

+++ News from the +++
Core Facilities



Cell Networks
Core Facility Newsletter No 01 / 2012

Dear CellNetworks Members,

It is with great pleasure that we present to you the first edition of the new CellNetworks Newsletter “News of the Core Facilities”.

The newsletter will be an information platform all about the life-science Core Facilities at Heidelberg University and the many partner institutions in Heidelberg. It will bring you the latest news and report on the most recent achievements of the Core Facilities. The first two editions of the newsletter will introduce a small selection of the existing Core Facilities to give you a general idea of the wide range of opportunities and offers. At the end of every introduction you will find a teaser showing the latest purchases or changes within the Core Facility!

If you have any general question, please do not hesitate to contact the CellNetworks PMO. If you have more specific questions on one of the Core Facilities, we kindly ask you to contact the Core Facility directly. The contact details of every facility can be found in the respective section.

We hope you will find a lot of useful information on the various Core Facilities.

Enjoy reading!

With best wishes from the

CellNetworks Project Management Office

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ZMBH Central Service Facility

Flow Cytometry and Fluorescence Activated Cell Sorting (FACS) represents a fast and reliable method for characterizing and isolating certain cell subpopulations based on fluorescent labeling, and can be applied to a great variety of organisms and cell types, including prokaryotic as well as eukaryotic cells.

The Flow Cytometry & Fluorescence Activated Cell Sorting (FACS) Core Facility is located at the ZMBH and operated jointly by the

ZMBH, BZH and SFB 638 „Dynamics of macromolecular complexes in biosynthetic transport“. The facility is equipped with state-of-the-art instrumentation and offers the possibility of cytometric cell analysis and cell sorting to members of the ZMBH-DKFZ Alliance, BZH and SFB 638, as well as to any other research group on campus. We also welcome projects from non-campus scientists.



Equipment

For analytical measurements our facility has a BD FACSCanto II flow cytometer equipped with 3 lasers for excitation (405 nm, 488 nm, 633 nm) and detectors for forward and side scatter (FSC, SSC) and up to 8 different fluorescence signals. A second analytical flow cytometer, BD FACScan, is available in the facility with a 488 nm excitation laser and detectors for FSC, SSC and 3 fluorescence channels.

Cell sorting is performed on a BD FACSAria system that was recently upgraded to a FACSAria III high-end cell sorter, thus achieving a remarkable improvement of the facility service offers. It uses 4 different laser excitation wavelengths (407 nm, 488 nm, 561 nm, 633 nm) and can detect FSC, SSC and up to 11 fluorescent colors simultaneously.

Furthermore the facility offers a separate workstation with common flow cytometry software for data analysis.

Service Offers

The head of facility, Dr. Monika Langlotz, offers individual introductory tutorials to flow cytometry and the use of the analytical instruments, as well as support and aid in all questions concerning flow cytometry as a method. Users, who have received a training lesson on the machines, can operate FACSCanto and FACScan independently. Dr. Langlotz operates the FACSAria cell sorter.

Contact details:

Registered users can book the analytical instruments online. For flow cytometry introduction and cell sorting appointments please contact Dr. Langlotz by phone or e-mail.

Please visit our webpage for further information.

ZMBH - Zentrum für Molekulare Biologie der Universität Heidelberg

Central Service Facility Flow Cytometry & Fluorescence Activated Cell Sorting (FACS)

Im Neuenheimer Feld 282

69120 Heidelberg

http://www.zmbh.uni-heidelberg.de/Central_Services/Cell_Sorting/

Dr. Monika Langlotz

Head of Facility

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+++ Individual introductory tutorials to flow cytometry +++
and use of the analytical instruments

Deep Sequencing Core Facility



The CellNetworks Deep Sequencing was founded to meet the next-generation sequencing needs of the Neuenheimer Feld Campus. Our team (Prof. Gabriele Petersen and David Ibberson), is looking forward to discussing your next generation sequencing project needs.

What Do We Offer?

Preparation of samples for next-generation sequencing using the Illumina sequencing technology:

- Personal meeting and discussion of YOUR personal research and ideas
- Consultation and guidance on finding the technology that fits YOUR research
- Full sequencing preparation service

Protocols for library preparation depending on source of material and desired outcome.

Most frequently requested preparations:

- gDNAseq (for re-sequencing of the genome or De Novo sequencing)
- mRNAseq (for transcriptome sequencing, including variants of strand specific library preparation)
- ChIPseq (for chromatin IP material)
- smRNAseq (for small RNA discovery/profiling)
- Mate-Pair (to help build a scaffold for genomic sequencing especially useful for De Novo sequencing)
- Exon Capture
- Access to the Covaris S2 Sonicator

What's new?

