Core facilities
University of Bergen

Professor Frode S. Berven
Head of the Proteomics Unit (PROBE)

Overview of the core facilities

MIC Molecular Imaging Center — Core facility for flow cytometry

The Laboratory Animal Facility — Kjernefasilitet for biostatistikk og dataanalyse (BIOS)

Genomic Core Facility (GCF) – UiB — Computational Biological Unit (CBU)

Core Facility for Metabolomics www.uib.no/metabolomics

Proteomics Unit PROBE University of Bergen

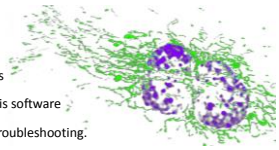
Molecular Imaging Center (MIC)
Department of Biomedicine

Advanced imaging core facility providing:

- The whole range of equipment for imaging cells, tissue and small animals
- Highly qualified scientific & technical staff
- Access to all researchers on equal terms (regardless of affiliation)

MIC offers:

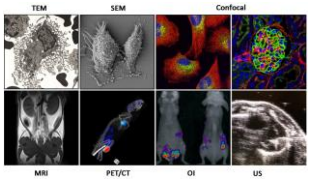
- Sample preparation for light and electron microscopy
- Courses (Confocal, EM, MRI, image analysis)
- Training of users
- Independent use of instruments
- Assisted/supervised use of instruments
- Access to image processing and analysis software
- Advice on procedures, protocols and troubleshooting.



MIC provides imaging systems and dedicated personnel for the following:

Cell & tissue imaging:
- Electron microscopy; transmission (TEM) & scanning (SEM)
- Advanced light microscopy; fluorescence and confocal microscopy (incl. live cell imaging)

Small animal imaging (non-invasive):
- Magnetic resonance imaging (MRI)
- Positron emission tomography /computer tomography (PET/CT); based on radioactive traces
- Optical imaging (OI); based on fluorescent and bioluminescent markers
- Ultrasound (US)



Contact information:	**mic@uib.no**	**phone: 55 58 60 07**
Webpage:	**http://www.uib.no/rg/mic**	
Booking page and registration to MIC:	**http://elabexperts.com/bergen/Facilities/micfacility**	

MIC encourages researchers to get in touch and discuss potential imaging related projects!

Core facility for flow cytometry

marianne.enger@k2.uib.no

The core facility for flow cytometry provide access and one-to-one training on the analysis instruments, and assisted cell sorting. Booking and invoicing is done by the MIC booking system

BD Accuri C6
4 colors

Flow cytometry allows simultaneous multi-parametric analysis of many thousands of cells per second, enabling rapid analysis of complex cell populations

BD Fortessa
17 colors + HTS

Cell sorting is done into up to four tubes simultaneously or wells or onto slides

BD Aria SORP
15 colors +
cell sorting

The Laboratory Animal Facility

- The Laboratory Animal Facility is a open core facility at UiB and provides for service to researchers in experimental medicine in animal.
- The laboratory animal facility offers:
  - Competence in traditional laboratory animals (rodents and pigs)
  - Modern well equipped facilities
  - Operation rooms for large animas
  - Operation rooms for small animals
  - Animal imaging equipment in collaboration with MIC
    - MRI, PET, Optical imaging, Ultrasound
  - Facility for experiments in contagious diseases.
  - Breeding unit for gene modified rodents
  - Controlled and monitored environmental conditions
  - Education in laboratory Animal Science
  - Alternative lab for training using models
- The Animal Facility have a good program for animal welfare, quality and scientific validity and have therefore been awarded full accreditation from AAALAC international
- This accreditation provides researchers assurance in a global community as well as it demonstrates accountability.

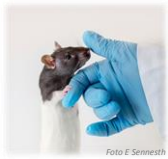


Foto E Sennesth

aaalac INTERNATIONAL

Kjernefasilitet for biostatistikk og dataanalyse (BIOS)

- Tjenester:
  - Gi innledende statistisk bistand til prosjekter samt kvalitetssikring av analyser
  - Tilby fast statistikerstøtte over tid til større prosjekter og forskningsgrupper
  - Utvikle og tilrettelegge systemer for sikker lagring, sporing og analyse av forskningsdata
- Timepriser ved kortvarige oppdrag:
  - Universitets og høyskoleforskere, inkl. helseforetak: 700 kr (+ mva dersom utenfor UiB)
  - Andre: 1196 + mva
- Pris ved langvarige oppdrag: Lønn + 40% sosiale kostnader for gitt stillingsbrøk (f.eks 20% i 6 mnd)
- Totalt 6 årsverk (+2 planlagt utlyst)
- Kontaktperson: Jannicke Igland (jannicke.igland@igs.uib.no)

Genomic Core Facility (GCF) – UiB

- A national platform for Microarray technology and high throughput genomics.
- Part of the Norwegian Genomics Consortium (NGC) together with genomic core facilities in NTNU and UiO.
- NGC-UiB offers service for state-of-the-art genome scale analysis, including microarray- and high throughput sequencing- based methods. Both labservice and bioinformatic-solutions, in close collaboration with the Bioinfomatic platform.

