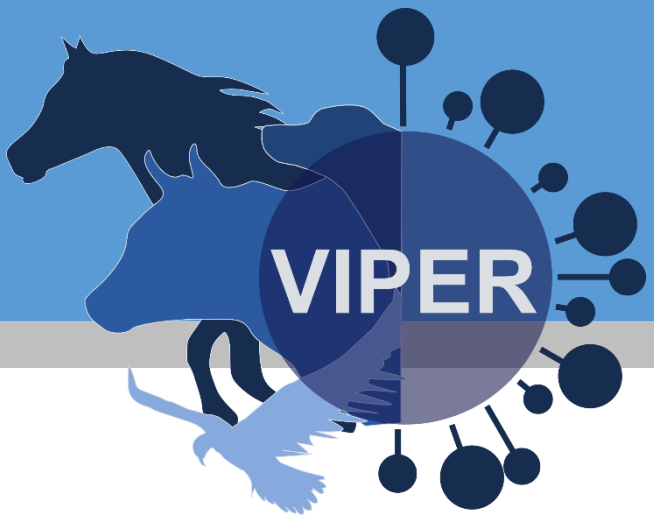
Research Training Group
Virus detection, pathogenesis and intervention (GRK 2485)



NEWSLETTER

Gefördert durch
DFG Deutsche Forschungsgemeinschaft

Volume - Dezember 2024

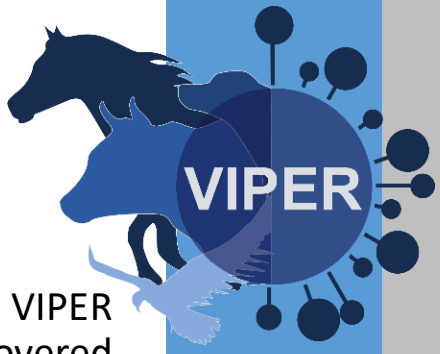
We are proud to release the fifth annual VIPER newsletter moret han five years after the official start of the Research Training Group in April 2019. Within this issue, we will recap the second and the beginning of the third year of the second cohort of VIPER students, all their experiences and achievements during their VIPER journey.

Content

En-block schools

Junior class (25.-29.09.2023)

The third one-week en-block school for the second cohort, the VIPER junior class took place on September 25th to 29th, 2023 and covered several aspects regarding virology, immunology and bioinformatics. In the afternoon, interactive activities such as the pandemic game and the journal club took place (see schedule).



GRK 2485

Monday	Tuesday	Wednesday	Thursday	Friday
8.45 – 9.00 **Welcome** 9:00 - 10:45 **Esther Wenzel** Antibodies and beyond: the power of animal-free	9:00 –10:45 **Terry Jones** Poxvirus evolution	8:45 –10:15 **Colin Russell** The value of diagnostics and sequencing for monitoring the evolution of respiratory viruses	9:00 –10:45 **Stefan Pöhlmann** The 3As of SARS-CoV-2 infection: ACE2, Activators & Antibodies	9:00 –10:45 **Manja Marz** Bioinformatical tools for secondary structure prediction of RNA viruses and Neuronal networks for virus classification
11:00-14:00 **Stefanie Becker + Andreas Beineke** Pandemic Game	11:00-14:00 **Gisa Gerold + Martin Ludlow** Journal club	10:30 –12:00 **Julien Zahouli** Ecology of mosquitoes and vector control of arboviruses and malaria in Côte d'Ivoire (West Africa) 13:30-16:30 **Imke Steffen + Silke Rautenschlein** Be creative! Develop your own collaboration projects I	11:00-12:30 13:30-14:30 **Imke Steffen + Silke Rautenschlein** Be creative! Develop your own collaboration projects II	11:00-14:00 **Closing remarks and lunch**

Invited speakers of the VIPER freshman class:

Esther Wenzel (Abcalis GmbH, Braunschweig)
Terry Jones (Institute of Virology, Computational virology, ancient viruses, virus evolution, virus discovery, virus ecology, computational virus diagnostics, Charité, Berlin)
Colin Russel (Laboratory of Applied Evolutionary Biology, Amsterdam, University Medicial Centers)
Julien Zahouli (Centre Suisse de Recherches Scientifiques en Côte d'Ivoire (CSRS), Abidjan, Côte d'Ivoire)
Stefan Pöhlmann (Infection Biology Unit, German Primate Center, Göttingen)
Manja Marz (Daculty of Mathematics and Computer Science, University of Jena)

Students' opinions on the junior class

The talk of Esther Wenzel was good and introduced me to multiclonal antibodies.

Q&A was perfectly done, 10/10 points

The pandemic game was fun and it is a lot easier to remember what we learned in this course due to the format!

Terry Jones has an interesting way of presenting concepts. The lecture contents were exciting which was communicated well through his teaching.

Very intersiting topic and Colin Russel has great presentation skills.

The course of Manja Marz introduced certain concepts, which I had no knowledge of, in an easily understandable manner.

I enjoyed the “Be creative!”-workshop very much although it was tough.

Senior class (05.-09.02.2024)

In the fourth one-week en-block school in February, students were introduced to specific topics such as vaccines and their development, recognition, pathogenesis and prevention of different viruses (in general and with specific examples) and management of wildlife in regard of biodiversity. Additionally, different methodologies of tissue slide analysis were presented.