Collaboration with GeneCore (EMBL) to offer access to the Illumina HiSeq 2000 instrumentation.

This gives us the great advantages that we can offer you

- state-of-the-art technology!
- more data for your money!

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+++ New Collaboration with GeneCore (EMBL) +++
More reads for the same price

The Advanced Light Microscopy Facility (ALMF) at European Molecular Biology Laboratories (EMBL) in Heidelberg offers a collection of state-of-the-art light microscopy equipment including high-throughput microscopy and accessory services.

Our services include:

Assisting all EMBL groups and **VISITORS** throughout the process of microscopic imaging: planning of a project, sample preparation, staining, selection and use of the microscope, image processing, presentation, data transfer and storage.

- Organization of courses and conferences (different EMBO courses per year).
- Facilitating hands-on evaluation of equipment
- Developing accessory software and microscopy equipment (co-developments with industrial partners, pre-evaluation of commercial equipment).

We offer and support:

- Widefield, Confocal, spinning disk and 2-photon laser scanning microscopy
- Total internal reflection microscopy (TIRF)
- Superresolution microscopy (GSD)
- High-throughput microscopy, with sample preparation (reverse transfection)
- Fluorescence recovery after photobleaching (FRAP)
- Fluorescence lifetime imaging microscopy (FLIM)
- Fluorescence resonance energy transfer (FRET)
- Fluorescence cross correlation spectroscopy (FCCS)
- Laser nanosurgery: cutting, ablation, DNA-damaging and uncaging
- Environmental control chambers for live cell imaging
- Image processing, e.g. Deconvolution, Particle tracking, 4D data visualization
- Microinjection

We are open to access from external institutions of all EMBL member states. We are open to questions related to light microscopy and image analysis.

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+++ New Imaris version 7.5.2 available +++

Seeing is believing: The Electron Microscopy Core Facility at the Heidelberg University

If you want to understand something - what can be better than observing it carefully and describing what you see? Unfortunately, most biological samples are far too small to see with the human eye. Intermediate magnification, as offered by the Nikon imaging center, is performed by sophisticated light microscopes. Light microscopes resolve tiny structures as pretty, colorful blobs without much detail. Their pattern can be very meaningful, but if detail is what you need, then EM should be your choice. In EM everything is about sample preparation and structure preservation.



EMCF-Team

We offer a wide range of techniques that enable us to address most questions through EM. A very powerful and popular method is EM immunolabeling that allows for precise and quantitative localization of proteins (lipids) in cells. Scanning EM can reveal details about fruit-flies, the surface of bacteria. A more recent addition to our facility is a microscope that enables 3D imaging.

If you think you need EM you can write us an email outlining your project. We encourage students and post-docs to get involved in EM preparation and interpretation in order to guarantee success.

More information can be found on our website:

http://www.cellnetworks.uni-hd.de/2901/cf_electron_microscopy

See you all at our scopes!

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+++ New Tecnai 200kV with field emission gun +++

Multiplexion - Quality control for your cell culture

Multiplexion GmbH was founded as a spin-off of the German Cancer Research Center (DKFZ) Core Facility "Contamination Control" in Heidelberg, Germany, in 2012. Multiplexion has more than six years of experience in the field of cell culture quality control.

Worldwide, 15-30% of all cell lines is estimated to be contaminated with Mycoplasma and viruses or cross-contaminated with other cell lines. Possible reasons are mishandling of cells during routine culture but also the lack of convenient tests for the quality control of cell cultures.

Cell culture contaminations affect scientific results and reputation, and lead to erroneous publications with dire consequences. The damage for society is high: in Germany only up to €70-140 m are spent annually on work with contaminated cell lines in public research!

Multiplexion offers comprehensive quality control services for your cell cultures in a uniquely cost-effective manner: just send us your cell line per post and submit your sample information online. Multiplexion will take care of the rest sending you the final results as a PDF.

Multiplex cell Contamination Test

- Detection of 25 of the most important contaminations with Mycoplasma, viruses and cell lines of other origin in a single reaction

Multiplex Cell Authentication

- Authentication of human cell lines
- Detection of contamination of one human cell line by another human cell line (as little as 3% contaminating cells detectable)
- In contrast to STR profiling, also widely used cell lines with mutations in their mismatch repair genes can be authenticated

