Dear members, associates and friends,

We are happy, excited and proud to announce that our Cluster ImmunoSensation is invited to submit a full proposal for the German Excellence Strategy. The full proposal will be due February 2018. We want to thank you in advance for all the hard work and great teamwork within the Cluster and the University and look forward to a hopefully new round of ImmunoSensation from 2019 on.

This Newsletter is a special edition. It is about new developments within our Cluster. We want to introduce you our new members and keep you updated at the technology front.

Yours,

Cluster Coordination Office

In this special edition our core facilities will be introduced.

Immuno is already testing the best conditions for its orange colour.
NEW CLUSTER MEMBER

Let us introduce to you: Part I

our new members of the Excellence Cluster ImmunoSensation. Some of them already have been part of the Bonn Immunoscience community and others just newly arrived. Welcome to the Cluster.

Heinz Beck - Department of Epileptology

My group has an overarching research interest in neuronal integration and the function of neuronal networks in the intact brain. We also have a strong track record investigating basic mechanisms of epilepsy in animal models and tissue obtained from epilepsy surgery. To achieve insights into the network motifs governing normal and aberrant behaviour, we are employing in vivo electrophysiology and imaging together with opto- and chemogenetic approaches in awake rodents.

Elmar Behrmann - Research Center caesar

I am a specialist in the application of cryo-electron microscopy (cryo-EM) to visualize dynamic protein assemblies in native-like environments, and thus unveil the structural pathways at the heart of diverse biological processes. Key to this is the preparation of samples with minimal perturbation of the native state, allowing not only the determination of specific conformational states, but instead also the observation and analysis of the full distribution of functional states. Currently, my group is applying this approach to a diverse set of proteins, ranging from integral membrane proteins, to membrane-associated proteins, as well as on inflammasome-associated proteins.

Monique Breteler - DZNE

Prof. Breteler’s main research interests lie in the etiology and prediction of neurodegenerative and cerebrovascular diseases. She has special expertise in elucidating the role of vascular and lifestyle factors in dementia as well as in population imaging. With the Rhineland Study – a large prospective cohort study, her team aims to identify causes of such diseases, to develop biomarker profiles that can predict them, and to investigate normal and pathological brain structure and function over the adult life course.
Let us introduce to you: Part II

**Bernardo Franklin - Institute of Innate Immunity**

The Franklin Lab (AG Franklin) at the Institute of Innate Immunity is focused on deciphering the innate immune mechanisms, and the cellular interactions that modulate host resistance to infection, auto-inflammatory diseases, and cancers. Specifically, the lab is interested in how the interaction of platelets with different immune cells modulate their function and drive innate immunity.

**Hiroki Kato - Institute of Cardiovascular Immunology**

My research focuses on the mechanisms by which cytoplasmic RNA sensors RIG-I like receptors (RLRs) distinguish between viral RNAs and self-RNAs and trigger type I IFNs. Current work examines spontaneous autoimmune symptoms in RLR mutant mice derived via mutagenesis and how RLR-dysregulation causes autoimmune disease. I am also particularly interested in the analysis of immune responses and pathogenesis in virus infection in vivo and autoimmune diseases using mouse models.

**Isis Ludwig-Portugall - Institute of Experimental Immunology**

Ludwig-Portugall and her group are interested in immune suppressive mechanisms that preserve immune homeostasis. In particular, her group focuses on how immune suppressive cells such as T regulatory cells and myeloid derived suppressor cells regulate inflammatory diseases or induce peripheral tolerance. The main research projects investigate the interaction of immune cells such as ILCs, DCs and T cells in sterile kidney inflammation that can lead to kidney fibrosis.
NEW CLUSTER MEMBER

Let us introduce to you: Part III

Mihai Netea - Life and Medical Sciences Institute (LIMES)
The goal of my research efforts is to translate information obtained through the assessment of human genetic variation in patients into novel diagnostic and therapeutic approaches. My group has a strong track record on translating genetic information into understanding pathophysiological mechanisms of disease. I have a broad expertise on the host mechanisms responsible for the recognition of bacterial and fungal pathogens and the activation of the innate immune system, on the one hand, and the genetic susceptibility to infections on the other hand. I have described the epigenetic mechanisms mediating innate immune memory (‘trained immunity’) for the first time.

Florian Schmidt - Institute of Innate Immunity
Florian Schmidt and his team seek to uncover the molecular mechanisms that govern innate immune responses in the cell. They use custom-made alpaca single domain antibodies (nanobodies or VHHs) to perturb, visualize and ultimately understand immunological signaling cascades in the responding cell types at endogenous protein levels. They investigate the activation mechanism of orphan inflammasome sensors and try to reveal how virus infection triggers the assembly of inflammasome complexes in different cell types. To delineate common strategies, they compare the responses to DNA and RNA viruses including herpesviruses (HSV-1), orthomyxoviruses (influenza A virus), poxviruses (vaccinia virus), and rhabdoviruses (vesicular stomatitis virus).

