrantly expressed proteins generally also termed as tumor associated antigens (TAAs) which are able to act as antigens and evoke an immune response which results in the production of autoantibodies. These autoantibodies can be detected months or years before the clinical diagnosis of cancer and can therefore be used as biomarkers for the early diagnosis of cancer. We have setup immunomics discovery technologies using high density protein and peptide microarrays for elucidation of novel biomarkers. By microarray discovery we have defined cancer specific classifiers with high diagnostic performance, obtaining AUCs>0.9 for the big 4 cancer entities. Autoantibody based strategies outperform the current clinical diagnostic methods and would be of high value for improving cancer diagnostics and patient management. To transfer assays onto clinical applicable formats our current developments of different technological variant settings using medium scaled multiplexed assays in microarray and bead array formats will be presented.

Biography

Andreas Weinhausel is a Biotechnologist and Specialist in Human Genetics. He has more than 20 years experience in molecular diagnostics. He has worked at the Children's Cancer Research Institute, Vienna (1995-2004); he specialized in human molecular genetics diagnostics of syndromal and hereditary neoplastic disease. Since 2004, he has been working in the "Molecular Diagnostics" unit at the AIT-Austrian Institute of Technology and his focus is on DNA-methylation and protein biomarker development for cancerous and other systemic human disease using omics discovery and high throughput validation technologies. He is also an Associate Professor for Molecular Biology at the University of Natural Resources and Applied Life Sciences, Vienna.