Monday	Tuesday	Wednesday	Thursday	Friday
9.00-10.45 **Thomas Pietschmann** Antiviral copound screens	9.00-10.45 **Dirk Schaudien** From simple evaluation to multidimensional multiplex image analysis of tissue slides	9.00-10.30 online **Verena Haist** Clinical trials in animal vaccine development	9.00-10.45 **Klaus Osterrieder** Equine Herpesvirus Type 1 - pathogenesis and prevention of abortion and equine stroke	9.00-10.45 **Stefan Finke** Rabies
10.45-12.30 **Angele Breithaupt** Live attenuated vaccines		10.45-12.30 online **Ursula Siebert** Sustainable management of wildlife in a changing environment: a contribution to biodiversity	10.45-11.15 Coffee and cake 15.00-16.00 online **Florian Krammer** Development of broadly protective influenza virus vaccines	10.45-12.30 **Sebastién Pfeffer** RNA recognition in viral infections
12:30 **Joint lunch**				

Invited speakers of the VIPER senior class:

Thomas Pietschmann (Institute of Experimental Virology, TWINCORE, Hannover)
Angele Breithaupt (Friedrich-Loeffler-Institute, Federal Research Institute for Animal Health, Greifswald - Island of Riems)
Dirk Schaudien (Fraunhofer-Institute for Toxicology and Experimental Medicine, Hannover)
Verena Haist (Boehringer Ingelheim Vetmedica, Ingelheim)
Ursula Siebert (Institute of Terrestrial and Aquatic Wildlife Research, University of Veterinary Medicine Hannover)
Klaus Osterrieder (President of the University of Veterinary Medicine Hannover)
Florian Krammer (Department of Microbiology, Icahn School of Medicine at Mount Sinai, New York)
Stefan Finke (Institute of Molecular Virology and Cell Biology, Friedrich-Loeffler-Institut, Greifswald-Insel Riems)
Sebastièn Pfeffer (Institut de Biologie Moléculaire et Cellulaire, CNRS, Strasbourg)

Students' opinions on the senior class

„Rabies“: The lecture was really great! It was easy to listen to but complex enough to stay interesting.

„Rabies“: So so amazing . Exceptionally outstanding. Would love to hear his lecture again.

The Viper Senior class was overall very good and included different interesting topics that helped me in creative thinking and being familiar with updated information

“Equine Herpesvirus Type 1 - pathogenesis and prevention of abortion and equine stroke”:
Very good presentation and way of presenting data. Easy to follow the talk.

“Antiviral copound screens”
The course was very interesting and never a dull moment.

Public relations

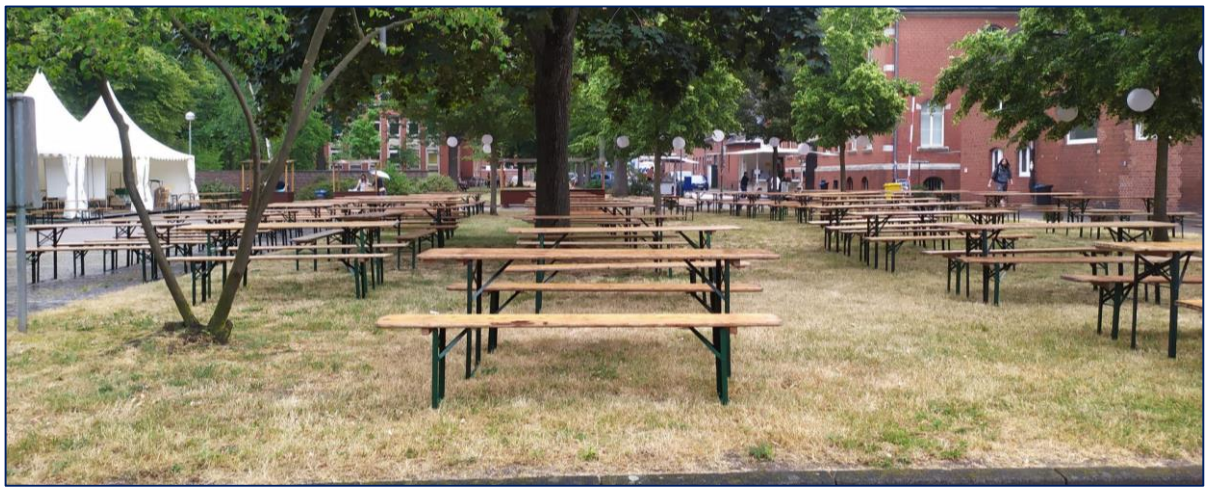
Booth at the summer party of the University of Veterinary Medicine Hannover

VIPER was represented at the TiHo summer party in the form of a booth. The VIPER students offered all interested visitors a playful insight into their work and projects.

There were various games, such as “VIPER Pong” and pipette tip guessing. You could also test your taste buds and try to guess the different ingredients of the “VIPER Drink”. Additionally, the students provided a quiz about virus related topics.

Do you want to test your own knowledge about viruses?

The quiz of the summer party is provided on the next pages (including solutions).



It's quiz time!

1. What was the first virus to be discovered?
   a) Poliovirus
   b) Influenza virus
   c) Tobacco mosaic virus
   d) Measles virus

2. When was the first virus discovered?
   a) 1892
   b) 1776
   c) 1939
   d) Unknown

3. What was the first virus to have its genome sequenced?
   a) HIV
   b) Hepatitis B virus
   c) Influenza virus
   d) Poliovirus

4. What is VIPER the short for?
   a) Very important elegant research
   b) Virus Particle Explorer
   c) Virus detection, pathogenesis and intervention
   d) Virus intelligent explorative research

5. Which of the following is an example of a zoonotic disease?
   a) COVID-19
   b) Lyme disease
   c) Ebola
   d) All of the above

6. Which of the following is an example of a One Health (An approach that recognizes the interconnectedness of human, animal, and environmental health) issue?
   a) Climate change
   b) Antibiotic resistance
   c) Emerging infectious diseases
   d) All of the above

7. What is the name of the virus that causes polio?
   a) Poliovirus
   b) Rhinovirus
   c) Coronavirus
   d) Influenza virus

8. Which virus is responsible for causing the flu?
   a) Rhinovirus
   b) Coronavirus
   c) Influenza virus
   d) Ebola virus

9. What is the name of the virus that causes AIDS?
   a) Human Immunodeficiency Virus
   b) Hepatitis B
   c) West Nile virus
   d) Dengue virus

Solution:
1 C; 2 A; 3 B; 4 C; 5 D; 6 D; 7 A; 8 C; 9 A

10. What is the most effective way to prevent the spread of viruses?

a) Wearing a mask
b) Washing your hands frequently
c) Social distancing
d) All of the above

11. What is the name of the virus that causes COVID-19?

a) Influenza
b) Coronavirus
c) Rhinovirus
d) Ebola

12. What is DNA sequencing?

a) The process of amplifying DNA samples
b) The process of determining the order of nucleotides in a DNA molecule
c) The process of introducing foreign DNA into a host organism
d) The process of editing DNA sequences