Jasper van den Boorn - Institute of Clinical Chemistry and Clinical Pharmacology
The research team of Dr. Van den Boorn is interested in the biology of memory NK cell responses, in particular of the pigment cell-specific memory NK cells induced by the contact-sensitizer monobenzone. In addition to investigating their induction and biology, they also explore their potential as biological therapy against melanoma. In a second research focus, the team investigates 5’-triphosphate RNA (3pRNA)-sensing by the retinoic acid-inducible gene-I (RIG-I)-receptor in tumor cells and the tumor microenvironment, with the aim of developing new 3pRNA-based cancer immunotherapy regimens.
Elmar Endl: According to our last DFG review, the facilities are very well organized, and this organization can serve as model for other Institutions of this size. We have an overarching structure where every facility has its own scientific director and core manager. We have a Core Managers’ Committee, where the managers discuss issues with their daily work and the committee and each facility then sends a representative to the Dean’s Commission, headed by Heinz Beck, where we collect information, structure it, discuss it, evaluate it and then provide the Dean with solid facts that are to serve as basis for any further decisions for the future development of the faculty.

From a user’s perspective, you will find almost all the information that you need about the facilities on our homepage, which serves as a central point of contact. You can register there. You will get access to the online scheduling system for the instruments and to services provided by the facilities. Logging in with your username and password also gives you access to central storage system where you can collect your data from all of the facilities and access a central data space to handle your data. These services are real time savers: you never have to remember your USB stick or try to reach someone on the phone to make a reservation on an instrument. In addition to facilitating scientific advancement, the university coordination of cores simply makes good business sense. Just to pick out one particular point that the reviewers found interesting, for example, we see core managers not only as position within the university but as a profession, meaning as a manager and not only as an expert responsible for running machines. He or she is also a teacher, negotiator, politician and psychologist. They are trained in accounting and marketing, but they are still a scientist and a colleague. We just now had a professional leadership

Dr. Elmar Endl

He is Core Facilities Business and Operations Coordinator and Speaker of the Core Managers Committee of the Medical Faculty Bonn. We interviewed him for an update about the Core Facilities at our campus.
and management training seminar from a consulting company in Heidelberg. If this structure proves to be productive, it can be expanded, and we have just started discussions about a Bonn Technology Campus.

**CCO:** What are the challenges of establishing a network of Core Facilities?

**Elmar Endl:** I think that one of the biggest challenges while creating a network of Core Facilities is that you don’t get to have a blueprint from any other organization. We had to start from scratch with setting up a structure that fits our local research area. Then, you also have modern ideas of organization, communication and business models that you have to adapt to the traditional structures of the university -structures that have already proven to be successful. You have to bring people together that are not used to working with each other. You have to set up a new culture of communication, administration and organization and this always takes some time, because you have to talk to whole a lot of people. That’s the reason we created a coordination office for scientific infrastructure where all of this information should come together.

**CCO:** Have a look into the future: How will Core Facilities be organized at the Medical Faculty in 10 years, and what will they be able to provide?

**Elmar Endl:** As Helmut Schmidt once said “People who have visions should go see a doctor”, but, of course, we have also had some brainstorming and open discussions on where will we be in 10 years. We envision a Bonn Technology Campus. You can think of that as a virtual campus where you can find information about instruments, contact information and lecture material all at the same place, whereas, in reality, these resources are spread out all over the campus. We are also considering using social media tools to facilitate scientific discussion. In the end, it’s not only about sharing instrumentation. It’s about getting people together and sharing knowledge, which are the two most important resources that we have at the University, and which brings us back to the beginning of our discussion about what a core facility is and why we need them.

Thank you Elmar for the Interview.

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**PEOPLE**

**Dr. Gabor Horvath**

He is the manager of the Microscope Core Facility located in the BMZ I. We asked him questions about the life of a Core Facility manager.

**CCO:** Gabor, what Core Facility are you in charge of and where is it located?

**Gabor Horvath:** I’m one of the managers for the Microscopy Core Facility. This facility is located at two sites: BMZ and Life&Brain. I’m responsible for the instruments at the BMZ.

**CCO:** Do you think Core Facilities are important and can improve our scientific output?

You can find the homepage of all core facilities [here](#).
Gabor Horvath: Core Facilities are important for multiple reasons. They can take some of the financial burdens from individual institutes/departments for purchasing generic instruments for their scientific needs. The facilities usually also provide the technical expertise to operate those instruments that they are responsible for. Quite often when an institute obtains an instrument, it is operated for a few months and then it gets neglected.

And then after a year or so, it would be hard to find who still knows how to operate that instrument. Whether the instrument is actually still operational. The Core Facilities take care of all of those, thus can provide all the resources needed for an experiment, most of the time, immediately.