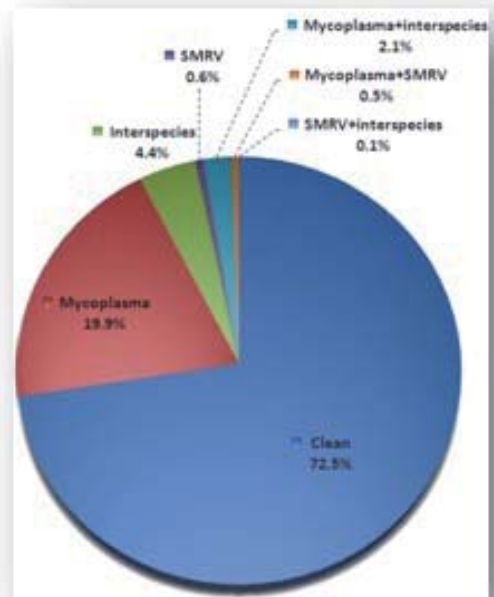
PRECISION: High sensitivity and specificity of Multiplexion's services in detecting most important cell contaminations and authentication of human cell lines

CONVENIENCE: No customer registration needed, intuitive online submission form, results in less than 10 working days, uniquely cost-effective

REPORTING: Results are electronically transferred as PDF; certificate for granting agencies or journals

REPUTATION: Increase your efficiency and reputation by working with qualified cell lines

More information at: www.multiplexion.de (**contact details** available there)



+++ Core Facility "Contamination Control" is now +++
Multiplex GmbH

The nCounter Core Facility



The nCounter system enables multiplexed measurements of gene expression and the detection of copy number variation/fusion genes using fluorescently labeled reporter probes, so-called 'codesets'. Applying a unique coding technology enables direct counting of individual RNA/DNA molecules across all levels of biological samples, with sensitivity and specificity comparable to real-time PCR.

The major advantages of our system are:

- Low amount of input material (100 ng of total RNA/sample) / 600 ng DNA
- Ability to analyze RNA samples of poor quality (such as FFPE samples)
- Up to 800 targets can be simultaneously interrogated per sample
- No enzymatic reactions are involved
- Very high dynamic range, sensitivity and reproducibility
- Perfect tool for microarray validation, pathway analyses, expression analyses of defined gene sets and for biomarker validation

Who has access to the service?

The following clients have access to this facility:

- Members of the Heidelberg University, including the medical faculties of Heidelberg and Mannheim Cluster of Excellence CellNetworks
- Graduate School HBIGS (Hartmut Hoffmann Berling International Graduate School of Molecular and Cellular Biology)
- HMLS (Heidelberg Molecular Life Sciences DKFZ/MPI)

How to contact the nCounter Core Facility

Colleagues interested in using the facility should contact us via email: n.counter@med.uni-heidelberg.de.

Contact details:

Head of Facility

PD Dr. Beate Niesler

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Further information can be found on our website: www.ncounter.uni-hd.de

+++System resistance to lower RNAquality- perfectly +++
suitable for critical samples such as FFPE

ViroQuant-CellNetworks RNAi Screening Facility

The Facility is located at BioQuant and was founded in 2007. We help our users to adapt their biological assays to high-throughput format for microscopy based RNAi studies. We provide an automated sample preparation and high-throughput / high-content microscopy-based screening platform. For genome-wide RNAi screening there is a small interfering RNA (siRNA) library targeting 20203 protein-coding genes (human) with 3 independent siRNAs per gene, but we also support our users when it comes to custom siRNA selection.



Fig1: For automated sample preparation we offer access to a pipetting robot equipped with a 96 channel pipetting head plus 4 independent channels ("Star" from Hamilton, left) and an automated microarrayer („Pro“, BioRad, right).

We offer solid phase transfection on cell arrays and in 96 or 384 well plates allowing a separation between the production and the experimentation workflows. On request, however, we also offer reverse liquid phase transfection. Our services may as well be used in a modular manner, e.g. for users who require automated sample preparation or automated image acquisition only. Sample preparation is performed on an automated liquid handler ("Star", Hamilton, see fig.: 1) and 2 automated microarrayers („Pro“, BioRad and custom-made printer from Graffinity Pharmaceuticals, 384 pins). We provide access to 3 automated wide-field screening microscopes "ScanR" from Olympus Biosystems (high-throughput, see fig.: 2) and for high spatial resolution there are 2 automated Leica SP5 confocal scanning microscopes, enabling fully automated high-resolution 3D confocal screening (low or medium throughput. Recently, we have added an automated spinning disc confocal microscope ("Opera", Perkin Elmer) to our equipment. We are fully connected to the BioQuant Large Scale Data Facility (LSDF) and created data may be managed in the iCHIP data base (iBios, DKFZ).

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Fig. 2: Here we show one of our automated screening microscopes ("ScanR", Olympus Biosystems) equipped with an incubation chamber for live cell imaging.

+++ New automaed spinning disc confocal microscope +++
("Opera" Perkin Elmer)