UTRECHT SCIENCE PARK

ACCELERATING INNOVATIONS IN LIFE SCIENCE & HEALTH

RESEARCH FACILITIES AND SERVICES

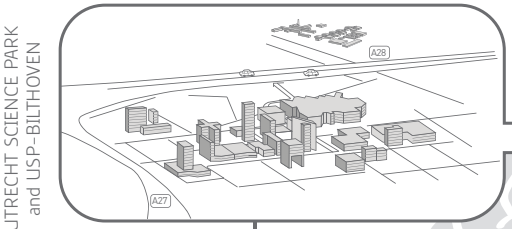

UTRECHT SCIENCE PARK BILTHOVEN, 5 MINUTES
6 KM FROM UTRECHT CENTRAL STATION
38 MINUTES FROM SCHIPHOL AIRPORT
UTRECHT SCIENCE PARK

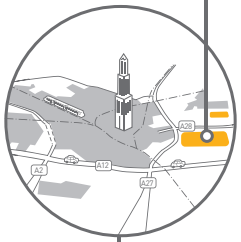
UTRECHT SCIENCE PARK

THE BEATING HEART OF ONE OF EUROPE'S MOST COMPETITIVE REGIONS

The largest science park in The Netherlands is an inspiring and exciting place to work, study and interact. It provides a vibrant meeting place for professionals in research, education, clinical care and entrepreneurship. A network of professionals and state-of-the-art research facilities provide fertile soil for the discovery, design and development of sustainable solutions for healthy life in a healthy environment. Activities at the Utrecht Science Park have a specific focus on the themes of Life Sciences and Health, Dynamics of Youth and Pathways to Sustainability.

For more information on the impact of the Utrecht Science Park on science, society and citizens, please visit the Utrecht Science Park website.





300
hectares

UTRECHT SCIENCE PARK

1,500,000,000
euros investment
between 2016 and 2021

120+
science-based
organisations

51,000
STUDENTS

27,500
EMPLOYEES

5,000
NEW R&D JOBS

PATIENTS RECEIVE MEDICAL TREATMENT EVERY YEAR
400,000

STUDENT HOMES WITH A POTENTIAL TO GROW TO 4,000
2,600

DAILY:
51,000 students
27,500 employees
78,500 people

UTRECHT SCIENCE PARK

Utrecht Science Park is the largest science park in the Netherlands, with the highest concentration of knowledge institutions within walking distance. We are home to Utrecht University, University Medical Center Utrecht, HU University of Applied Sciences Utrecht, and several other internationally renowned research institutes and companies such as Hubrecht Institute, Princess Máxima Center for Pediatric Oncology, Danone Nutricia Research and Genmab.

In addition to excellent educational and research programs, the Utrecht Science Park offers a unique research infrastructure that is among the best in Europe. This makes the Utrecht Science Park an exceptional place where scientists from research organizations and science-based companies join forces to accelerate their science and solutions.

To unlock the unique and rich ecosystem of talent, expertise and cutting-edge research infrastructure to the international Life Sciences and Health community, we have initiated the BOOSTER program. The purpose of this program is to stimulate and accelerate innovation by pro-actively matching our research ecosystem with the needs of knowledge-intensive companies and unlocking research facilities and services.

An important part of this program is our front office that serves as a single point of contact for external organizations. We will help you to navigate your way through the complexity of different organizations and departments at the Utrecht Science Park. If necessary we can provide you with integrated solutions involving multiple facilities, services and talents and thereby help you to accelerate your innovations.

Simultaneously, we support the research and education institutes by increasing exposure of their facilities, services and talents, and by facilitating the collaboration with organizations in need of scientific support or human capital. To this end, we work closely with business development managers and research support offices at the Utrecht Science Park and the ROM Utrecht Region.

You can contact the front office through:
researchfacilities@utrechtsciencepark.nl


UTRECHT
SCIENCE
PARK
BILTHOVEN

UTRECHT SCIENCE PARK BILTHOVEN

Satellite Location

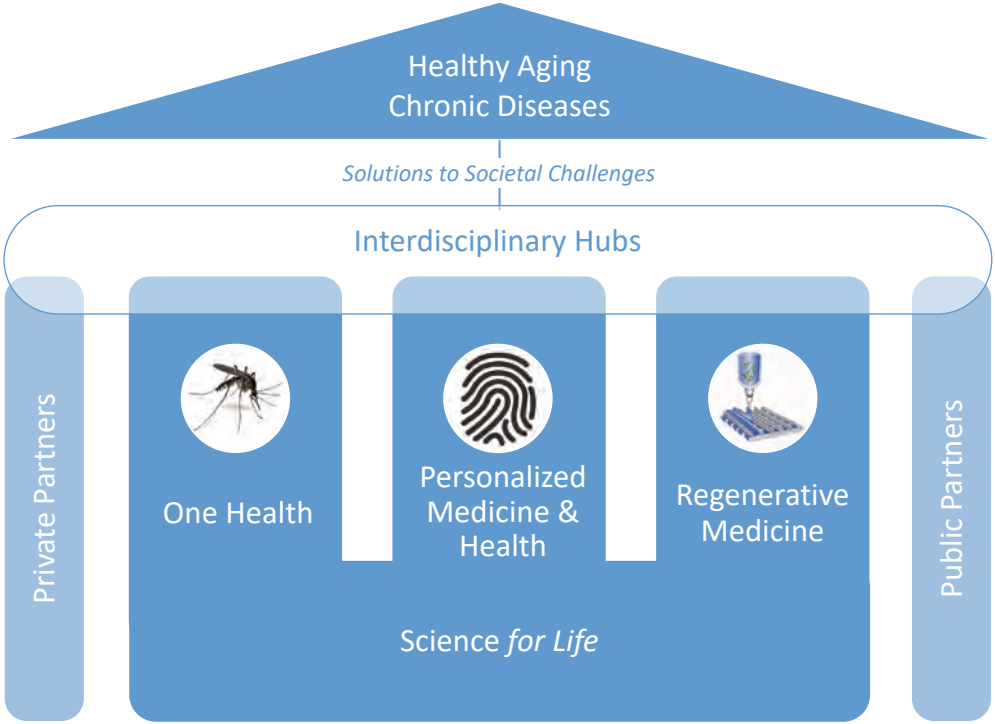
Utrecht Science Park incorporates two different locations, one in Utrecht and one in Bilthoven. At the location in Utrecht, the focus is on research, education, clinical care and entrepreneurship, while the focus at Bilthoven is on product development, process improvement and manufacturing with an emphasis on vaccines.

Lease Opportunities

By combining knowledge, network, facilities and talents, fundamental and applied research at molecular and cellular level can directly be implemented in the development and manufacturing of new therapies. The relocation of the National Institute of Public Health and the Environment (RIVM) to the Utrecht site of Utrecht Science Park in 2021 and the adjacent greenfield site will create the space necessary to attract new companies to Bilthoven that are in need of a manufacturing ecosystem.

Since 1903, Bilthoven has played a key role in the history of vaccinology. About one third of all vaccines worldwide are based on technology from Bilthoven and 95% of globally manufactured inactivated polio vaccines follow a production technology that was primarily elaborated here.

LIFE SCIENCES RESEARCH AT UTRECHT SCIENCE PARK



Life Sciences is one of four strategic themes of Utrecht University and comprises approximately 50% of the total university research activities. It combines the strengths of the Utrecht University Faculty of Sciences and Faculty of Veterinary Medicine, with the University Medical Center Utrecht (UMC Utrecht). Proximity and close collaboration between disciplines fosters a research ecosystem that is unique in Europe and attracts top talent to the Utrecht Science Park.

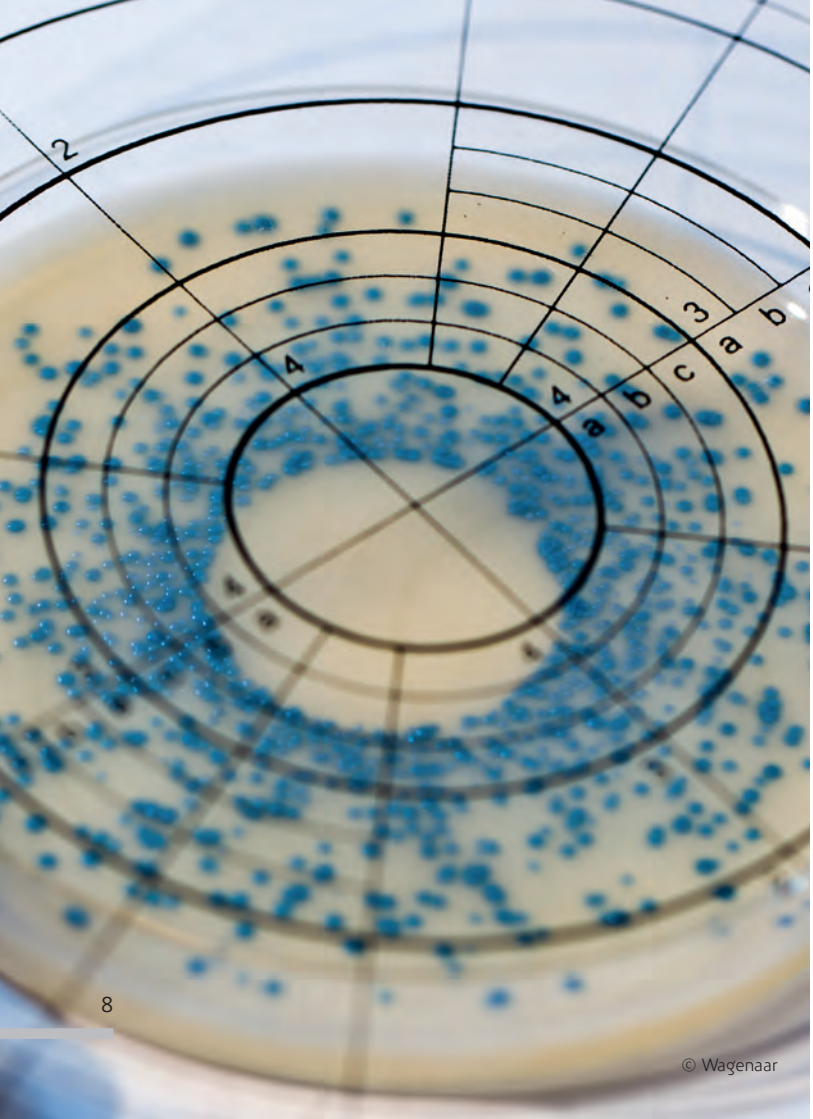
Our vision is that interdisciplinary research is the key to solve unmet societal needs and to address the complex challenges of today and the future. To further improve health and well-being of animals and humans, life sciences studies life at all levels: From molecule to population. For insights to flow freely between these levels, we build excellent research communities beyond the traditional borders of academic disciplines, where we share research, resources and infrastructure. Our research is interdisciplinary by nature and combines fundamental, clinical, translational and applied research. Our research connects external partners from across a regional and global network of research institutes, non-governmental organizations, patient organizations, government, and/or private companies.

Research, education, training and entrepreneurship within the strategic theme focuses on three thematic pillars; One Health, Personalized Medicine & Health, and Regenerative Medicine & Stem Cells. A strong foundation of more fundamental life sciences research is organized within the central Science for Life theme.

Utrecht is home to Europe's largest Graduate School of Life Sciences. Knowledge and expertise from the fields of Medicine, Veterinary Medicine, Chemistry, Biology, Pharmacy, Physics and Mathematics converge into 16 English research training Master programs and 14 PhD programs.

For more information, please visit the Life Sciences website.

For more information, please visit the Graduate School of Life Sciences website.



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FOUR LIFE SCIENCES HUBS

Within the strategic theme Life Sciences, four hubs function as a catalyst for interdisciplinary collaboration. Hubs are the ultimate representation of a new way of thinking: one that is not based on the application or valorization of previously acquired academic knowledge independently, but on joining forces with others to ponder research questions and strategies.

The four Life Sciences hubs aim to bring excellent researchers from different disciplines and organizations together to work on societally relevant issues and scientific breakthroughs within the framework of One Health, Personalized Medicine & Health, Regenerative Medicine & Stem Cells and Science for Life. The hubs stimulate productive and long lasting multidisciplinary collaborations with public and/or private stakeholders thereby creating shared value and, hence, societal and economic benefit.

For more information, please visit the Life Science Hubs website.

Utrecht Advanced *In Vitro* Models Hub

The Utrecht Advanced *In vitro* Models (U-AIM) hub facilitates the development, validation and implementation of advanced *in vitro* methods. Through strong collaboration between scientists, students, regulators and industry, the hub aims to strongly reduce animal experimentation by developing *in vitro* models that are highly predictive for effects in humans. This can greatly benefit drug and advanced therapy development as well as regulatory safety testing of chemicals and food components.

Within U-AIM, strong synergy is realized between regenerative medicine and pharmaceutical sciences; embedded advanced models include organ-on-chip, organoids (and other stem cell-based methods), 3D models/bioreactors and humanized cell lines.

U-AIM activities include organization of a Summer School and seminars, hosting/co-organization of (international) conferences, *in vitro* model validation guidance, co-writing of project proposals, consortium formation, supporting spin-outs/start-ups and communication of novel concepts/progress internally and externally.

For more information, please visit the U-AIM website.

Utrecht Molecular Immunology Hub

The Utrecht Molecular Immunology Hub encompasses researchers with complementary expertise in the areas of structural biology, proteomics, glycobiology, and functional immunology. Together they aim to understand how the immune system functions at the molecular level, thereby contributing to the development of novel ways of immune interventions, improving our immune responses in health and disease and thus the wellness of life.

Our researchers are at the forefront of science in unraveling molecular mechanisms of immune activation and immunotherapies. They are making key contributions towards technological development in studying the immune system, exploiting it for vaccine and drug development and specific immune therapies using unique epitope sequences and adjuvants. The UMI Hub platform provides exciting opportunities concerning the development of novel immune-targeted therapies against infectious diseases and cancer and also lends itself to establishing future partnerships and collaborations in addressing other diseases with unmet clinical needs.

For more information, please visit the UMI website.


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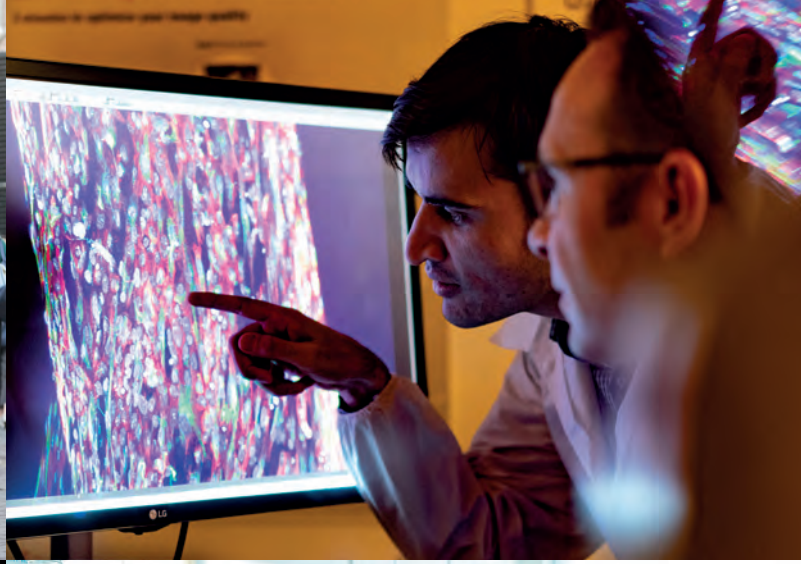
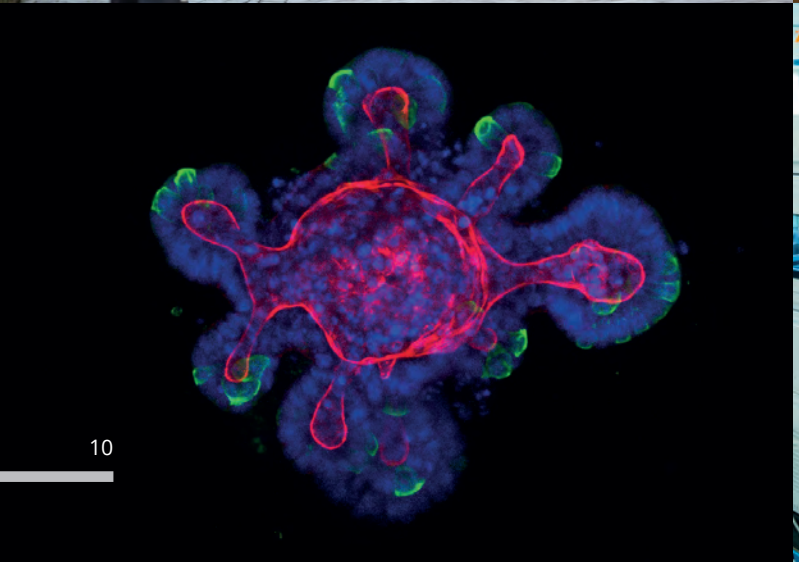




Utrecht EXPOSOME Hub

Where the microbiome meets exposure science to advance human health. Our health is shaped by environmental factors that we humans are exposed to on a daily basis: what we eat, the air we breathe, our social interactions and lifestyle choices. The sum of all these environmental drivers of health and diseases is called the exposome. This very complex set of elements is continually evolving, and to map it is a challenging undertaking.

The Utrecht Exposome Hub stimulates productive and long-lasting interdisciplinary collaborations on exposome research. Researchers from different disciplines work together with public and private partners to unravel and map the exposome.

In addition to the external exposome, we also focus on the internal exposome: we investigate, on a large scale, the role of the microbiome in interaction with various environmental factors. By combining the internal with the external exposome, we aim to develop successful prevention and intervention strategies in amongst others cardiovascular, mental, infectious, and immunological diseases.

For more information, please visit the EXPOSOME website.

Utrecht Platform for Organoid Technology

Organoid culturing methods represent a major scientific breakthrough, allowing researchers to generate 'mini-organs' in a dish for studying fundamental biological processes in health and disease. The technology has also entered the clinical arena, where organoid-based tests are starting to be used for personalized treatment.

Utrecht Platform for Organoid Technology (UPORT) provides a stable framework for rapid and standardized tissue acquisition and processing.

In addition, UPORT supports the generation and analysis of novel organoid-based model systems with valorization potential and clinical relevance. By stimulating knowledge exchange within the organoid community as well as the organization of courses and match-making events, UPORT aims to extend the benefits of organoid technology for patients, clinicians and researchers.

UPORT consists of a team of study coordinators who organize the logistics of acquiring human and animal tissues for research.

For more information, please visit the UPORT website.

"Investing in child and youth research leads not only to more in-depth knowledge but also to economic benefits and cost savings"

Catrin Finkenauer

STRATEGY RESEARCH THEME DYNAMICS OF YOUTH

UU

How are individuals shaped into who they are? Why do they show certain behavior? In order to understand social problems and how to deal with them, we need to start with understanding child development. Children growing up today will eventually determine the resilience of our society.

How does the interplay between biology and environment determine how children learn to function in our rapidly changing society? How can our children develop into well-balanced individuals? Inspired by societal issues, researchers throughout Utrecht University integrate their expertise to answer crucial questions about future generations.

The strategic theme Dynamics of Youth combines excellent child research, knowledge and expertise from six interdisciplinary hubs and coordinates several large-scale, longitudinal cohort studies on children, adolescents and young adults.

Six Interdisciplinary Hubs

- The first 1001 days of a child's development;
- Where do I belong? - a child's sense of belonging;
- Educational perspective - teaching and education;
- Healthy play, better coping - chronic diseases;
- Youth Got Talent - Optimizing youth's potential for societal participation;
- Developmental labels - understanding how diagnostic classifications affect children's wellbeing.

Longitudinal Population Cohort Studies

- YOUth Cohort Study (p. 183) - following a cohort of children from gestation until the age of 18;
- HBSC - Health Behavior in School-aged Children;
- PIAMA - asthma and allergy in children;
- WHISTLER - WHeezing Illnesses STudy LEidsche Rijn;
- Pro-active - on parent-child relation in chronic diseases;
- RADAR - Research on Adolescent Development And Relationships.

For more information, please visit the Dynamics of Youth website.

START-UP AND BUSINESS SUPPORT

UTRECHT HOLDINGS

The Utrecht Science Park community offers various forms of support for new startup companies. This ranges from training courses, workshops and coaching sessions to accommodation, networking opportunities and access to facilities and investors.

Utrecht Holdings is the joint Technology Transfer Office (TTO) of Utrecht University (UU) and University Medical Center Utrecht (UMC Utrecht). Utrecht Holdings helps academics to translate knowledge into economic enterprise. Utrecht Holdings has several active licensing opportunities available for partnering. They are based on inventions for which a patent application has been filed. Non-confidential information about each opportunity is disclosed in a licensing opportunity description.

For more information, please visit the Utrecht Holdings website.

UTRECHT HOLDINGS

The Utrecht Holdings Fund

The Utrecht Holdings Fund is a revolving fund that is funded by UU and/or UMC Utrecht. Key investment criteria include: scalable technology/concept based on research of UU and/or UMC Utrecht with a minimum Technology Readiness Level 3.

For more information, please visit Utrecht Holdings website.

The Utrecht Health Seed Fund

The Utrecht Health Seed Fund is funded by Utrecht University, UMC Utrecht and the EU's European Regional Development Fund. Key investment criteria include: SME's registered in the province of Utrecht developing a technology for a scalable product or service in Life Sciences, Digital Health, Medical Devices & Animal Health with Technology Readiness Level 2-7.

For more information, please visit Utrecht Health Seed Fund website.

RESEARCH, FACILITIES AND SERVICES

FROM MOLECULE TO POPULATION

MOLECULAR RESEARCH

CELLULAR RESEARCH

TISSUE AND ORGAN RESEARCH

ORGANISM RESEARCH

CLINICAL RESEARCH

TECHNICAL SERVICES AND PROTOTYPING

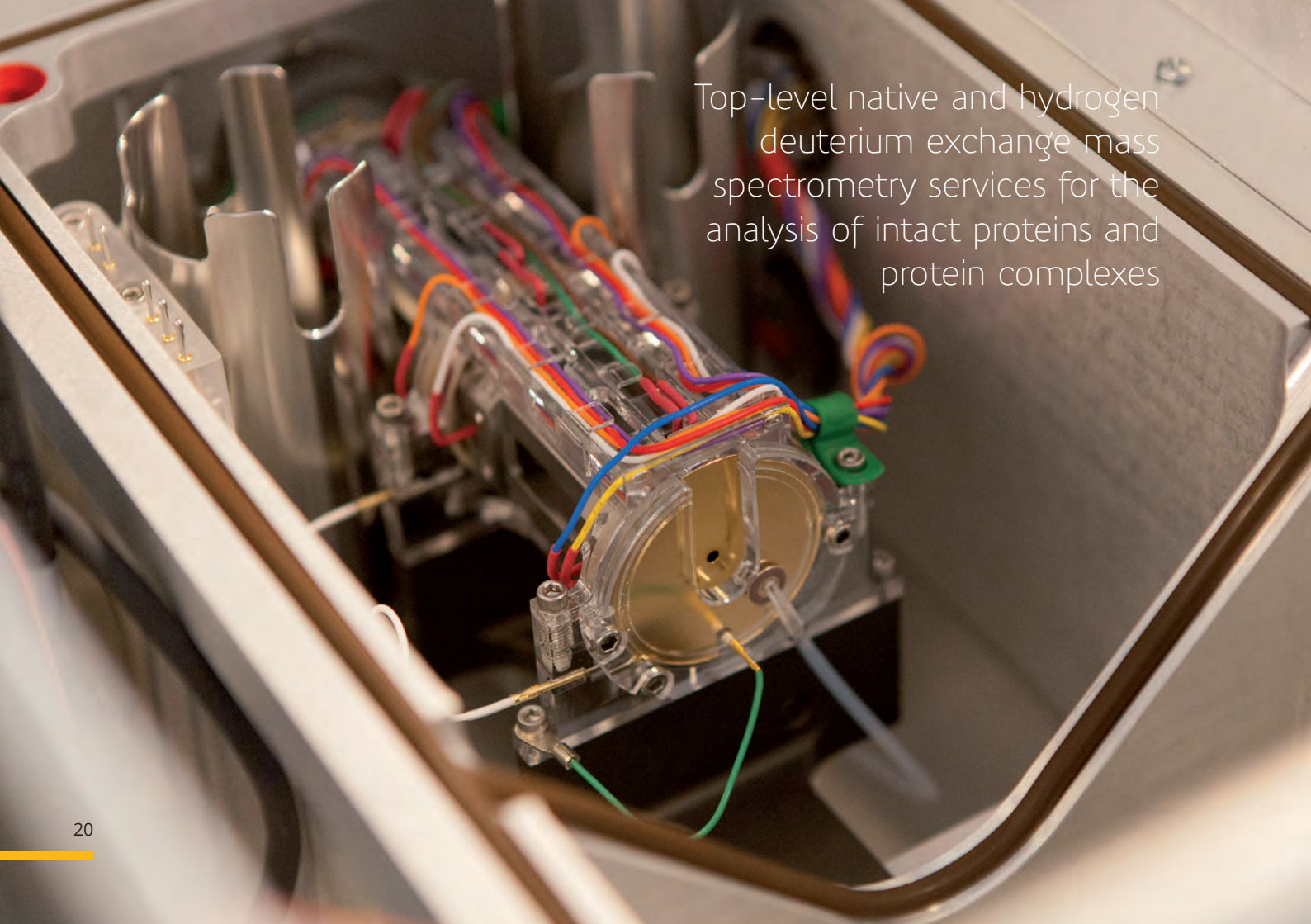
PRODUCTION

DATA RESEARCH

GENERAL SERVICES

IN BLACK: PUBLIC FACILITIES & SERVICES. IN BLUE: PRIVATE FACILITIES & SERVICES.
NUMBERS REFER TO PAGE NUMBER.
For additional information see also: www.utrechtlifesciences.nl/facilities


FACILITIES
FOR
MOLECULAR
RESEARCH



Top-level native and hydrogen deuterium exchange mass spectrometry services for the analysis of intact proteins and protein complexes

ABLAB NATIVE PROTEIN MASS SPECTROMETRY AND HYDROGEN DEUTERIUM EXCHANGE MASS SPECTROMETRY SERVICES

UU

AbLab is a contract research unit that operates within Utrecht University, providing the expertise, equipment and labor to perform native mass spectrometry and hydrogen deuterium exchange (HDX) mass spectrometry analysis of proteins and protein complexes.

Native mass spectrometry

A key feature that makes native MS unique is the preservation of non-covalent interactions during the mass analysis. Native MS thereby allows the analysis of intact proteins and protein complexes in their native state. Native MS can provide a wide range of information, such as structural information, complex stoichiometry, sample composition and purity. Through progressive development of this analytical technique at Utrecht University, it is possible to mass analyze with high precision and resolving power complex molecules such as plasma glycoproteins, biopharmaceuticals and viruses.

Hydrogen deuterium exchange

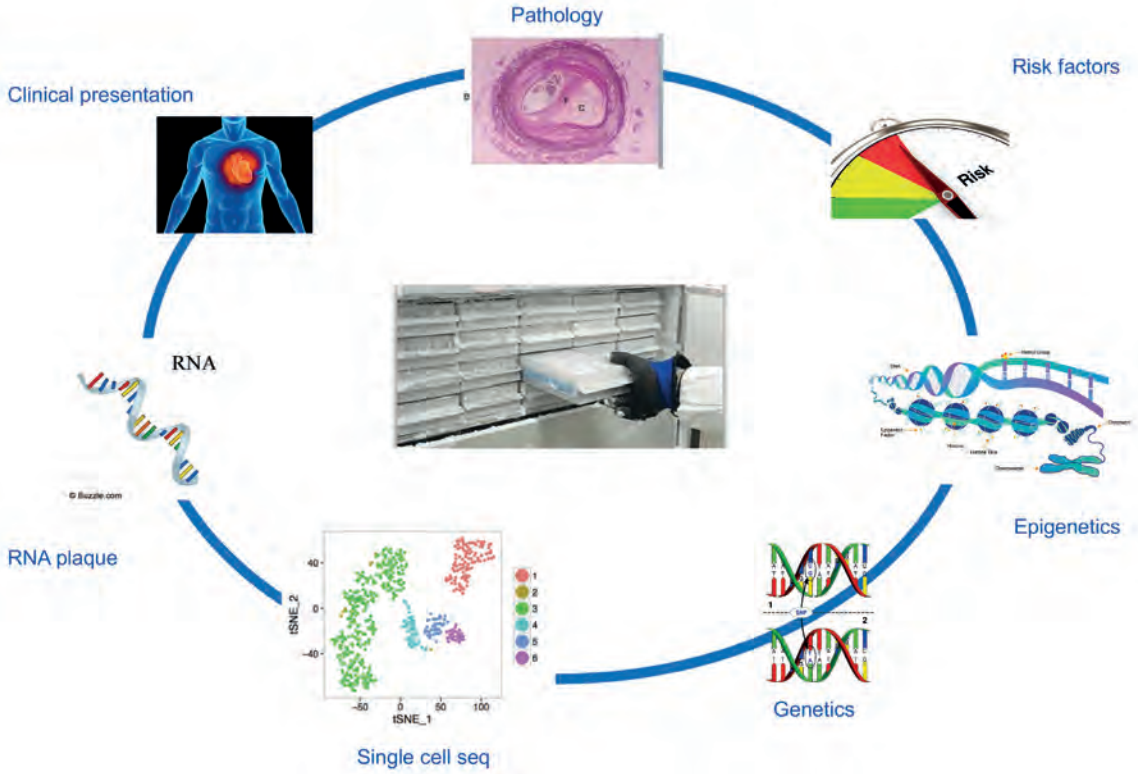
Hydrogen deuterium exchange mass spectrometry (HDX MS) can provide structural information on a protein, expose the solvent-accessible regions, the protein interaction interfaces and is often used for epitope mapping. HDX-MS is highly sensitive but the analysis is quite elaborate, requiring a dozen of LC-MS/MS runs. By picking up peptides with altered deuterium exchange rates, structural conformers and protein interactions interfaces can be mapped.

Equipment

AbLab provides access to dedicated (Q)-ToF mass spectrometers, and Orbitrap Exactive Plus and EMR instruments for native MS analysis and the Xevo QToF G2 nanoAcquity system for HDX MS.

For more information, please visit the Heck Lab website.

Phenotyping an genotyping of atherosclerotic human lesions



ARTHERO-EXPRESS™ BIOBANK

UMCU

The Athero-Express™ studies are a joint collaboration between the Experimental Cardiology Laboratory at the UMC Utrecht, the Vascular Surgery and Pathology Department of the St. Antonius Hospital Nieuwegein and the Department of Vascular Surgery of the UMC Utrecht.

The aim is to identify protein markers in the local plaque that are predictive for systemic cardiovascular adverse events. As the Athero-Express™ is currently searching for markers in more advanced stages of disease, we also strive for the search of targets in blood derived structures.

The Athero-Express™ Biobank Studies have developed a unique and proprietary discovery pipeline involving different sample types and clinical endpoints. This has led to the discovery of hundreds of potential therapeutic targets, and biomarkers for disease or efficacy.

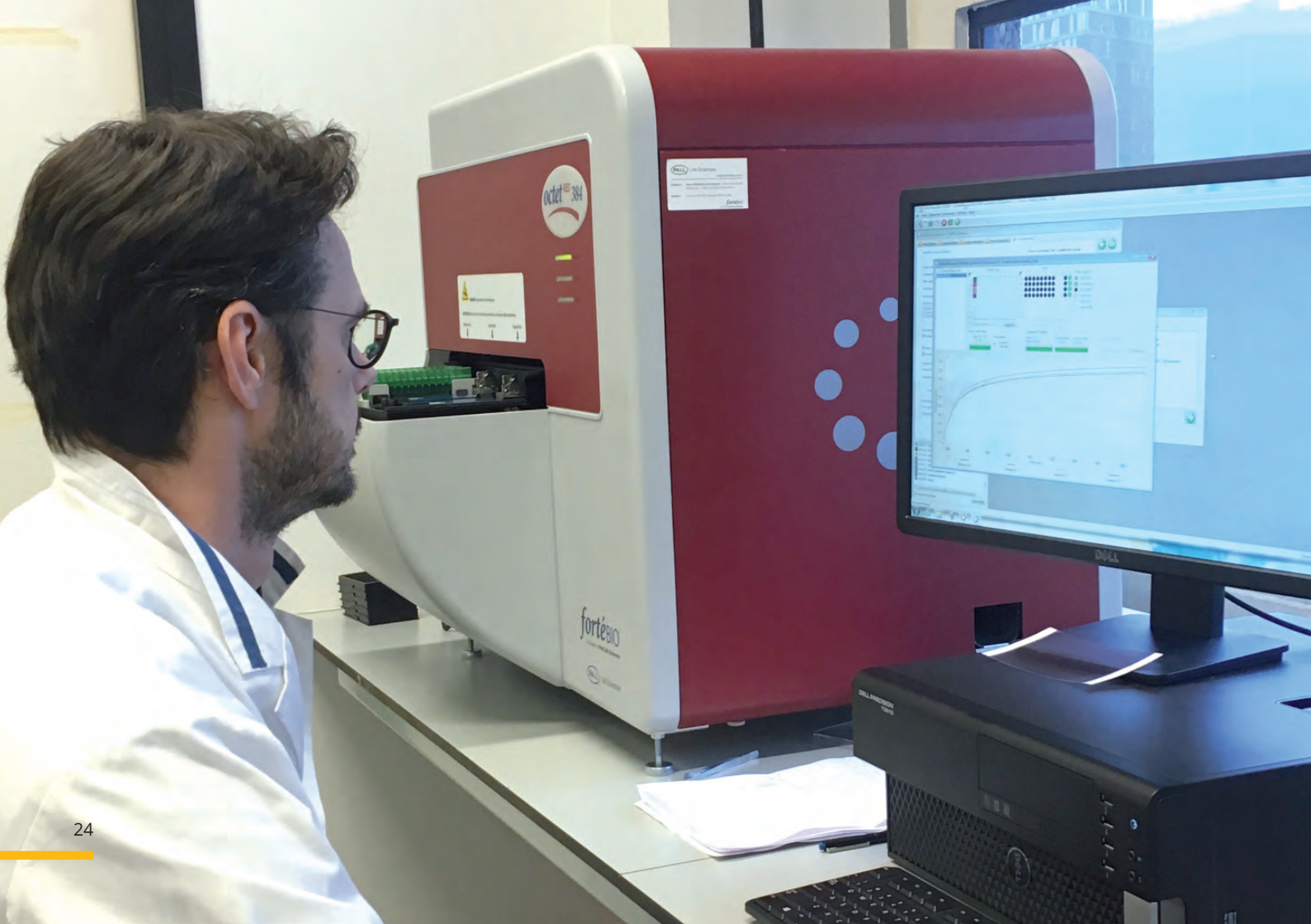
Activities

- Follow-up study: to study the predictive value of locally expressed proteins for the occurrence of adverse cardiovascular events in patients undergoing (carotid) endarterectomy;
- Cross-sectional studies: to study and validate differential expression in atherosclerotic plaques and/or blood cells among patient groups and plaque phenotypes;
- Integrative studies: to combine genomic (whole genome SNP and CNV analyses), proteomic and medical data to identify subgroups of patients at risk for adverse cardiovascular events.

The Athero-Express™ researchers also organized the initiation of a second vascular biobank study with a longitudinal study design. This bank is entitled Abdominal Aneurysm Atheroma (AAA) Express™ and over 430 patients are included, also including patients operated on other types of aneurysms.

We are always looking out to broaden our collaborative efforts.

For more information, please visit the Arthero-Express website.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BIOMOLECULAR INTERACTION FACILITY

UU

Biolayer interferometry is a label-free technology for measuring biomolecular interactions. It is an optical analytical technique that analyzes the interference pattern of white light reflected from two surfaces: a layer of immobilized protein on the biosensor tip, and an internal reference layer (Figure 1).

Any change in the number of molecules bound to the biosensor tip causes a shift in the interference pattern that can be measured in real-time.

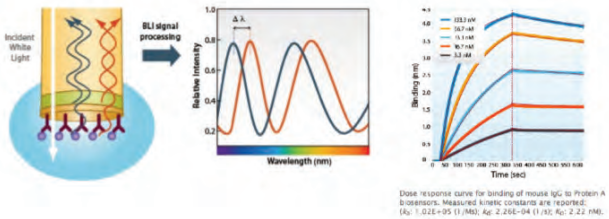


Figure 1. Bio-layer interferometry uses the interference produced from two light reflections of a single source to measure the association/dissociation of a target molecule on the sensor surface: with association or dissociation from the target to the probe, the distance between the reflection sources changes accordingly (left). Example of an application is depicted (right).