13. Which of the following vaccines was the first to be developed?

a) Smallpox
b) Polio
c) Measles
d) Influenza

14. Who coined the term "bioinformatics"?

a) Paulien Hogeweg and Ben Hesper
b) Francis Crick and James Watson
c) Rosalind Franklin and Maurice Wilkins
d) Craig Venter and Hamilton Smith

15. What technology has revolutionized the field of bioinformatics by allowing for the rapid sequencing of large amounts of genetic material?

a) PCR
b) Sanger sequencing
c) High-throughput sequencing
d) CRISPR-Cas9

16. When was the first complete genome sequence of a free-living organism, *Haemophilus influenzae*, published?

a) 1965
b) 1975
c) 1985
d) 1995

Solution:
10 D; 11 B; 12 B; 13 A; 14 A; 15 C; 16 D

VIPER

GRK 2485

Second year project - IdeenExpo 2024

As their second year project, the VIPER students offered workshops for pupils at the IdeenExpo 2024 in Hannover. Using real cases of the necropsy hall, the VIPER students walked the pupils through post mortem examination and histological evaluation with focus on viral diseases of the central nervous system. The participants could examine formalin fixed specimens as well as histological slides. Also, various laboratory utensils were presented and made available to the pupils for practical exercises. In addition to that, there were also insights given into the safety measurements that the VIPER students have to deal with in their everyday lives.

Biodiversity: Excursion to the Crau/Camargue, France

(Tom Schreiner)

The excursion to the Crau/Camargue (Southern France), offered by the Institute of Animal Ecology since 1998, is an adventurous field-trip, combining academic research with the occasion to get hands-on insights into the origin, biodiversity and maintenance of a unique and fragile European region.

Identification of caught dragonflies (by courtesy of Lukas Hagen)

Broadly, the excursion focuses on the subject of nature conservation with special emphasis on endemic floral and faunal species to this region and critically enlightens the past, contemporary and future biotic and abiotic impact. Throughout the excursion, we gained a geographical overview of the regional complexity. The different ecosystems within and the associated anthropogenic impacts (public and military infrastructure, industry, racing tracks, waste dumps etc.) were discussed in more depth during guided tours given by local experienced experts from governmental and non-governmental organizations on an almost daily basis. The guided tours exemplified in each region the harsh reality and complexity of nature conservation and highlighted the controversies between public, industrial and sustainable interests. Additionally, participants were obliged to perform oral presentations on relevant, regional topics. Prior to the excursion, each student was assigned a scientific topic related

related to the excursion, to be performed as 15-minute oral-presentation on site. The topics were then discussed in the group and expanded by the knowledge and experience of local experts.

Coussouls de Crau (by courtesy of Josephine Hoffmann)

Another major scientific topic of the excursion, led by PD Dr. Heike Hadrys, was the observation and non-invasive sample-collection for genetic analysis of different endemic and non-endemic species of dragonflies in the region. The project aims at generating a long-term genetic monitoring, in order to determine the genetic pool present in the regional populations and provide a better assessment of human impact on species diversity and their habitat. Finally, the excursion was also directed at collecting aquatic samples in order to detect individuals of Placozoa sp. a multicellular, aquatic organism of high scientific potential. In the working group of Prof. Dr. Bernd Schierwater, samples will be examined by morphologic as well as metagenomic laboratory methods in Hanover in order to get more insights into the origin, diversity and scientific potential of this underestimated animal. During our stay, students were constantly pushed to make their own critical observations and discuss them on a socio-economic and eco-sustainable level during a debriefing meeting each evening at the campsite.

Although not closely related to my PhD-project, this excursion gives participants the unique opportunity to think outside the mundane laboratory box. I was faced the subject of one health from a global point of view and received a realistic and devastating introduction to the importance and complexity of nature conservation directed at combatting anthropogenic climate change and environmental pollution as a constant growing and inevitable threat to mankind. Nevertheless, my experience was accompanied by the overwhelming kindness and welcome of the scientists and personnel from the Institute of Animal Ecology. In conclusion, I´ve personally learned to treat my surroundings with a more conscious and sustainable perspective and I can strongly recommend this excursion to fellow VIPER students.

Camargue horse in Marais du Vigeuriat, Camargue

International Virus Bioinformatics Meeting in Valencia, Spain

(Josefin Säurich)

From May 24 till May 26, 2023, I attended the annual 'International Virus Bioinformatics Meeting' (ViBioM) in Valencia, Spain. The event, jointly organized by the European Virus Bioinformatics Center (EVBC), the Institute of Agrochemistry and Food Technology (IATA-CSIC), and the University of Valencia, featured eleven poster and talk sessions over the course of three days. The sessions covered various topics, including virus discovery, virus classification, virus visualization, viral infection, viromics, RNA viruses, viral sequence analysis, viral surveillance, molecular epidemiology, phylodynamic analysis, and metagenomics. The attendees of the ViBioM were experts and newcomers in the fields of virology and bioinformatics.

Keynote speakers included Bernhard Renard from the Hasso Plattner Institute, Potsdam, Germany, and Emma Thomson from the University of Glasgow, Glasgow, United Kingdom. Thomas Renard presented the use of machine learning in viral surveillance, while Emma Thomson gave a fascinating talk on metagenomic next-generation sequencing as a tool for identifying undiagnosed pathogens in Uganda.

ViBioM offered numerous opportunities for networking with scientists at various career stages and numerous different backgrounds. As a PhD student, attending the ViBioM was a milestone for me, as this was my first major conference I attended independently and abroad. During the talk and poster sessions, I had the opportunity to learn more about ongoing research, breakthroughs, and the importance of interdisciplinary collaboration.

During the poster session, I engaged in many insightful discussions about my poster titled 'Computational processing of public sequencing files to identify clusters in high-dimensional human virome data'.

