

M MELISA
INSTITUTE
PROTEOMICS & GENOMICS

Services catalog



About us

We are a biotechnology research corporation striving for the development of health solutions for people, with a special focus on maternal and fetal health, human reproduction, and women's health.

MELISA integrates diverse areas of human life sciences including basic sciences, epidemiology, and medicine. Our institution's core capabilities include: advanced research in proteomics, genomics and the development and manufacturing of medical products with diagnostic or therapeutic applications. In addition, MELISA Institute is interested in investigating biological and social determinants of health at the population level.

Our Institute has developed a research platform that enables us to get closer to deciphering the *in vivo* molecular dialogue between the embryo and its mother, in the period from fertilization to nesting in the uterus. The main feature of our research is our *in vivo* platform based on the collection of biological specimens from a preconception cohort. Through the integration of various analytical technologies we seek to reveal these signals and find biomarkers of this process.

During the current global health emergency provoked by the COVID-19 outbreak, MELISA Institute adapted its research platform to collaborate in investigating clinical applications and possible solutions to this major public health crisis.



Elard Koch, PhD.

Chairman, Senior Epidemiologist
Head of Research at MELISA
Institute

Elard S. Koch is a senior Epidemiologist at MELISA Institute, based in the city of San Pedro de la Paz, Concepción, Chile. He completed much of his training as an Epidemiologist and Researcher at the School of Medicine of the University of Chile and became the Head of Research at the Department of Family Medicine. First Koch's mentor was Dr. Aída Kirschbaum Kasten, a leading immunologist and epidemiologist in infectious diseases with whom he obtained his Master's of Science Degree. Koch had a strong interest and training in biostatistics and published a series of theory articles on the application of popperian logic models to clinical trials.

Elard Koch won a scholarship to carry out his PhD under the guidance of Dr. Tomás Romero Carvajal cardiologist and professor of the University of San Diego, California. He performed several investigations on physiology of exercise, high blood pressure, heart rate variability and cardiovascular risk factors, and founded the SFP study (San Francisco Project), a prospective observational cohort of Chilean population followed for 15 years. The SFP study had a remarkable scientific production with numerous publications and awards, in addition to the training of various young researchers in epidemiology.

Dr Koch continued his postdoctoral training with Dr. John Thorp Jr., Professor of Maternal and Child Health at the Gillings School of Public Health from University of North Carolina. Here, Koch conducted two large natural population experiments on maternal health determinants in Chile and Mexico.

Strongly drawn to developmental biology and maternal-fetal health, Koch and other scholars founded the MELISA Institute, a biotechnology corporation dedicated to researching ultra-early biomarkers of fetal health, and developing a prenatal therapy for Down Syndrome, a genetic condition caused by trisomy on chromosome 21.

Our team



Cristian Vargas, MD
CEO & Core Facility Manager
and Business Development



Mauricio Hernandez, MSc
Chief BIOCHEM
Expert in Mass Spectrometry,
Staff Scientist



Guillermo Nourdin, MSc,
Expert in Bioinformatics,
Staff Scientist



Pablo Saldivia
BIOCHEM, Staff Scientist



Verónica Latapiat
Expert in Bioinformatics,
Staff Scientist



Estefania Contreras
Laboratory Technician,
Staff Scientist



Felipe Castro
Bioengineer,
Staff Scientist

Our instruments: Proteomics



timsTOF Pro Mass Spectrometry Platform
(Bruker Daltonics)



ÄKTA Avant 25 Preparatory Chromatography
System (GE Healthcare Life)



EVOSEP One (EVOSEP)



nanoHPLC nanoElute
(Bruker Daltonics)



IRSpirit Fourier Transform Infrared
Spectrophotometer (Shimadzu)

Our instruments: Proteomics



HyperVAC vacuum centrifugal concentrator connected to HyperCOOL Cold Trap.



DirectDetect IR-Spectrometer (Merck-Millipore)



Ultrasonic Cell Crusher Noise Isolation Chamber



Infinite M200 Pro Nano Quant (Tecan)



Odyssey CLx (Li-cor)



Megafuge 16 (Thermo Scientific)

Our instruments: Genomics



Qsep 100 Fragment Analyzer
(BioOptic Inc.)