Possible Applications

- antibody characterization;
- protein-protein and protein-peptide interactions;
- protein-DNA/RNA interactions;
- protein-lipid/liposome interactions;
- protein-small molecule interactions;
- (label-free detection down to 150 Da);
- Virus-receptor interactions.

Equipment

Affinity Range	1 mM-10 pM
Molecular weight	>150 da
Min. sample volume	100-40 µl
Max. simultaneous reads	8-16

Services

We provide expertise input for your experimental design, choice of platform, advice on sample preparation, and help with data analysis.

For more information, please visit the Biomolecular Interaction Facility website.


2x
LB
CERGENTIS
COMPLETE GENE SEQUENCES
2xLB | 2 x Ligation Buffer
Store at -20°C
LOT: K30816 | EXP: JUL-2017
SB | Cell Suspension Buffer
Store at -20°C
LOT: K30816 | EXP: JUL-2017
1xRB | 1 x Restriction Buffer
Store at 4°C
LOT: K308816 | EXP: JUL-2

CERGENTIS

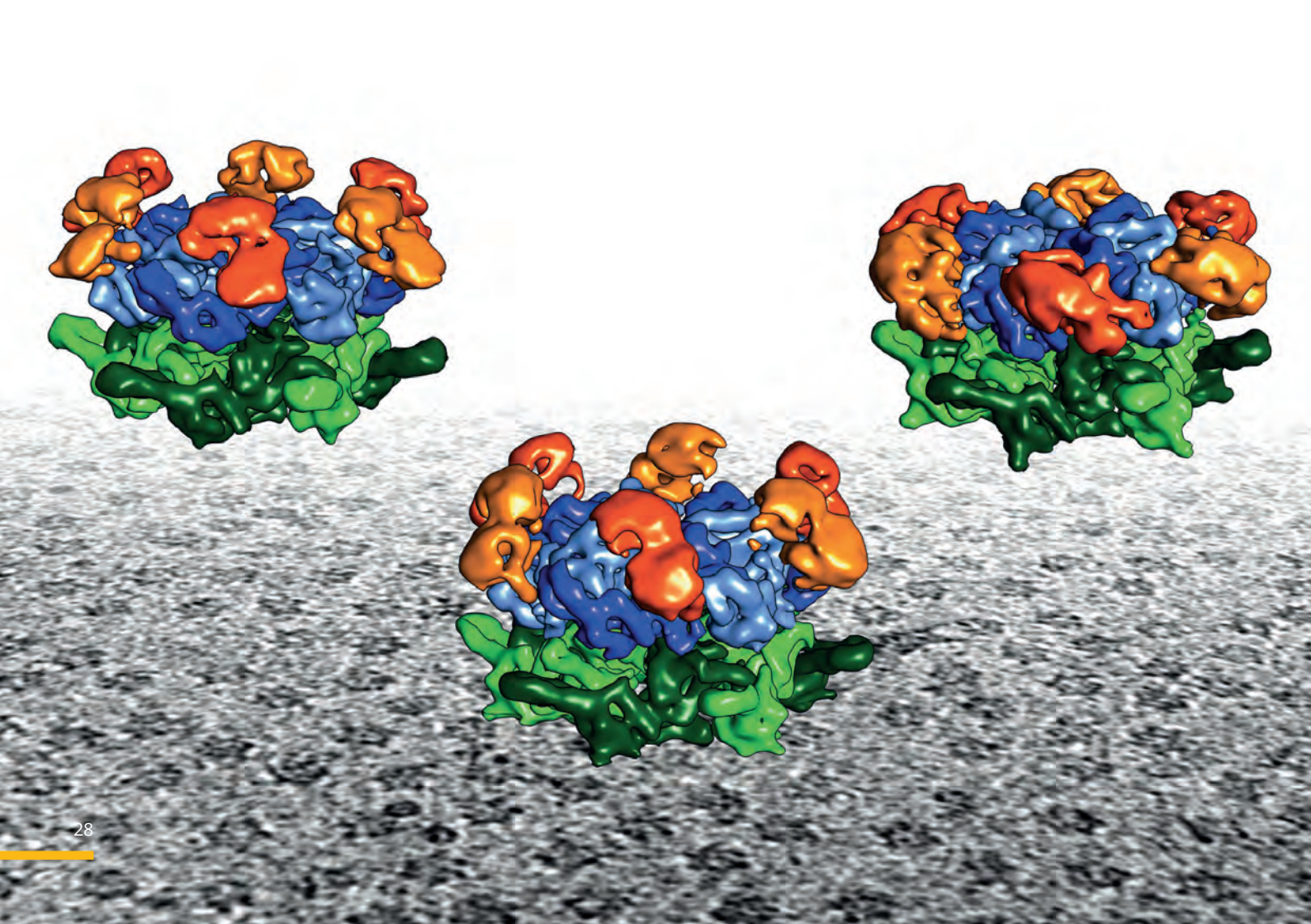
Cergentis, a genomics company, was established in 2012 as a spin-off from the Royal Netherlands Academy of Arts and Sciences (KNAW) and its Hubrecht Institute for Developmental Biology & Stem Cell Research.

It is our mission to improve the quality of genetic research and human healthcare by empowering precision medicine. We provide services and kits based on our proprietary Targeted Locus Amplification (TLA) technology (Nature Biotech 2014) to leading diagnostic labs, research institutes and pharmaceutical companies worldwide.

TLA enables rapid, cost-effective, complete next-generation sequencing of genes of interest and provides critical advantages in genetic (cancer) research and diagnostics.

For more information, please visit the Cergentis website.

Empowering precision medicine



EM SQUARE

UU

Together with the Cell Microscopy Center of the UMC Utrecht, EM square forms the Utrecht EM facility. EM square is devoted to the development and application of electron microscopy methodologies for life sciences, geosciences, and material sciences research, covering the entire range of specimen preparation, electron microscopy data collection and analysis, and 3D reconstruction techniques. On the molecular side of life sciences, the focus is on structural characterization of molecular complexes in isolation and in situ. To warrant interpretation at highest resolution, samples are imaged in the frozen-hydrated state ('cryo-EM'), which is in contrast to common preparation methods in cell biology that utilize de-hydration and heavy-metal staining.

Equipment

The infrastructure includes several advanced (Cryo) Transmission Electron Microscopes (TEM) and Scanning Electron Microscopes (SEM), with a full range of imaging modes and analytical tools such as bright-field and dark-field STEM, electron diffraction, 2D EDX chemical mapping, and cryo-electron tomography (ET). For the life sciences, the facility focuses on cryo-EM and ET. In addition to standard TEMs, the facility houses a dedicated cryo-TEM Thermo Fisher Scientific Talos Arctica), a cryo-focused ion beam (FIB)/SEM (Thermo Fisher Scientific Talos Aquilos), and a cryo light microscope (Thermo Fisher Scientific CorrSight).

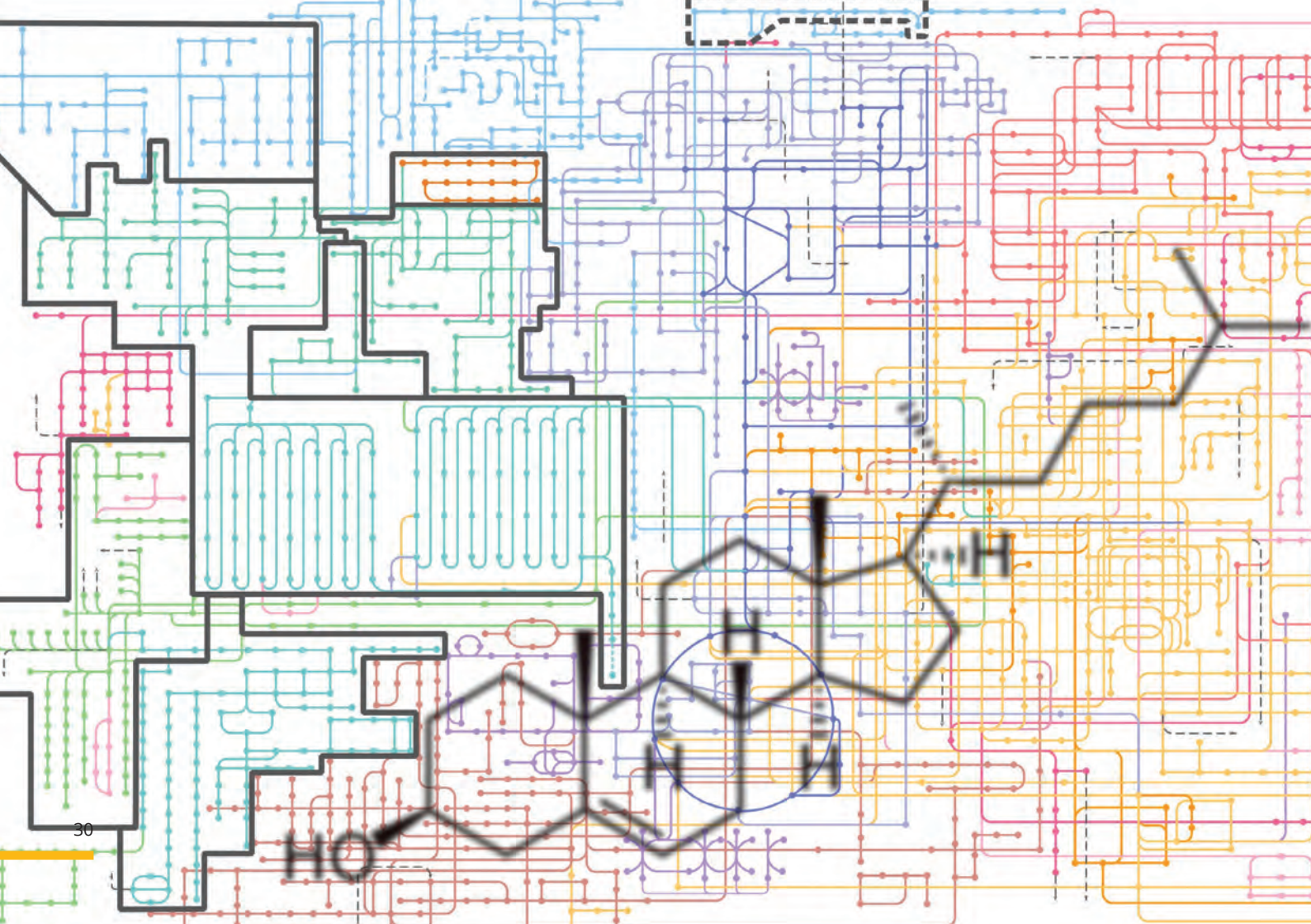
Possible Applications

Single particle cryo-EM is the method of choice for determining the atomic structures of purified macromolecules (molecular weight typically > 100 kDa). Requirements are the pure, concentrated (~0.1-1 mg/ml) sample. Resolutions of 3-4 Å can be achieved at the facility.

Cryo-ET allows analysis of macromolecules in their native environment, i.e., in their molecular context. While thin samples (e.g., viruses, vesicles, small bacteria and archaea) can be imaged in the cryo-TEM directly, eukaryotic cells have to be thinned by cryo-FIB milling prior to cryo-ET. Correlation with light microscopy (CLEM) is also possible. Statistical analysis enables resolutions beyond 1 nm for specific molecules.

After appropriate training, users can book the EMs via an online system. A fee contributes to the operational costs of the facility.

For more information, please visit the EM Square website.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LIPIDOMICS FACILITY

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Lipidomics is the large-scale study of pathways and networks of cellular lipids in biological systems. The enormous structural diversity of lipids requires complex regulation at multiple spatial and temporal scales in biological systems and we are only beginning to understand the role of individual lipid species. Mass spectrometry MS-based lipidomic analysis is rapidly advancing this field. The Lipidomics Facility houses chromatographic and mass spectrometric equipment that is required for the analysis of complex lipid mixtures and performs data interpretation using bioinformatics.

Equipment

The available technologies include MS-based lipidomics techniques (three mass spectrometers, equipped with ion sources (turbo-)ESI, nano-ESI, APCI, autosamplers, micropumps, UV detectors, UPLC and variable wavelength Fluorescence detector), assays for lipid metabolism and lipid flux using heavy isotope labeled precursors.

Activity

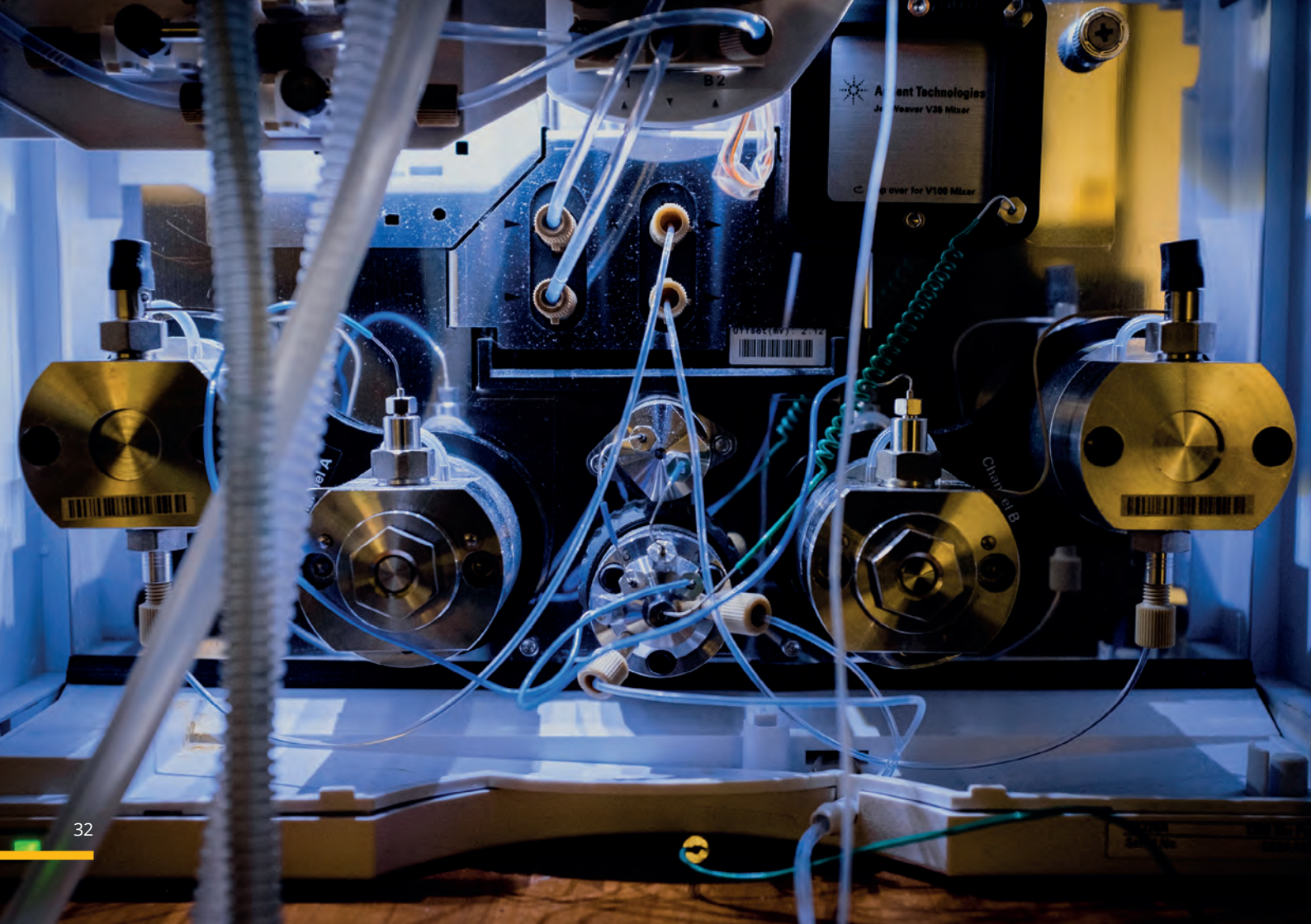
High-throughput technologies have been developed in our laboratory, allowing automated lipid analysis of 300 samples per day. We built a web-based ontology enrichment tool (LION/web) for lipidomic data analysis, allowing the handling of the large amounts of data and the translation of results to interpret the involvement of lipids in biological systems. This allows the understanding how lipids, together with proteins, determine cellular functions in health and disease.

Services

- Molecular analysis of a broad spectrum of (phospho)lipids (lipid fingerprinting);
- Biomarker identification;
- Analysis and identification of unusual lipids;
- Lipid flux studies;
- Semiquantitative and quantitative analysis;
- Bioinformatic analysis and data interpretation.

For more information, please visit the Lipidomics Facility website.

Your partner for lipid analysis and fingerprinting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Channel B

METABOLISM EXPERTISE CENTER

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The Utrecht Metabolism Expertise Center (MEC) specializes in cellular metabolomics. We use state-of-the-art mass spectrometry to identify and quantify small-molecule metabolites in biological systems. These metabolites are part of a complex network of biochemical reactions and are highly affected by genetic or environmental changes (e.g. disease, drug treatment). At MEC, it is our mission to translate metabolite measurements into meaningful insights into the biological system at hand.

MEC's expertise is in targeted and untargeted metabolomics and in fluxomics. Fluxomics experiments use stable-isotope labeled substrates and allow for measuring pathway activities, thereby providing a highly dynamic understanding of cellular metabolism.

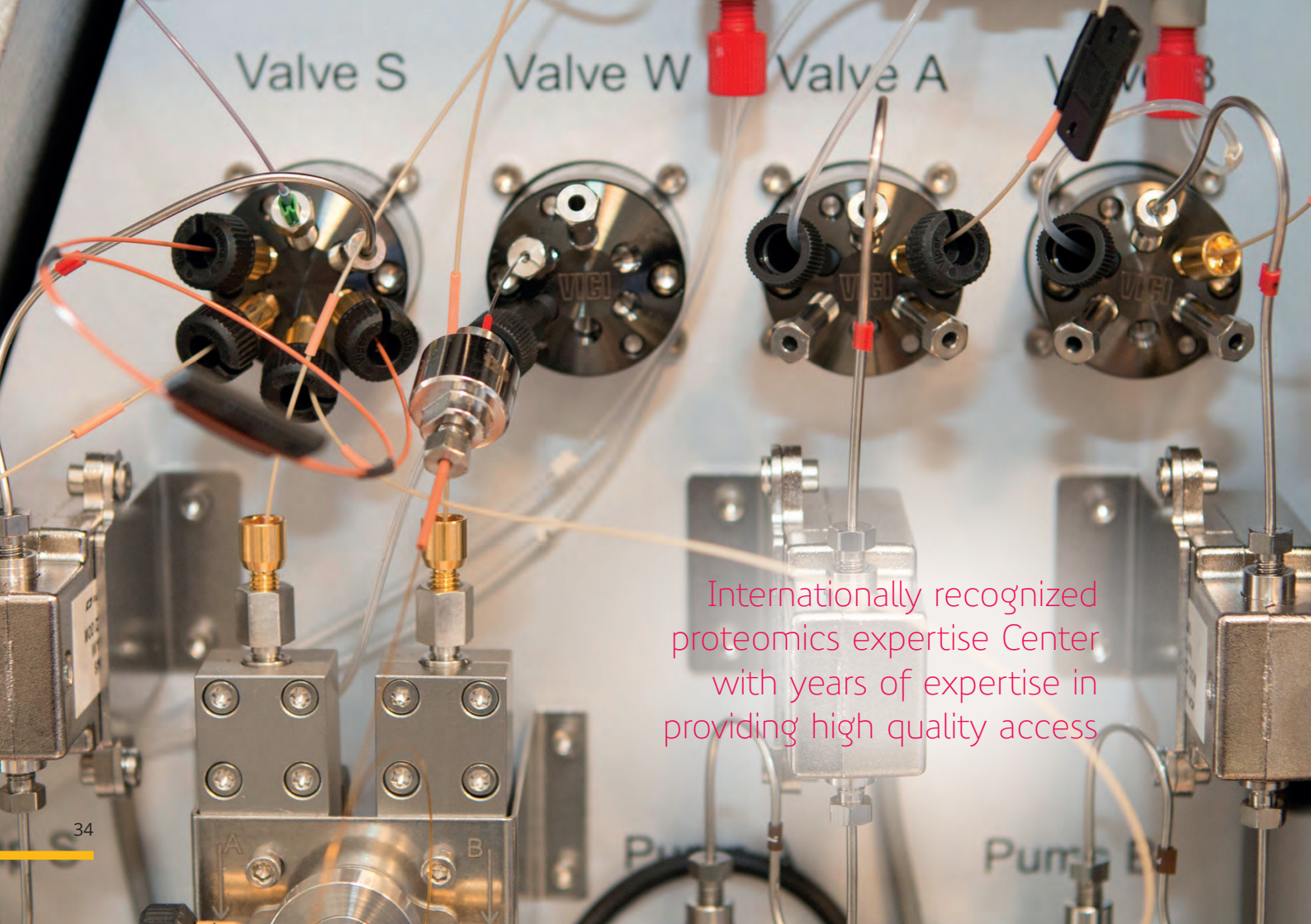
Being affiliated to the Metabolomics group at Utrecht University, MEC has significant experience in the fields of onco-metabolomics, immuno-metabolomics, and drug resistance and mode of action. In addition, MEC has built experience in a broad range of model systems, organisms, and sample types, also outside these fields. Because metabolites are involved in many cellular processes, metabolomics can also help to verify data from other -omics platforms (genomics, transcriptomics, proteomics).

Services

MEC offers full metabolomics support, from experimental design to data interpretation. Our service involves the high-quality measurements of metabolites in different sample types (e.g. cells, tissues, body fluids). With our extensive experience in metabolomics, we also provide advice on experimental setup, perform data analysis and visualization and support with data interpretation. Our close collaboration with the lipidomics facility makes it possible to combine metabolomics with lipidomics, to maximize the coverage of metabolites.

Contact

Dr. Esther A. Zaal
e.a.zaal@uu.nl



Internationally recognized proteomics expertise Center with years of expertise in providing high quality access

NETHERLANDS PROTEOMICS CENTER: X-OMICS PROTEOMICS FACILITY

UU

The proteomics facility at Utrecht University provides access to state-of-the-art proteomics equipment and expertise to researchers in the Life Sciences from academia and industry. The facility develops and implements mass spectrometry-based methods for the efficient and detailed characterization of proteins in relation to their biological function within cells and/or tissues.

The available MS-based proteomics technologies range from single protein identifications to complex whole cell lysate and/or tissue samples. The facility forms the core of the proteomics pillar of the national X-Omics Road map program and the European large-scale proteomics facility EPIC-XS.

Possible Applications

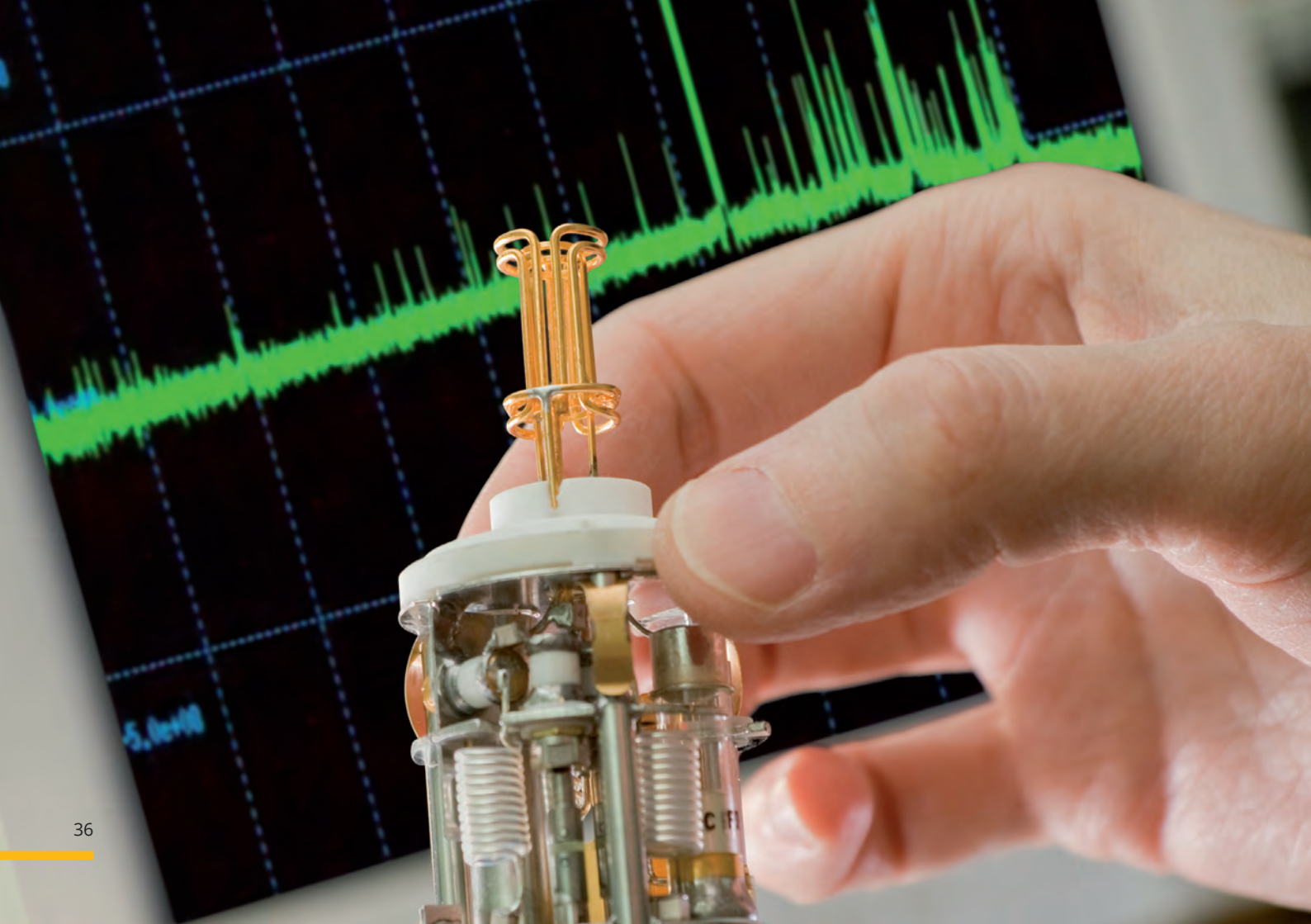
- Protein identification and quantification;
- HLA peptidome analysis;
- Analysis of protein post-translational modifications;
- Cross-linking mass spectrometry.

Equipment

The facility boasts a wide range of HPLC systems coupled on-line to high-end mass spectrometers, including a number of high-resolution Orbitrap mass spectrometers supporting multiple quantitation (such as LFQ, SIM, PRM, and DIA) as well as multiple peptide/protein identification (such as CID, HCD, ETD. EThcD). Advanced high-performance mass spectrometry systems are equipped with UVPD and ETD/ECD dissociation capabilities. The facility has dedicated computational clusters for data storage and a large suite of software for data analysis. The facility is run by highly trained experts in the field of mass spectrometry and services are offered through research collaborations with scientists worldwide.

For more information, please visit the X-OMICS website.

For more information, please visit the EPIC-XS website.



NMR LARGE SCALE FACILITY

UU

Novel research concepts are being developed and applied to complex biomolecular systems including protein-protein and protein-nucleic acid complexes or membrane proteins. Additional research is conducted on heterogeneous systems such as hydrogels, biomaterials, liposomes and cellular membranes. The facility is part of the Bijvoet Center for Biomolecular Research at the faculty of Science Utrecht University.

Equipment

As a national and European large scale facility, state-of-the-art instrumentation for NMR experiments on soluble molecules or heterogeneous preparations (solid-state NMR) is available. Currently, NMR fields range from 500 MHz to 950 MHz (solution NMR) and from 400 MHz to 950 MHz (solid-state NMR). In addition, two solid state spectrometers (400 and 800 MHz) are equipped with gyrotrons for DNP (dynamic nuclear polarization), which provides highly increased spectral sensitivity. The NMR facility also functions as an European computational e-Infrastructure for NMR and structural biology.

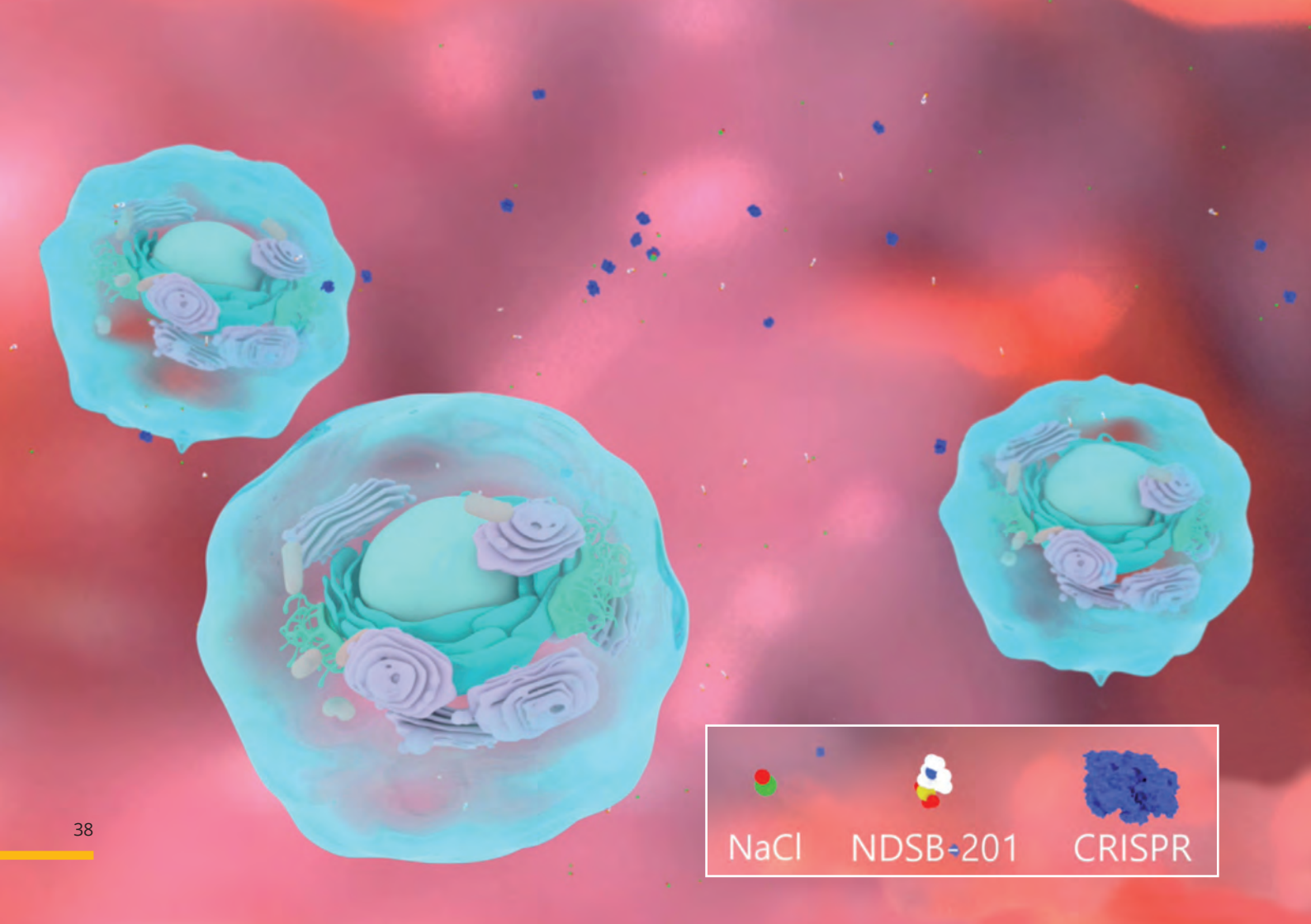
The computational infrastructure consists of several Linux clusters with over 1500 CPU cores. It also provides access to High Throughput Computing resources of the Dutch Life Science GRID and EGI. Further information can be obtained on our website.

Access

The Utrecht NMR facility operates as a national and European research infrastructure for solution and solid-state NMR, as well as computational structural biology. Access is provided to local, national and international researchers from academia and industry.

For more information, please visit the NMR website.

Gaining fundamental insight into molecular processes


NaCl
NDSB-201
CRISPR

NTRANS TECHNOLOGIES

TOP Technology

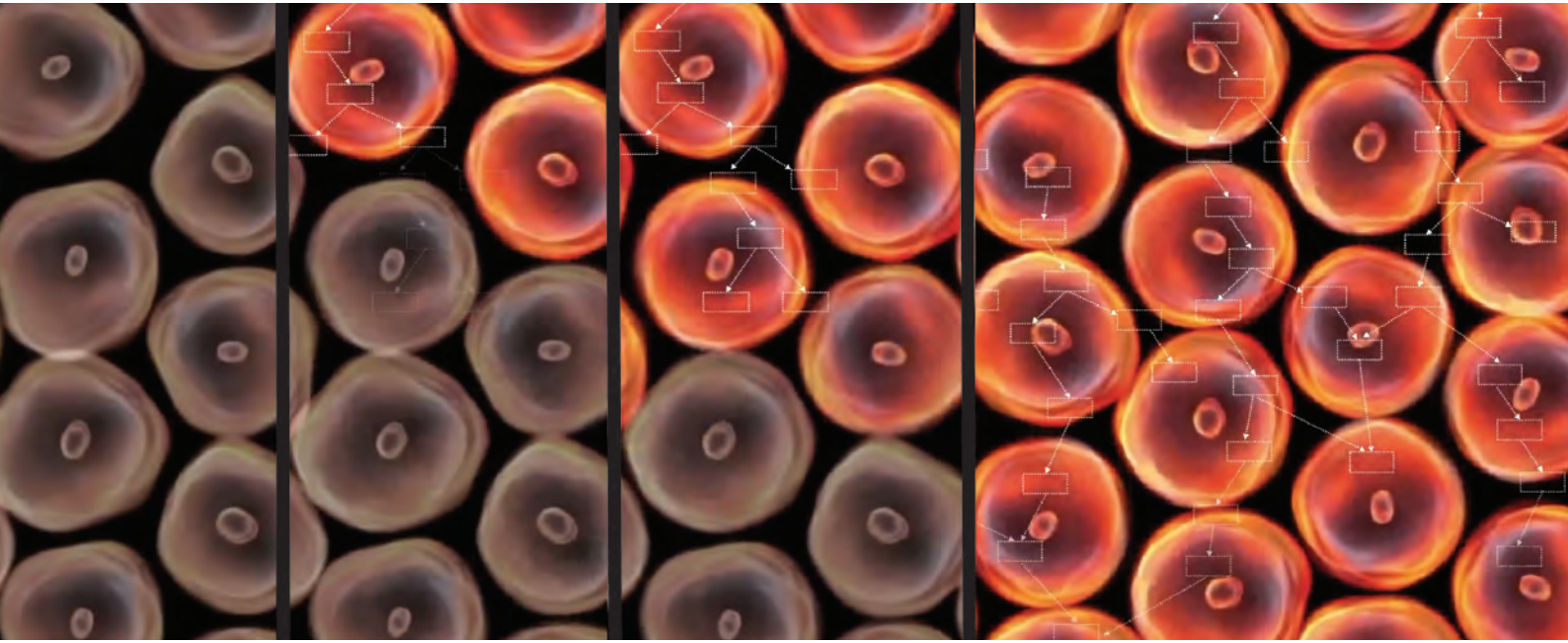
NTrans Technologies BV was founded in 2015 based on a proprietary platform technology for the intracellular delivery of bioactive molecules developed at the Hubrecht Institute of the Royal Netherlands Academy of Arts and Sciences. The iTOP intracellular delivery technology is based on a combination of small molecule compounds which forces the uptake of large gulps of extracellular fluid, containing the bioactive molecules, by the cell. Once inside, the vesicles release their content into the cytoplasm, where the bioactive molecules, such as gene editing systems, can exert their therapeutic action.

Services

Our goal is to further support distribution and commercialization of the iTOP technology for the research community and to develop a therapeutic platform for iTOP-based delivery of bioactive molecules. The Ntrans Technology mission is to translate the unique iTOP technology into revolutionary new therapies for the treatment of genetic diseases and cancer.

For more information, please visit the Ntrans Technologies website.

NTrans TECHNOLOGIES



Your partner for developing
precision kinase inhibitor therapies

PEPSCOPE

Pepscope is a biotechnology company with more than 15 years' experience in kinome profiling technologies. Protein kinases are very attractive targets for cancer and immunological disorder treatments. Our vision is to improve patient lives with precision kinase inhibitor therapies, by providing tailored solutions that make therapies more efficacious.