Another aspect is that the personnel at a facility are highly familiar with general procedures and methods applied on these instruments. Thus they can help to guide the scientists to design their experiments in a way that could provide the desired outcome.

CCO: What are your tasks as a Core Facility Manager?

Gabor Horvath: Operation and maintenance of the instruments. Help with experimental design. Administrative tasks. Teaching both basic and specific techniques.

CCO: Are you more of a scientist or manager in your job?

Gabor Horvath: It is more of a managerial job. However, if time permits it is possible to perform a few scientific experiments of our own.

CCO: If I want to use a microscope in your facility, how can I do this?

Gabor Horvath: We are in the process of setting up a centralized booking, scheduling and financial tracking system for all the Core Facilities at the medical faculty. Once we have that, that would be the central place to access our resources. Until then, we have the following means: There is a website for all the Core Facilities: https://cores.ukb.uni-bonn.de. The contact information for the managers of the facilities can be found on that website. If you'd like to use a microscope, you can contact me by email or phone. Then if you haven't used the facility before, we will set up a meeting where we can discuss what you would like to do and what we can provide. We would also discuss the general terms of use. We allow assisted and unassisted use of our instruments. And if you would like to use one of the instruments on your own, then we would provide training. The booking for an instrument is currently done on an internal calendar, so you will have to contact me by email or phone to do the booking.

Thanks Gabor for the Interview.

Contact to Dr. Gabor Horvath:
gabor.horvath@uni-bonn.de
0228/287-51229

We asked a user.

Dr. Jonathan Schmid-Burgk did his PhD in the lab of Prof. Veit Hornung. We asked him about his experience with the FACS Core Facility.

CCO: Jonathan, as a user of the FACS Core Facility: What are the advantages of a Core Facility?

Jonathan Schmid-Burgk: The advantage of a FACS core facility is the up-to-date machinery available, the professional maintenance of the machines, and the high level of expertise of the operators when something goes wrong.

CCO: When coming to a Core Facility, what do I need to prepare as a user?

Jonathan Schmid-Burgk: I have to prepare enough controls to be able to
separate spectral overlap of fluorophores and I have to plan well how much time I need.

CCO: You publish a paper (A Genome-wide CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) Screen Identifies NEK7 as an Essential Component of NLRP3 Inflammasome Activation) in which you used a FACS screen. How was the work-flow with the FACS core facility to undertake this kind of experiment?

Jonathan Schmid-Burgk: The sorts often took 12 hours and more, so the FACS core gave me special training and access to their sorting devices, which I often ran at night.

CCO: Are there disadvantages in using a Core Facility? Are there things that can be improved?

Jonathan Schmid-Burgk: The only disadvantage I could think of is the need for better planning when using a core facility. However, I think that this requirement can also be seen in a positive way!

Thanks for the Interview Jonathan.

TECHNICAL FACILITIES

Overview: Core Facilities I

Here is a summary about our Core Facilities on campus.

Biobank
https://cores.ukb.uni-bonn.de/biobank/
Contact: Dr. Astrid Luks
Astrid.Luks@ukbonn.de

Cell Pogramming
https://cores.ukb.uni-bonn.de/cell-programming/
Contact: Dr. Michael Peitz
r.neuro@uni-bonn.de

Flow Cytometry
https://cores.ukb.uni-bonn.de/fccf/
Contact: Andreas Dolf
andreas.dolf@uni-bonn.de

Mass Spectrometry
https://cores.ukb.uni-bonn.de/mass/
Contact: Marc Sylvester
masse@uni-bonn.de
Overview: Core Facilities II
Here is a summary about our Core Facilities on campus.

Microscopy
https://cores.ukb.uni-bonn.de/icf/
**Contact:** Dr. Gabor Horváth (BMZ) and Dr. Hannes Beckert (Life & Brain)

Nanobodies
https://cores.ukb.uni-bonn.de/nanobodies/
**Contact:** Dr. Florian Schmidt
fschmidt@uni-bonn.de

Next Generation Sequencing
https://cores.ukb.uni-bonn.de/ngs/
**Contact:** Dr. André Heimbach
heimbach@uni-bonn.de

Transgenic Service
https://cores.ukb.uni-bonn.de/tgs/
**Contact:** TGS@uni-bonn.de

Virus
https://cores.ukb.uni-bonn.de/virus/
**Contact:** Lioba Dammer
ldam@uni-bonn.de

Zebrafish
https://cores.ukb.uni-bonn.de/zebrafish/
**Contact:** Benjamin Odermatt
b.odermatt@uni-bonn.de
Imprint

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WEB www.immunosensation.de

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the immune sensory system - Bonn cluster of excellence

[Logos of DFG, ukb, klinikum bonn, LiMES, D2NE, and caesar]