NextSeq 500 Sequencer (Illumina)



Qubit 4 Fluorometer
(Thermo Fisher Scientific)

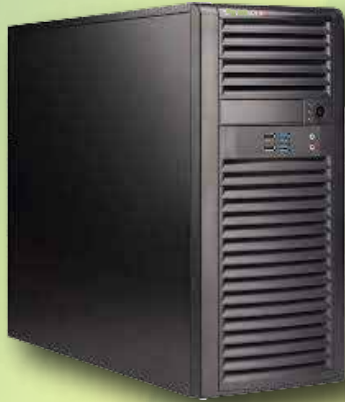


Centrifuge 5430R (Eppendorf)



StepOnePlus Real Time PCR
(Applied Biosystems)

Our instruments: Bioinformatics



2 SUPERMICRO Computational server

Characteristics:

- 2 AMD EPYC 7552 Processors (2.2 GHz to 3.3 GHz) 192 Mb Cache
- 2 x 48 cores
- 2 x 96 threads
- 512 Gb RAM
- 1.9 Tb SSD disk (SO)
- SSD RAID0 8 Tb
- OS: Windows 10 pro and Linux Ubuntu 18.04



Perseus
(Max-Planck Institute of
Biochemistry)



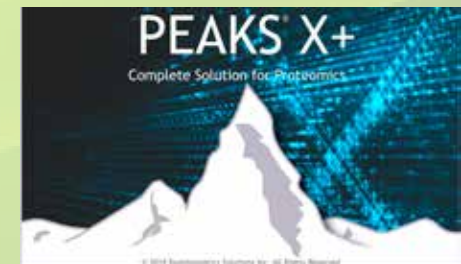
MaxQuant(-
Max-Planck Institute
of Biochemistry)



DiaNN
(Demichev, Ralser and
Lilley labs)



MSFragger
(Nesvizhskii lab)



PEAKS Studio X+
(Bioinformatic Solution Inc.)

Our mounted techniques

Proteomic techniques:

- LC-MS / MS: Data dependent acquisition (DDA), Data independent acquisition (DIA), Parallel reaction monitoring (PRM)
- Reverse pH fractionation

Genomic techniques:

- Sequencing of genetic material
- PCR-RT-qPCR
- Genomic, transcriptomics, metagenomics sequencing through NGS
- Extraction and quantification of proteins and nucleic acids

Bioinformatic techniques:

- Identification and massive quantification of proteins



Our mounted techniques



Chromatography techniques:

- Purification of recombinant proteins
- Antibody purification (mono and polyclonal antibodies)

Molecular and cellular biology immunoassay:

- Immunofluorescence, immunohistochemistry
- Cell culture: culture of immortalized cell lines, primary culture and tissue culture
- ELISA, DotBlot, Western Blot
- Freeze drying and concentration of samples

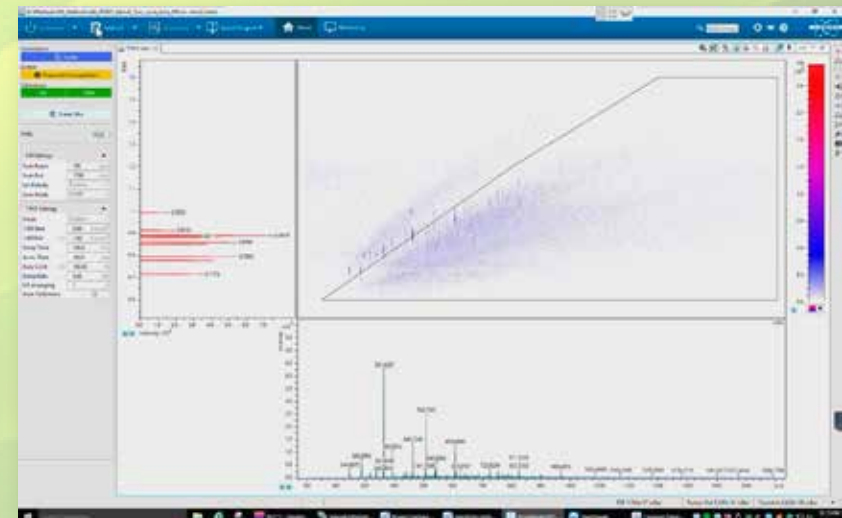
Proteomics services

- Protein identification service in gel and solution
- Protein quantification service (LFQ)
- Peptidomics service
- Protein post-translational modification service
- Selected Reaction Monitoring
- Metaproteomics service
- De novo Antibody Sequencing
- Subcellular Proteomics
- Exosome Proteomics
- Cell Surface Proteomics
- Customized Deep Proteomics



Bioinformatics services

- Functional annotation and enrichment analysis
- Network analysis
- Pathway analysis
- Proteomics analysis of PTMs
- Protein sequence analysis
- Customized services



Genomics services

- Gene expression profiling (mRNA-SEQ)
- Exome sequencing
- Whole-Genome Sequencing
- Targeted Gene Panels
- De Novo Sequencing
- Microbiological analyses and Metagenomics
- Real-time PCR for analyzing gene expression
- Customized services

Chromatography services

- Recombinant Protein Purification (IMAC, GST)
- Molecular Exclusion Chromatography
- Ion Exchange Chromatography (Cationic/Anionic)
- Antibody Purification
- Affinity Chromatography
- Customized services



Research & Development Solutions

We provide unique scientific expertise, technology and professional support in the fields of biomedical research and life sciences to meet the needs of R&D in multiple areas.