QuantaKinome™ technology

Pepscope offers QuantaKinome™, a cutting-edge mass spectrometry technology for profiling the activity of all protein kinases directly in patients. By providing 'fingerprints' of the pathway activation status of tumors, QuantaKinome™ deciphers how tumor cells respond to signals and therapies.

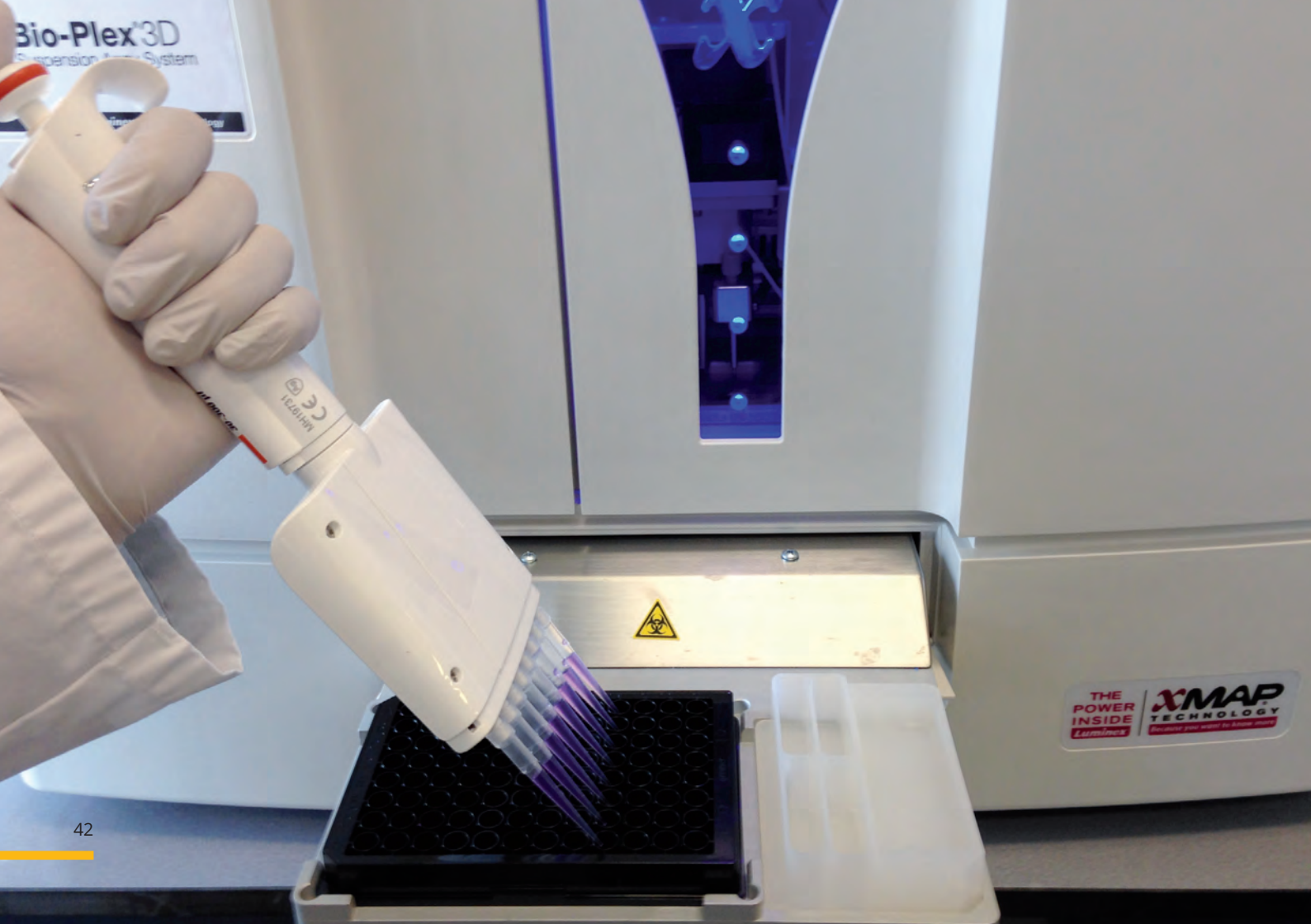
Services

We establish long-term partnerships with pharma- and biotech companies and hospitals, by entering in development programs for the following applications:

- Developing novel protein kinase inhibitors and de-shelving orphan compounds;
- Activity-based disease monitoring in patients for clinical trials, patient stratification and personalized medicine;
- Identifying activity-based clinical biomarkers;
- Designing mechanism-based drug combinations;
- Extending the exclusivity period of expiring drugs.

For more information on QuantaKinome™ technology, please visit the Pepscope website.

pepscope


Bio-Plex 3D
THE POWER INSIDE
Luminex
XMAP
TECHNOLOGY

PLATFORM IMMUNE MONITORING

UMCU

The Platform Immune Monitoring (PIM) provides an extensive set of technologies to study immunological parameters in patients with immune-mediated diseases and to assess the effects of immune modulatory treatment. Standardized application of diagnostic and state-of-the-art research methodologies enable validated biomarker research and comparison of biomarker profiles between patient cohorts. Upon request we develop, optimize and validate novel analytical tests to facilitate research on disease-specific parameters.

Services

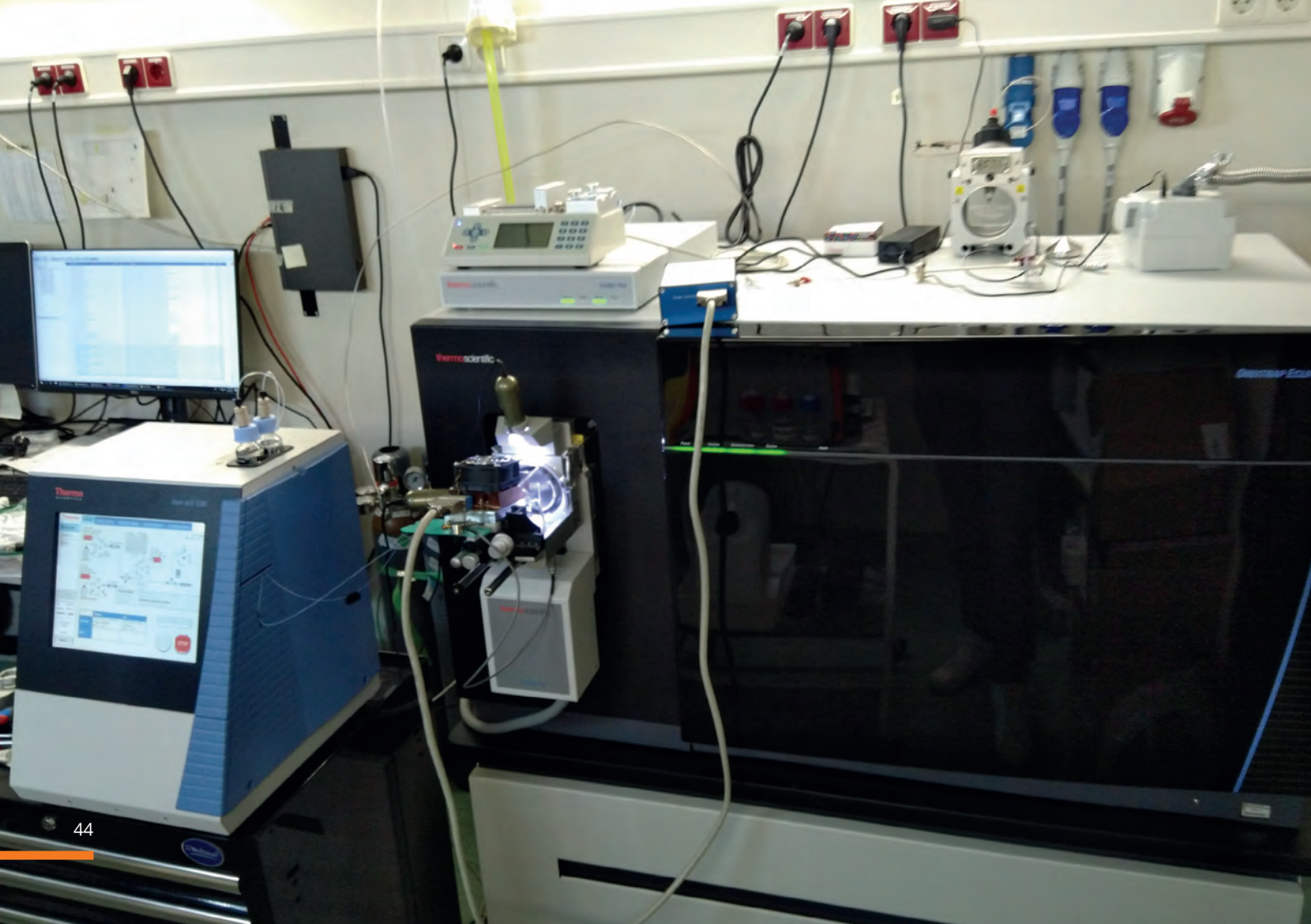
- High throughput and sensitive measurement of proteins (cytokines, chemokines, and growth factors) in many biological fluids using multiplex immunoassays (Luminex; 160+ analytes in < 250 µl or Olink technology (~1200 proteins in < 20 µl);
- Extensive phenotyping of leukocytes (e.g. T, B and NK(T) cell lymphocyte subsets) using flow cytometry;
- Functional assays and assessment of intracellular cytokine profiles in (un)stimulated lymphocytes;
- Assessment of allergenicity of proteins and patient allergic phenotypes by cellular testing in the Basophil Activation Test (BAT);

The Platform Immune Monitoring is GCP compliant and is ISO9001:2019 accredited. Our services can be used to support regulatory dossiers.

For more information, please visit the U-DAIR website.

For more information, please visit the Multiplex Core Facility website.

Platform Immune Monitoring facilitates immunology research and diagnostics


thermoscientific

PROTEOMICS FOR ONCODE

Oncode Institute is an independent institute dedicated to understanding cancer and translating fundamental insights from cancer biology into novel diagnostics, new drugs and innovative treatments.

This virtual institute brings together more than 800 excellent scientists from different universities and institutes in the Netherlands. To facilitate technology transfer within the various research domains, Oncode has financed a proteomics facility. This facility is run via a collaboration between Oncode Investigators Boudewijn Burgering (UMCU) and Michiel Vermeulen (RU, Nijmegen). These groups have unique but also overlapping expertise in proteomics.

We provide a diverse suite of mass spectrometry-based proteomics workflows to the community, while at the same time maximizing capacity - with five high-end instruments being operated (two in Utrecht, two in Nijmegen). Furthermore, various state-of-the-art off-line fractionation/ sample preparation workflows are available in Utrecht and Nijmegen. The facility also actively pursues further technology development and implementation of new mass spectrometry-based proteomics workflows as they emerge in the field.

The facility currently focuses on developing single-cell proteomics to combine with other single-cell based approaches.

Equipment

Utrecht:

- Orbitrap Fusion Tribrid Mass Spectrometer with ETD
- Orbitrap Eclipse Tribrid Mass Spectrometer with Faims
- EASY-nLC 1200 HPLC System
- EASY-nLC 1000 HPLC System
- Evosep One HPLC system for clinical proteomics
- Ultimate 3000 Semi-Prep HPLC system

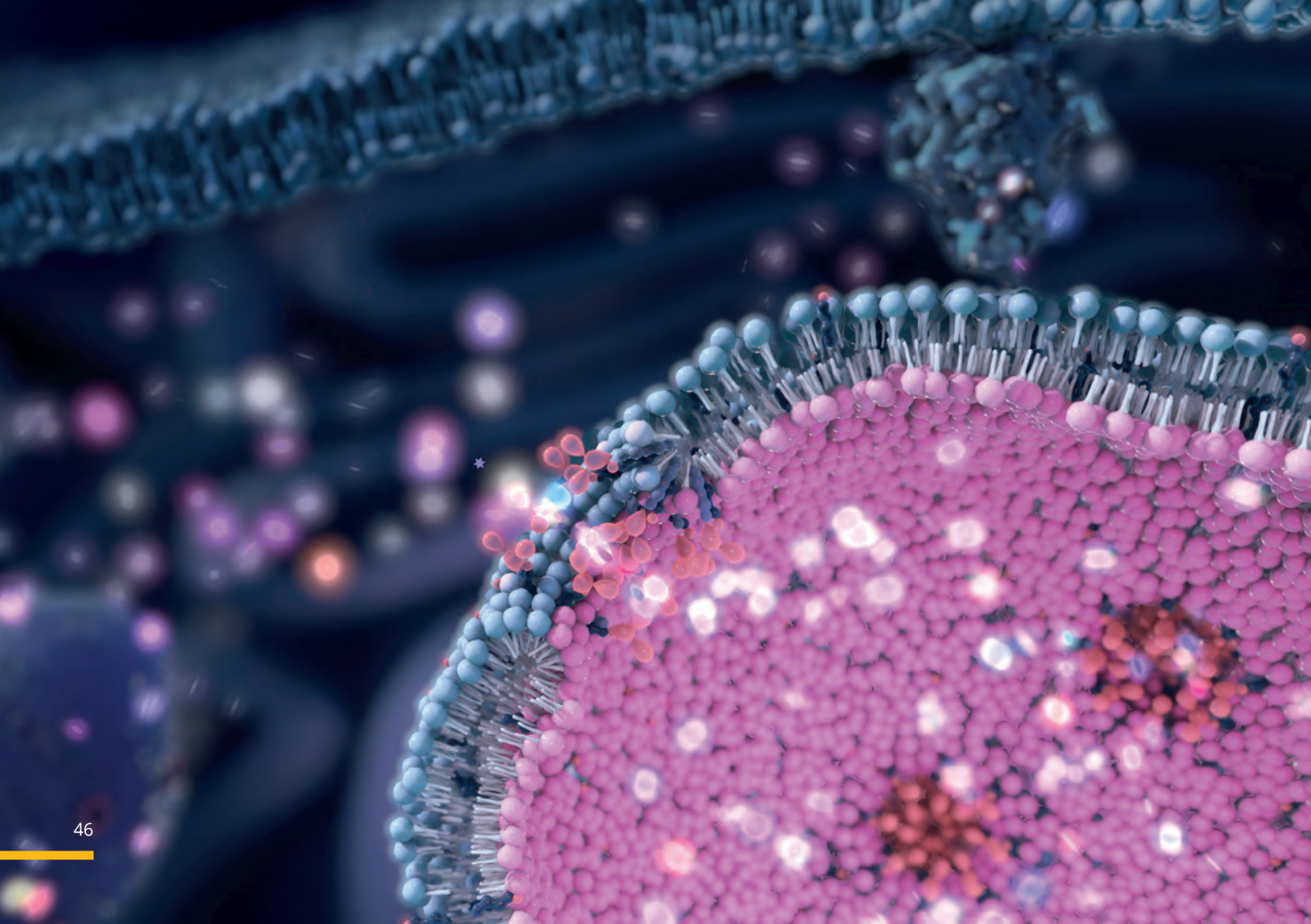
Nijmegen:

- Orbitrap Fusion Tribrid Mass Spectrometer with ETD
- Q Exactive HF-X hybrid quadrupole-Orbitrap Mass spectrometer
- EASY-nLC 1200 HPLC System
- EASY-nLC 1000 HPLC System

Services

We use an interactive mode of operation and all solutions will be/are tailored made. Access will be through a facility manager.

For more information, please visit the Proteomics for Oncode website.



SAPREME TECHNOLOGIES

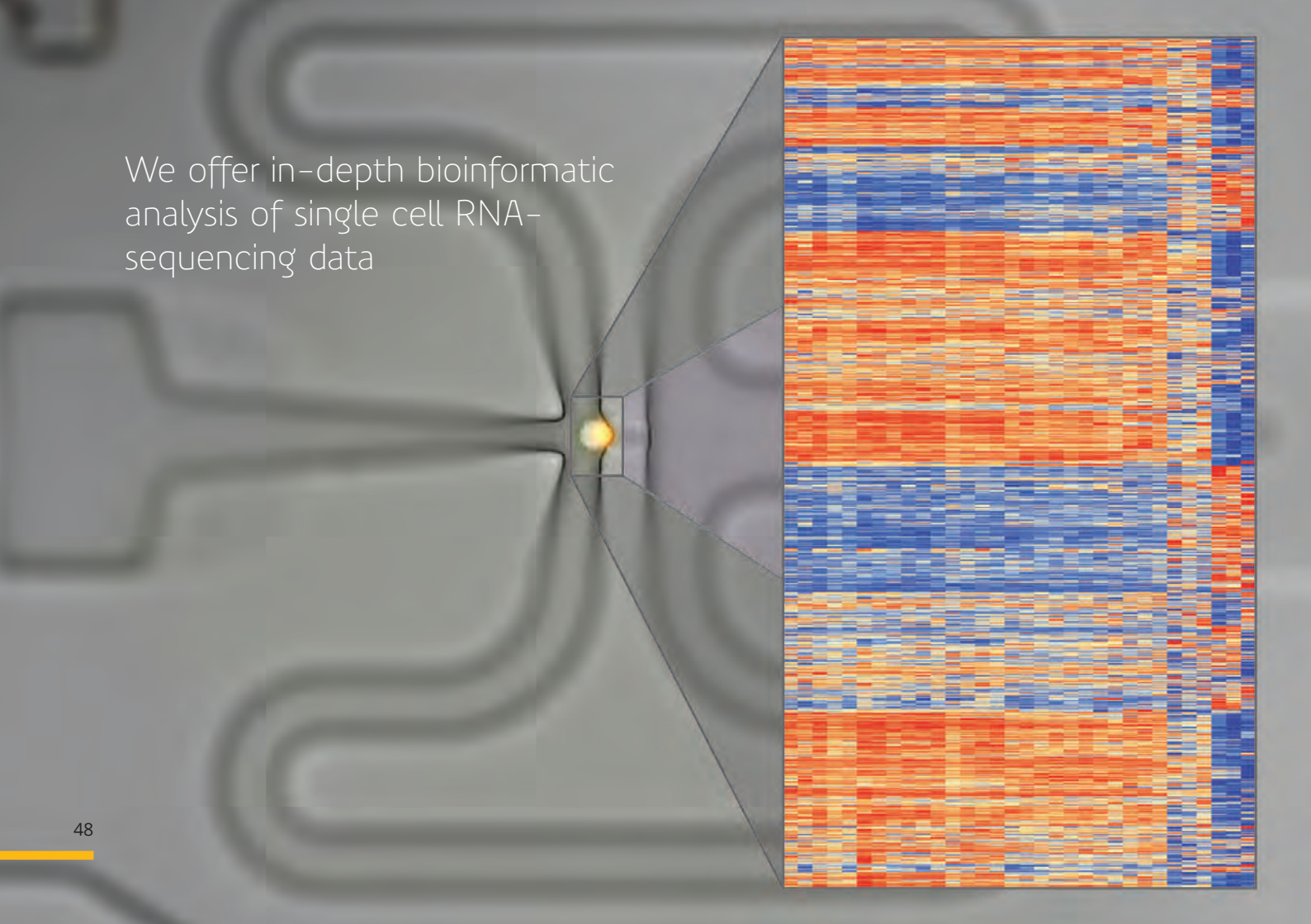
Sapreme was founded in 2016 by Aglaia Oncology Funds. Based on intellectual property licensed from the Charité – Universitätsmedizin Berlin (Charité) and Freie Universität Berlin (FUB), Sapreme developed a proprietary technology enabling macromolecule therapeutics to efficiently escape of from endosomes (ENDOSCAPE®), currently the major hurdle in efficiently engaging intracellular targets.

Based on this targeted delivery technology platform, the company develops new applications for antibody-drug conjugates and oligonucleotide-based therapeutics for its internal pipeline, as well as in collaboration with biopharma.

Sapreme R&D facilities are located at the Life Science Incubator in Utrecht at the Utrecht Science Park. The company has extensive R&D partnerships with a large number of academic groups, as well as with a network of CROs.

For more information, please visit the Sapreme Technologies website.

We offer in-depth bioinformatic analysis of single cell RNA-sequencing data



SINGLE CELL ANALYSIS CENTER UTRECHT

UU

We have unique equipment to capture cells for single cell RNA-sequencing and offer support with in-depth bioinformatic analysis. The cell is a fundamental unit in life science, but many molecular and genetic assays are based on material derived from thousands to millions of cells. This resulted in 'average' values, although no such thing as an average cell exists.

The rapidly evolving field of single cell 'omics' analysis of single cells offers researchers a much deeper understanding of cellular heterogeneity. However, single cell analysis is technically challenging, especially capturing sufficient viable cells of interest and the data analysis. Therefore, we have cell-capture equipment that is compatible with samples containing extremely low numbers of cells (less than 100).

In addition, our equipment is suitable for high-quality fluorescence microscopy on living cells immediately prior to the cell capture and lysis. Finally and importantly, we can perform in-depth bioinformatic analysis and biological interpretation of single-cell RNA-sequencing data.

Equipment

- VyCAP needle puncher;
- Customized Leica LMD7 laser microdissection microscope with live cell imaging feature;
- Fluidigm C1 Autoprep system;
- Fluidigm Access Array system.

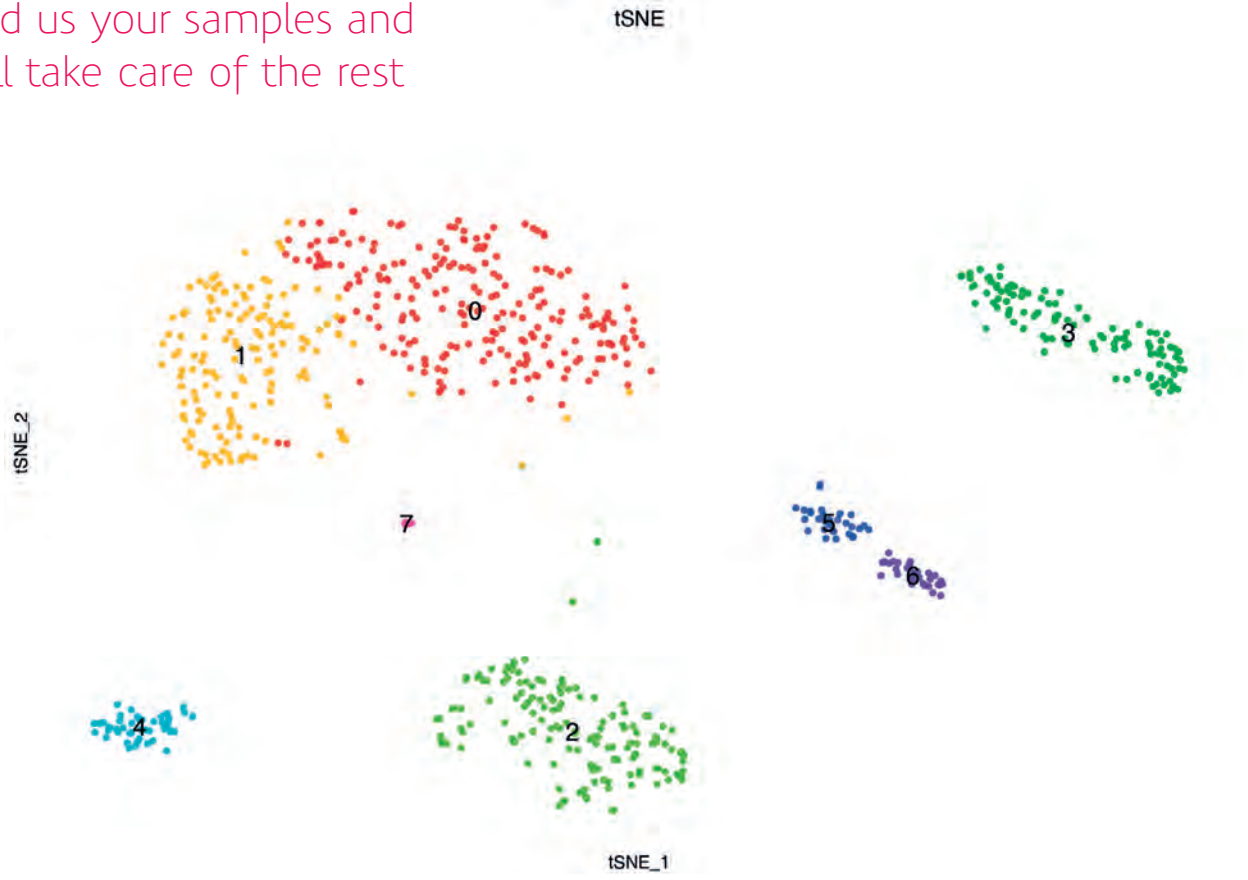
Services

- Guidance and consult with experimental design;
- Hands-on support with cell capture;
- Bioinformatic analysis of single cell RNA-sequencing data;

(Note: library preparation and Illumina sequencing are outsourced to Single Cell Discoveries; p. 51)

For more information, please visit the Single Cell Analysis Center website.

Send us your samples and
we'll take care of the rest



SINGLE CELL DISCOVERIES

Single Cell Discoveries (SCD) is a dedicated service provider for single-cell RNA Sequencing and bulk RNA sequencing. The company is a spin-off from the single-cell sequencing Core Facility at the Hubrecht Institute (p. 91) and was founded by scientists in 2018. Its mission is to make single-cell sequencing accessible to a broad research community.

Activity

Single-cell sequencing is used in a wide range of research areas and has multiple applications. Typical applications include the identification of different cell types in a sample, discovery of new drug targets, or assessing the immune response in a sample. Depending on your biological question, sample type and budget, Single Cell Discoveries offers different platforms and single-cell solutions.

Services

- **SORT-seq**: plate-based single-cell sequencing;
- **10x Genomics**: high-throughput single-cell sequencing;
- **Bulk RNA sequencing**: cost-effective bulk RNA analysis;
- **Data analysis support**.

Access

Single Cell Discoveries delivers fast, complete, and cost-effective single-cell and bulk sequencing services.
A project starts with a free intake meeting, in which we discuss your biological question and advise on the experimental set-up. When the project begins, we process your samples and deliver feedback on the quality of the resulting sequencing libraries. If they pass QC, your samples are sent for sequencing. To help you get on your way with the data, we provide preliminary data analysis for all our services. Upon request, we can support further, tailor-made analysis.

Our services are available to all universities, institutes, and companies.

For more information, please visit the Single Cell Discoveries website.

Single Cell Discoveries

UTRECHT CENTER FOR MEDICAL METABOLOMICS

UMCU

In metabolomics, one of the platform sciences of the various 'omics', the small-molecule component (metabolome) of a biological system is identified and quantified. These diverse molecules, called metabolites, underpin the ongoing biochemical reactions in a living cell, tissue and organism.

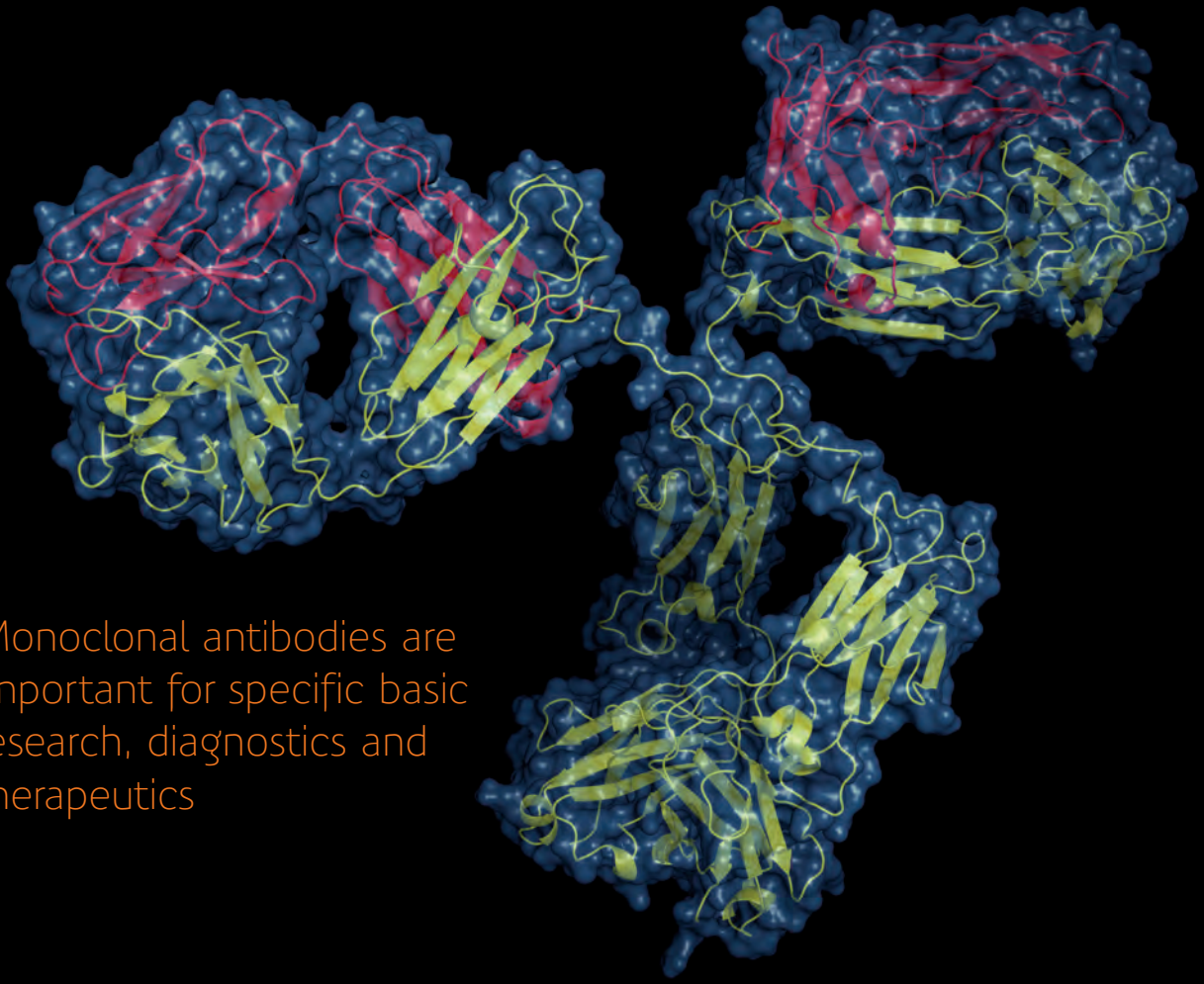
Measurement of some individual metabolites is common practice for diagnostic purposes. Progress in analytical science and informatics allows the analysis of a large part of the metabolome simultaneously, providing not only information on the individual metabolites but on the whole of functioning biochemical networks.

The Utrecht Centre for Medical Metabolomics (UCMM) is a joint initiative of the department of Molecular Cancer Research and the department of Metabolic Diagnostics of the UMC Utrecht. It u unites metabolic knowledge from both the diagnostic laboratory and more fundamental metabolic research. The UCMM is specialized in the study of metabolites in individual cells, tissues, and body fluids in context of biological perturbations and nutritional status. The centre has a variety of mass spectrometry setups and develops and validates both targeted and untargeted assays that will become accessible as a fee-for-service for researchers. At this point, several metabolite assays for biomedical research can be offered.

Equipment

- 2 Waters Xevo;
- Thermo Q-Exactive Plus;
- Thermo LTQ-Orbitrap-XL;
- Agilent 7000 GC-MS;
- Various U(H)PLC instruments (Waters Acquity, Thermo Acella);
- Nano-LC (Eksigent, Agilent);
- Advion Triversa Nanomate (direct-infusion MS).

For more information, please visit the UCMM website.



Monoclonal antibodies are important for specific basic research, diagnostics and therapeutics

UTRECHT MONOCLONAL ANTIBODY FACILITY

UMCU

The UMAB Facility is part of the Center of Translational Immunology at UMC Utrecht.

Unique Immunization method

UMAB offers a new and very efficient cellular immunization method (UMi/UMb) to raise antibodies against low immunogenic membrane proteins. With this method, antibodies were generated to tetra spanning membrane proteins, conformational epitopes and agonistic and antagonistic mAbs. On request we can make mAbs against soluble proteins/peptides with Complete Freund's adjuvant.

Activities

- Dossier management for ethical approval (Animal Experiments Committee);
- Immunizations of mice with unique proprietary immunization methodology (UMi/UMb);
- Screening for high-specific binding to protein of interest by flow cytometry;
- Hybridoma generation and selection;
- Specific monoclonal antibodies for conformational epitopes;
- Generation of agonistic or antagonistic antibodies to check point inhibitors for example;
- Cross reactivity with cynomolgus monkey for clinical development.

Services (on request)

- Subcloning of positive wells by limiting dilutions;
- Sequencing of hybridomas;
- Chimerization and production of recombinant antibodies;
- Modification of antibodies for enhanced or silenced interaction with Fc receptors and/or complement;
- Affinity determination by Ligand Tracer platform;
- Functional assays, e.g., inhibition assays, internalization, ADCC, CDC and others;
- Wide variety of tumor models in mice.

The facility works with ISO9001 certification.

For more information, please visit the UMAB website.

Your partner for the selection and production of nanobodies

UTRECHT NANOBODY FACILITY

UU

Nanobodies

Next to their repertoire of conventional antibodies, animals from the Camelidae family also have smaller antibodies, the heavy-chain-only antibodies, which are devoid of light chains. These antibodies have a functional VH domain that has binding affinities similar to the VH-VL domain of conventional antibodies. This structure is called single domain antibody (sdAb), variable domain of the heavy chain from a heavy-chain-only antibody (VHH) or nanobody. Nanobodies are the smallest functional antigen-binding fragments known with a molecular weight of around 15 kDa, which is only one tenth the size of a conventional antibody.

Services

The Utrecht Nanobody Facility offers support with immunization, library generation, selection and further characterization of nanobodies. The facility is highly experienced in functionalization of nanobodies using different conjugation strategies including NHS-lys and malcys conjugation, sortase-tagging and click-chemistry.

Examples exist for application of nanobody conjugates for super-resolution light microcopy, electron microcopy including cryo-EM, crystallography, NMR and for development of novel diagnostic approaches including PET and for therapeutic approaches such as nanobody fusion proteins, nanobody-drug conjugates (NDCs) and targeted nanoparticles.

Activities

- Llama immunization;
- Library generation;
- Selection by phage display;
- Characterization;
- Functionalization;
- Production.

Equipment

- AKTAxpress and AKTA prime;
- Bioreactor BioFlo 115;
- Odyssey;
- Pearl imager.

For more information, please visit the Utrecht Nanobody Facility website.

UTRECHT SEQUENCING FACILITY

UMCU

The Utrecht Sequencing Facility is a research infrastructure that provides support for Next-Generation Sequencing (NSG)-based research. We aim to stimulate efficient research and innovation by sharing expertise and providing access to NGS technology through the X-omics community (p. 35). We strive to increase knowledge transfer, enable stronger interaction and cooperation, and optimize the use of resources. Embedded within an active research environment we support collaborations to achieve scientific excellence.

Services

We provide support for a broad range of services, including DNA/RNA isolation, library preparation, sequencing, SNP fingerprinting and basic data analysis (in collaboration with Utrecht Bioinformatics Expertise Core; p. 177).

