

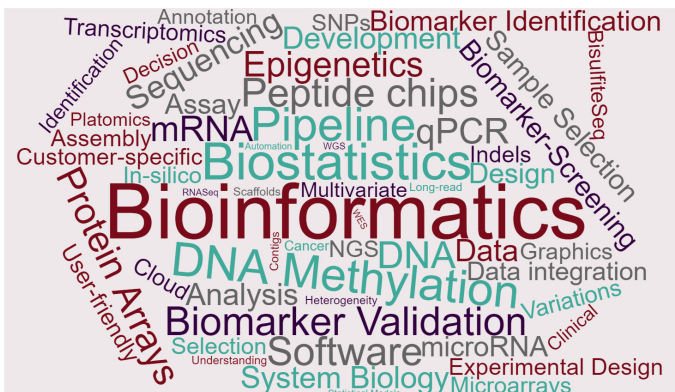


BIOINFORMATICS

INTRODUCTION

Today's personalized medicine is based on in-depth knowledge of the genetic and epigenetic repertoire of diseases and the availability of novel agents for targeting altered genes and pathways. Therefore, automated and reliable methods for analysing and interpreting this data are needed to achieve maximum explanatory power, cost and time efficiencies in medical diagnostics.

Our bioinformatics services range from experimental design, feature selection and assay standardisation to the development of decision support systems. A major focus of our research is on the analysis of sequencing data. We have comprehensive experience in analysing data obtained with various high-throughput technologies (including sequencing) and can thus provide optimal support in this field.



RESEARCH SERVICES

- **Experimental design:** sample selection, choice of platform, good practices
- **Assay design & analysis for biomarker validation:** screenings using microarrays and sequence analysis, customer-specific data analysis
- **Customised modules for biomarker identification and validation:** multivariate statistics, identifying and applying the appropriate statistical models
- **Data analysis of NGS experiments:** whole genome sequencing, whole exome sequencing, RNA sequencing, bisulfite sequencing
- **Development of decision support systems** based on biomarkers and clinical studies
- **Microbiome studies:** analysis setup, data analysis and interpretation of results
- **Genome assembly:** generation of contigs and scaffolds, annotation, gene identification and analysis, homology analysis
- **Pipeline development:** NGS data analysis, qPCR data analysis, creation of graphical input masks for users without bioinformatics background
- **In-silico assay design & analysis solutions** for standard biomarker validation
- **User-friendly data analysis software** for point-of-care (mobile) devices



DATA ANALYSIS & BIOMARKER DISCOVERY

We develop and apply advanced statistical and bioinformatical methods and provide statistical support for biomarker discovery and validation studies.

Platform specific know-how

We have experience and in-depth knowledge with a broad spectrum of different platforms including: Illumina and Ion Torrent NGS systems, Agilent, Affymetrix, Fluidigm, Luminex, protein and peptide arrays, and individual customer generated platforms.

Data integration

We create and apply advanced bio-statistical models to integrate various types of data and perform systems biology analyses (transcriptomics, microRNA, DNA methylation, SNPs).

Biostatistics

We use and develop innovative statistical and bioinformatics methods and offer statistical support in validation studies. Our services range from study design, data storage and processing, inference statistics, exploratory statistics, feature selection to pattern recognition, survival analysis, secondary analysis (GSEA, Ingenuity), and meta-analysis.

SOFTWARE DEVELOPMENT

We generate easy to use software solutions for scientists and clinicians, providing a standardized diagnostic framework and information system for genetic and epigenetic testing. Our bioinformatics & software development experts provide custom-tailored modules for biomarker discovery and diagnostic data analysis and decision support.

Cloud-based analysis platforms

We focus on accelerating clinical biomarker research for biomarker detection by combining the advantages of efficient, user-friendly, integrated, clinical expert and decision support systems. Our systems are especially designed for non-bioinformaticians assisting them in their research tasks – from sample to report – in a fast accurate and reliable manner. Combined with high throughput sequencing and cloud-based computing infrastructures, these systems have great potential for future clinical research. These projects can be carried out in close collaboration with the start-up company Platomics, an AIT spin-off (<http://www.platomics.com>).



AIT – AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH

DI Klemens Vierlinger
Competence Unit Molecular Diagnostics
Tel +43(0) 50550 4459 // Giefinggasse 4 // A-1210 Vienna
Klemens.Vierlinger@ait.ac.at
www.ait.ac.at/solutions/molecular-diagnostics/