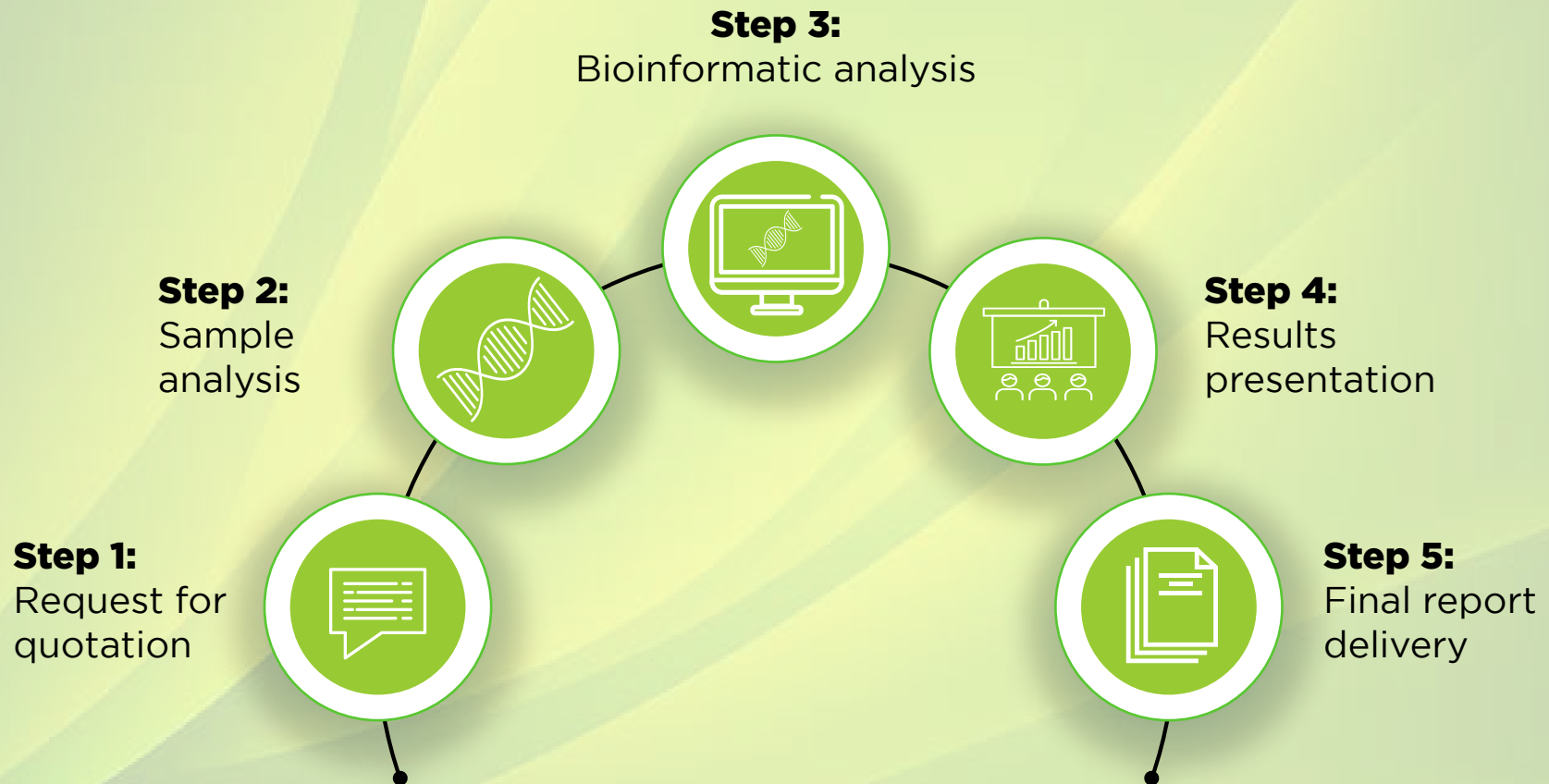
MELISA Institute acts as a catalyst for innovative R&D initiatives by supporting collaborative research works or executing customized research projects with high-performance technologies, quantitative methods and advanced data integration techniques for academic centers or private companies.

R&D areas which we support:

- Life Sciences
- Agriculture
- Food Industry
- Forestry
- Biomedical
- Microbial
- Minery



Core Facility Workflow



Our clients



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DE CHILE



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de Concepción



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Playa Ancha



Universidad Austral de Chile
Conocimiento y Naturaleza



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los Andes

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