Equipment

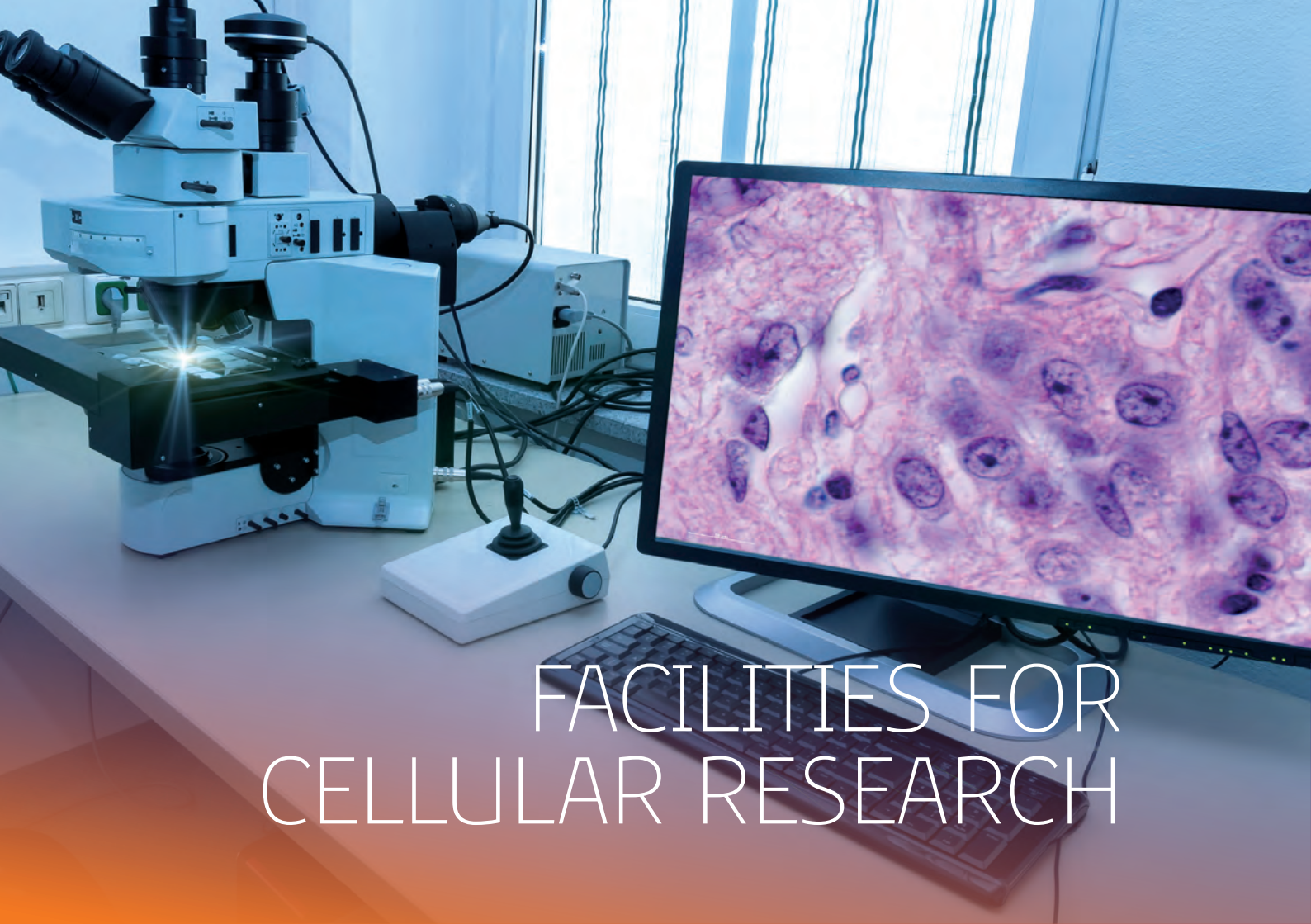
A comprehensive state-of-the-art infrastructure is available, including NGS sequencers, liquid handling robotics, bioinformatics tools and ICT. Currently we operate five Illumina Sequencing platforms: iSeq100, NextSeq500, NextSeq2000, MiSeq and Novaseq.

In addition, we offer Oxford Nanopore for single molecule, long-read sequencing applications on our GridIon or PromethIon. Moreover, NanoString nCounter and GeoMX digital special profiling is available for high-throughput DNA, RNA or protein panel screening with the option to link results to morphology.

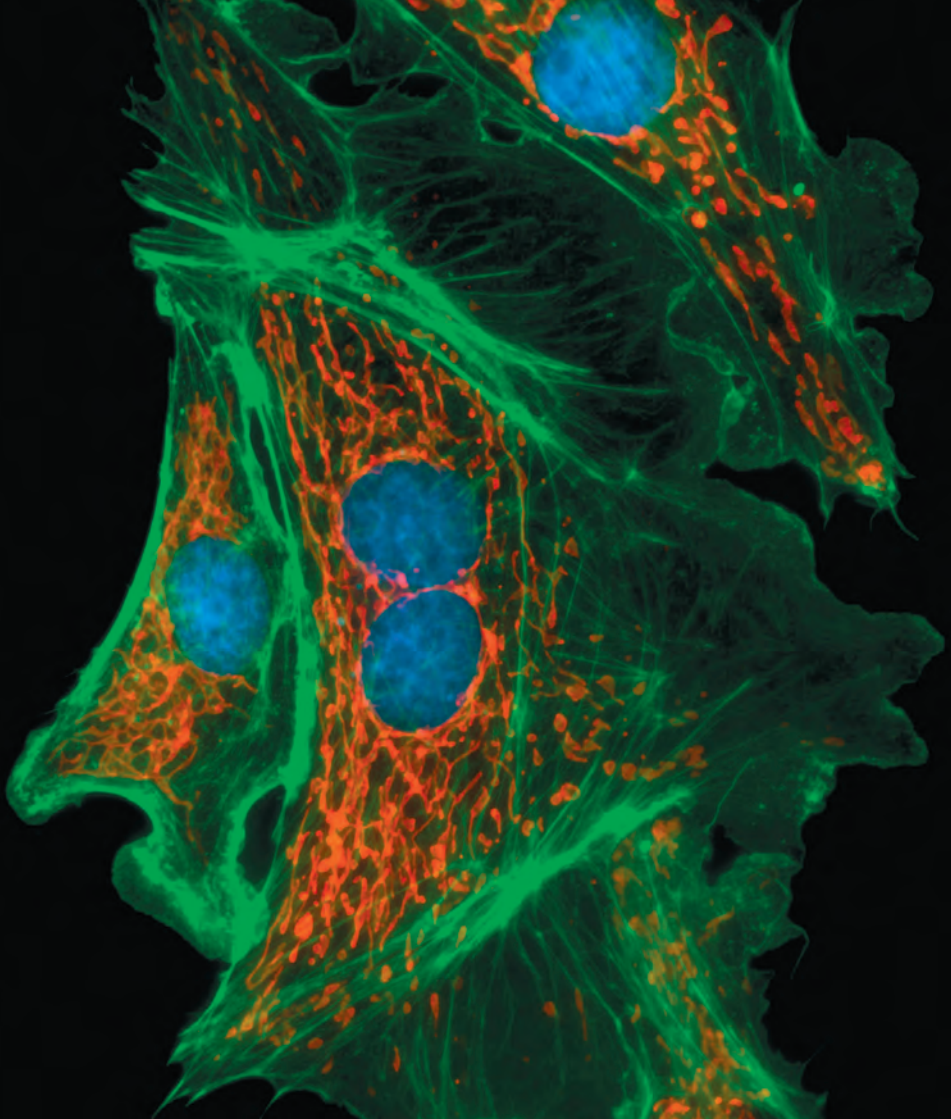
You are welcome to discuss the option for your experiments in our free consult sessions!

For more information, please visit the USEQ website.

Your partner for Next-Generation Sequencing-based experiments



FACILITIES FOR CELLULAR RESEARCH



BIOIMAGING UTRECHT

UU, UMCU, HUBRECHT INSTITUTE

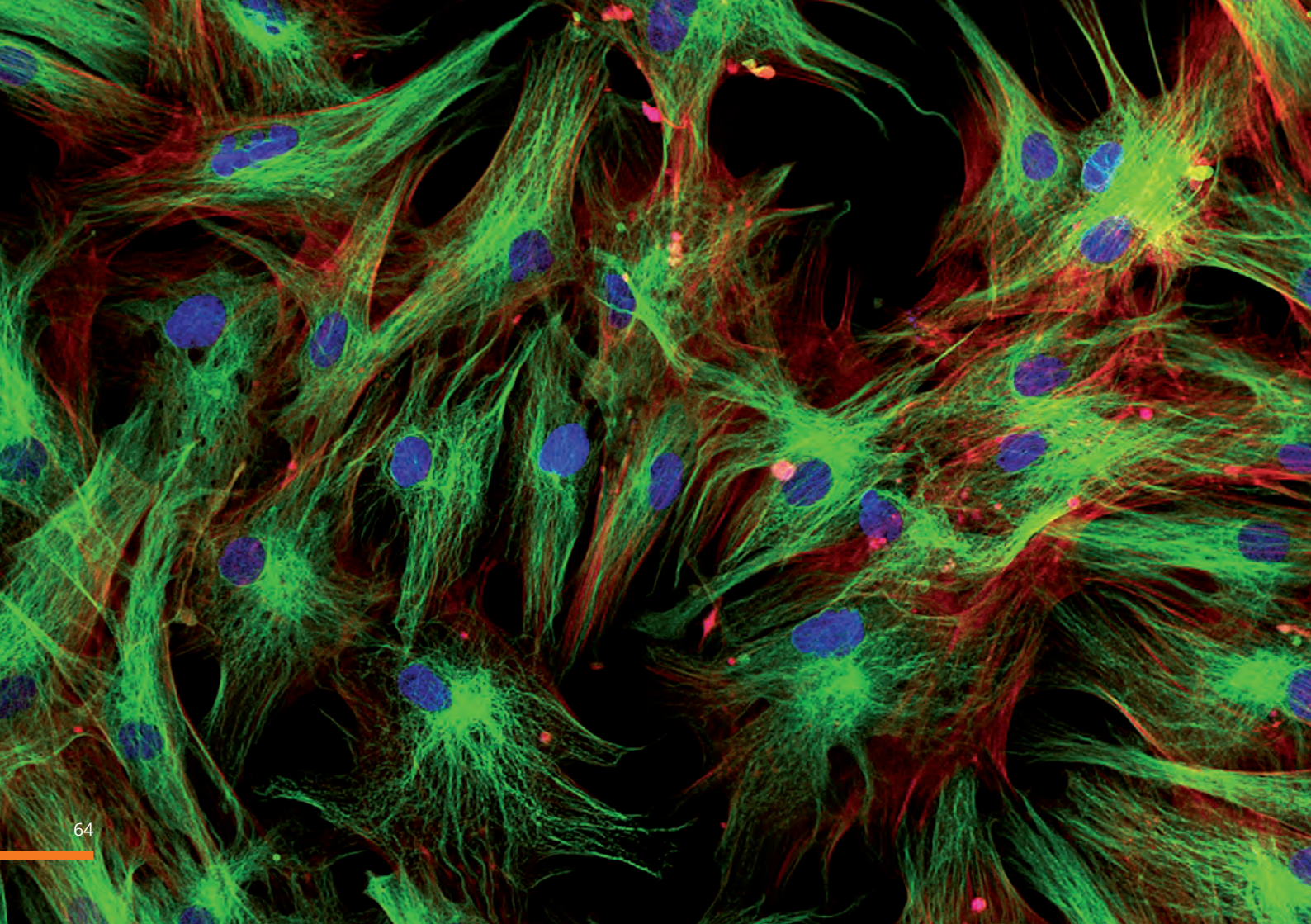
BioImaging Utrecht brings together Utrecht University, UMC Utrecht and Hubrecht Institute, which either develop microscopy techniques or apply advanced microscopy technologies for the study of biological processes.

Bioimaging Utrecht It is a platform formed by Biology Imaging Center (BIC; p. 65), Cell Microscopy Core (CMC; p. 67) and Center for Cell Imaging (CCI; p. 69). Within this platform expertise and methodologies are exchanged. Moreover, this platform creates access to the advanced microscopy techniques for the life science community in Utrecht.

Through visualizing cells, subcellular structures, biological molecules and their interactions, we aim at deciphering networks that regulate biological processes across all organization levels – from nanoscale through the dynamic architecture of the cell to the scale of development and functioning of multicellular organisms. This information is crucial for understanding disease mechanisms and for development of new drug leads and therapies.

For more information, please visit the Bioimaging Facility website.

We aim to participate in building the national and European infrastructure for generating access to cutting edge imaging technologies required for biological and biomedical research



BIOLOGY IMAGING CENTER

UU

Services

The Biology Imaging Center (BIC) of Utrecht University provides access, support and training in advanced light and fluorescent microscopy techniques. The experts at the BIC have unique expertise in fast multicolour imaging of intracellular dynamics in different types of mammalian cells, including neurons and cancer cells cultured in 2D and 3D. The combination of single molecule biophysics and strong cellular expertise, which makes it possible to perform analysis of the same molecules *in vitro* and *in vivo*, is unique. The center also has excellent expertise in laser microsurgery of cells in application to mammalian cell biology and neurobiology research.

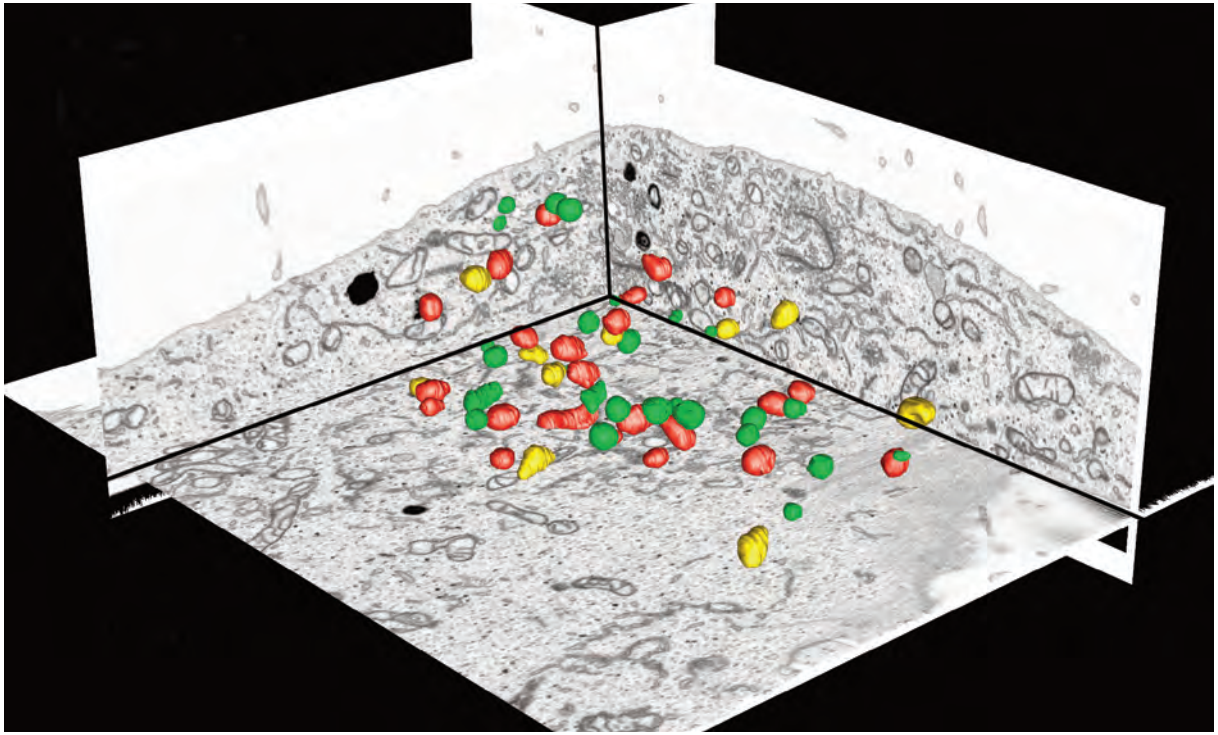
Equipment

The Biology Imaging Center incorporates equipment and expertise on Phase Contrast microscopy, VE-DIC microscopy, regular Wide-Field Epifluorescence microscopy, Total Internal Reflection Fluorescence (TIRF) microscopy and Laser Scanning and Spinning Disk Confocal microscopy.

The advanced techniques in which the center currently specializes include multicolor live cell imaging with a high spatial and temporal resolution, 3D live imaging of thick samples using Spinning Disk and Two-Photon microscopy, Fluorescence Recovery after Photobleaching (FRAP), photoactivation, photoablation, super-resolution localisation microscopy (PALM/STORM) and Stimulated Emission Depletion (STED) microscopy.

For more information, please visit the BIC website.

Visualizing cells, subcellular structures, biological molecules and their interactions



Cellular Function meets Ultrastructure
at the Nanoscale

CELL MICROSCOPY CORE
UMCU

The Cell Microscopy Core (CMC), embedded in the Cell Biology section of the Center for Molecular Medicine, is an international expertise Center for (immuno-) electron microscopy (EM), correlative light and electron microscopy (CLEM) and associated sample preparation techniques.

CLEM is a rapidly evolving field of methods to perform light/live microscopy and EM on the same sample, creating a new type of integrated microscopy. The CMC is the CLEM Flagship Node of the microscopy infrastructures Euro-BioImaging (EU) and Netherlands EM Infrastructure (NEMI) and serves as CLEM reference site for Leica Microsystems.

CMC comprises equipment for EM sample preparation of biological specimens, fluorescent microscopy, live-cell imaging, transmission EM, focused ion beam-scanning EM (FIB-SEM), and CLEM. Together this covers a full range of microscopy methods for integrated studies at the subcellular, cellular and tissue level. Together with the EM square of the UU, CMC forms the Utrecht EM facility.

Services

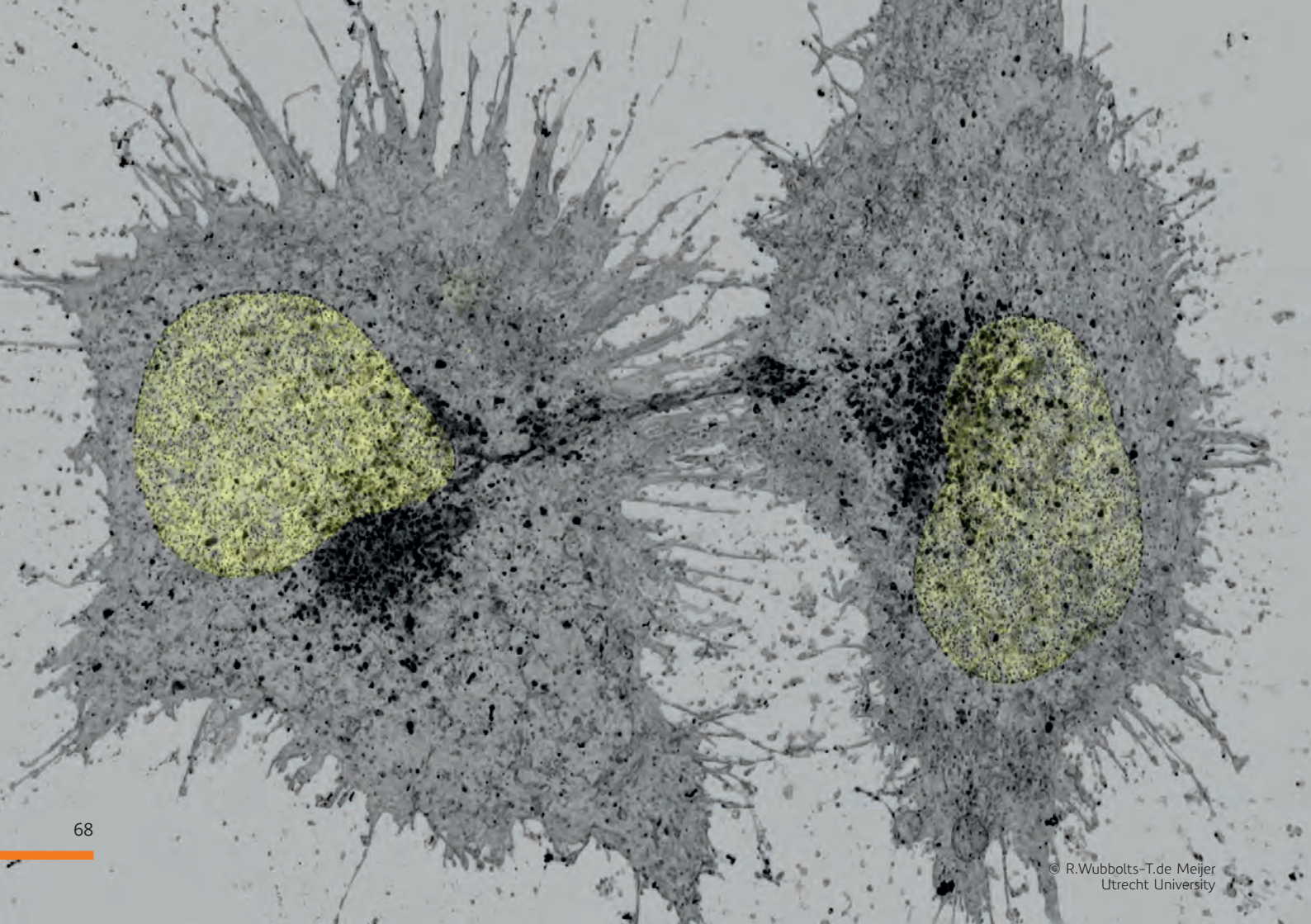
CMC provides service and access to local (UMCU, UU and Hubrecht Institute), Dutch (e.g. via NEMI) and international (e.g. via Euro-BioImaging) academic users, and we work with (inter)national industry partners.
We provide expert input in choice of microscopy methods, experimental design, sample preparation, data acquisition and analysis.

Access

- **Use of equipment and lab space**. All users receive an on-site training after which they obtain permission to independently book and use the equipment.
- **Pilot study/ short project**. Performed by the expert staff of the CMC.
- **Contract research**. Performed by expert members of CMC.
- **Annual EM courses**. CMC organizes annual, international, hands-on courses on Resin EM, Immuno-EM, and Correlative Light and Electron Microscopy.

CMC also produces specialized EM tools (e.g. grids, goldprobes, micro-manipulation tools).

For more information, please visit the CMC website.



CENTER FOR CELL IMAGING

UU

The Center for Cell Imaging (CCI) provides advanced light microscopy methodology at the Faculty of Veterinary Medicine. We specialize in digital imaging of diverse biological samples and supply equipment and expertise in histology specimen analyses as well as high-end fluorescence microscopy.

Services

The CCI allows preparation of biological samples in our wet-lab and has the expertise to efficiently extract high content image data within a ML-II biosafety environment. Our facility provides detailed knowledge on high-end fluorescence microscopy applications and analyses. Different modi of imaging are available such as wide field imaging, confocal microscopy, TIRF microscopy, live cell microscopy, (intravital) multiphoton microscopy and 'super' resolution microscopy (by both structured illumination (SIM), single molecule light microscopy (SMLM) or Expansion Microscopy (ExM)).

Equipment

Wet-lab optimized for immunolabeling procedures (Leica S6D preparation microscope and laminar flow safety cabinet for handling cells, FDM 3D printer, sheet plotter/cutter).

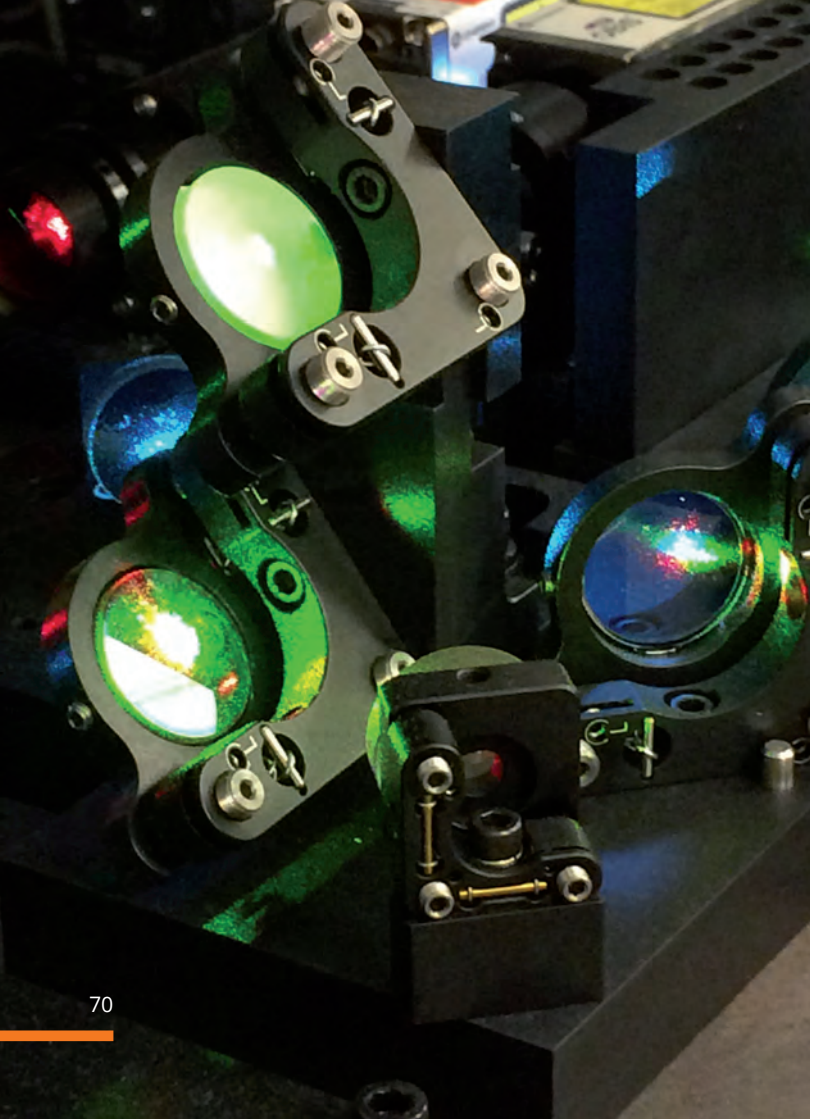
Microscopes

Brand	Stand	Detector(s)	Light source(s)	Add-ons
Olympus/Leica	upright	color CCD	EL6000	
Leica SPE2	inverted	PMT	EL6000 + vis lasers	
Nikon A1R/STORM	inverted	PMTs/EM-CCD	LED / vis lasers	Live cell chamber
Cytiva OMXV4-blaze	Inverted	4xsCMOS	LED / vis lasers	Live cell chamber
Zeiss LSM880 NLO	Inverted	PMT s / BiG.2	HXP/ vis/IR lasers	Heated cover

Access

Users are instructed by CCI staff before access is granted and online reservation is implemented.

For more information, please visit the CCI website.



CORE FLOW CYTOMETRY FACILITY

UMCU

The Core Flow cytometry Facility (CFF) is part of the Laboratory of Translational Immunology at UMC Utrecht and provides state-of-the-art flow cytometry equipment, knowledge and high-speed cell sorting. The facility works with certification of ISO15189 and ISO9001, which makes it possible for research and diagnostics to work in close collaboration.

This UMC Utrecht facility cooperates with commercial and non-commercial partners, provides dedicated operators for assistance and is actively involved in flow cytometry education on different levels.

We think in solutions!

Equipment

- 6 FACS canto II, 3 lasers (405nm, 488nm, 635nm);
- 2 LSRFortessa, 4 lasers (405nm, 488nm, 561nm, 635nm) 16 fluorescent parameters;
- Aria II, 3 lasers (405nm, 488nm, 635nm) 10 fluorescent parameters and can sort and collect 4 different cell populations simultaneously;
- Aria III, 4 lasers (405nm, 488nm, 561nm, 635nm) 16 fluorescent parameters and can sort and collect 4 different cell populations simultaneously;
- 10 re-analysis PC's with DIVA and Flowjo;
- 16 channels Imagestream;
- 6 way sorting, 70.000 ev/ps, 5 lasers, 35 parameters acquisition.

Services

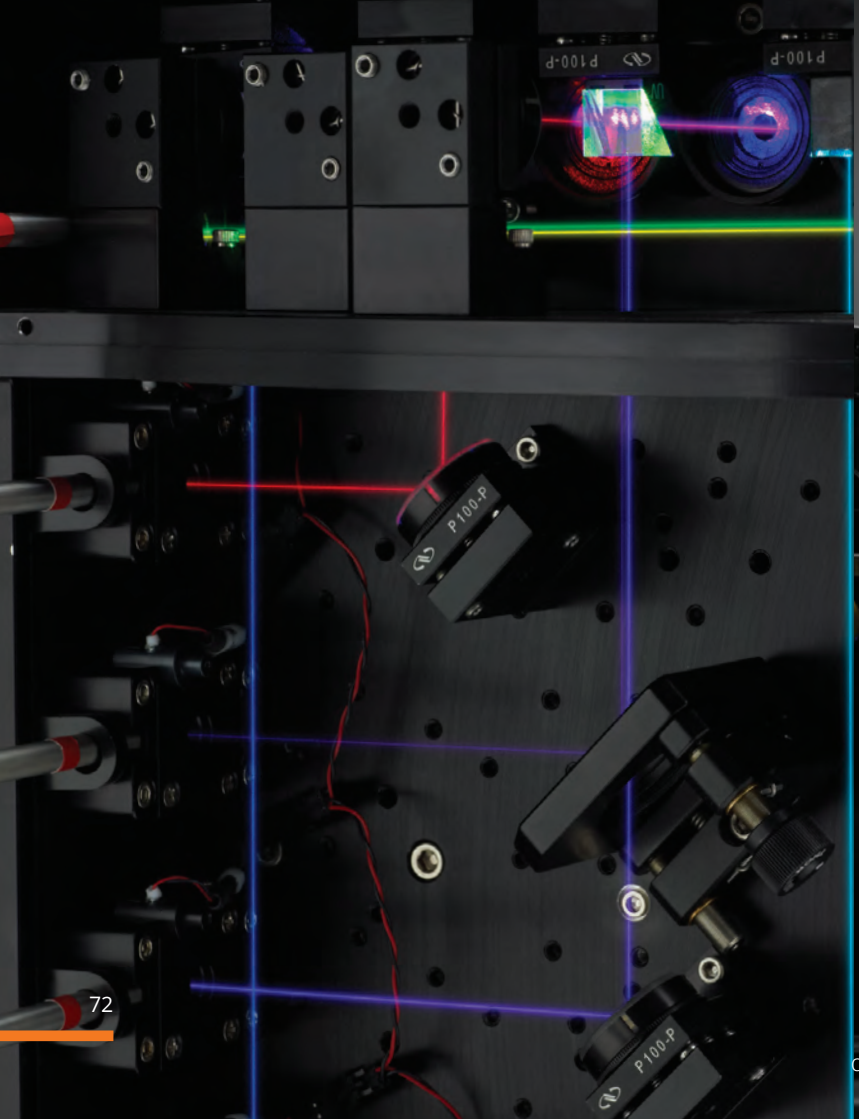
- Next-generation sequencing;
- Single-cell cloning (6-384 wells plates);
- Purifying genetic modified cells;
- Isolation of (rare) cell populations and more.

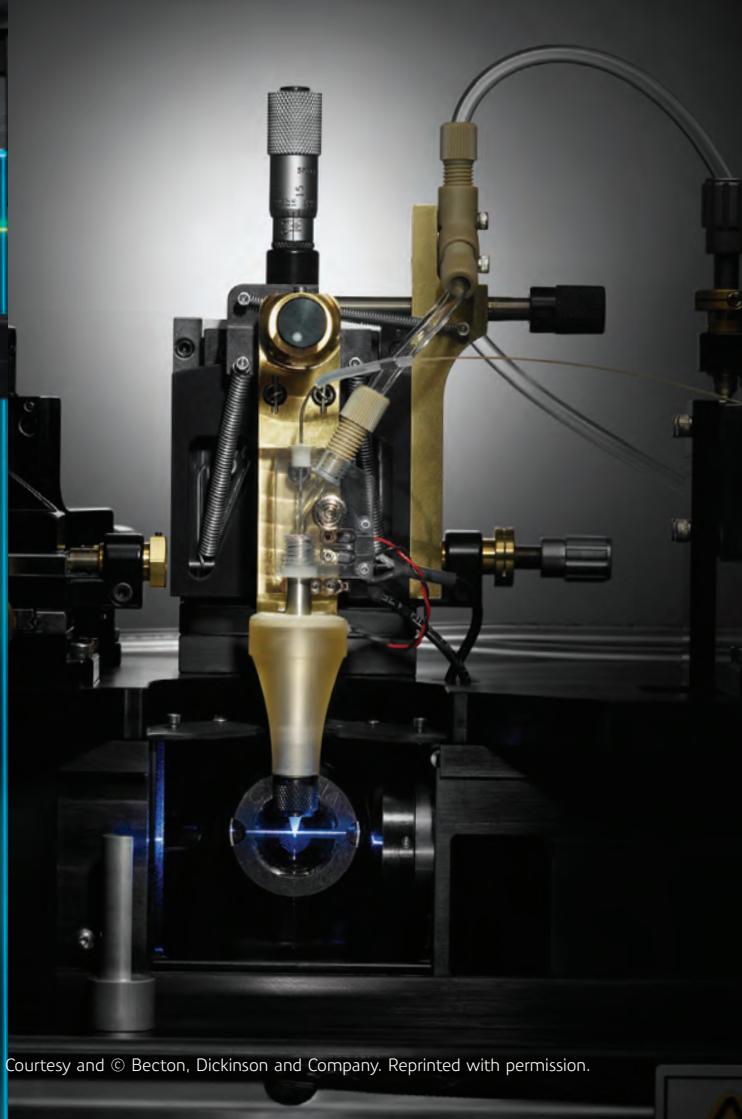
Sorting and measuring conditions

- High-speed and viability sorting;
- Sorting/analyzing at lab-, BSL 1-and BSL 2-level;
- Index cell sorting;
- High throughput analysis (96, 384 wells);
- Up to 18 parameter cell analysis;
- Minimal residual disease detection (1 of 1*106).

All analysers and high-speed cell sorters have uniformly standardized cytometer settings, for different sizes of particles, based on several years of diagnostic and research immunophenotypic knowledge. This standardization protocol increases the interchangeability and makes it easily possible to participate in multi-centre trails.

For more information, please visit the CFF website.





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FLOW CYTOMETRY AND CELL SORTING FACILITY

UU

Flow cytometry

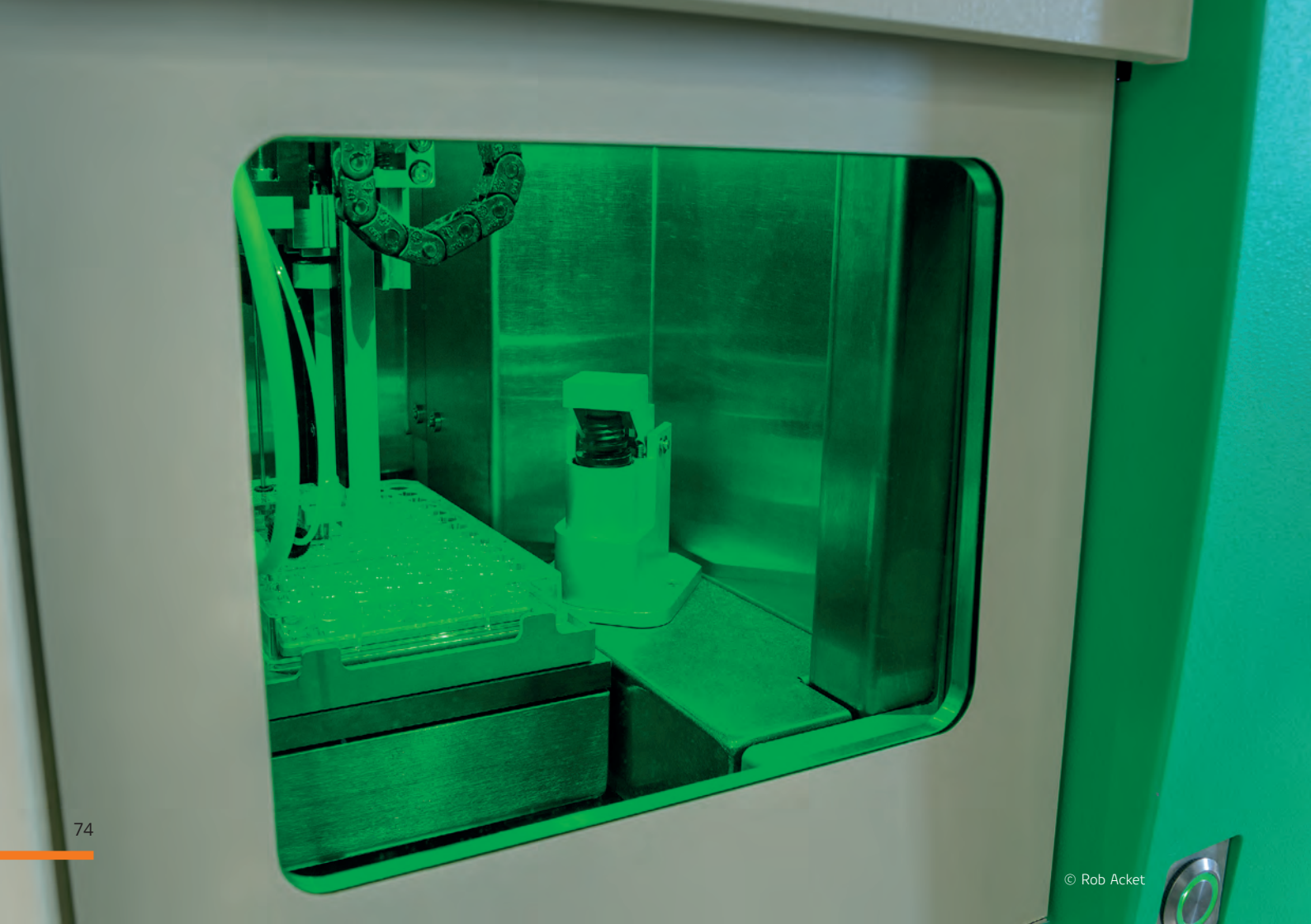
Flow cytometry literally means the measurement of cells in flow. In real life it means that any suspension of particles within the size range of approximately 50 micrometer to 100 nanometer can be measured. The measurements can be performed at high speed, on average up to 20,000 per second. In this way, data can be obtained from each individual particle and high numbers of particles can be measured in a short period of time. This technique is extremely suitable for measuring sub-populations (e.g. of cells) within a suspension. In addition, individual cells or particles can be purified using cell sorting.