I received valuable ideas and advice that I hope to implement in my project. Further, I exchanged experiences and ideas with fellow attendees. I connected with Manja Marz from the University of Jena, Jena, Germany, and director of the EVBC, which later on lead to her being part of our VIPER Junior class.
Overall, the conference is a great platform for virologists and bioinformaticians to 'join forces' in the study of viruses.
I would like to thank the organizers for that great event and VIPER for the opportunity to participate!

9th European Scientific Working Group on Influenza (ESWI) Conference in Valencia, Spain

(Monica Mirolo)

I attended the 9th European Scientific Working Group on Influenza (ESWI) Conference in Valencia (Spain) from 17th to 20th September 2023. ESWI is to discuss about respiratory viruses, tackling influenza virus, but also RSV and SARS-CoVs.
My poster described in detail the infection of grey seals with highly pathogenic avian influenza A virus (HPAIV) H5N1 that we reported last year, and my talk entitled "Avian influenza virus infections in marine mammals, another reason for concern?" took place during the scientific session "Threats from the animal world". The talk presented the knowledge we had as of September 2023 about H5N1 in marine mammals, aiming to discuss to the threat of virus adaptation to mammals posed by H5N1 infections in these animals, bringing examples from past epizootics of influenza virus in seals. Comments, constructive feedback, and discussions were abundant for both poster and talk. ESWI gives floor to established experts in the field of virology to inspire others by sharing their knowledge. Of note, ESWI focuses on the future of science too.
During the time in Valencia, I joined the "Early Career Scientists (ECaS) Community" with other PhD students, which gave great networking opportunities. I met people from my country, we talked about future job opportunities.

European Congress of Virology 2023 in Gdansk, Poland

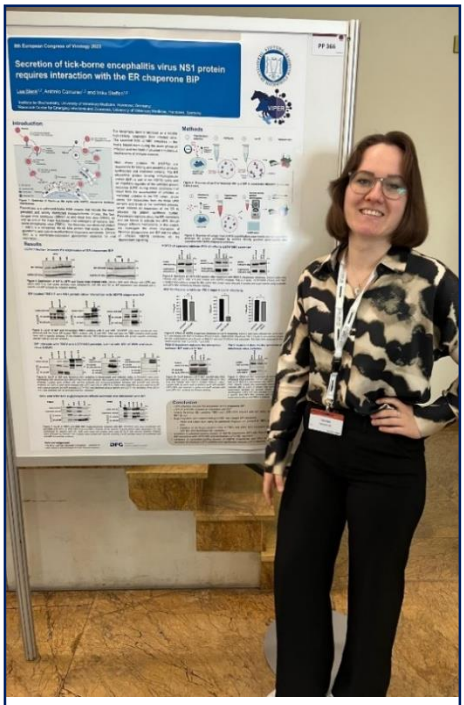
(Alina Friedrichs, Lea Blank and Sophie Kolbe)

From May 4 to 7, the 8th European Congress of Virology took place in Gdansk, Poland. Three of us: Alina, Lea and Sophie, attended the conference together to present our current research as posters and

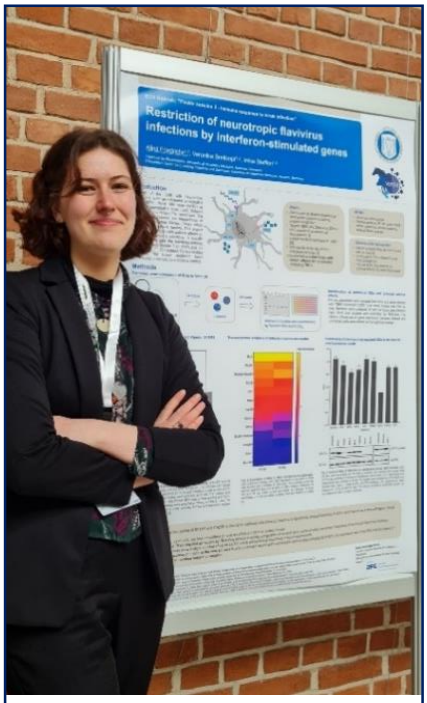
to listen to the top talks of leading European virologists. We traveled to Gdansk by train on May 3rd and were able to get a first impression of this very picturesque city on the coast of the Baltic Sea. After some free time the next morning to explore the city, the conference started later in the afternoon with an international reports on how the pandemic impacted the field of virology. Professor Stefan Pöhlmann gave the keynote lecture on the identification of ACE2 as the receptor of SARS-CoV-2. During the conference there were many interesting presentations on a wide variety of topics, ranging from plant virology to public health and vaccine development. The topic of SARS-CoV-2 was of course very prominent. Lea and Alina were most interested in the presentations on Flaviviruses, with multiple experts in the field being present. Meanwhile the topic of Orthopneumoviruses, which was the most interesting for Sophie, gained more attention during the

conference due to the approval of the first vaccine against Respiratory Syncytial Virus during this period.

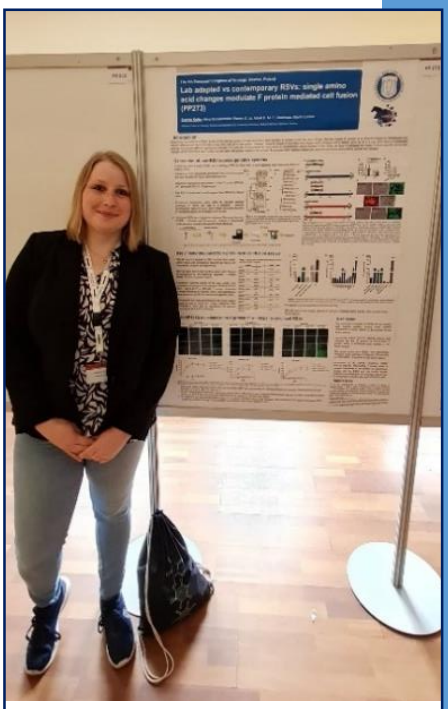
On May 6, we were able to present our own research during a poster session. Each of us attracted the interest of several other researchers in the field and it was very exciting to discuss our results with other experts in the field. In summary, it was a very impressive experience to see so many virologists together and to participate in the scientific exchange. We are already looking forward to the next conference.



Lea Blank with her poster «Secretion of tick-borne encephalitis virus NS protein requires interaction with the ER chaperon BiP».