Microarray Service:
Gene expression arrays
chIP-on-chip arrays
Custom GoldenGate SNParrays
Low Density TaqMan arrays

High Throughput sequencing Service:
Exome/targeted sequencing
RNA-sequencing
miRNA sequencing

www.genomics.no

Contact:
bergen@microarray.no

Core Facility for Metabolomics

- The research laboratory is on the 8th floor of the Laboratory Building at Haukeland University Hospital. It is equipped with two units for liquid chromatography-tandem mass spectrometry and a liquid handling robot.
- The instruments have unit mass resolution and are well suited for quantitative analyses
- We have established methods for steroids and other small molecules in serum, saliva, urine and tissue.

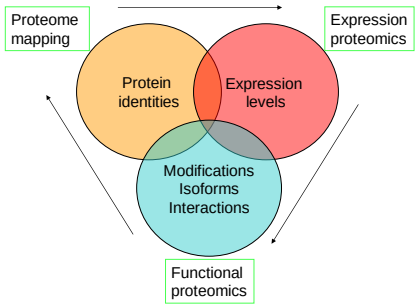
Core Facility for Metabolomics
www.uib.no/metabolomics

PROBE

Proteomics Unit
University of Bergen

- Proteome: The complete set of proteins expressed and modified by a species, or produced/present in a defined compartment within the species at a particular time.
- Proteomics: The (large-scale) study of proteins, their presence, abundance, modifications, functions and structures.

Proteomic strategies



Unbiased protein quantification

Control group

Tissue / body fluids
- Control vs. disease
- Patient before and after treatment

Cell lines
- Unstimulated / Stimulated cells
- untreated / Drug treated cells
-Mutants / wild type cells

Affected group

Sample preparation including chemical labeling of proteins to allow for quantification

75 regulated proteins

2000 unaffected proteins

Tissue / body fluids

Cell lines

Biomarker candidates:
A need for verification in larger sets of patient samples

Proteins affected by:
Stimulation, drug treatment or mutations

Targeted protein quantitation

Litterature searches

Genomic data

Proteomics biomarker candidates

Proteomics biomarker discovery experiments

Data from animal models

Create a prioritised list of biomarker candidates (10-100).

Validation by immunoassays is well established, but:

- Number of useful Abs: small
- Number of candidates: large
- Making new, immunoassay capable Ab's is expensive

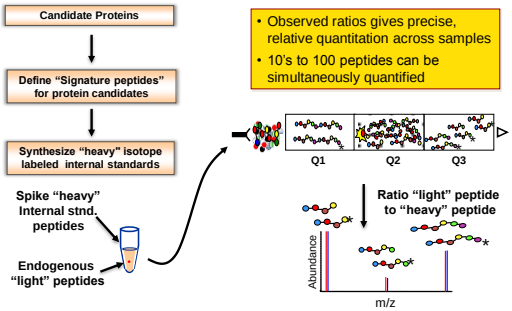
New approaches are required

Targeted quantification

Required: **robust technology to quantitatively assay 10's to 100's of biomarker candidates in patients**

- Absolute molecular specificity
- Ease of detecting and avoiding interferences
- Short assay development timeline
- Can be highly multiplexed
- Quantify proteins down to 1 ng/mL in plasma
- Reproducibility approaching clinical assays
- Tailor the assay to target specific sequence areas

SID-MRM: Use peptides as surrogates of proteins for detection and quantification



SRM possibilities for tayloring the quantitative assays

MKWVTFISLLFLFSSAYSRGVFRRDAHKSEVAHRFKDLGEENFKALVLIAFAQYLQQCPF
EDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEP
ERNECFLQHKDDNPNLPRLVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLF
FAKRYKAAFTECCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGERAFKAWAV
ARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADLAKYICENQDSISSKLK
ECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKNYAEAKDVFLGMFLYEYAR
RHPDYSVVLLRLAKTYETTLEKCCAAADPHECYAKVFDEFKPLVEEPQNLIKQNCELFE
QLGEYKFQNALLVRYTKKVPQVSTPTLVEVGRNLGKVGSKCCKHPEAKRMPCAEDYLSVV
LNQLCVLHEKTPVSDRVTKCCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTL
SEKERQIKKQTALVELVKHKPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKLV
AASQAALGL

Choose signature peptide(s) based on protein knowledge, taylor the assay.

Summary

www.probe.uib.no

- **PROBE offers:**
  - Expertice in quantitative and clincal proteomics, including all the methods described above, and the related data analysis.
  - Complete service: Experimental design, sample preparation, mass spectrometry analysis and data analysis..
  - Courses and Technical assistance.
  - Answering scientific questions regarding planning of proteomics projects, and assistance with discussing/writing proteomics-based grant applications.

All researchers are welcome at equal terms regardless of affiliation.

Prices (details see: www.probe.uib.no)

- Mass spectrometry
  - Orbitrap ELITE, Qexactive HF, Q-Trap 5500 400 Nok/hour.
- Technical assistance, 550 Nok/h (protein conc meassurments, protein extraction, data analysis etc).