Services

The facility has accumulated specific expertise on measurement and sorting of cells since 1998. This expertise builds on the experience accumulated with a wide variety of analyses and purifications, e.g. with immune cells, stem cells, sperm cells, chromosomes, bacteria, hybridoma's for monoclonal antibody production, single cell sorting for cloning and/or PCR analysis, cell selection based on fluorescent reporter gene products, rare event purifications and the high resolution analysis and sorting of sub-micron particles. We are trained to rethink seemingly impossible demands into successful experiments.

- For analysis of suspensions we can accommodate experiments requiring lasers with the following wavelength: 405 nm, 488 nm 561 nm, 640 nm and 806 nm. Up to 25 parameters can be measured simultaneously.
- For purification we can accommodate experiments requiring lasers with the following wavelength: Ultra Violet, 405 nm, 457 nm 488 nm, 561 nm and 640 nm.
- For sorting, up to 4 populations can be selected simultaneously in one run. There is a choice of collection modules like multi-well trays, tubes or slides where cells can be directly sorted in.

For more information, please visit the Flow Cytometry and Cell Sorting Facility website.



FLOW CYTOMETRY AND CELL SORTING FACILITY

PRINCESS MÁXIMA CENTER FOR PEDIATRIC ONCOLOGY

The core facility aims at ensuring state-of-the-art equipment, professional maintenance and calibration up to diagnostic laboratory standards, as well as providing world-class expertise for training and support of using this equipment and related research methods.

Training is offered by appointment, primarily for users who make frequent and long-term use of the equipment. Trained Máxima researchers and close collaborators are allowed to book and independently use most of the equipment at convenient times.

Other projects are allowed during idle times at the discretion of supervising Principle Investigator.

Our facility has successfully helped researchers from UMCU, the Hubrecht Institute, and NTrans Technologies.

The facility specializes in rapid deposition of single cells in 384 multi-well plates for SortSEQ method, as well as high-throughput and high-parameter analysis.

Equipment

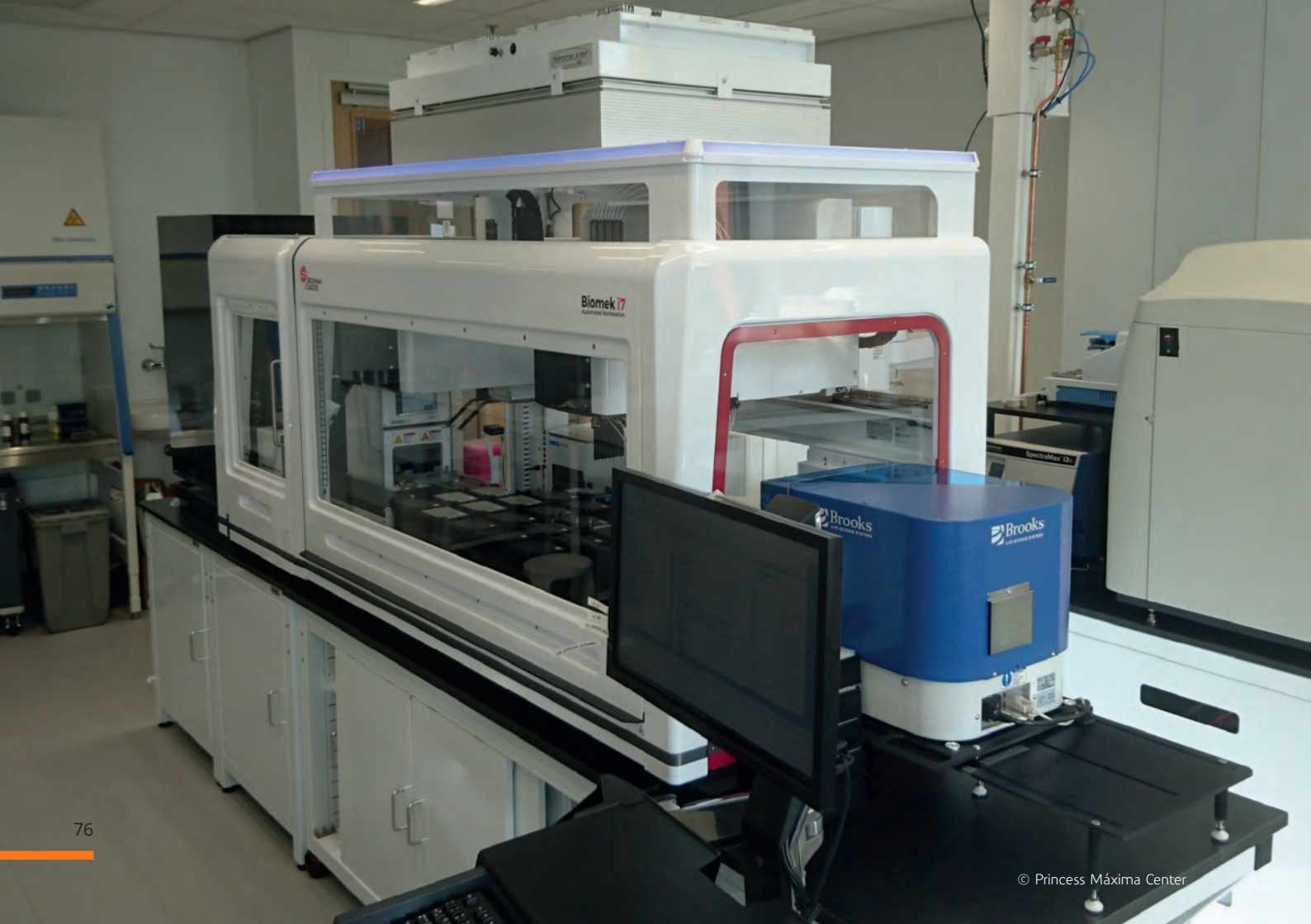
Room 3-1T1 (MLI)

- AstriosEQ - 5 laser, 23 color cell sorter; operator only (can be adapted for MLII work, if required)
- SONY SH800S - 4 laser, 6 color cell sorter (also for independent use)
- Cytoflex LX - 6 laser, 21 color analyzer
- Biorad ZE5 - 5 laser, 27 color analyzer

Room 3-1S2 (dedicated MLII, custom ClassII biosafety cabinets)

- SONY SH800S - 4 laser, 6 color cell sorter (also for independent use)
- Cytoflex S - 4 laser, 13 color analyzer

For more information, please visit the Flow Cytometry and FACS Facility website.



HIGH-THROUGHPUT SCREENING FACILITY

PRINCESS MÁXIMA CENTER FOR PEDIATRIC ONCOLOGY

Services

The High-Throughput Screening (HTS) facility at the Princess Máxima Center for pediatric oncology offers fully-automated, large scale, efficient, flexible, accurate, reproducible and cost-effective drug testing. The aim of this core facility is to facilitate the accelerated identification and validation of improved treatment strategies and disease-associated genes and proteins by supporting the development, performances and analysis of high-throughput perturbation assays. Next to the drug screening, we offer support in the translation of research questions into assays suitable for high-throughput screening and the data analysis. We currently can provide a library of 200 drugs specific for pediatric cancer and offer the possibility to set up other libraries. The research of our own researchers and other research that is focused on pediatric cancer.

Equipment

The HTS facility includes a state-of-the-art robotic system, the Beckman Coulter Biomek i7 Hybrid automated liquid handling workstation, with deck positions for assay and compound plates, robot grippers and flexible arms, 96-well and 384-well pipette heads, heating and cooling modules, shakers and a centrifuge. A fully automated incubator for high-capacity cell growth and assay incubation and a storage hotel for tip boxes and compound microplates are included. Precise addition of the drugs and assay solutions will be performed by an Echo 550 acoustic liquid handler for nL transfer volumes and a Thermo Multicrop Combi reagent dispenser, ensuring reproducible assay data. For the assay read-out, the Spectramax i3x is part of the robotic system, allowing absorbance, luminescence and fluorescence detection.

For more information, please visit the HTS Facility website.

princess máxima center
pediatric oncology

"Visualizing the unexpected"

Anne Rios

MICROSCOPY AND IMAGING CENTER

PRINCESS MÁXIMA CENTER FOR PEDIATRIC ONCOLOGY

The Princess Máxima Imaging Center provides access to and training in advanced widefield, confocal, multiphoton and light sheet microscopy technologies.

Equipment

Our microscopes and imaging devices range from basic to state-of-the-art microscopes that allows for cell culture imaging (e.g. organoids), whole tissue as well as *in vivo* imaging.

- Automatized Stereomicroscope with Fluorescence Leica M205 FA;
- Leica DM6 fluorescence;
- Leica DMi8 wide field;
- Leica SP8 confocal with 8Khz Resonant scanner;
- Leica Thunder 3D Live Cell Imager (summer 2020);
- Zeiss Z.1 Light Sheet;
- Dual multiphoton/confocal Zeiss LSM880 platform equipped with AiryScan;
- Olympus multiphoton FVMPE-RS equipped with SIM scanner for simultaneous imaging and high-precision photomanipulation;
- Quest Spectrum Imager;
- Perkin Elmer IVIS Spectrum ④CT.

Services

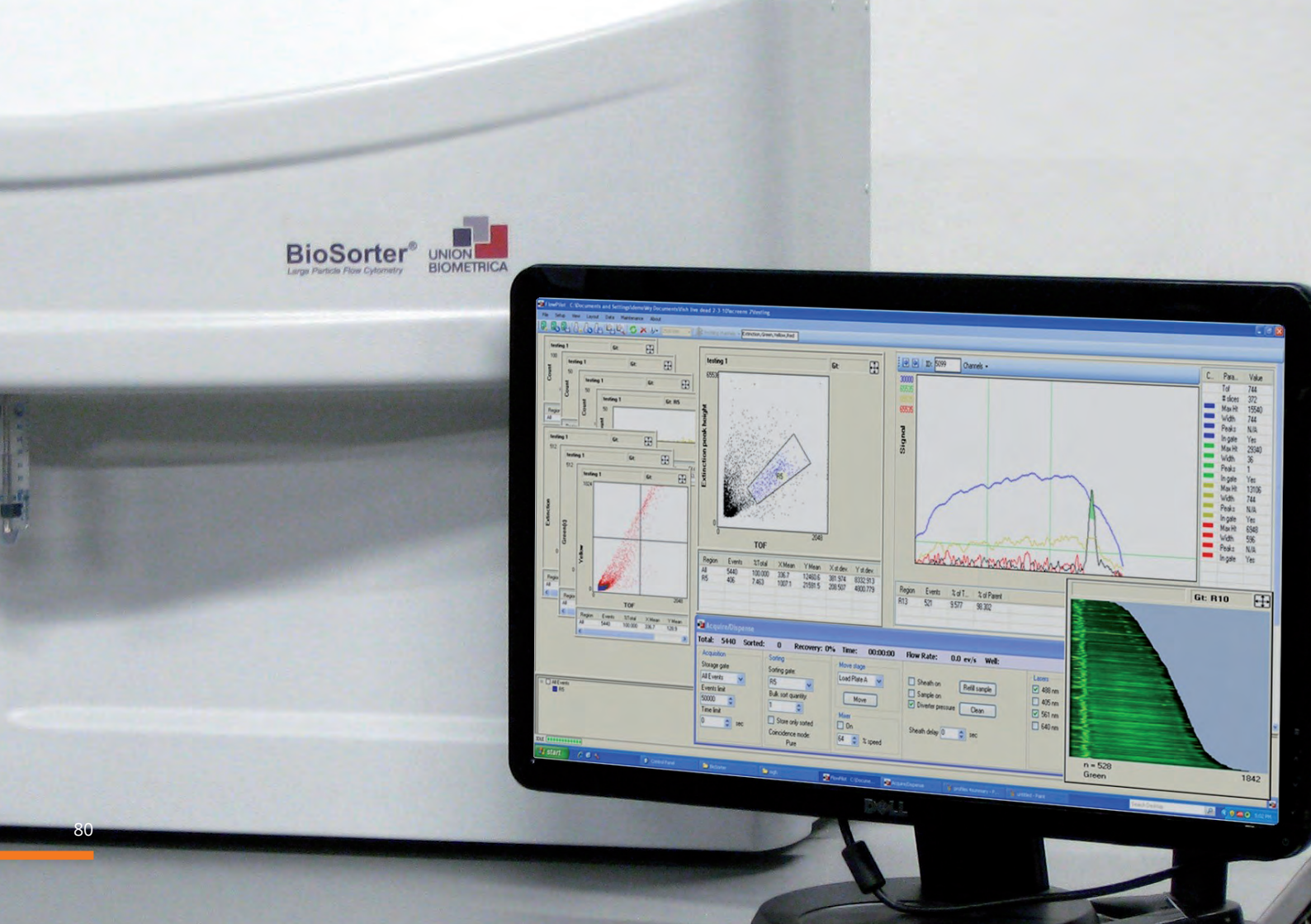
We provide basic and advanced imaging resources to assist our users. We also offer specific training and consultation, technical assistance and image analysis. Applications include single-cell resolution 3D imaging of organoids, of intact tissue, live cell imaging and intravital imaging. Furthermore, we also host workshops and demo's on advanced microscopy techniques for the imaging community.

Access

All researchers of the Princess Máxima Center Research department have access to our expertise and equipment. External use and collaborations are possible upon request.

For more information, please visit the Microscopy and Imaging Center website.

princess máxima center
pediatric oncology


BioSorter®
Large Particle Flow Cytometry
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TOF
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Total: 5440 Sorted: 0 Recovery: 0% Time: 00:00:00 Flow Rate: 0.0 ev/s

LARGE PARTICLE FLOW CYTOMETRY FACILITY

UU

The selection and purification of specific chemical or biological materials are critical and often time-consuming aspects of fundamental and biomedical research. Fluorescence-Activated Cell Sorting (FACS) provides a method for sorting specific cells from heterogeneous mixture. Many objects are too large and/or too sensitive for conventional FACS-based flow cytometry. The BioSorter-Pro (Union Biometrica®) has been developed for flow cytometry of objects in a wide range of sizes (10 to 1500 µm) with high speed and high sensitivity.

Your partner in counting, sorting, collecting, dispensing and analyzing objects in the size range of 10–1500 µm

Possible Applications

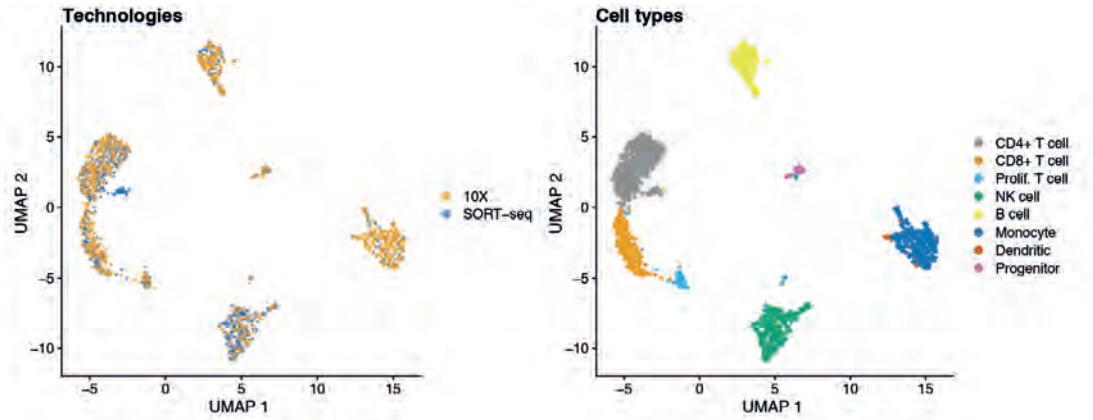
- Counting, sorting, dispensing and analyzing;
- Combinatorial peptide libraries coupled to carrier beads;
- Large cells, cell cluster or tissues;
- Embryoid bodies and cultured organoids;
- Zebrafish embryos;
- Plant seedlings and seeds (e.g. *Arabidopsis*);
- *C. elegans* larvae;
- Microcolonies of *Aspergillus* and filamentous bacteria.

Access

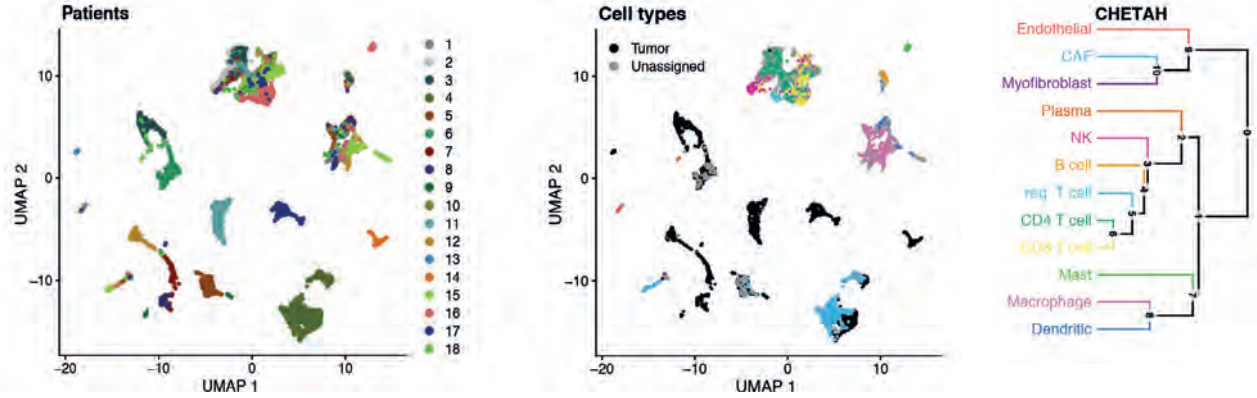
The Large Particle Flow facility was established with financial support from the Netherlands Organization for Scientific Research (NWO investment Grant) and Utrecht University (Support Core Facilities, Life Sciences). Other institutions and organizations can access the facility as well.

For more information, please visit the Large Particle Flow Facility website.

HEALTHY BLOOD MONOCLEAR CELLS



PEDIATRIC TUMOR SAMPLES



SINGLE CELL GENOMICS FACILITY

PRINCESS MÁXIMA CENTER FOR PEDIATRIC ONCOLOGY

The Máxima Single Cell Genomics Facility is a KiKa-funded research infrastructure dedicated to making single-cell mRNA sequencing technology available to study pediatric tumors.

Equipment

- **SORT-Seq**: involves FACS sorting of cells into 384-well plates that are processed into sequencing libraries;
- **10xGenomics Chromium Single Cell Controller**: the leading microfluidics platform. Higher cell throughput per experiment, but less flexible.

Results of the facility have shown that combining output from both platforms complement each other.

Studying pediatric cancers one cell at a time

Activities

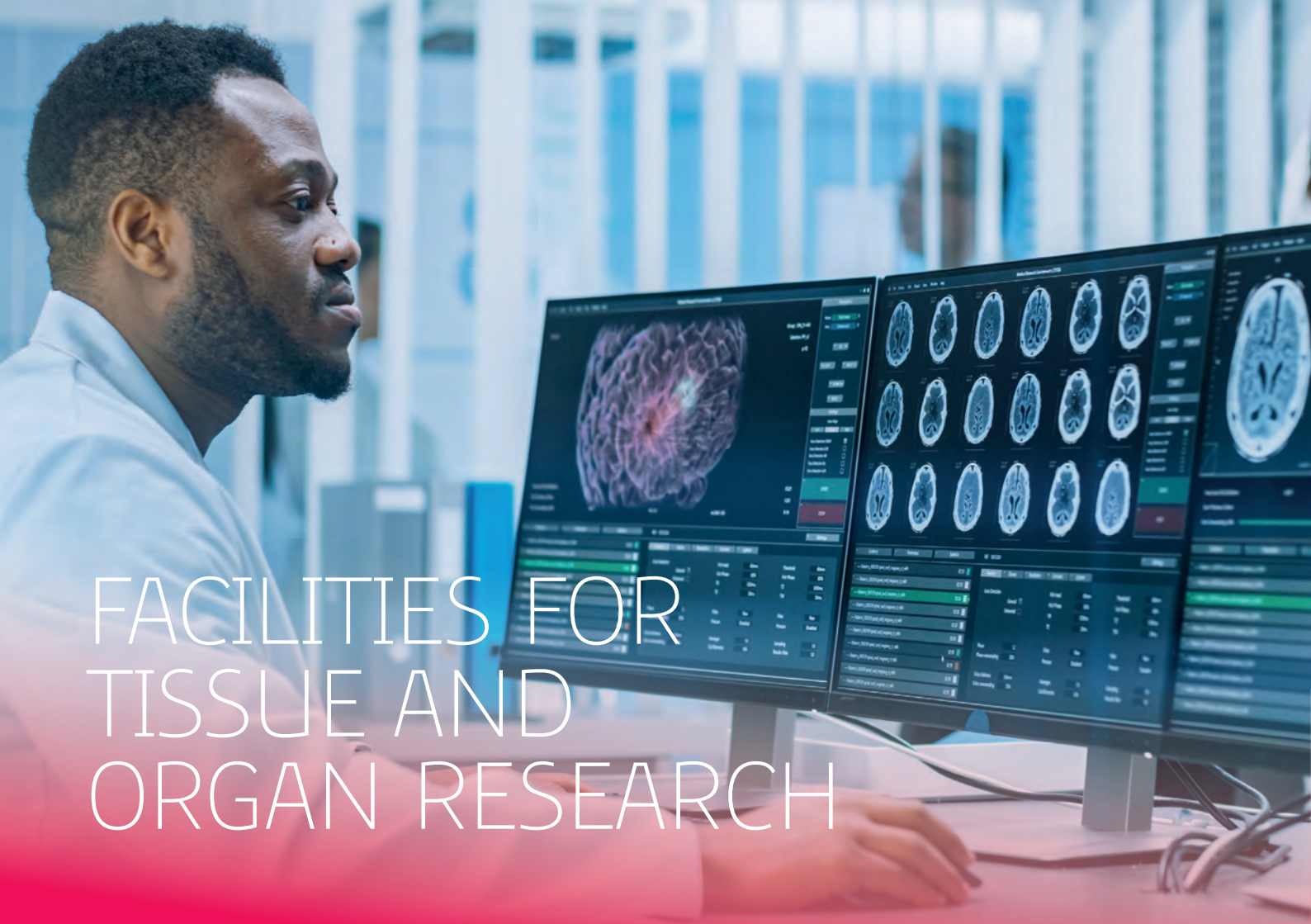
The facility is involved in developing computational tools:

- **Ameba**: a database for storing single cell experiment information and facilitating pipeline deployment in computer clusters.
- **Sharq** (Candelli et al. bioRxiv 2018): a data-processing and analysis pipeline, maintained and developed by the facility. It runs on the Utrecht High Performance Computing (p. 175) environment, processing and mapping reads, as well as performing quality-control.
- **CHETAH** (de Kanter et al. NAR 2019): an accurate cell type identification method that uses single-cell RNAseq reference data to classify cells in a hierarchical fashion, and collaborating in analyzing scRNA-seq results.

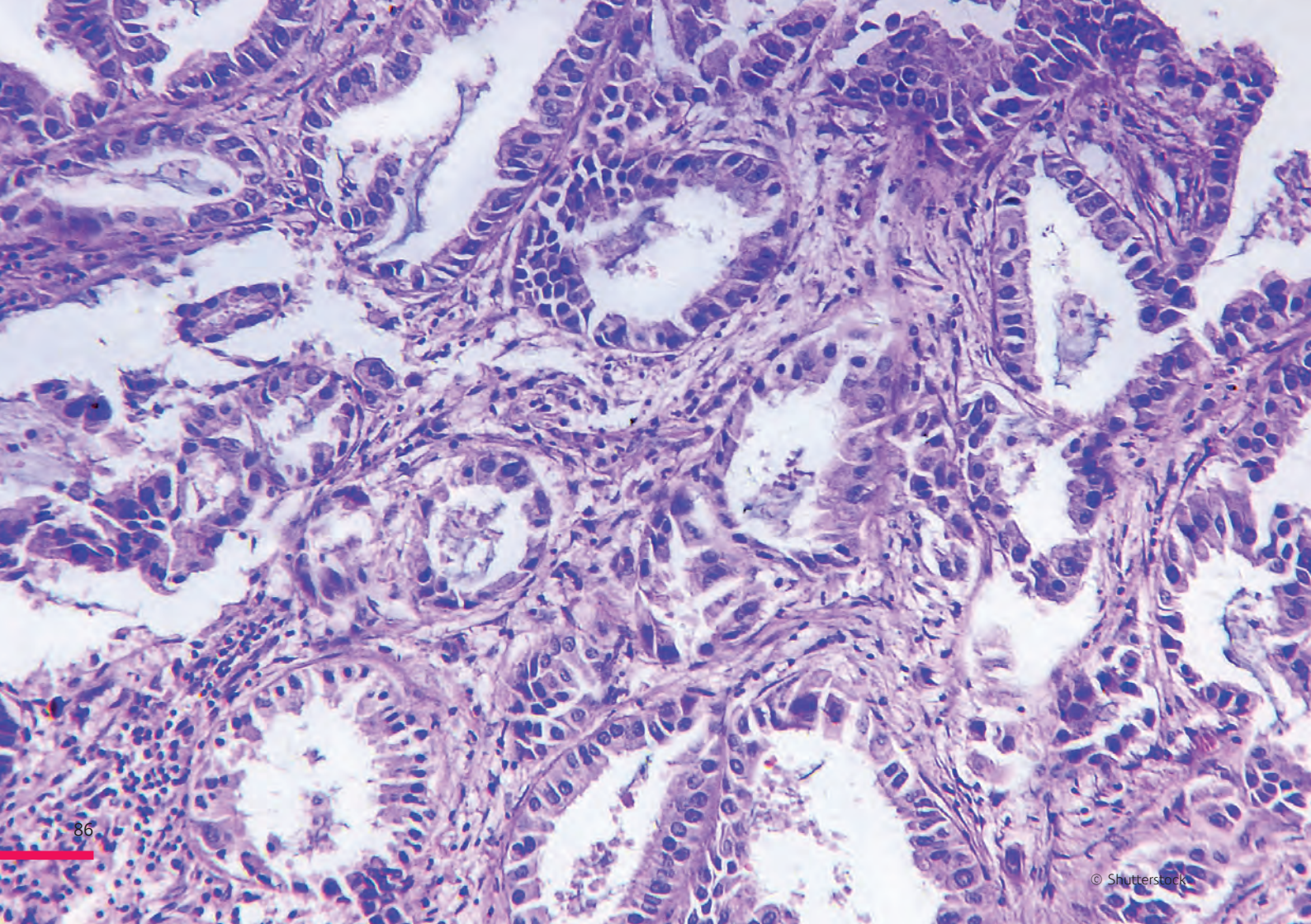
Knowledge Transfer

Facility members teach researchers how to use the various kinds of equipment. They also train bioinformaticians interested in analyzing single-cell genomics data, both internally and abroad within the European network ELIXIR.

For more information, please visit the Single Cell Genomics Facility website.



FACILITIES FOR TISSUE AND ORGAN RESEARCH



DIGITAL HUMAN PATHOLOGY

UMCU

Services

The Pathology department of the UMC Utrecht performs diagnostic testing of body samples such as tissues (histology) and cells (cytology). Also, autopsies are performed for medical practice to determine and evaluate the cause of death. In order to assist in the diagnosis, additional examination can be done including:

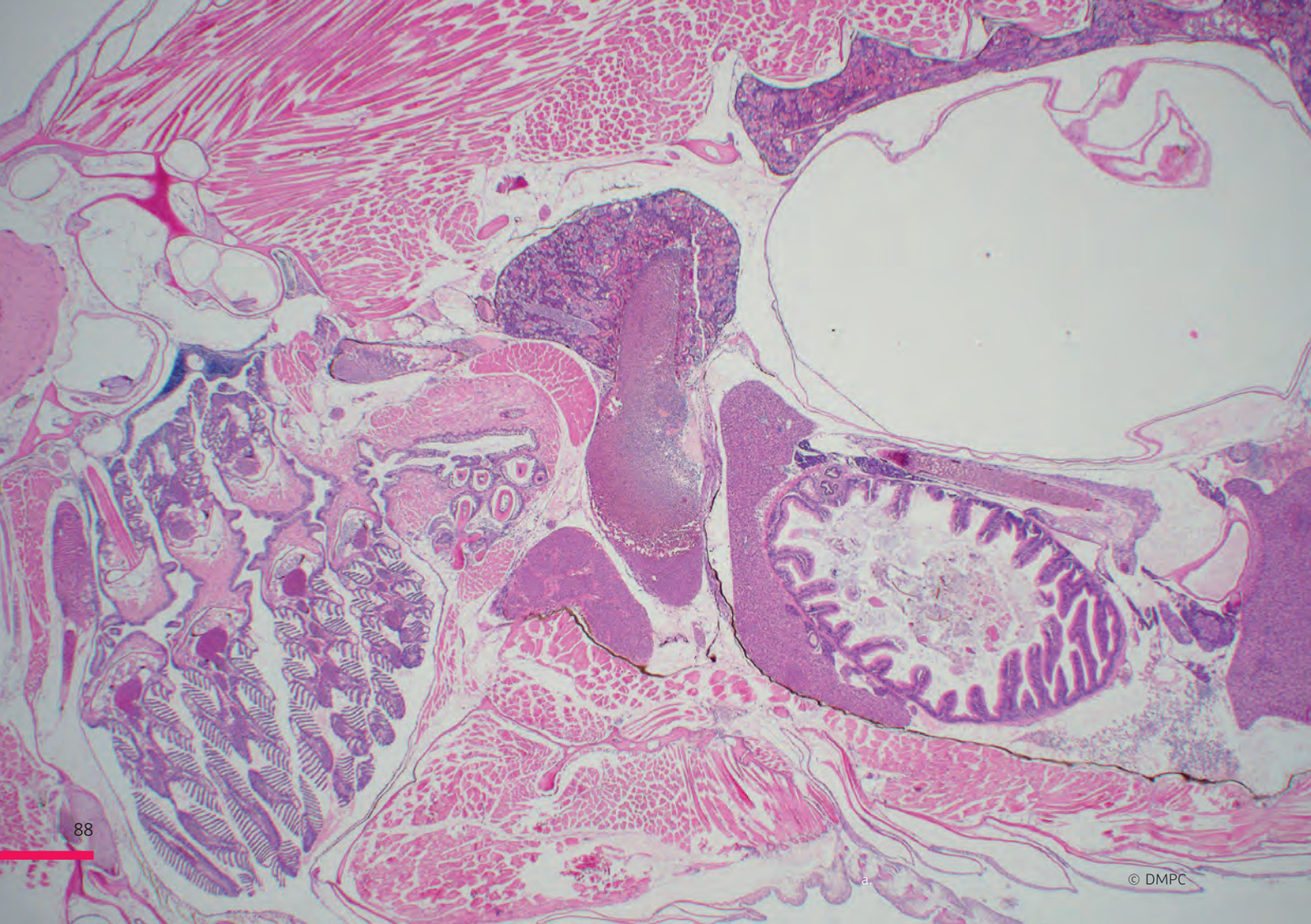
- Immune- and enzyme histochemistry to demonstrate abnormalities of proteins;
- Molecular diagnostics to indicate abnormalities in the DNA in order to make a diagnosis and/or determine the sensitivity to a treatment;
- Electron Microscopic examination;
- Tissue microarrays;
- Laser microdissection;
- Mass spectrometry imaging.

The Pathology department is home to the Dutch Surveillance Center for Prion Diseases.

Infrastructure

As first university hospital in the world, the department is making the transition to fully digital pathology diagnostics. This not only results in faster diagnosis, it also yields a better interpretation of the images: measurements through the microscope are less accurate than with a computer program on digital images. Furthermore, it enables a more close collaboration with the department of Radiology by combining digital pathological images with digital radiological images. This makes it easier to establish a link between imaging and tissue diagnosis, to determine for example whether a tissue biopsy is representative. This increases the quality of diagnosis and treatment, and thereby improves patient safety.

For more information, please visit the Digital Human Pathology website.



DUTCH MOLECULAR PATHOLOGY CENTER

UU

The Dutch Molecular Pathology Center (DMPC) performs expert pathological analysis of tissues from animals used in academic and industrial research. Our team of board-certified and training veterinary pathologists is specialized in the (histo-)pathology of commonly-used laboratory species and works closely with graduate and post-graduate cell and molecular biology scientists.

Equipment

Based at the Regenerative Medicine Center in the Hubrecht Institute, the DMPC has a state-of-the-art facility for processing, staining and imaging tissues from experimental animals. We offer a full necropsy service including gross examination of tissues, appropriate tissue fixation, slide preparation, and histological evaluation. In addition, the DMPC can offer tailored necropsy training for researchers and technicians.

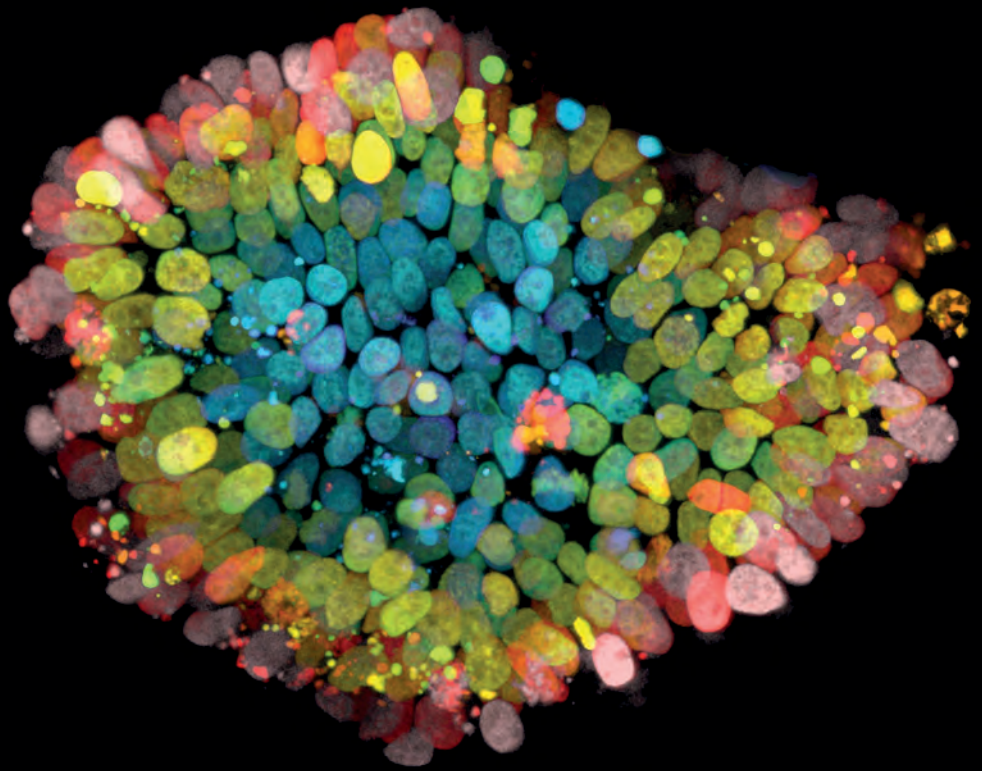
Services

Our services include descriptive pathology, (semi-) quantitative scoring, digital image capture and automated digital image analysis. Immunohistochemistry and special stains for features such as proliferation, apoptosis, differentiation, inflammation, fibrosis can be performed and analyzed. Furthermore, we offer transgenic reporter marker analysis, such as LacZ and GFP for monitoring tissue cell-type-specific expression.

Access

These services are available to academic or industrial researchers either in the form of partial cost-recovery based collaboration or full-cost service.

For more information, please visit the DMPC website.



HUBRECHT ORGANOID TECHNOLOGY

Hubrecht Organoid Technology (HUB) exploits the pioneering work of Prof. Hans Clevers, who discovered methods to identify and grow adult stem cell-derived mini-organs from epithelial tissue of patients. These so-called organoids can be made from different organs and are characterized by genome sequencing, expression profiling and selective drug sensitivity. The HUB organoid biobank links genetic and transcriptional information to drug responsiveness as well as clinical data of the patient.