Alina Friedrichs with her poster «Restriction of neurotropic flavivirus infections by interferon-stimulated Genes».



Sophie Kolbe with her poster «Lab adapted vs contemporary RSVs: single amino acid changes modulate F protein mediated cell fusion».

2nd workshop „One Health and Zoonotic Viruses" of the Society of Virology (GfV) in Goslar, Germany

(Mara Duven)

In September 2023 I had the opportunity to present my VIPER-project at the 2nd workshop „One Health and Zoonotic Viruses" of the Society of Virology (GfV) taking place in the Wöltingerode Monastery.

The workshop started with a keynote lecture given by Prof. Friedemann Weber who discussed interferon responses to pathogenic RNA viruses. Other invited keynote speakers included Prof. Seema Lakdawala, Prof. Martin Beer and Dr. Allison Groseth.

As the number of workshop participants was limited, every attendant had the chance to present their work orally and discuss with the scientific audience. Lively discussion also took place during a science communication workshop, a topic that had become more and more important during the COVID-19 pandemic.

Anyone who was not only interested in science but also into learning about the process of distilling schnapps, had the opportunity to participate in a guided tour of the monastery's own distillery.

Overall, the workshop was very useful for my project as I did not only get insights into the research of and methods used by other virologists but also a lot of feedback and suggestions for my own work.

Lab visit in Prof. Pleschka's lab in Gießen, Germany

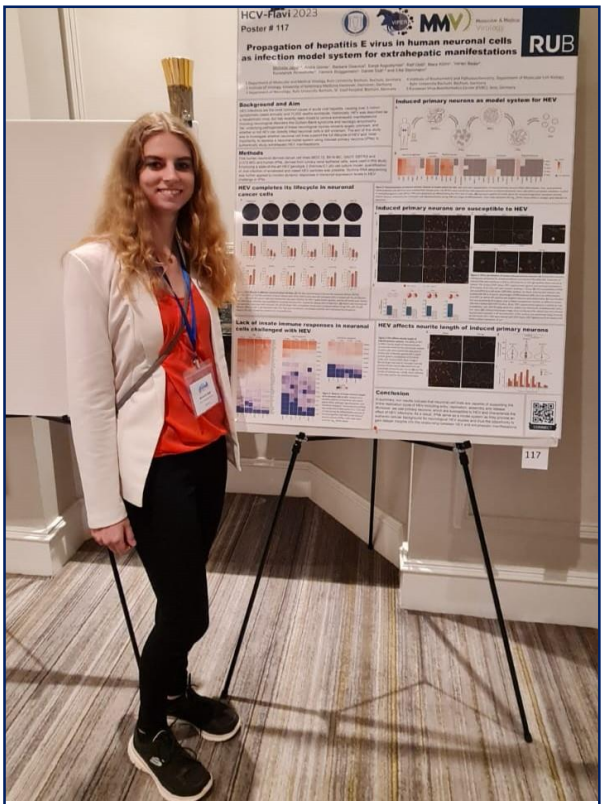
Bassel Aboukhadra

I was delighted and thankful for the VIPER program, which gave me the chance to do part of my work as a doctoral student at the Institute of Medical Virology, Giessen, with the Prof. Stephan Pleschka group. I learned some techniques for the generation of mutant recombinant viruses. I was happy from the visit that I learned more. I enjoyed the nice accommodations and comfortable transportation, which were all funded by the Viper program.

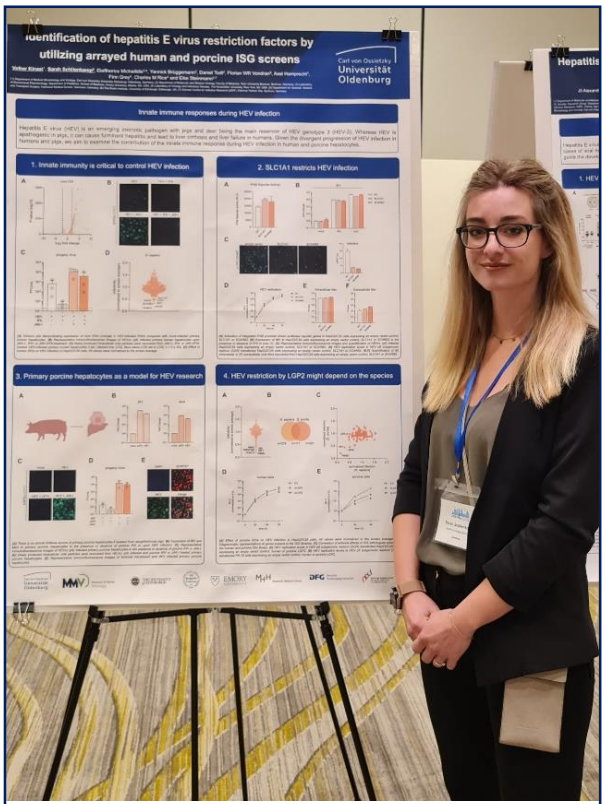
HCV-Flavi Conference in Atlanta, Georgia, USA

(Sarah Schlienkamp, Michelle Jagst)

From 1 to 4 October 2023 the 29th International Symposium on Hepatitis C Virus, Flaviviruses and Related Viruses (HCV-Flavi) took place in Atlanta, Georgia, USA. It was organized by a Chair from Emory-University, which is also located in Atlanta. For us, it was the first visit of an international conference, and we were even more excited as one of the announced keynote speakers was Charles Rice from Rockefeller University, NY! Also, many other famous and influential virologists gave keynote lectures like Ralf Bartenschlager, Alexander Ploss and Brett Lindenbach, but we also attended inspiring sessions on diverse virological topics including innate and adaptive immunity, viral replication cycles, pathogenesis, and drug development. In addition, abstract-talks were held for some of the posters. We presented our PhD projects at the poster session, giving us the opportunity to exchange with experts on the field and gain helpful input for further experiments. Altogether, we felt lucky to be able to attend this impressive conference and learnt a lot about the latest progress in virology, especially, but not only Flaviviruses.



