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IMMUNOMICS TECHNOLOGIES USING PROTEIN AND PEPTIDE MICROARRAYS – FOR ANTIBODY PROFILING

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An individual's antibody profile or immunome is stable over years but can change in respect to pathological changes as well as these changes can be triggered by vaccination/ immunization or different therapeutic intervention. Antibody profiling on high density protein and peptide arrays has been shown to elucidate pathophysiological alterations in various indications like auto-immune, cancerous, and neurological disease, as well as in allergy and infectious disease. Protein-arrays are usually generated using recombinant expression, and have limited flexibility – but can be customized when proteins are available. Peptide-arrays can be easily customized to present proteins deduced from sequences, without the need of protein-expression. We have setup immunomics discovery technologies using protein- and peptide-microarrays (presenting 32000 spots or up to 6 million peptides, respectively) as well as targeted multiplexed technologies for validation of findings. These are all customizable and affordable even when discovery studies are done with a small number of samples. In line with the different technologies we have established and optimized bioinformatics and laboratory methods and can provide complete workflows from design, experimental setup and sample analysis till data-analysis. This is also true when we have lower multiplexed technologies available providing targeted micro-arrays (presenting hundreds-thousands antigens) as well as bead-arrays in an up to 500-plexed format for marker-refinement and confirmation. For broader validation and clinical studies we have both micro- and bead-array technologies established for analyzing large series of samples in 96-well microtiter-plates in medium-plexed assays. We have established and optimized different methods and combined these to a full workflow for providing modules as well as the entire pipeline for antibody-based analysis and diagnostics, which can be conducted with 10µl amounts of serum or plasma as well as using other body fluids like saliva.

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 is 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.

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