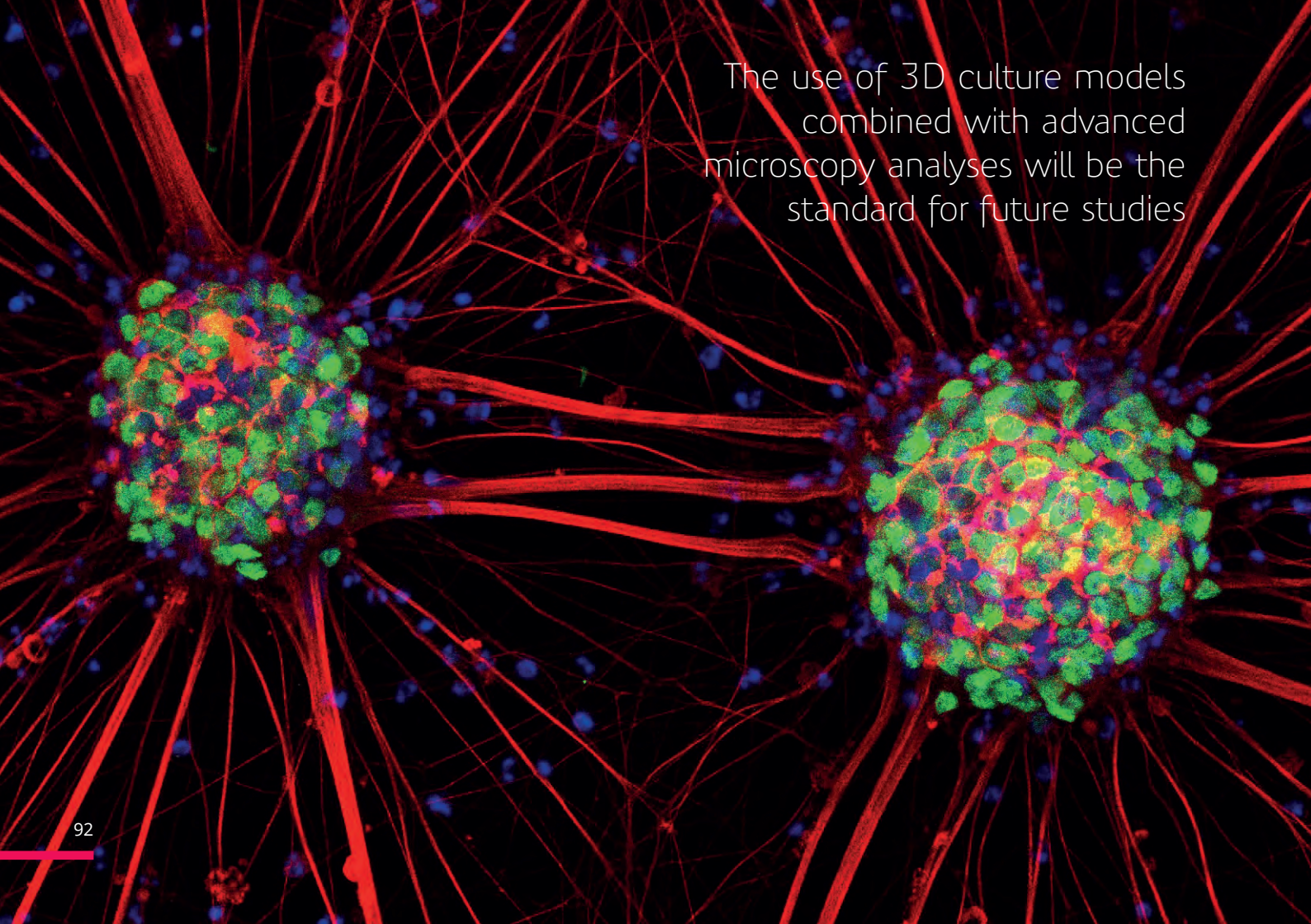
New method of developing cures

The lack of relevant model systems that are sufficiently representative of human patients and diseases remains the single biggest problem in drug development. The key advantage of HUB organoids is their ability to establish a representative laboratory model of any epithelial disease. They exhibit organ functionality similar to the tissue of origin and represent the most physiological relevant 3D *in-vitro* model. HUB organoids from individual patients are already being used as a tool for diagnosis, designing targeted and personalized therapies as well as clinical screens. Ultimately, HUB organoids even have the potential to be developed into treatments themselves as regenerative cures.

Access

With this technology, HUB offers licenses to its patent portfolio of organoid technology for drug development and access to HUB organoids from the HUB Biobank for preclinical drug discovery and validation. In addition, HUB provides drug screening for external collaborators as a service and in joint development. HUB aims to engage in spin-out opportunities, be it stand-alone or in combination with other innovative technologies.

For more information, please visit the HUB website.



The use of 3D culture models combined with advanced microscopy analyses will be the standard for future studies

MIND FACILITY

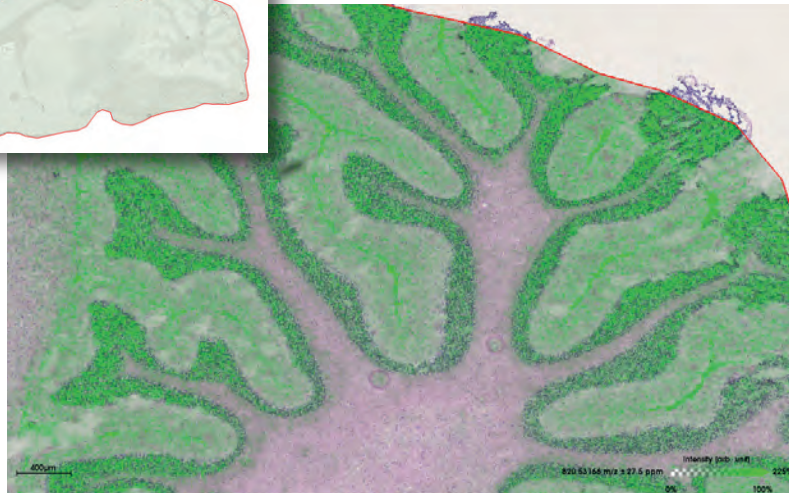
UMCU

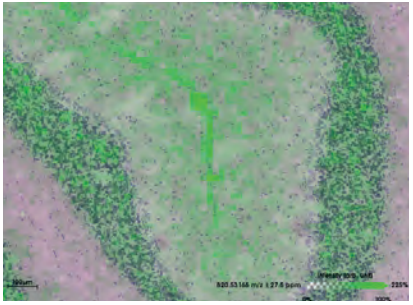
The MIND (Multidisciplinary Investigation of Neural Disorders) facility at the UMC Utrecht Brain Center aims at generating, analyzing and manipulating next-generation human brain cultures. It has unique expertise in human iPS cells and 3D brain organoid culturing technology, which it combines with state-of-the-art imaging, gene manipulation techniques and brain-on-a-chip approaches for drug finding.

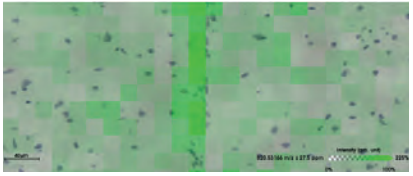
The MIND facility is unique in the world and serves as a research hub in Utrecht, as it links different research facilities and initiatives and hosts a large number of local and (inter)national researchers. A wealth of information on brain disorders (e.g. ALS, developmental disorders, schizophrenia) is accumulating from different disciplines (epidemiology, clinical genetics, neurobiology, social sciences and imaging). This information needs to be translated into biological models for dissecting disease mechanisms and for setting up tractable therapy.

Recent technological developments allow us to generate human neurons and glial cells from patients and healthy controls. These neurons can be grown in two-dimensional but also in three-dimensional (3D) cultures (e.g., cerebral organoids), which more closely mimic the brain. Furthermore, new technologies have recently become available to manipulate and study 3D neuronal cultures with advanced microscopic techniques, including light sheet imaging and genome editing of cultured cells. Together, this facility offers unique tools to enable dissection of brain disease mechanisms and development of therapeutic strategies.

For more information, please visit the MSI website.







UTRECHT MASS SPECTROMETRY IMAGING FACILITY

UU, UMCU

Mass Spectrometry Imaging (MSI) is a label free, multiplex technique that is used to identify and locate a broad variety of molecules at the cellular scale (~20 µm) in biological samples based on their unique m/z (mass over charge ratio) characteristics. This technique has the ability to study the spatial distribution of endogenous molecules such as peptides, lipids, glycans and metabolites, as well as exogenous toxins, drugs and their metabolites within tissues and their substructures.

The system in the Utrecht MSI facility uses the Matrix-Assisted Laser Desorption Ionization (MALDI) technique for the ionization process. In addition, tissue samples subjected to MALDI-MSI can be imaged and aligned with other molecular imaging and standard histological techniques providing highly relevant complementary information. Therefore, MALDI-MSI can be of great value for biomarker discovery and tumor classification, pathway and cross-talk analysis, and also for drug development including pharmacodynamics, as well as other clinical and pre-clinical studies in virtually every field of biomedical research.

Infrastructure

The Utrecht MSI Facility is the result of a joined initiative from a diverse range of research groups at the UU and the UMCU and has been enabled by a UU/UMC research infrastructure grant. The facility is hosted by the department of Pathology of the UMC Utrecht as part of its Tissue Facility, providing operational and background expertise including extensive experience in handling tissue samples.

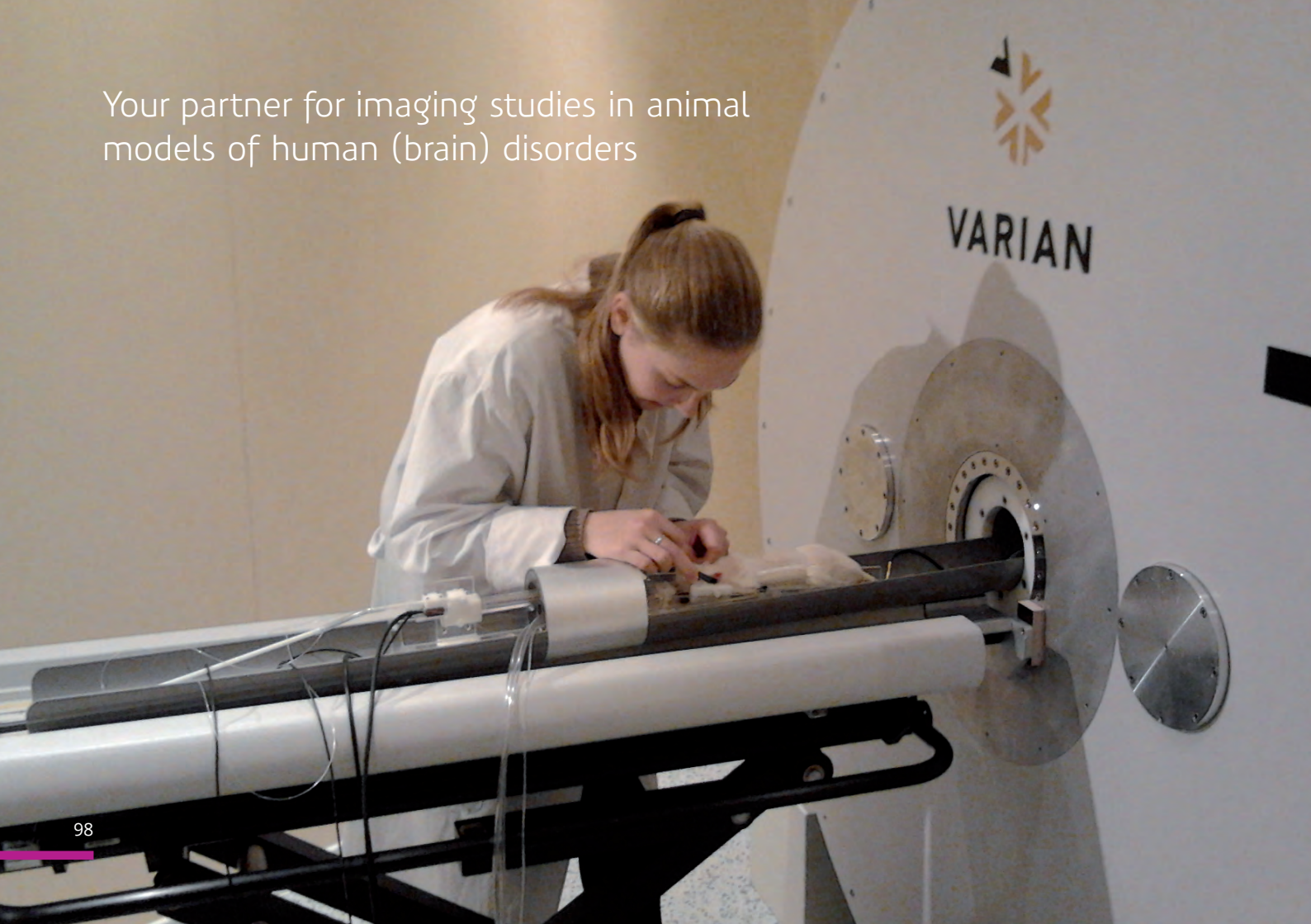
Equipment

The facility hosts a state-of-the art Bruker timsTOF flex MSI machine and equipment for sample preparation, including matrix application, cryosectioning, stainings, (digital) microscopy as well as advanced image analysis.

For more information, please visit the MSI website.

FACILITIES FOR ORGANISM RESEARCH

Your partner for imaging studies in animal models of human (brain) disorders



BIOMEDICAL MR IMAGING & SPECTROSCOPY FACILITY

UMC

The inherent characteristics of MR allow us to perform non-invasive, three-dimensional and multiparametric biomedical research, in which we can assess tissue status (structural MRI, diffusion tensor imaging), hemodynamics (perfusion MRI), functional activation (functional MRI, including resting-state fMRI and pharmacological MRI) and metabolism (MRS). In addition to *in vivo* MRI studies, we can perform ultrahigh-resolution MRI on *in vitro* or post mortem (tissue) samples. When combined with contrast agents, MRI allows the detection of cells and molecular entities (cellular and molecular MRI). These MR tools are combined with other methodologies to correlate MR results with behavioral, electro - physiological and histological measures.

Services

- Elucidation of pathophysiology, recovery mechanisms and treatment effects in preclinical disease models with MRI and MRS;
- Validation and improvement of the diagnostic potential of clinical MR tools in experimental *in vivo* models;
- Development and optimization of MR acquisition and analysis techniques for biomedical application.

Equipment

Our laboratory is equipped with two state-of-the-art animal MR systems at 7 T (30-cm horizontal bore) and 9.4 T (20-cm horizontal bore). We have a HD CCD camera for *in vivo* optical imaging and equipment for transcranial magnetic stimulation in (small) animals.

Access

Our facility is accessible to external users and staff is available for (assistance with) MR data acquisition and analysis, and biotechnical support.

For more information, please visit the MRI Facility website.

For more information, please visit the Dijkhuizen Lab website.

CENTRAL LABORATORY ANIMAL RESEARCH FACILITY

UU

The Central Laboratory Animal Research Facility (GDL) provides professional housing and care for a variety of laboratory animals used in research and education by the UMC Utrecht, Utrecht University and third parties.

Equipment

Complex experiments require state-of-the-art facilities for rodents and large animals. The following facilities are available from the GDL (and its partners):

- (Micro)Surgery;
- Imaging e.g. CT/MRI/Fluorescence;
- Irradiation;
- Breeding programs.

Activities

The GDL provides expert biotechnical and other support, e.g. veterinary advice project support, taking samples, administration techniques and monitoring tasks during surgery/microsurgery. We also offer training in experimental procedures. The animals' welfare is always our top priority.

Quality

The GDL is the only academic institution in the Netherlands with an international AAALAC accreditation; this accreditation is specifically for facilities where research is done with animals. In addition, the GDL is ISO 9001 certified.

For more information, please visit the GDL website.

Laboratory animals – we care *about* them, we care *for* them

CENTER FOR SUSTAINABLE ANIMAL STEWARDSHIP

UU

What is constitutive for responsible and sustainable relationships between humans and animals and what does this imply for the treatment of animals? These are the core questions that CenSAS aims to answer as a collaborative effort between the faculty of Veterinary Medicine and the Animal Sciences Group of Wageningen University & Research.

When it comes to our relationship with animals, people often have differing visions and interests, resulting in a plurality of views on what is a good treatment of animals. This results in societal debate on a broad range of animal-related questions. In most cases, answers and solutions are not self-evident or automatically shared by all parties. Our approach aims to bring together science and society and to create an open space for a constructive dialogue on animal-related issues. Our approach is science-based and at the same time we provide room for different interests and intuitions and emotions. By building bridges and facilitating cooperation, we want to contribute to a more sustainable and responsible relationship between humans and animals.

Activity

Our activities include research, education, multi-stakeholder projects and our annual animal dialogue. We link our stakeholder projects to current research and take advantage of the expertise available at Wageningen University and Research and Utrecht University. In education and supervision of graduate students and interns, we use these issues to prepare future veterinarians and animal scientists for their role in society and the practice of their professions.

Services

- Stakeholder consultation and engagement;
- Facilitation of dialogue and collaboration;
- Research and projects in the field of animal welfare and animal ethics.

For more information, please visit the CenSAS website.

CIRCULATORY HEALTH SMALL ANIMAL RESEARCH FACILITY

UU

The Circulatory Health Small Animal Research Facility is dedicated to both fundamental and early stage translational research. We have vast experience with, but are not exclusive to, different mouse models of cardiovascular disease.

Services

The Circulatory Health Research Facility for small animal experimentation provides state-of-the-art high frequency ultrasound imaging, echo guided injection, Laser Doppler, *ex vivo* heart perfusion systems and several surgery working stations. It is located within the Central Laboratory Animal Research Facility and operated by highly experienced researchers and biotechnical support.

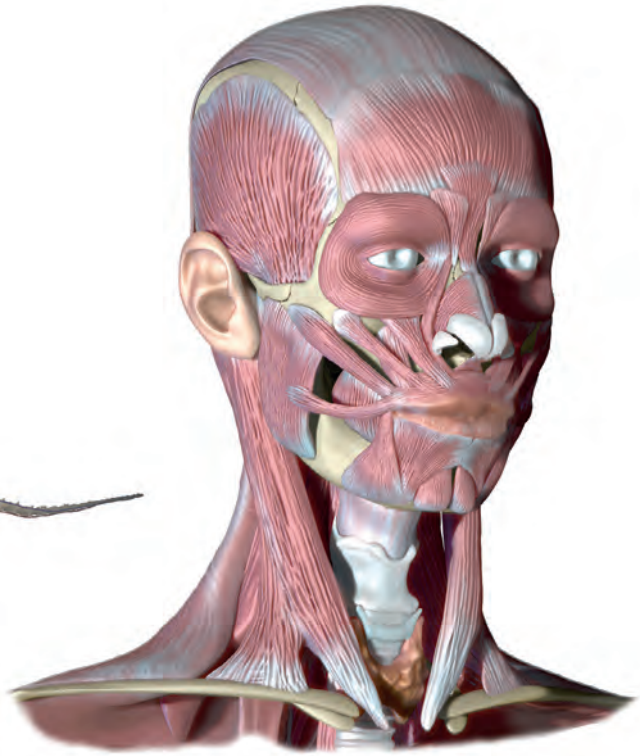
Equipment

The Circulatory Health Small Animal Research Facility is equipped with a Visualsonics Vevo3100 4D high frequency ultrasound, allowing imaging in 3D and 4D, echo guided injections, Power Doppler, and Tissue Doppler measurements. The AD instrument Mouse working Heart System allows Langendorff perfusion and working heart mode with cardiac pacing and enables, amongst others, the measurement of cardiac pressures. The lab is equipped with several surgery stations with rodent ventilation systems and microscopes, of which one can be equipped with a camera, which makes it an ideal setting for training purposes.

Contact

Dr. Saskia C.A. de Jager
s.c.a.dejager@umcutrecht.nl

To teach, to train,
to get a better insight



COMPARATIVE CENTER OF EXCELLENCE FOR PLASTINATION AND VIRTUAL REALITY MODELS

UU, UMCU

The Center of Excellence for Plastination and Virtual Reality provides models for training clinical skills and a wide range of procedures in humans and animals. The Center is a joint initiative between anatomy sections of the faculty of Veterinary Medicine and UMC Utrecht.

What is plastination?

Plastination allows preservation of human and animal body parts. Plastinates last for decades, greatly reducing the number of animals used in education and training. We offer both hard and soft plastinates. Hard plastinates are particularly useful for studying musculoskeletal anatomy, whereas soft plastinates are ideal for studying internal organs. With our soft plastination technique, tissues remain supple, which allows us to create training models for clinical procedures, such as intubation, bronchoscopy and vaginoscopy.

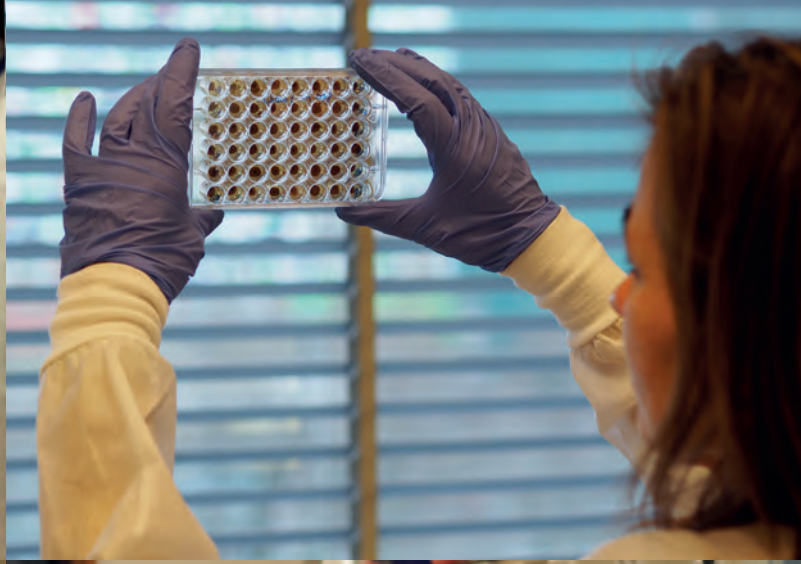
Possible Applications

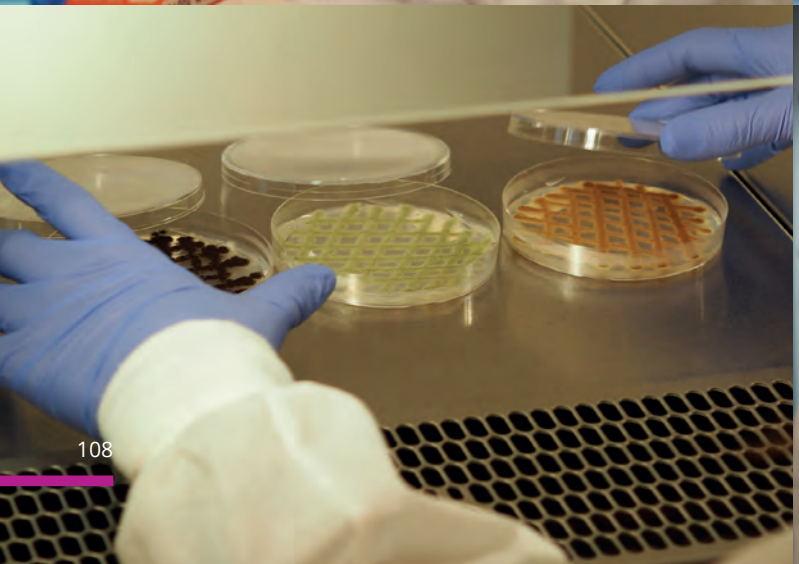
We have a long-lasting experience in creating digital three-dimensional (3D) models to aid learning and teaching anatomy. By virtual reality technology we are able to transform 3D models in functional models, the so-called 'avatars'. It is feasible to make avatars from plastinated samples or CT/MRI scans. Avatars offer an interactive view of the object from all angles. Virtual reality models are great for studying anatomy, physiology and diseased organ systems of humans and animals and are valuable for training and practicing clinical and surgical techniques, and experimental procedures.

Services

- Combining of state-of-the-art plastination techniques with virtual reality technology;
- Preparation of high-quality most advanced functional and anatomically realistic models for any training purpose;
- Preparation of 3D models;
- Holographic technology.

For more information, please visit the CoE Plastination website.





DUTCH DNA-BIOTECH

Dutch DNA Biotech (DDNA) designs, develops and implements protein production processes for companies around the globe. These processes developed by DDNA are mainly used for the production of proteins such as enzymes for food, feed and other industrial applications, food proteins to replace animal proteins, and proteins for therapeutic use including antibodies and vaccines.

The processes developed by DDNA make use of fungi, microorganisms that have been used for decades for the industrial production of enzymes, organic acids and antibiotics.

To this end, DDNA has developed an *Aspergillus niger* strain which has unique fermentation properties; it allows for the very efficient (carbon to protein conversion) production of large amounts of a wide variety of proteins. Its low viscosity fermentation properties make this strain very suitable for large scale industrial production processes. In addition to this production platform, DDNA has developed a collection of fungal strains which can serve as a source of unique enzymes and a new generation production hosts.

The core competences of the DDNA research team are molecular genetics and fermentation process design.

For more information, please visit the Dutch DNA website.

DUTCH DNA

Unleash the canine and feline genome to catch disease-causing mutations in humans

EXPERTISE CENTER ANIMAL GENETICS

UU

Within the Expertise Center Animal Genetics at the Faculty of Veterinary Medicine we study hereditary diseases in dogs and cats. Purebred dogs harbor hereditary diseases in high frequency. Many of these diseases closely resemble human diseases, which makes them excellent natural models to study causes of human hereditary disease.

New treatments for hereditary diseases relevant to both animals and humans, including gene therapy, can first be applied in veterinary patients before clinical application. By genome-wide associations studies and whole genome sequencing of well-characterized canine and feline patients we identify new mutations in a variety of diseases, including: congenital heart diseases, congenital urogenital and vessel disease, neoplasia, metabolic diseases, neurological disorders, immunological diseases as well as behavioral traits.

Equipment

- DNA database of ~30,000 DNA samples of well characterized canine and feline diseases;
- Biobank with blood and tissues from a variety of hereditary diseases in dogs and cats;
- Veterinary clinic for phenotypic classification of dogs (CT, MRI, routine lab, ultrasound etc);
- Canine research facility for pre-clinical studies.

Services

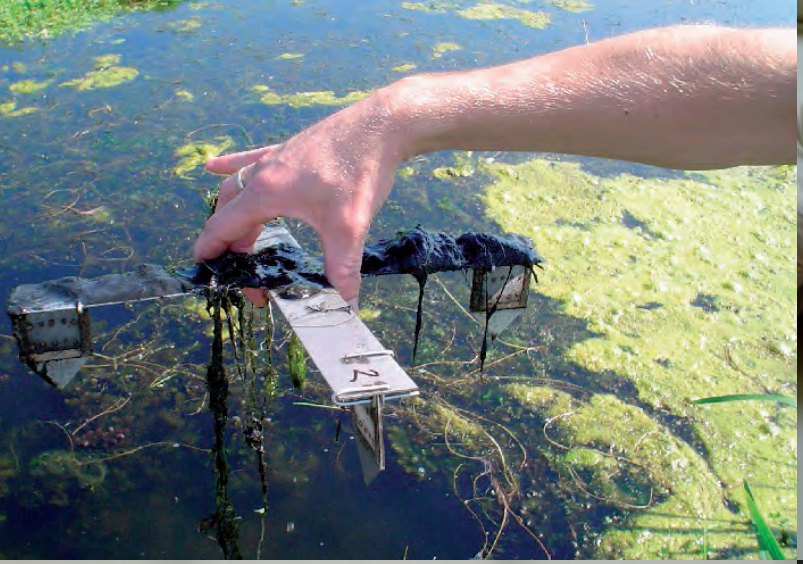
You are ... a medical doctor, human geneticist, basic scientist or bio-informatician

You want ... knowledge on the presence of your disease of interest in dogs and cats and status of the genetic research on this specific disease

You want ... to investigate whether mutations you have identified in human patients are similar to what we find in dogs in cats, for example to explore possibilities for pre-clinical studies.

We are willing to help you!

For more information, please visit the ECGG website.




ACN

EXPOSURE EXPERTISE CENTER

HU

The Exposure Expertise Centre (EEC) is part of the Utrecht Science Park InnovationLab Life Science & Chemistry. It constitutes a collaboration between the HU University of Applied Sciences Utrecht and the Institute for Risk Assessment Sciences of Utrecht University. It houses quality chemical analytical facilities and concentrates renowned expertise in analytically measuring, theoretically explaining, and modelling concentrations of (mixtures of) drugs, industrial chemicals, and environmental contaminants in biological and environmental matrices, such as body fluids, tissues, water, air, soil and sediments.

Research is performed to determine sorption and bioavailability of chemicals. These are key aspects in exposure science and are quantified with state of the art methods by passive sampling in/for various phases, including lipids, membranes, proteins, cells, tissues, (whole) organisms, (bio)polymers, sediments, and soils.

Results, such as binding constants and bioaccumulation factors, can be used as input in exposure and toxicological effects models and help in environmental risk assessments and managing of contaminated sites.

Furthermore, the EEC develops methods to store, sample, extract, clean-up, fractionate, dose, and analyse chemicals, including ones with 'cumbersome' physicochemical properties, such as strongly hydrophobic, volatile, and surfactant-like chemicals.

Equipment

The analytical equipment of the EEC includes: GC-MS, -FID, and -(μ)ECD; HPLC-UV, -FLD, and –ELSD, and LC-MS/MS.

See also InnovationLab Life Sciences & Chemistry (p. 193).

For more information, please visit the EEC website.


2862
6749

FACILITIES DEPARTMENT OF FARM ANIMAL HEALTH

UU

The department of Farm Animal Health of the faculty of Veterinary Medicine has state of the art facilities and comprehensive expertise on farm animal health, welfare, infectious diseases, metabolism, fertility and food at its disposal. The animal facilities are modern and highly equipped to meet the needs of the animals, researchers, students and teaching staff. In addition, several laboratories are available on the campus of the faculty of Veterinary Microbiology Diagnostic Center (VMDC; p. 143), molecular pathology (DMPC; p. 89) and diagnostics: University Veterinary Diagnostic Laboratory (UVDL).

The *in vitro* fertilization (IVF) laboratory offers a wide range of opportunities to investigate reproductive disorders and the impact of (metabolic) conditions in human and animals by the use of oocytes derived from slaughterhouse ovaries. The combination of specialists on the different areas of Veterinary Medicine and in house biologists and epidemiologists creates an ideal scientific environment.

For more information, please visit the Farm Animal Health Facilities website.

HYBRID OPERATION ROOM FOR LARGE ANIMALS

UU

The hybrid operation room is dedicated to late-stage preclinical research in drug and medical device development, facilitating the translation towards clinical implementation. Due to the clinical grade equipment and set-up, the facility also provides the perfect place for product demonstration and clinician training for first-in-man trials and device handling.

Services

The hybrid operation room for large animals experimentation provides state-of-the-art X-ray equipment in a clinical grade setting for preclinical research. It is located within the Central Laboratory Animal Research Facility (p. 101) and operated by highly experienced researchers and biotechnical support.

Equipment

The hybrid operation room meets all your clinical needs. It is equipped with a Philips Allura FD20 Carm with 3D reconstruction capabilities, power injection, 3D-ultrasonography, OCT and ECG monitoring. The control room has direct view on the OR and is equipped with several displays including live camera view on the operation table that allows following and controlling the procedure from the control room.

For more information, please visit the Hybrid Operation Room Facility website.

Your partner for clinical-grade preclinical research


Precise Treatment System™

UU ANIMAL CANCER CENTER

UU

The UU Animal Cancer Center (UUACC) is a multidisciplinary clinical oncology treatment and research facility at the University Clinic for Companion Animal Health. At the UUACC, veterinary clinical specialists work together with researchers providing state-of-the-art oncological care for veterinary patients and investigating novel cancer treatments in clinical trials following a 'One Medicine' approach: veterinary patients benefit from novel cancer treatments while serving as comparative translational research models for human patients with comparable disease. In this respect, collaborations exist with research groups, academic institutions, and industries.

The UUACC has ample experience in translational research on hormone-related tumors, and in addition focuses on brain tumors and radiation/radionuclide treatment development (linear accelerator, 166-holmium microspheres). The UUACC provides:

- Academic companion animal hospital;
- Multidisciplinary oncology group;
- Research laboratory;
- Medical imaging (radiography, fluoroscopy, ultrasound, CT, MRI, SPECT);
- Chemotherapy/medical treatments;
- Megavoltage photon and electron beam radiation treatment (ELEKTA Synergy Platform);
- Radionuclide imaging and treatment;
- Modern surgery theatres;
- State-of-the-art patient care facilities, including veterinary intensive care unit;
- Hematology, biochemistry, radiopharmaceutical, and histopathology laboratories;
- 3D-printed endoprosthesis.

Services

The UUACC can facilitate advanced cancer diagnostics and treatment development in companion animal patients with naturally occurring tumors in a pre-clinical or clinical translational phase of treatment development for humans. This 'One Medicine' approach provides a better clinical disease model than laboratory animals, accelerating translation to the human patient while reducing laboratory animal use.

For more information, please visit the UUACC website.

WESTERDIJK FUNGAL BIODIVERSITY INSTITUTE

The Westerdijk Fungal Biodiversity Institute is part of the Royal Netherlands Academy of Arts and Sciences and is situated in the Utrecht Science Park. It is a research institute that maintains a world-renowned biological resource Center of living filamentous fungi, yeasts and bacteria. It is also a Center of expertise for mycology.

The institute studies fungal biodiversity in the widest possible sense. Its researchers develop and utilize a broad range of techniques for studying fungal biology, ecology, biotechnology and genetics. The institute's unique collection of more than 100,000 living strains of fungi places it at the top of the global list of mycological research institutes. The institute provides answers to questions from society and industry concerning health and agriculture.

Services

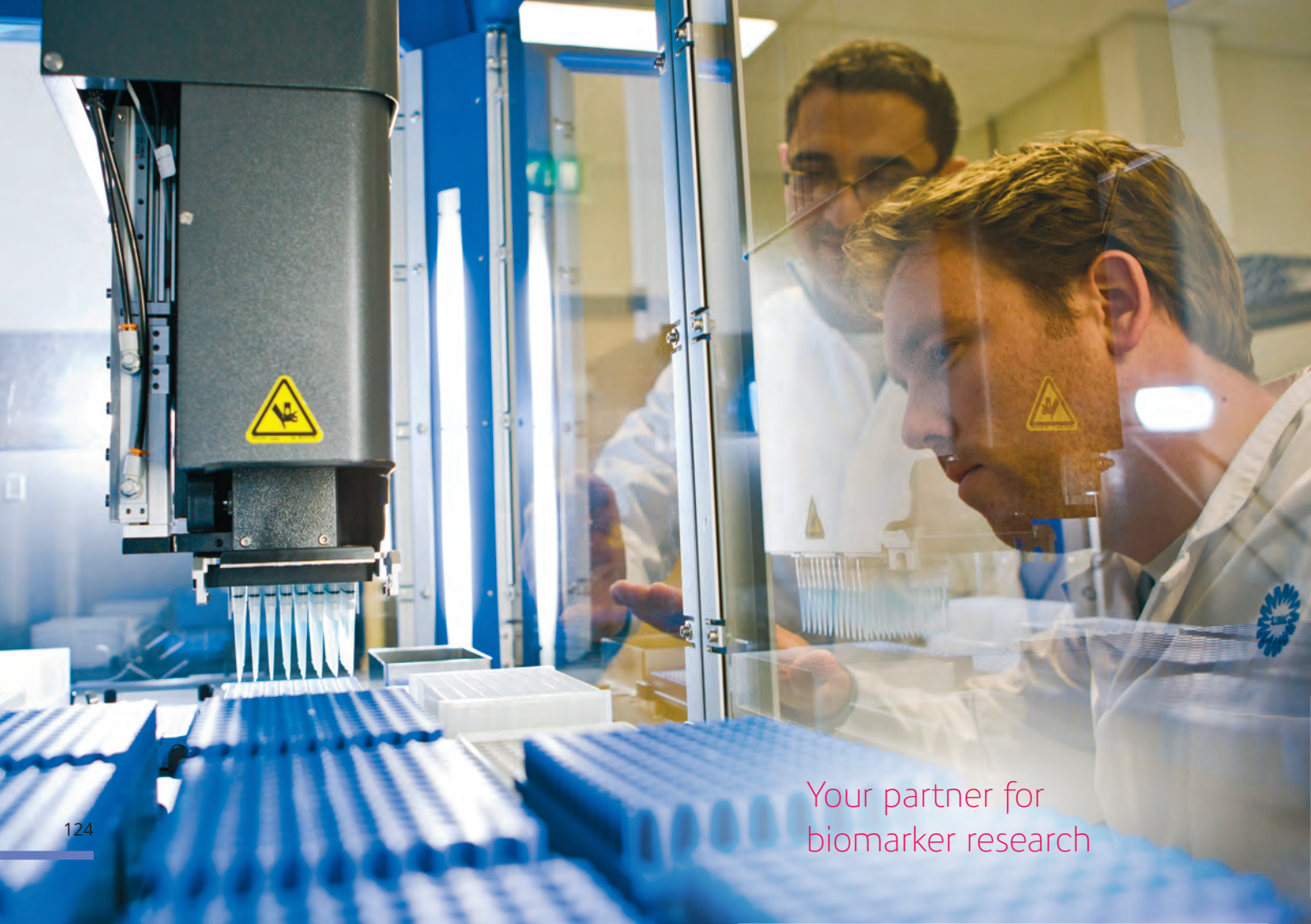
- Preservation of (proprietary) fungal strain collections;
- Provide fungi, bacteria and plasmids;
- Product discovery for the medical, agricultural and industrial fields;
- Detection of fungi in food ingredients and food products to ensure food safety;
- Analyzing fungal problems in indoor and industrial environments including museums and archives;
- Customized research & development and troubleshooting projects for individual companies;
- Identification service for filamentous fungi, yeasts and bacteria.