Michelle Jagst with her poster «Propagation of Hepatitis E virus in human neuronal cells as infection model system for extrahepatic manifestations».

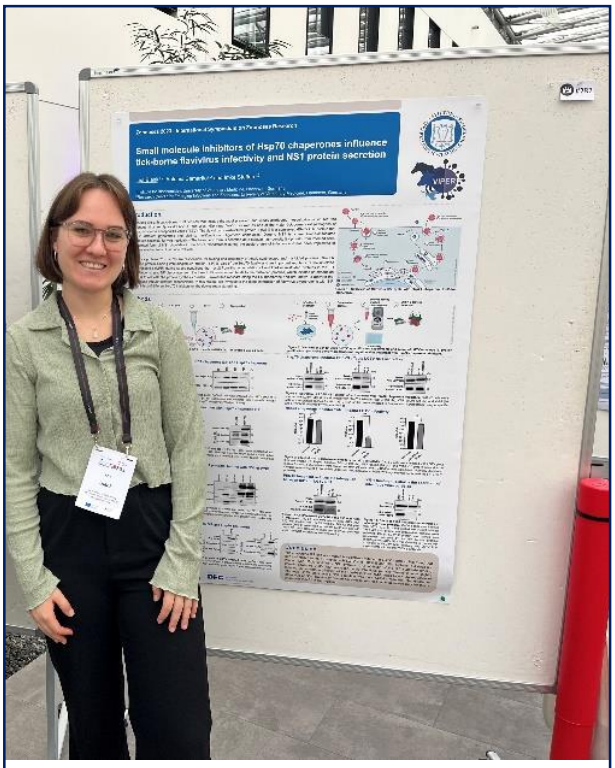


Sarah Schlienkamp with her poster «Identification of Hepatitis E virus restrictions factors by utilizing arrayed human and porcine ISG screens».

International Symposium on Zoonoses Research 2023 (09. – 11.10.2023) in Berlin, Germany

(Lea Blank)

The international symposium on Zoonoses Research 2023 took place from 09.10. to 11.10.2023 in Berlin. The Zoonosis Congress is a relatively small event with around 350 participants, which makes the conference very personal and well manageable. The conference offered three days of interesting presentations on the latest research results from zoonosis research. Young researchers also had the chance to express their research creatively at the poster presentation and poster slam, in which I also took part. In addition to the scientific part, the conference impressed with its delicious entirely vegetarian catering. On the last evening of the conference, the social dinner took place, where you can expand your scientific network in a pleasant atmosphere and end the conference on a high note. At the end of the conference, the award for the best poster slam video was announced, which was very well deserved, and then it was already time to go home.



Lea Blank with her poster «Small molecule inhibitors of Hsp70 chaperones influence tick-borne flavivirus infectivity and NS1 protein secretion».

33nd Annual Meeting of the Society for Virology in Vienna, Austria

(Sonja Ohrnberger)

Attending the 33rd Annual Meeting of the Society for Virology in Vienna was a wonderful experience. It was both informative and enjoyable, and I'm really glad I had the chance to be a part of it. There were so many interesting talks about new research projects that really expanded my knowledge and inspired me. Being able to present my own research project as a poster was a fantastic opportunity. The feedback I received was incredibly helpful and will definitely improve my work.

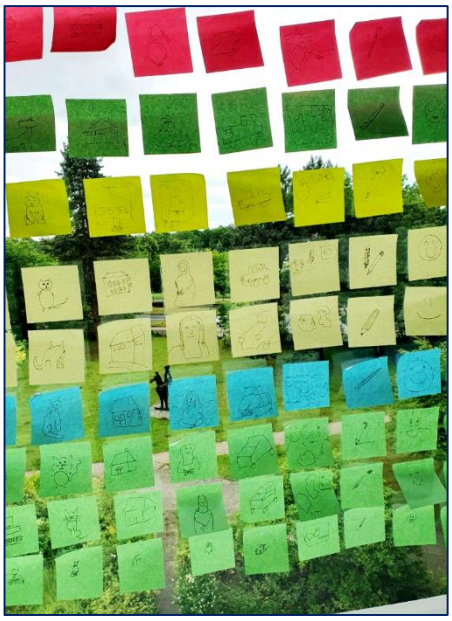
The atmosphere at the congress was great. Everyone was enthusiastic and eager to share ideas, which made the whole event feel very collaborative and exciting. The social evening in the "Wiener Rathshauskeller" was a perfect chance to connect with people in a more relaxed setting. The venue was beautiful, and it was a lot of fun to meet and talk with other attendees.

I would love to attend next year as well!

NaWik Workshop: “Better visualization”

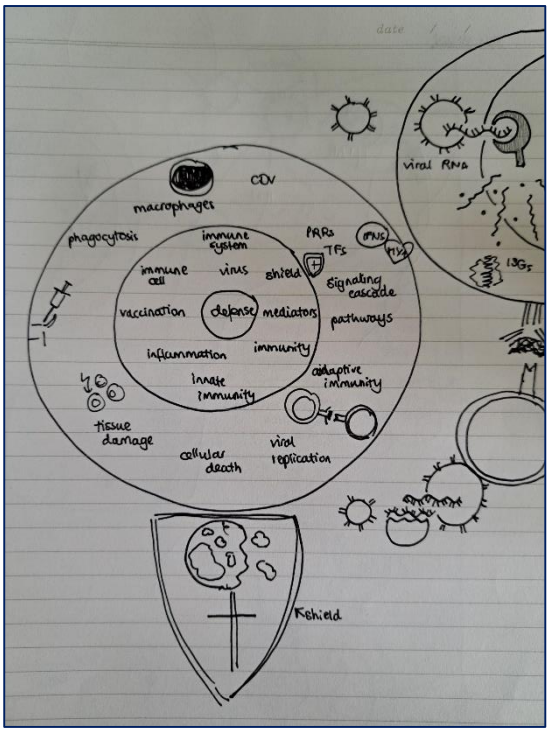
(Pauline Pöpperl)

Several VIPER students attended a two-day course from the NaWik in order to improve their skills to design appealing visualizations for posters, presentations or graphical abstracts. In the beginning, an exercise of ten second drawings (see pictures) lead to a little bit of panic but also a lot of fun and laughing. This was followed by some theoretical input on visualization concepts and infographics.