For more information, please visit the Westerdijk Fungal Biodiversity Institute website.

WESTERDIJK FUNGALBIO DIVERSITY INSTITUTE

Explore, Study, Preserve

FACILITIES FOR CLINICAL RESEARCH



Your partner for
biomarker research

ARCADIA
UMCU

ARCADIA is a dedicated unit within the Central Diagnostic Laboratory of the UMC Utrecht linking our life science research with routine diagnostics. Its central position within laboratory diagnostics in one of the largest academic hospitals in the Netherlands enables ARCADIA to provide comprehensive analytical services to its partners and clients.

ARCADIA offers a variety of services, platforms and tailored solutions to strengthen interaction between patient care, innovation and fundamental research and support your project according to your specific needs and requirements focusing on:

- Biomarker discovery and validation;
- Utrecht Patient Oriented Database (UPOD; p. 181);
- Red blood cell diagnostics and research.

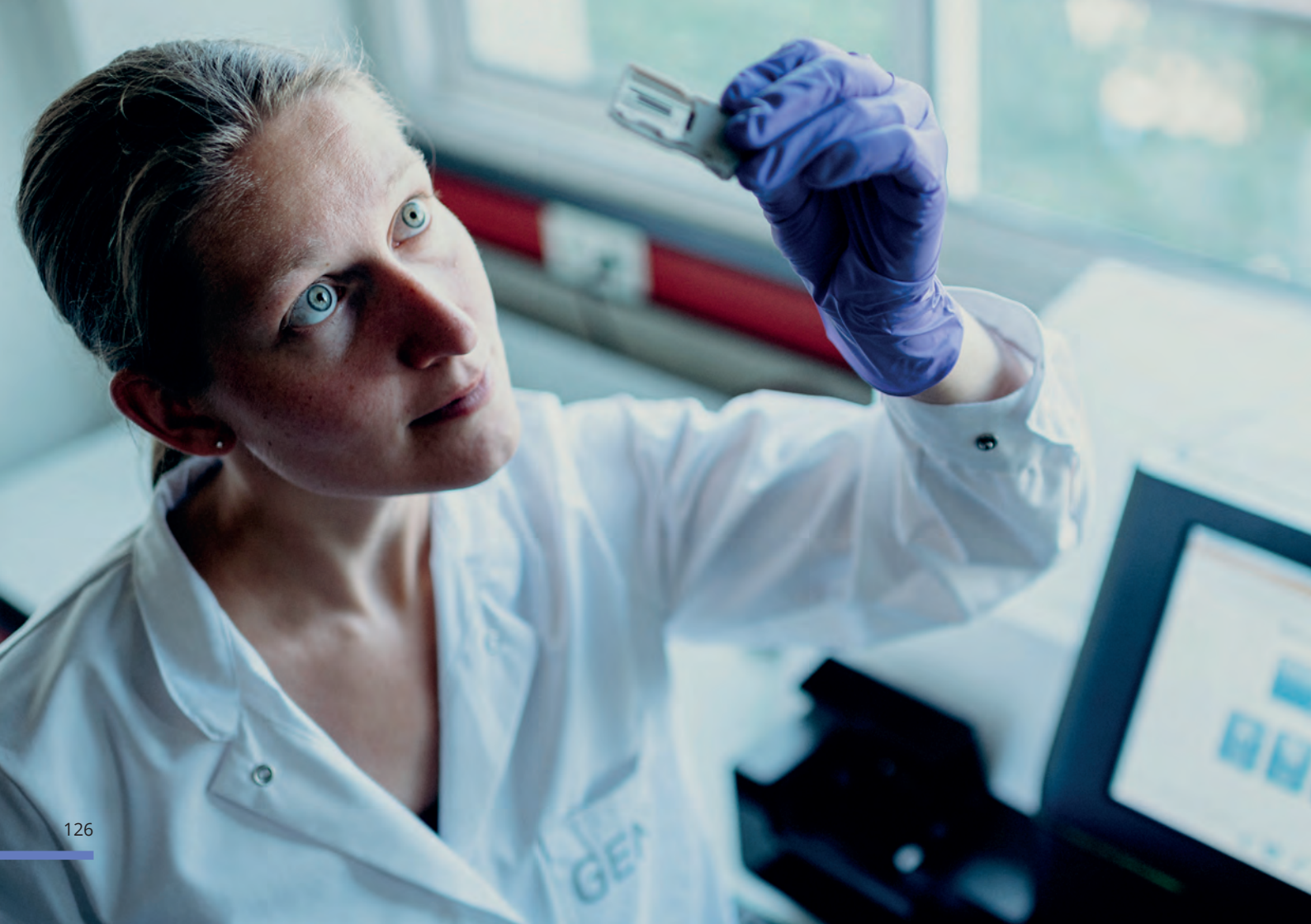
ARCADIA provides various analytical solutions for measuring single or multiple analytes in fluids. Herein, ARCADIA serves as official service provider and/or CRO for several companies specialized in bioanalytical assays.

Biomarker Discovery Using Olink-Targeted Proteomics

With our Olink proteomics platform we can offer a high capacity analysis service for comprehensive protein biomarker analyses using many different disease and biological process-focused panels. Using a minimal sample volume, this provides quantifiable results with high throughput, exceptional sensitivity and specificity, with coverage across a broad dynamic range.

To facilitate researchers in biomarker validation, ARCADIA offers a ISO9001 work environment with a wide range of cutting-edge technology platforms such as MSD multi-array technology, Luminex xMAP technology, Ella Next Generation multi-ELISA technology, all suitable for measuring several biomarkers simultaneously in low sample volumes with assay performance at ultra-sensitive pg/ml or fg/ml range. The combination with state-of-the-art diagnostic analyzers (Siemens Atellica, Abbott ARCHITECT, Roche Cobas) within the clinical routine laboratory (ISO15189) allows us to offer tailored analysis services suiting your specific requirements and needs and reducing sample volumes and costs to a minimum.

For more information, please visit the ARCADIA website.



GENDX

GenDx is a science-based company, specialized in molecular diagnostic solutions for matching transplant patients with donors, and for monitoring transplant success. GenDx offers excellent diagnostic tools to advance the field of transplantation worldwide. As a spin-off from the UMCU, our head office is located on the Utrecht Science Park. With an office in Chicago, IL, USA, and a network of 60 distributors, our products and services are used worldwide.

At GenDx, we are focused on the development, production, and sales of innovative reagents and analysis software for sequencing-based HLA typing and chimerism monitoring. Our cutting-edge products are combined with excellent customer support and education in order to provide the best possible service to the laboratories that use our products.

Next to being a pioneer in product development, GenDx is renowned for providing excellent support, demonstrations, and highly valued education activities like webinars, user group meetings and courses, with the aim to share knowledge and to train the field. Thanks to our in-house expertise, we also offer custom laboratory services for specific tissue typing requests by other laboratories and clinical research organizations.

With a highly educated and motivated team of approximately 60 people, we believe that we ultimately contribute to the quality of life of transplant patients worldwide.

For more information, please visit the GenDX website.

GENDX

Our mission is to improve the quality of life and survival of transplant patients

JULIUS CLINICAL

Julius Clinical was founded as a spin-off from the University Medical Centre Utrecht (UMC Utrecht), the Netherlands. We manage global clinical drug trials that will have a major impact on medicine and make a real difference to people's lives around the world. Our unique combination of scientific leadership and operational excellence ensures that the data obtained from the trials is of the highest quality.

Our internationally recognized academic leaders are actively involved in the design, conduct, and interpretation of clinical trials. This scientific expertise and credibility combined with operational expertise, means that our company is uniquely equipped to assist in providing answers for today's clinical drug development challenges.

Due to the way we are structured and our willingness to look at innovative solutions, we have the ability and flexibility to react to changes in requirements very quickly. We are able to look beyond process to address the real issues that matter and work with our site networks and clinical research experts to provide tailor-made, cost effective proposals addressing the needs for Biotech and Pharmaceutical companies, as well as Investigators sponsoring a trial.

Activities

We specialize in distinct therapeutic areas including cardiovascular, central nervous system, infectious diseases, metabolic diseases and oncology and can offer a full service proposal or separate functional services as required. Our expertise ranges from early phase to post registration, and we advocate use of RWE if this enhances the outcome of the project.

Our collaborative approach has led to many long-standing relationships with a reputed client base.

For more information, please visit the Julius Clinical website.

Julius Clinical

JULIUS SUPPORT FOR RESEARCH AND CLINICAL TRIALS

UMCU

Julius Support for Research & Trials has been set up to assist researchers with the design, conduct, data management, analysis and reporting of medical research. This ranges from drug research, to diagnostic and prognostic test and biomarker research, to etiologic, bioinformatics, decision support, and healthcare innovation research.

Our support includes primary studies and meta analytical studies, conducted in primary-, secondary- or tertiary care or in the public health setting. The support can be called for during the study conception, grant application or innovation phase, during the phase of protocol writing, data collection or data analysis, or during the reporting and dissemination phase.

Services

We provide this support for all types of clinical research, in all care settings, including:

- Clinical trials;
- Research on causes of diseases;
- Research on the clinical value of (for example) diagnostic and prognostic tests, prediction models and decision support tools, E-health and self-monitoring tools, medical devices and technology, and other healthcare innovations;
- Systematic reviews and meta-analysis;
- Access to primary care networks with more than 250,000 patients and various other cohorts;
- Access to over 1,000 clinical sites globally;
- Scientific support to grant proposals (e.g. for the EU).

We work in close collaboration with Julius Clinical (p. 129), a contract research organization and with Cochrane Netherlands, a formal center of the international Cochrane Collaboration.

For more information, please visit the Julius Support website.

LABORATORY FOR MEDICAL MICROBIOLOGICAL

UMCU

The department of Medical Microbiology is responsible for the diagnosis of infectious diseases (bacteriology, virology, serology, parasitology and mycology) and infection prevention at UMC Utrecht.

In addition, all kinds of trials are done in which microbiological diagnostics need to be performed, both viral and bacteriological.

Services

Facilities are available to grow bacteriological and viral strains and perform molecular analyses. We have specific expertise in the field of antimicrobial resistance and perform both molecular and phenotypic assays to determine resistance to bacteria as well as viruses. We have several clinical strains of viruses and bacteria for research purposes.

We deploy next-generation sequencing techniques in bacteriology and virology and are in the final stage of setting up a pipeline for microbiome research.

For more information, please visit the Medical Microbiology Laboratory Facility website.

NUTRITIONAL CLINICAL RESEARCH UNIT

Health, knowledge and innovation are key to the research and development services at Utrecht Science Park. The Nutrition Clinical Research Unit (NCRU) is where we investigate how nutrition works in the human body by conducting high-quality clinical research. The NCRU is an exclusive facility where we conduct high-standard clinical studies investigating the role of specific nutrients and nutrient combinations within the human body, strengthening our ability to develop high-quality, innovative products and processes. Complementing the extensive research capabilities on the Utrecht Science Park, the aim of the facility is to contribute to nutrition innovation by providing greater insight into how nutrition affects health.

The NCRU is designed to conduct a wide variety of study types, including investigation of bio-equivalence and bioavailability, mechanism of action, and glycemic index, as well as pilot studies using questionnaires, devices and biomarkers.

The facility also allows us to collect and evaluate different sample types, including blood, urine, feces and saliva, as well as anthropometric data.

Participant safety is paramount

Our teams of highly skilled researchers and qualified medical staff carry out research with both healthy volunteers and specific target populations, giving us important insights that drive and steer our product innovations. Participant safety is paramount; we work according to strict standard procedures of our Quality Management System, which is fully compliant with ICH-GCP as well as national and international regulations.

In 2017, the NCRU quality system received a positive outcome of the first ISO 9001:2015 surveillance audit. The UMC Utrecht, Utrecht University and Nutricia Research jointly invested in the development of the NCRU. In principle, the NCRU is open to all scientists from Utrecht University, the UMC Utrecht and their partners.

For more information, please visit the NCRU website.

NCRU

Cu
Copper
63.546
Zn
Zinc
65.39
Ga
Gallium
69.723
Cd
Cadmium
112.411
In
Indium
114.818
Al
Aluminium
26.981538
Si
Silicon
28.0855
Sb
Antimony
121.760
Te
Tellurium
127.60
Bi
Bismuth
208.98038
Ho
Holmium
Einsteinium
FeCl3
conc. HNO3
dil HNO3
CH3COOH
SOCl2
PCl5
COOH
CH3
purple
OH
NO2

PHARMACY LABORATORY
UMCU

Services
The pharmacy laboratory of the UMC Utrecht performs analyses for clinical pharmacology and toxicology for patient care and clinical research. In addition, quality control is performed on (in-house) pharmaceutical preparations including shelf life tests and formulation tests as well as quality control of the raw materials. There is a whole range of routine analyses that take place at least once a year. Most methods are based on LC-MS/MS technology.

Research
The central research theme of the pharmacy laboratory is to explain, predict and improve the variability of patient response to pharmacological treatment through clinical pharmacology and clinical pharmaco-epidemiological approaches. This theme is inspired from the problems in patient care.

We run over 150 routine lab tests in an ISO15189-accredited environment

Main lines of research:
- Drug innovation in pediatrics;
- Central nervous system pharmaco-epidemiology;
- Biomarkers for drug response;
- Pharmacokinetics of biologicals;
- Immunopharmacology in (hemato)-oncology and rheumatology;
- Adherence assessment using LC-MS/MS technology.

Equipment
The following techniques are used for analysis of patient material: immunoassay, AAS, HPLC/UV-fluorescence, GC, LC-MS/MS technology, UV-spectrophotometry.
For quality control of raw materials and preparations additional techniques are used including IR, titrimetry, TLC, osmolarity and chemical tests.

The pharmacy laboratory at UMC Utrecht is ISO15189-accredited.

For more information, please visit the Pharmacy Laboratory website.

THINC. HEALTHCARE

Promising innovation?

Let's make it work!

THINC. HEALTHCARE

Science as a service

Agile research to prove and improve your healthcare innovation.

THINC. HEALTHCARE

Access to

- Patients
- Test environments
- Scientific expertise
- Healthcare professionals
- Healthcare costs
- Healthcare data

THINC.

THINC. The Healthcare Innovation Center, is part of the UMC Utrecht Julius Center. Our aim is to help innovators in healthcare to evaluate the usability, feasibility, effectivity, and cost effectiveness of their innovations. We work for e.g. medical researchers, start-up companies, SME's and policy makers.

Healthcare is marked by a huge increase in all sorts of (non-drug) innovations. This can either be a medical device, an eHealth application or a new procedure in healthcare. However, not every innovation is a success. Sometimes there is no benefit for patients and/or professionals, or there is no effect on quality of healthcare or the healthcare costs.

Early Health Technology Assessment

Together with the end user, relevant stakeholders and the innovator, we analyze the healthcare innovation at an early stage by using an agile approach for scientific engineering. Our multidisciplinary THINC. team exists of experts in the field of Clinical Epidemiology, Health Technology Assessment (HTA), Self-management, Ethics, Public Health, Nursing Sciences, Primary Care and Implementation.

We have a broad experience with various research designs, have access to scientific data and the clinic where they can evaluate the innovation with the right design in the appropriate context.

For more information, please visit the THINC. website.

THINK
INNOVATION
THINC.
HEALTHCARE

The Healthcare Innovation Center

U-TRIAL
UMCU

In order to develop and implement an innovative clinical trials portfolio in the UMC Utrecht with both scientific and healthcare global impact, the UMCU has established the Utrecht Trial Innovation Alliance initiative (U-TRIAL).

U-TRIAL is designed to strengthen the UMCU's pursuit of ambitious goals in (notably phase 2b, 3 and 4) clinical trials in its six priority fields: Circulatory Health, Brain, Cancer, Infections & Immunity, Regenerative Medicine, and Child Health. In UTRIAL the six UMCU priority fields cooperate closely with Julius Clinical (p. 129) and with external partners, including industry and governmental organizations.

In each of these areas, an experienced trialist will act as a clinical trial facilitator. These trialists are key opinion leaders in their respective field and have access to trial networks and consortia. In addition, a clinical trial methodology group specialized in innovative design, analysis and reporting of trials is created to support the U-TRIAL ambitions. The U-TRIAL trialists and methodologists are keenly interested in working with other parties to enable their trial ideas.

The UMCU strategically invests in U-TRIAL to increase the number of high impact clinical trials with innovative design initiated and/or conducted by the UMC Utrecht. This will include clinical trials sponsored by pharmaceutical companies, investigator initiated and governmental (such as EU or national health institute) funded trials. The results of the clinical trials should translate into tangible effects on patient care.

The head of U-TRIAL, the professor of clinical trial methodology and the Julius Clinical chief scientific officer together with the trial facilitators for each priority field will form the U-TRIAL management team that has the authority and means to achieve the clinical trial goals set by the UMC Utrecht.

U-trial@umcutrecht.nl

An innovative engine for groundbreaking trials

VETERINARY MICROBIOLOGICAL DIAGNOSTIC CENTER

UU

The Veterinary Microbiological Diagnostic Center (VMDC) of the faculty of Veterinary Medicine offers a broad scale of diagnostic assays for veterinary infectious diseases (bacteriology, virology, serology, parasitology and mycology) in animals. We are an important sparring partner for practitioners in the diagnosis and treatment of animals. Next to routine diagnostics on clinical samples, the VMDC leads a national project on the monitoring of zoonotic diseases and antimicrobial resistance in companion animals.

The VMDC is part of the division of Clinical Infectiology that focuses on two main research themes:
1. Antimicrobial and anthelmintic resistance;
2. Studies on zoonotic pathogens.

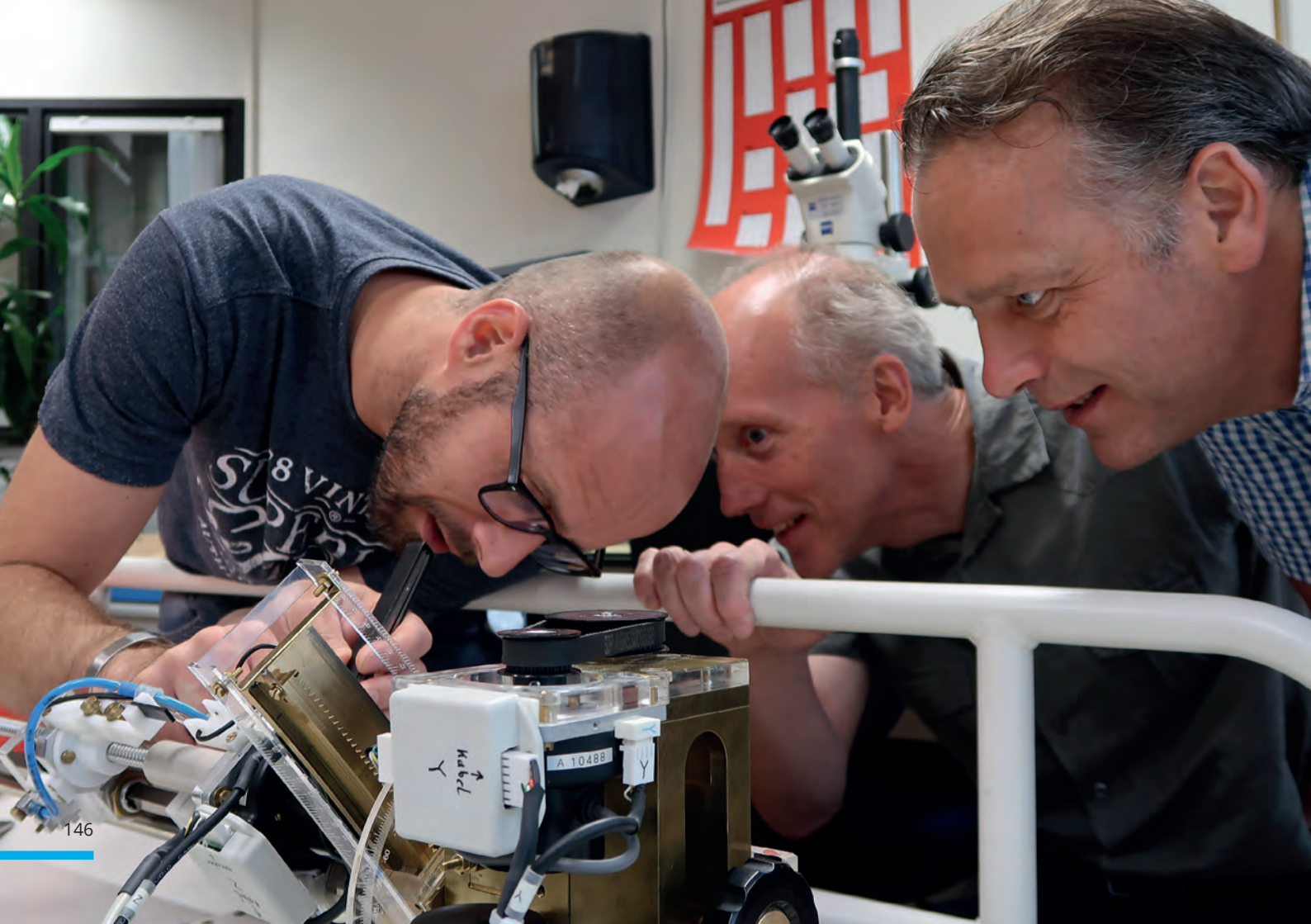
The close interaction between the VMDC and the research group facilitates exchange of expertise and results.

Services

- Routine diagnostics for veterinary practitioners;
- Isolation and identification of bacteria, parasites and fungi;
- Customized research projects for individual parties;
- Training of residents in veterinary microbiology;
- Advice on diagnosis, treatment and prevention of infectious diseases.

For more information, please visit the VMDC website.

FACILITIES FOR TECHNICAL SERVICES AND PROTOTYPING



MEDICAL DEVICE PROTOTYPING FACILITY

UMCU

The Medical Device Prototyping Facility under ISO 13485 certification offers (external) researchers, health care professionals and MedTech startups and external researchers the possibility to translate their concepts into functional demonstrators and even prototypes for clinical use.

Equipment

The infrastructure includes several traditional milling and turning machines as well as Computer Numerical Control (CNC) machines. Also, Computer Aided Manufacturing (CAM) software to translate Computer Aided Designs (CAD) into CNC codes is available and offered as a service. Other services include for example 3D-printing laser cutting and marking of materials, cutting and bending of materials.

Our facilities and dedicated instrument makers operate under an EN ISO 13485:2012 and are certificated to ensure safe product manufacturing and assembly, suitable for clinical investigation in our hospital and partnering institutes.

Access

Together with Pontes Medical (p. 149) and THINC. (p. 139) we assist entrepreneurial researchers and health care professionals as well as (startup) companies to help them build their demonstrator for preclinical investigation or build their medical device prototype and assist in the essential documentation and preparation for clinical evaluation.

For more information, please visit the Medical Device Prototyping Facility website.

Bringing medical device developments to the clinical practice in a safe and efficient manner

PONTES MEDICAL
UMCU

Pontes Medical is a team of innovation managers active at the academic hospitals of UMC Utrecht and Amsterdam UMC. We have developed a method to manage the innovation process from idea to market introduction for medical equipment, implants and devices. In Utrecht, five innovation managers are active and part of the department of medical technology and clinical physics.

Services

Pontes Medical realizes medical devices in collaboration with companies, health care professionals, researchers and investors. When a health care professional, researcher or company has an idea, Pontes medical investigates the clinical, economical, technical and commercial feasibility and builds a partnership with companies and clinicians.

Pontes Medical manages the process of co-creation and co-design with the end users and patients, who both take a pivotal role. We manage the building and testing of prototypes, the development of a business case and establishment of intellectual property. This will lead to a market introduction of a new product by an established company or a new spin off.

Together with experts including THINC. (p. 139), we manage market access analysis such as cost effectiveness, implementation analyses reimbursement analysis. Clinical pilots can be serviced as well. With this approach Pontes medical has brought 12 medical devices from scratch to the medical market.

Mission

The process from idea to market implementation and acceptance is complex. Hence, great ideas that improve health care, making it more efficient, safe and affordable, encounter many hurdles and pitfalls. Many good ideas do not reach the patient and fundamental academic research does not have the impact we aspire. By offering specialized infrastructure, pitfalls and hurdles can be avoided and Pontes Medical improves the chance of innovative successes and boost its impact on health care.

For more information, please visit the Pontes Medical website.

SCIENTIFIC INSTRUMENTATION FACILITIES

UU

The Scientific Instrumentation Facilities serve to develop and produce high-tech equipment and prototype devices to enable your ground-breaking research and/or education goals. The unique combination of highly skilled employees and state-of-the-art equipment make it possible to generate new designs, manufacture products (0-series), build equipment, advise and provide a range of services. We also can service or repair equipment, produce custom parts, and modify existing instrumental installations or equipment.

The Scientific Instrumentation Facilities consist of three specialist groups:

- The Engineering group has specialists in system architecting, mechanical design, optical design, electrical design and (embedded) software & interfaces;
- The Realization group produces custom metal and plastic components using advanced industrial machines. For example 5-axis simultaneously CNC milling, CNC turning, and Electrical Discharge Machining are all operated by specialists and assisted by Computer Aided Manufacturing. In addition to production, we also frequently purchase components to assemble and test;
- The Glass Workshop designs and produces both glass and ceramic parts, using cold and warm processing. Cold processing consists of several conventional techniques and a highly special ultrasonic milling machine. Warm processing of glass is craftsmanship with torches and ovens (e.g. for providing complex glassware setups used in chemical research).

The Scientific Instrumentation Facilities are part of the Faculty of Science of Utrecht University and offer their skills to external parties including other academic institutions, as well as established and start-up companies.

For more information, please visit the Scientific Instrumentation Facilities website.


We aim at expediting emerging biofabrication technologies in areas of regenerative medicine, 3D *in vitro* cell culture models and therapeutic treatment

UTRECHT BIOFABRICATION FACILITY

UU, UMCU

The Utrecht Biofabrication Facility aims at expediting emerging biofabrication technologies in areas of regenerative medicine, 3D *in vitro* cell culture models and therapeutic treatments. It brings together engineers, materials scientists, cell biologists, clinicians and commercial partners to create living 3D laboratory models.

Equipment

Equipment ranges from conventional 3D printing, stereolithography (SLA) and electrospinning equipment to extrusion, direct light projection and volumetric bioprinters, melt electrospinning and writing, as well as converged systems that combine the different technologies in a single printing platform.

Services

We perform a range of different Biofabrication services that include the (co-)development of printing equipment and (tissue) specific bio-inks. The facility and its team are continuously researching new technologies to advance the roadmap of bioprinting and serve researchers with complementary expertise, as well as promoting cross-talk with companies interested in biomaterials, printing hardware and advanced software, engineered tissues and pharmaceutical applications.

Further, we develop 3D *in vitro* models in close collaboration with the Utrecht Advanced *In Vitro* Models Hub (p. 11), e.g., articulating joint, bioartificial kidney and perfusable models to study breast cancer invasion, liver performance and fertilization.

Moreover, we develop regenerative implants, including those for the treatment of cartilage, bone liver and cardiac injury.

For more information, please visit the Utrecht Biofabrication website.

FACILITIES FOR PRODUCTION

CLINICAL TRIAL PHARMACY

UMCU

The Clinical Trial Pharmacy unit of the UMC Utrecht supports annually over 250 clinical trials that involve investigational medicinal products (IMPs). We have wide experience with various types of IMPs, such as classical 'small molecule' drugs, but also advanced therapeutics, such as biologicals and cellular therapy. Our dedicated team is fully GCP certified and our Pharmacy is GMP licensed for the production of IMPs.

Services

IMP handling and storage, randomization and unblinding, support monitor visits and audits, preparation of IMPs, Therapeutic drug monitoring

IMP handling and storage

We store IMPs at standardized conditions in our Pharmacy according to GCP guidelines. Temperature monitoring is fully automated (24/7) and is periodically calibrated to ensure adequate monitoring.

Randomization and unblinding

We can help researchers with randomization (e.g. block randomization and minimization) and have a dedicated storage area for randomization codes. In case of emergency, we have a 24/7 unblinding service available.

Support monitor visits and audits

We have a wide experience with supporting monitors and researchers during their visits and audits. Please contact our team to plan your monitor visit or audit.

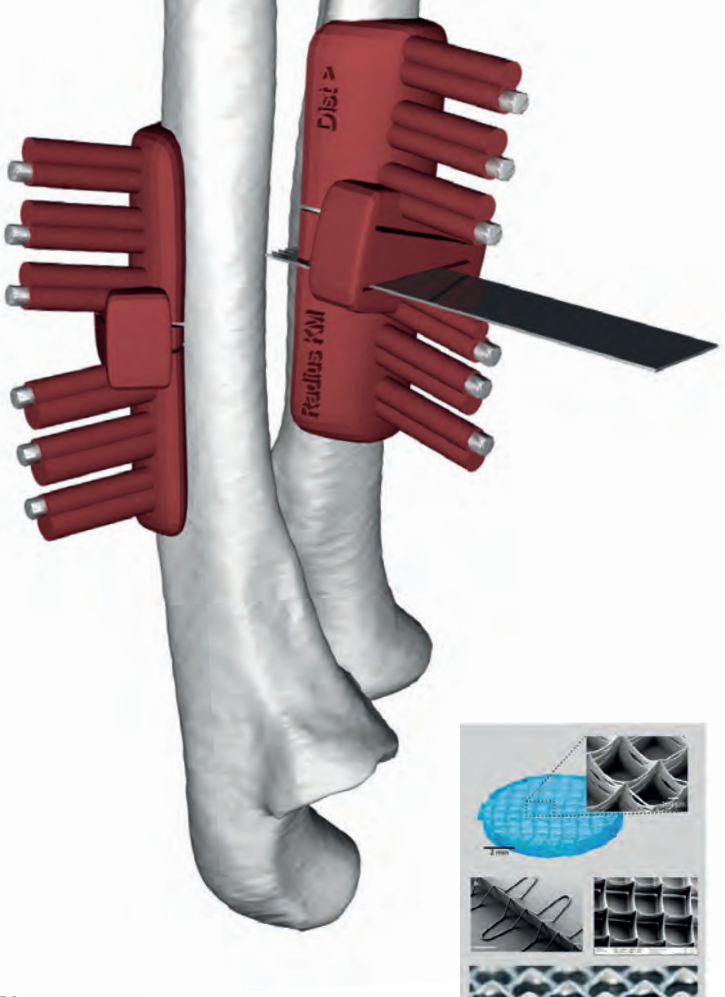
Preparation of IMPs

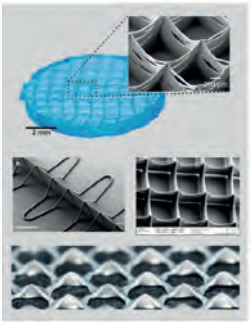
Our Pharmacy is GMP licensed for the preparation of IMPs (including ATMPs). We can therefore support your trial with the production of new IMPs and also have the ability to package and label your IMPs according to GCP / GMP Annex 13.

Therapeutic drug monitoring

We have a large and comprehensive laboratory (CCKL accredited) at our Pharmacy to support your study with therapeutic drug monitoring. A large library of validated tests is already available at our site (Farmalab) and we also have experience in setting up novel drug tests for clinical trial purposes. We can help researchers with bioanalysis and have the skills and knowledge support with pharmacokinetic(-pharmacodynamic) analysis on request.

For more information, please visit the Clinical Trial Pharmacy website.





FIELDLAB 3DMEDICAL

UU, UMCU, HU

Fieldlab 3D Medical is a collaboration initiated by:

- UMC Utrecht: Division of Surgical Specialties & Bio-fabrication Facility;
- HU University of Applied Sciences Utrecht;
- UU: Strategic theme Life Sciences;
- Utrecht Science Park foundation.

Affiliated partners in the collaboration are:

- Pontes Medical (p. 149);
- Technical University Eindhoven;
- Industrial partners.

This collaboration in the medical and technical field increases knowledge and accelerates the development of new medical applications based on 3D technology towards the market. Our multidisciplinary approach can be useful in lower TRL levels towards a proof of concept and in higher TRLs aiming for transfer to industry.

Fieldlab 3D Medical develops solutions for 3D patient-specific cure in surgery. We offer expertise and cooperation in the field of the following 3D Medical strategic themes:

- (Bio-) Fabrication of patient-specific medical devices (tools & implants);
- Digitalization of surgery planning and execution (workflow).

Equipment

- Computer Visualization & Navigation;
- 3D Design & Engineering of patient-specific implants, tooling and aids provided with sensoring functionality;
- Biofabrication: conventional 3D printing, stereolithography (SLA), electrospinning equipment, extrusion, direct light projection and volumetric bioprinting, melt-electrospinning and -writing and converged systems that combine the different technologies in a single printing platform;
- 3D Digital workflow development in surgery;
- Systems Engineering.

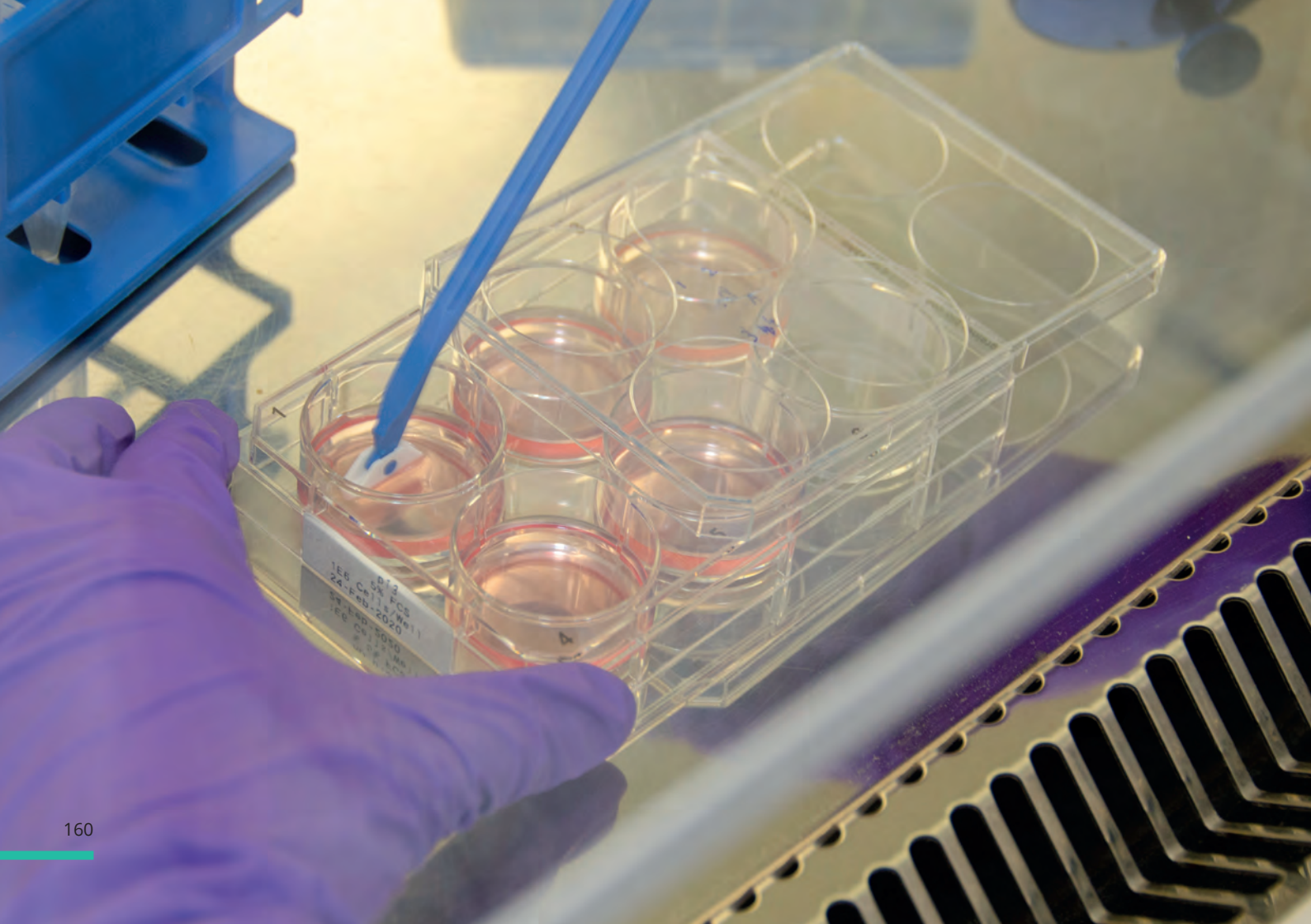
Activity

Fieldlab 3D Medical develops solutions for 3D patient-specific cure in surgery.

Access

We warmly invite interested parties to join the Fieldlab 3DMedical partnership.

For more information, please visit the Fieldlab 3D Medical website.



INTRAVACC

Intravacc is a not-for-profit R&D organization with 100+ years of experience in vaccine development. We develop and optimize vaccines, improve production processes and explore novel vaccine technologies.

Our aim is to substantially reduce risks and costs of vaccine development. Through strategic collaborations with academia, public health organizations (WHO/BMGF), biotech and pharmaceutical companies, we contribute to global health through access to vaccines.

Services

Our in-house expertise enables us to bridge the gap between fundamental research and clinical studies. As a translational institute with BSL2 and GMP facilities, we can offer services in:

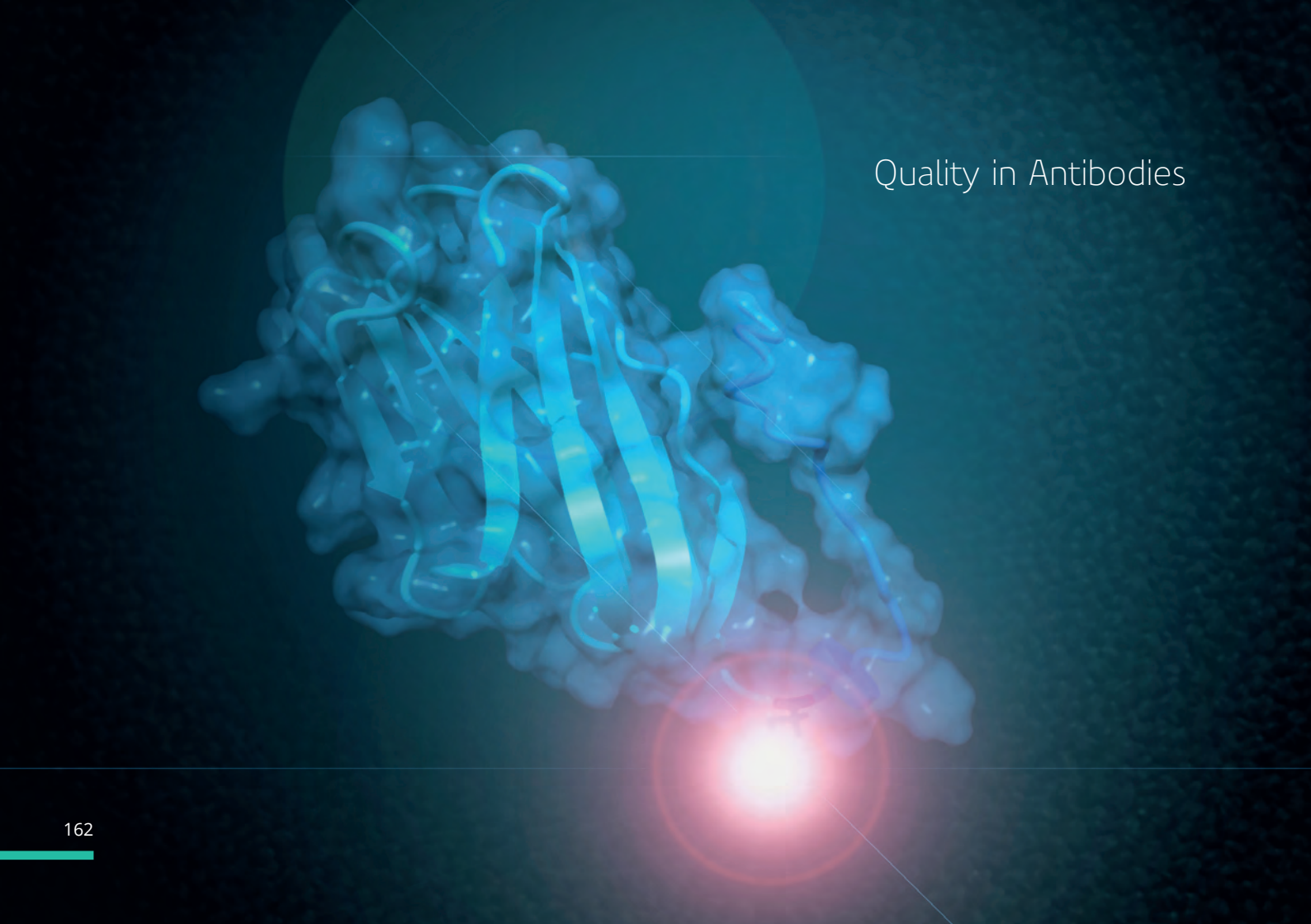
- Process development of vaccines;
- Vaccine formulation;
- Novel adjuvant technologies;
- Analysis and QC;
- *In vivo* immunological evaluation;
- Bacterial, viral and cell seed development and manufacturing;
- Technology transfer.

Intravacc is located at Utrecht Science Park Bilthoven

For more information, please visit the Intravacc website.

intravacc
innovating vaccines

Innovating Vaccines



Quality in Antibodies

QVQ

QVQ aims to work with top academic groups, institutes and industrial partners by delivering custom- made single-domain antibody services, including immunization, library construction, panning selection, screening and production services. QVQ also develops a portfolio of top-quality and validated imaging and research agents that are based on directionally conjugated single-domain antibodies (sdAbs or VHH).

VHH

Animals from the Camelidae family (i.e. camels, llamas and alpacas) contain a particular class of antibodies that are devoid of light chains. These so-called heavy chain-only antibodies (HcAbs) undergo normal selection and maturation by the animals' immune system. For this reason, HcAbs and their variable domains (VHH, sdAb or also known as Nanobody), can exhibit high affinities (nM range) and overall stability.

QVQ provides expertise in each step of VHH technology, including immunization, phage-display selection and screening, production, molecular modelling and genetic optimization. QVQ offers customized projects in which lead panels of VHH are developed in close collaboration with customers. As such, experiments are always adjusted to the project needs. In addition, QVQ offers a considerable number of high quality, off-the-shelf VHHs that target molecules related to cancer, age-related diseases and infectious diseases.

Lead Development Services:
- Customized VHH Research;
- Immunization And Immune Response;
- Phage Library Construction;
- Phage Display Panning;
- VHH Binding, Epitope Binning, Competition;
- Bio-Informatics.

Recombinant Protein Services:
- Validated, Recombinant VHH Protein;
- Mono- and Multivalent Constructs;
- Production in *E.coli* and *S.cerevisiae*;
- Affinity Purification;
- VHH in PBS or Freeze Dried;
- Proprietary C-terminal C-Direct Tag;
- Directional Conjugation To: Biotin, Fluorescent Dyes, Chelators.

For more information, please visit the QVQ website.

U-PROTEIN EXPRESS

U-Protein Express is a dedicated service provider that offers fast and large-scale production of (mammalian) recombinant proteins and antibodies for research and pre-clinical applications. We have many years of experience and produced over 1000 different recombinant antibodies and proteins for biotech, pharma and academic partners. With a success rate of over 90%, our technology allows the production of even your most difficult-to-express proteins.

Fully post-translational modified mammalian proteins are produced via our r-PEx transient protein production platform. The r-PEx production platform consists of serum free suspension growing HEK and CHO cells which are transiently transfected. For each recombinant protein to be expressed, a large array of expression vectors is available. This allows, for example, choice of nature and position of the purification tag.

Antibody-variable domains can be seamlessly ligated in antibody expression vectors to generate each antibody class. We are able to provide gram amounts of purified antibodies with low levels of endotoxin in 4 to 6 weeks.

Our r-PEx platform has a modular architecture that allows several transfection and delivery options to match your needs. In addition, our platform is highly suitable for parallel production, saving you both time and money.

Services

- Transient mammalian recombinant protein and antibody production in HEK293E, HEK293ES (simple N-Linked glycosylation) and CHO cells;
- Protein purification and characterization;
- Sale of recombinant proteins and antibodies via our webshop;
- Through our sister company Immunoprecise, we provide end-to-end protein services, supporting the next-generation of antibody therapeutics.

For more information, please visit the U-Protein Express website.

VETERINARY PHARMACY FACILITY

UU

The Veterinary Pharmacy of the faculty of Veterinary Medicine Utrecht University offers all facilities to deliver and prepare prescribed medication for the treatment of animals. The pharmacy has a production facility on GMP-level for the production of medication that is not available as registered drug. In this facility, a B-level room is available for aseptic production of stock preparations. Next to the B-level room, there is a biohazard cabinet available to prepare cytostatic and other high-risk preparations.

Besides the production of standardized (stock) medication, the pharmacy also produces individualized medication for animals or for research purposes. Our pharmacists are sparring partners to both veterinary practitioners as to researchers of other faculties and other facilities.

Services

- Production of high-risk (cytostatic) and aseptic preparations;
- Production of non-registered medication;
- Production of customized medication;
- Advice on medicational treatments and the use of drugs for research purposes;
- Education and training of residents in veterinary practitioners and pharmacists.

For more information, please visit the Veterinary Pharmacy Facility website.

The Veterinary Pharmacy has a GMP–level production facility


DATA
MANAGEMENT

3Rs-Center: Reduction, Refinement and Replacement of animal experiments

3RS-CENTER

UU, UMCU

The 3Rs-Center Utrecht Life Sciences stimulates the development, acceptance and implementation of methods which can replace, reduce and refine (3Rs) animal experiments. The Center facilitates the 3Rs in education and animal research in many ways, by providing information, advice and free access to the following databases.
For more information, please visit the website.

Interspecies Database

The Interspecies Database provides insight into physiological, anatomical and biochemical parameters of different animal species and humans. With the database, researchers can choose the best animal model for a particular study. This could lead to a reduction in the number of experimental animals. All available data originates from peer-reviewed literature.
interspeciesinfo.com

Humane Endpoints Database

The Humane Endpoints Database provides information and training modules on how to recognize and apply humane endpoints in laboratory animals. Subsequently, unnecessary pain and distress in the animals can be prevented. Therefore, the website contributes to refinement of animal experiments. humane-endpoints.info

FCS-free Database

Fetal calf serum (FCS) is a common supplement of animal cell culture media. FCS is harvested from bovine fetuses taken from pregnant cows during slaughter. The use of culture media containing FCS raises considerable moral and scientific concerns. The FCS-free Database allows researchers to identify serum-free media for specific cell types and to exchange information on the applicability of each product. This website will contribute to replacement of animals used for research and to the reproducibility of *in vitro* methods.
fcs-free.org

Enabling data-intensive pediatric oncology research

BIG DATA CORE FACILITY

PRINCESS MÁXIMA CENTER FOR PEDIATRIC ONCOLOGY

The Big Data Core coordinates activities concerning data stewardship and data infrastructures and provides bioinformatics analyses for the Princess Máxima Center biobank and diagnostic lab.

Services

We coordinate data stewardship activities for preclinical research within the Princess Máxima Center for pediatric oncology. These include providing data management plans (DMPs) for research projects, advising on compliancy of data collections regarding research data management policies and alignment of DMPs with FAIR data principles.

In collaboration with IT, a platform has been setup to harmonize research data structures and share research data for data intensive research. The platform has a clear separation between the clinical and research domain through a pseudonymization layer.

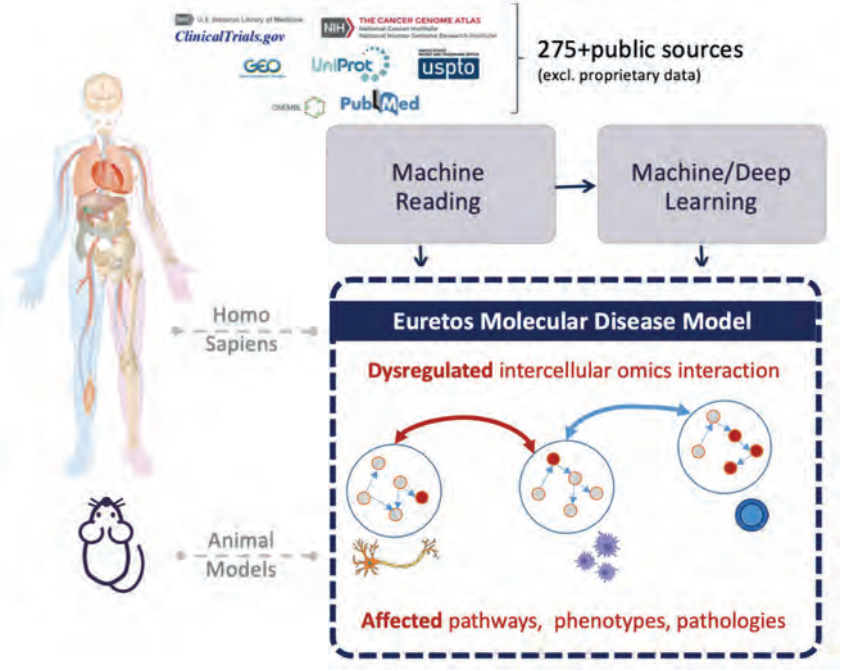
We provide standardized analyses for biobank whole-exome sequencing (WES), whole-genome sequencing and RNA-seq samples. The activities not only involve providing standardized analyses for detecting somatic variants (SNVs, indels, CNVs and SVs) in tumor and organoid samples, but also include setting up and coordinating the entire infrastructure for genome biobanking data. In collaboration with the diagnostic lab, we also provide WES and RNA-seq based diagnostics for all patients within the Princess Máxima Center.

Access

All researchers within the Princess Máxima Center have access to our expertise and we collaborate within the larger Utrecht Bioinformatics Center community. External projects are allowed during idle times at the discretion of supervising Principle Investigator.

For more information, please visit the Big Data Core Facility website.

Enabling a systems biology approach to discovery and validation of targets, biomarkers and indications



EURETOS AI PLATFORM

Euretos provides AI-driven contract research services and cloud access to the Euretos AI Platform to enable preclinical discovery and clinical validation of targets, biomarkers and indications.

The Euretos AI platform uses Machine Reading to semantically integrate over 275 different public life sciences data and textual sources to provide the largest knowledge base where multi omics data is interlinked to literature, patents, experimental and clinical evidence. Machine & Deep Learning is used to create molecular disease models where target perturbations are simulated to assess the impact on the overall molecular disease profile.

These unique assets enable (pre)clinical researchers to take a translational systems biology approach; connecting multi-omics interactions, through cell-type involvement, to downstream pathways, phenotypes and disease pathologies.

Services

Our team of translational biologists, bio-informaticians and data scientists provides an AI-driven consulting service to support our pharmaceutical and biotech customers to leverage the Euretos knowledge base and molecular disease modeling in target and marker discovery, indication expansion and analysis of clinically observed toxicities, drug response and patient stratification. In many projects, customers bring in private data sets.

Access

Euretos gives individual researchers access to its unique, machine-read knowledge base through the Euretos AI platform (https://ask.euretos.com). A user license provides access to a suite of applications such as Search, Target Discovery and Gene Evaluation Workflows, Analytics and Relation Map.

For more information, please visit the Euretos website.

EURETOS

HIGH PERFORMANCE COMPUTING FACILITY

UU

The High Performance Computing (HPC) facility, as part of the Utrecht Bioinformatics Center (UBC) offers extensive computing possibilities for all researchers of the Utrecht Science Park. From a large UU starting grant, the HPC has grown with the support of the community to the largest cluster on the campus. This allows both small and very large research groups to run their computing. There are over 50 principal investigator groups and 750 users registered. There are generally over 50 different users on a daily basis. These groups vary between research disciplines, from Life Sciences to Linguistics.

Your partner for high performance computing demands

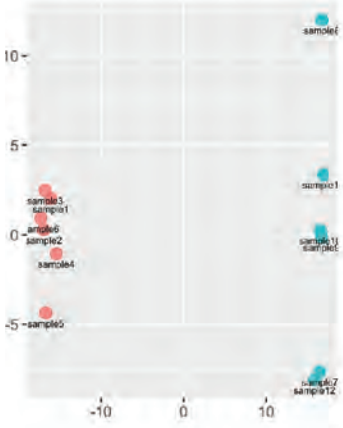
Activity

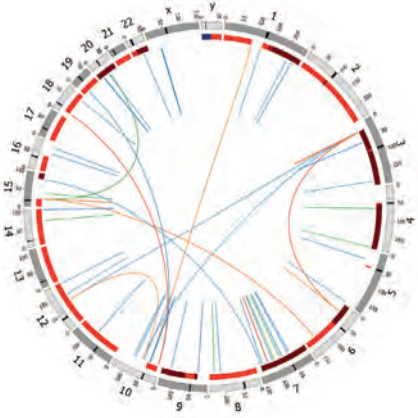
- The cluster consists of a collection of servers (>2000 CPU cores, 30 GPUs, 20TB RAM), 1.7 PB high performance storages and 1.1 PB archive storage running on CentOS Linux;
- It is controlled by the SLURM batch-wise queuing system with a few head nodes and data transfer nodes;
- Data storage is separated between PI groups;
- We provide a central GUIX software management system, notebook services and container support;
- Two full-time staff members are available to maintain, innovate and support the essential research resource.

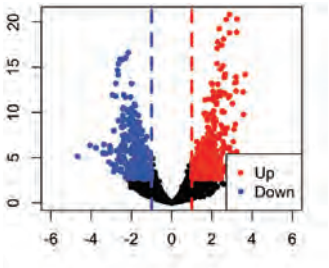
Access

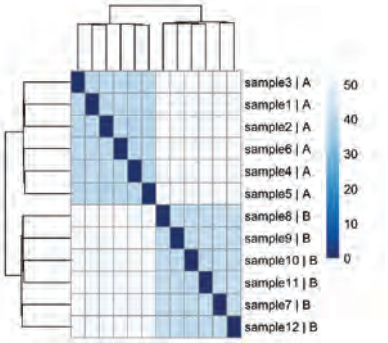
To ensure future sustainability, users can participate after a free trial by buying virtual shares to cover their compute demand. You are welcome to discuss the options for your computing needs.

For more information, please visit the High Performance Computing Facility website.









The place for your bioinformatics analyses!

UTRECHT BIOINFORMATICS EXPERTISE CORE

UMCU

The Utrecht Bioinformatics Expertise Core (UBEC) is a team of bioinformaticians that can assist in routine bioinformatics analyses. They work together with the Utrecht Sequencing facility (USEQ; p. 59) and can perform data analyses. This can be analyses of Next-Generation Sequencing (NGS) data such as mapping, variant calling, RNA digital expression profiling or machine-learning problems. We can also work together with you on a custom project.

Activity

Next to bioinformatics analyses, we also provide data stewardship services through education and courses. We can assist in setting up data management plans or help to make your data FAIR (Findable, Accessibly, Interoperable, Reusable). You can also request support for uploading your data to the European Genome-Phenome Archive (EGA; ebi.ac.uk/ega/home), as well as using the UBEC's Data Access Committee (DAC) for the EGA to administrate your data's access control.

Services

- **Outsourcing** services for taking over routine and standardized data analyses and data stewardship;
- **Helpdesk** and support services on bioinformatics and compute questions;
- **Consulting** on advanced data analytics, high-performance computing and data stewardship;
- **Grant application support** for data analytics and data stewardship;
- **Harmonizing** bioinformatics expertise between researchers, especially between embedded bioinformaticians, by hosting regular, topical, bioinformatics meetings as well as alignment of bioinformatics projects to increase productivity;
- **Innovation** of the in-house bioinformatics expertise and introduction of new analysis tools and methods;
- **Training on bioinformatics, data analytics and data stewardship** in BSc and MSc programs;
- **High Performance Compute** (HPC; ubc.uu.nl) facility technical and scientific coordination.

For more information, please visit the UBEC website.

Your partner for combining clinical diagnostics and research

UTRECHT PATIENT ORIENTED DATABASE

UMCU

Database

Diagnostic algorithms and clinical research depend on proper identification and characterization of patient populations. The UPOD database is a unique relational database collecting and combining clinical characteristics, medication and laboratory measurements since 2000. It encompasses data from more than 600,000 individuals and over 121,000,000 laboratory results (including pediatric patients). UPOD is operated by the Central Diagnostic Laboratory of the UMC Utrecht.

Services

Requests for data are handled by a multidisciplinary team and reviewed to comply with institutional ethical standards. The multidisciplinary team also provides competent expert advice on data analysis including data science and epidemiology support and clinical chemistry and pharmacology expertise.

UPOD also includes one-of-a-kind background data on blood cell characteristics that are measured during routine clinical hematology analysis. These data comprise more than 70 additional parameters not reported in clinical routine and have been shown to provide highly predictive outcome markers in various diseases. Raw hematology analyzer files are also available upon request from over 2,000,000 measurements for further in-depth analysis.

Paramaters

Selection of parameters included in UPOD: Clinical chemistry, Hematology, Medication, ICD codes, Radiology, Pathology, Procedures, Diagnosis, Patient characteristics, Length of stay, FCS files, ICU, NICU, PICU, Cohorts, Transfusion.

For more information, please visit the UPOD website.

Access to high quality data on brain and behavioral development

YOUTH COHORT STUDY

UU, UMCU

All children develop differently, learning and growing at their own pace. To offer each of them optimal chances in life, we need to understand what happens as they grow up.

YOUth is a large-scale, longitudinal cohort study, following children in their behavioral and brain development from pregnancy until early adulthood. With a specific focus on the development of social competence and behavioral control, we take the role of brain development as a focal point. Thousands of babies and children from Utrecht and its surrounding areas are being included in two different age groups and followed at regular intervals.

Through YOUth, we do not only collect data and knowledge: we share our data, knowledge and facilities. We aim to be a trailblazer for open science and offer you:
1. an advanced digital infrastructure for data sharing;
2. possibilities to conduct 'add-on' studies;
3. employ YOUth's expertise and facilities.

We produce high quality data that are sustainable and FAIR (Findable, Accessible, Interoperable and Reusable), while safeguarding the privacy of our participants.

The YOUth data set includes 3D-ultrasound sweeps of the fetal brain, eye-tracking, EEG, (f)MRI, computer tasks, cognitive measurements and parent-child observations. YOUth also collects a broad range of questionnaires on behavior, personality, health, lifestyle, parenting, child development, use of (social) media and more. In addition, we collect biomaterials, including (umbilical) blood samples, buccal swabs, saliva and hair samples.

YOUth is an initiative of Utrecht University and UMC Utrecht, and is part of the research theme Dynamics of YOUth (p. 13) of Utrecht University and UMC Utrecht Brain Center.

For more information, please visit the YOUth Cohort website.

We aim to be a trailblazer for FAIR, safe and open data


GENERAL SERVICES

We work with you on excellent research with optimal animal welfare

ANIMAL WELFARE BODY UTRECHT

UU, UMCU

At the Animal Welfare Body Utrecht (Instantie voor Dierwelzijn), we offer support and advice for optimizing research that involves animal experiments. Together with you, we aim for excellent quality of research with optimal animal welfare. This also includes the 3R's (Replacement, Reduction, Refinement) and innovations for animal-free science.

Activity

For researchers who want to apply for a project license involving animals, we offer an advisory and fine-tuning process.

For researchers, biotechnicians, and animal caretakers, we offer a sounding board for any questions about compliance, education (being qualified and competent for working with animals), animal welfare, processes, policies, and licenses.

We bring people together and encourage them to communicate, to build a culture of care, to keep working on improvement, and to share knowledge.

Services

- Advice and fine-tuning for researchers on conducting animal studies and/or applying for an animal research project license;
- Advice on animal welfare during acquisition, accommodation, and care of animals, and on procedures;
- Information visits to research groups and education teams;
- Extensive website with steps to take, legislation, codes of practice, local policy, amongst other topics;
- Advice and support if you want to communicate with the public about animal research;
- Audits to monitor animal welfare and quality of research, with extensive feedback;
- Technical and ethical sounding board for anyone working with animals or thinking about it
- Help in the search for the right partners concerning animal research and the 3Rs.

For more information, please visit the Animal Welfare Body website.

DATA AND KNOWLEDGE HUB HEALTHY URBAN LIVING

UU

How do you make an urban environment livable and healthy? And how do you combine data and knowledge from public organizations with the innovative entrepreneurial power of companies and the experiences and behavior of residents?

The Data and Knowledge Hub Healthy Urban Living is an independent and open platform of public and private organizations. We work together with residents on solutions for a healthy urban living environment. The organizations within the hub develop scientific, data-driven concepts and measures: evidence-based products and services that have a positive effect on the health of everyone who lives, works or recreates in an urban environment. Now and in the future.

Utrecht University, the National Institute for Public Health and the Environment (RIVM) and Economic Board Utrecht are the founding partners of the hub. In the meantime several Dutch public and private organizations joined this hub to make use of the data and knowledge of the platform.

For more information, please visit the Data and Knowledge Hub website.

ELEVATE

Elevate Health provides evidence-based learning solutions for businesses and organizations in health and life sciences. Our aim is to train professionals across the globe in health and life sciences, to support high quality health research capacity building and to reduce the differences in standards of medical care between countries.

Elevate consists of a team of passionate online learning experts, including instructional designers, media experts and project managers. As educational specialists, the experts of Elevate have insights into the needs of trainers and moderators when it comes to teaching online. Do you need a learning solution for your LSH business or organization or would you like to learn more about our online courses? Let's talk!

Your academic partner in online learning

Services

- Academic curriculum: Elevate offers a wide array of accredited, academic courses, in close cooperation with renowned academic partners, through an online learning platform;
- Tailor-made, online and blended training programs: Elevate handles the design, development, teaching and moderation, in close collaboration with our content partners;
- Educational consultancy: Elevate advises on all types of issues related to offering e-learning, including strategic-, didactic- and technical issues;
- Implementation and exploitation of training: Elevate makes use of educational expertise and offers the most innovative tools for dissemination;
- Online and blended train-the-trainer programs: Elevate provides state-of-the-art, proven solutions including e-modules, e-zines, knowledge clips and MOOCs;
- Business models and sustainability plans: Elevate takes into account the business and sustainability aspects during and after the development of learning solutions.

For more information, please visit the ELEVATE website.

elevate

INNOVATIONLAB LIFE SCIENCES & CHEMISTRY

UU, HU

The InnovationLab Life Science & Chemistry is an open learning community accommodated by HU University of Applied Sciences in collaboration with Utrecht University. To students and experts, it offers lab facilities for cell biology, biochemistry, microbiology, analytical chemistry, organic and polymer chemistry, (bio-) chemical engineering and big data analysis. In the InnovationLab, startups, SME's and corporates can have access to infrastructure, expertise and talents to co-develop new applications.

Our Expertise in Life Sciences

Development of new 3R methods. We develop new approaches to replace, reduce and refine animal experiments; *in silico* and *in vitro* models are being developed to test safety and efficacy of substances. For instance, sophisticated cell-, organoid- and tissue culture systems, *C. Elegans* and humane exercise tests have been developed and are ready for use.

Immunotoxicology. Immune modulation by drugs, feed and food compounds and environmental pollution plays an important role in health and disease. This research area focuses on the development of new analytics in complex matrices and diagnostic markers, particularly in the area of gastrointestinal diseases.

Our Expertise in Chemistry and Chemical engineering

Gaining efficiency in sustainable synthesis and production. New methods for biobased production of compounds are being developed. Screening micro-organisms for particular applications or transferring batch production into a continuous production flow are some examples.

Circular management of waste and raw materials. Circular management of water and waste in the urban region is a central theme in the research. Using waste streams as nutritional source in fermentation or finding new applications for biobased raw materials and waste streams are topics of investigations.

For more information, please visit the InnovationLab website.

UTRECHT SCIENCE PARK
INNOVATIONLAB
LIFE SCIENCES &
CHEMISTRY

INSTITUTE FOR RISK ASSESSMENT SCIENCES

UU

The Institute for Risk Assessment Sciences (IRAS) is a partnership between the Faculties of Medicine, Veterinary Medicine and Science, where approximately 130 staff members, among whom some 50 PhD fellows, are engaged in world class environmental health scientific research and education.

The research at IRAS is conducted in three domains: environmental epidemiology, toxicology, and veterinary public health. Our research program is composed of experts in exposure science, toxicology, molecular biology, epidemiology, and veterinary and human medicine.

Together we are generating critical insights in how the environment is affecting the health of humans and animals. We do so by combining observational studies with mechanistic insights obtained from experimental studies. The ultimate goal of the program is to translate these insights into the development of effective prevention strategies to improve the health of animal and human populations.

For more information, please visit the IRAS website.

Impact of chemical and micro-organisms on animal and human health

TPI UTRECHT

UU, UMCU, HU

TPI Utrecht (Transitie Proefdiervrije Innovatie Utrecht / Transition to Animal-free Innovation Utrecht) stimulates animal-free innovations and research methods that are relevant for human and animal health and safety. We offer advice and our extensive network to boost animal-free science. Our group consists of scientists and other professionals with relevant knowledge and experience.

We help the research and education community to make the transition into animal-free science and we collect and expose inspiring showcases.

Now is the time to nudge the movement towards animal-free innovations

Services

- Helpdesk that:
  - Answers your questions concerning animal-free innovations in science;
  - Provides information on research grants concerning animal-free innovations;
  - Gives advice on disseminating your innovative animal-free research;
  - Provides help to submit an inspiring video pitch to the national platform tpi.tv;
- Tips and tricks for integrating animal-free innovations into educational programs;
- Helpathons to explore and find animal-free solutions: multi-disciplinary creative meetings with patients, health professionals, researchers, funding agencies, advisory committees and policy makers;
- Showcases (including yours) on our website.

Please contact us if you have any suggestions or questions concerning animal-free solutions for research and education.

For more information, please visit the TPI Utrecht website.

Enabling access to affordable bio therapeutics in Low-and Middle Income Countries by business associations

UTRECHT CENTER FOR AFFORDABLE BIOTHERAPEUTICS

UU

UCAB is a non-profit foundation and is a result of a collaboration between Utrecht University and the World Health Organization. UCAB aims to facilitate the development and accessibility of safe, effective and affordable biotherapeutics in low and middle income countries (LMICs). The focus is on biotherapeutics with the greatest impact on public health in LMICs, which are preferably included in the Essential Medicines List (EML). UCAB's strategy is to initiate the formation of business associations between biotherapeutic manufacturers.

The business associations share the development technology for the biotherapeutics and build a shared dossier for the European Medicines Agency (EMA) that forms the basis of marketing authorization applications in their territories. In this way, development costs are reduced while maintaining high quality. UCAB provides services in guiding the manufacturers towards the required information and supporting them with generating safety and efficacy data and preparing information for the marketing authorization application.

UCAB can serve as a link to collaborate with the scientific and business partners at the Utrecht Science Park for laboratory, validation or manufacturing services such as cell line development, drug substance analysis, *in vitro* services or clinical services at the Utrecht Science Park. As a 'broker', UCAB initiates the business associations and formalizes these associations in a collaboration agreement in order to ensure affordable prices for and market access of effective and safe biotherapeutics to LMICs.

For more information, please visit the UCAB website.


hello
Hi there!

UTRECHT CENTER FOR GAME RESEARCH

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How are people motivated to eat healthily? How are citizens involved in making decisions about their city? Such societal issues are far-reaching and urgent, but it is challenging to make people active, and to keep them engaged. Games have the potential to contribute to these and other grand societal issues. Games are designed experiences, players learn by doing, taking decisions and experiencing consequences in a safe and stimulating environment.

It is our mission to employ games to help solving large societal challenges. Games are pre-eminently suitable to inform, motivate, appeal to emotion, and influence behavior. For these purposes, games are better suited than other types of media.

The Utrecht Center for Game Research provides the interdisciplinary expertise that is necessary for top level research into developing and studying games: game mechanics, technologies, player-game interaction, as well as the context.

We achieve high-quality research results through our interdisciplinary collaboration. We combine knowledge about games, technology, persuasion to change attitude and behavior, learning processes and design. The necessary expertise is provided by our research groups from sociology, psychology, media studies, computer science, education, medicine, etc. All faculties of Utrecht University are involved.

For more information, please visit the Center for Game Research website.

GAME STUDIO 253GAMES

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253Games is the game design and development studio of the Center for Game Research of Utrecht University. It develops games for learning and research purposes for clients within UU. The design and development of the games is done by students at Utrecht University, supervised by lecturers and researchers. The projects are implemented in coordination with Educate-IT. We frequently collaborate with the Grafisch Lyceum Utrecht (GLU), and the Hogeschool voor de Kunsten Utrecht (HKU) for the graphic art design.

253Games works on a projects basis. Each project is defined by a project description stating the overall idea of the game, the main elements of the game, the stakeholders, and the size of the project in terms of number of hours and number of students assistants. The studio has a coordinator who holds consultations with the clients, acquires students, handles contracts, and supervises running projects.

For more information, please visit the Game Studio 253Games website.

MOTION CAPTURE LAB

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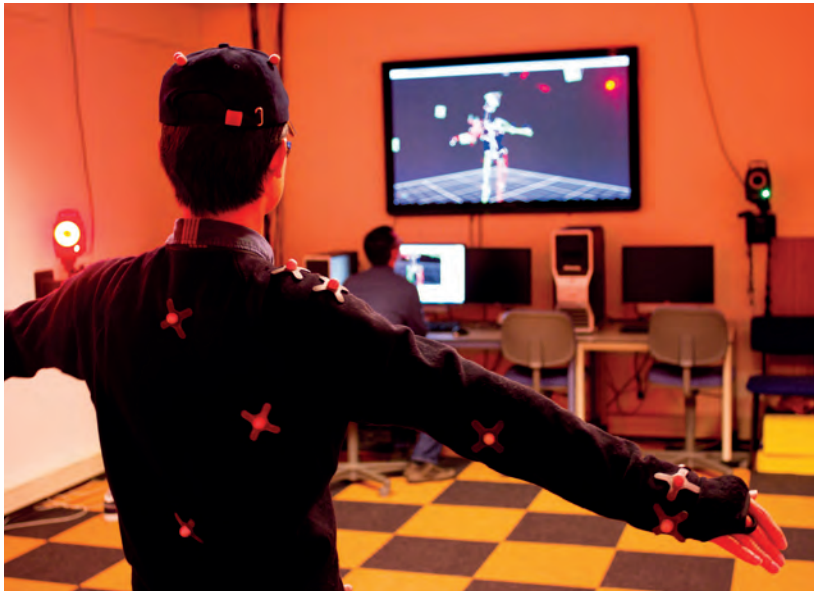
In our Motion Capture Lab, situated in the Buys Ballot Building, 18 high-speed cameras track the reflectors placed on the joints of the body, thus capturing the motion of the articulated subject or actor, for example while walking, sitting, dancing, gesturing or hand shaking. The motions are recorded to be analyzed or processed, for example in rehabilitation, as a lie detector, to animate an avatar, etc. In addition, three video cameras can be synchronized to facilitate additional multi-modal analysis.

For more information, please visit the Motion Capture Lab website.



UTRECHTINC STARTUP INCUBATOR

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Startup Incubator UtrechtInc at the Utrecht Science Park supports scientists, students, and entrepreneurs to successfully set up (IT) companies. UtrechtInc offers (future) entrepreneurs in e-health, e-learning, and e-climate educational programs, facilities, and a community of peers, experts, and investors.

UtrechtInc ranks top 10 in the World Top University-linked Incubators by UBI Global 2019/2020 and has supported over 230 startups to date. In its educational programs startups work at an accelerated pace to develop a working prototype, to secure paying customers, and to validate or scale their business model.

Programs

- **Validation for science-based startups**: free part-time 10 month program for scientists to take their research to the market.
- **Validation for student startups**: free part-time 5 month program for students to learn everything about startup entrepreneurship.
- **Validation for tech startups**: part-time 3 month program for tech founders to validate their value proposition and turn their idea into a startup.
- **Acceleration for tech startups**: full time 4 month program for teams who already have a functioning prototype and several customers and looking to grow their market share.

For more information, please visit the UtrechtInc website.

utrechtinc·

If you are interested in any of the referenced facilities or services
please contact: researchfacilities@utrechtsciencepark.nl
For further information visit our website at www.utrechtsciencepark.nl

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