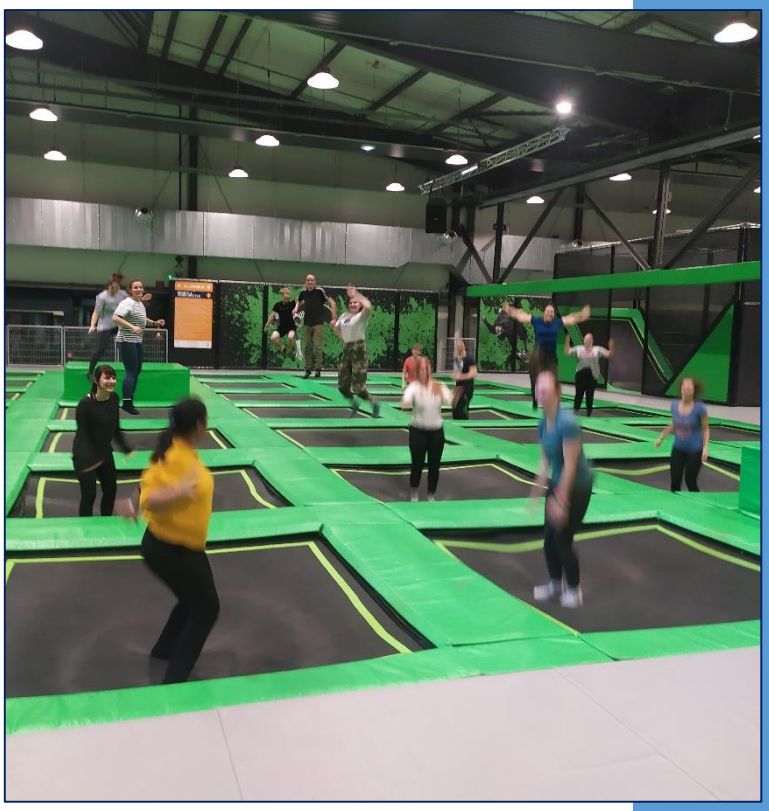
To improve our design concepts, we learned something about colors, font styles and sizes and format structure and hierarchy within the infographic. To practice the new knowledge, we designed out own infographic using an example from a magazine. Next, we started to work on our own infographic by thinking about a short core message and discussing this with a partner. It was quite hard to break it down to such a few words, but this helped to clear the mind to the key points. This was followed by sketching in an “Image Generator” with associated small drawings that could fit to our topic. After that, we were ready to do the first drafts for our infographic, which was followed by some feedback from the other participants.

The lecturer Johanna Barnbeck also gave us a lot of helpful websites as resources to search for open source images, create graphs and so on. In the end, we had still a little time left to discuss some additional topics as AI-generated images, creating small videos and image rights. All students really enjoyed the course and got a lot out of it for their work and maybe also some inspiration for a future careers in scientific communication of visualization.



Recent activities – social interactions

Christmas party at Jump One – Getting active one last time before the peaceful Christmas season starts



This time, the annual VIPER Christmas party took place at Jump One – a trampoline park for all ages. The students could not only jump on all different kinds of trampolines, there were also plenty of other sporting activities. Balance, strength and coordination skills were tested on slack lines, the trapeze and climbing courses.
For those who liked it a bit more competitive, there was the option of playing various ball games or challenging each other in zorb balls on the trampoline.

For those who liked it a bit more competitive, there was the option of playing various ball games or challenging each other in zorb balls on the trampoline.

Achievements:

Congratulation to our new VIPER PhDs:

During the last year (until the end of August 2024), another 6 VIPER students finished and defended their thesis successfully.

We wish you success and good luck for your future career.

- **Frederik Bexter:**

  “Organ cultures as a tool to investigate virus-host-interactions at epithelial structures

- **Belén Carriquí Madroñal:**

  “Characterization of ADAM10 as a hepatitis C virus host factor”

- **Madeleine de le Roi:**

  “Investigation of potential viral etiology by using different molecular techniques in central nervous system disease syndromes of known and unknown cause in various species”

- **Olivia Luise Gern:**

  “Myeloid cell responses to neurotropic viruses in the skin and the central nervous system”

- **Mareike Heinig-Hartmann:**

  “In vivo characterization of the insect-specific Culex Y virus and the establishment of a mosquito larvae test system for vector control”

- **Michael Wißing:**

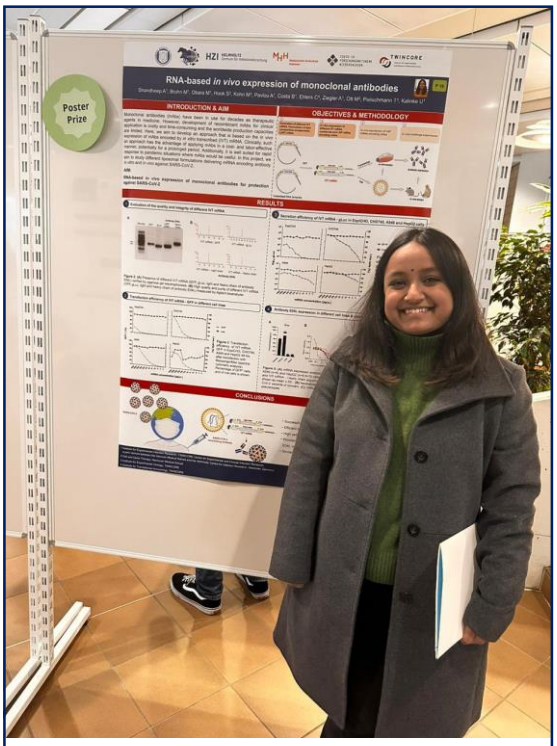
  “Role of host determinants in the replication cycle of the hepatitis E virus”

Achievements:

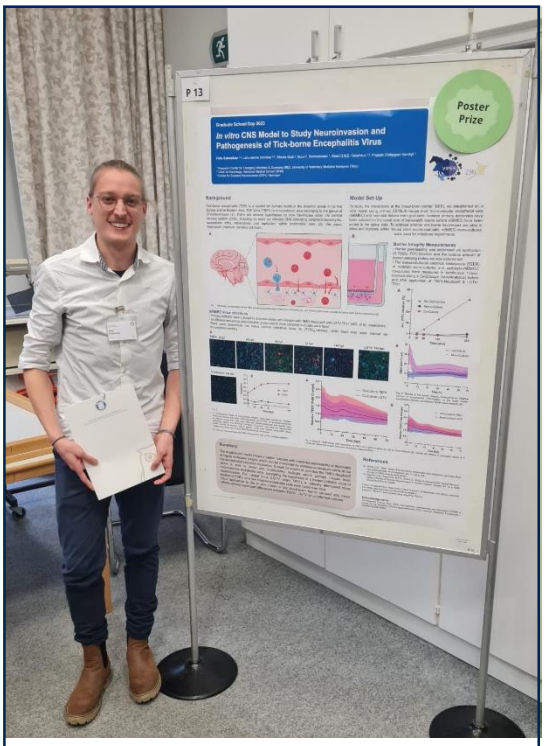
Poster prizes

Our VIPER students also took part in the HGNI's annual Graduate School Day in November 2023. At this event, they presented their outstanding projects in talks and posters.Special congratulations go to Aparna Shandheep, Sophie Kolbe and Felix Schweitzer, whose posters were awarded the poster prize.

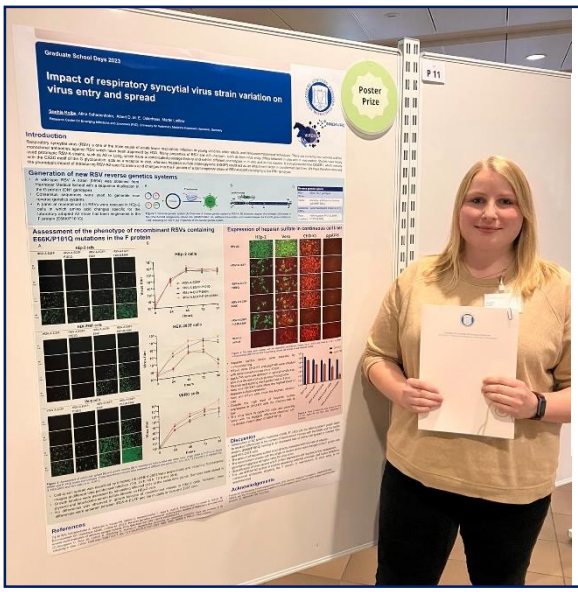
We are proud of you and your achievements as scientists!



Aparna Shandheep with her poster «RNA-based *in vivo* expression of monoclonal antibodies».



Felix Schweitzer with his poster «*In vitro* CNS model to study neuroinvasion and pathogenesis of tick-borne encephalitis virus».



Sophie Kolbe with her poster «Impact of respiratory syncytial virus strain variation on virus entry and spread».

GRK 2485

Recent VIPER publications

Contributing VIPER students highlighted in *italics*

- **Hamster model for post-COVID-19 alveolar regeneration offers an opportunity to understand post-acute sequelae of SARSCoV-2.** *L. Heydemann*, M. Ciurkiewicz, *G. Beythien*, K. Becker, K, Schughart, S, Stanelle-Bertram, B. Schaumburg, N. Mounogou-Kouassi, S. Beck, M. Zickler, M. Kühnel, G. Gabriel, A. Beineke, W. Baumgärtner & F. Armando. Nature Communications (2023) https://www.nature.com/articles/s41467-023-39049-5

- **Emergence of resistance-associated variants during sofosbuvir treatment in chronically infected hepatitis E patients.** *A. Gömer*, M. Klöhn, *M. Jagst*, M. Nocke, S. Pischke, T. Horvatits, J. Schulze zur Wiesch, T. Müller, S. Hardtke, M. Cornberg, H. Wedemeyer, P. Behrendt, E. Steinmann, D. Todt. Hepatology (2023) https://journals.lww.com/hep/Abstract/9900/Emergence_of_resistance_associated_variants_during.487.aspx

- **Distribution of importin-α isoforms in poultry species and their tissue- and age-related differences.** *A. Herbst*, *F. Bexter*, N. Mounogou Kouassi, G. Gabriel, S. Rautenschlein. Research in Veterinary Science (2023) https://www.sciencedirect.com/science/article/abs/pii/S003452882300245X

- **Secreted NS1 proteins of tick-borne encephalitis virus and West Nile virus block dendritic cell activation and effector functions.** *A. A. R. Camarão*, *O. L. Gern*, F. Stegmann, F. Mulenge, B. Costa, *B. Saremi*, K. Jung, B. Lepenies, U. Kalinke, I. Steffen and M. Kalia. Microbiology Spectrum (2023) https://journals.asm.org/doi/10.1128/spectrum.02192-23

- **Genetic and pharmacological perturbation of hepatitis-C virus entry.** *B. Carriquí-Madroñal*, L. Lasswitz, T. von Hahn, G. Gerold. Current Opinion in Virology (2023) https://www.sciencedirect.com/science/article/pii/S1879625723000627?via%3Dihub

- **The matrix metalloproteinase ADAM10 supports hepatitis C virus entry and cell-to-cell spread via its sheddase activity.** *B. Carriquí-Madroñal*, J. Sheldon, *M. Duven*, C. Stegmann, K. Cirksena, E. Wyler, F. J. Zapatero-Belinchón, F. W. R. Vondran, G. Gerold. Plos Pathogens (2023) https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1011759

- **Immunity to Tick-Borne Encephalitis Virus NS3 Protein Induced with a Recombinant Modified Vaccinia Virus Ankara Fails to Afford Mice Protection against TBEV Infection.** *M. Kubinski*, *J. Beicht*, T. Gerlach, A. Aregay, A. D. M. E. Osterhaus, A. Tscherne, G. Sutter, C. Kandiyil Prajeeth and G. F. Rimmelzwaan. Vaccines (2024) https://www.mdpi.com/2076-393X/12/1/105

Recent VIPER publications (continued)

Contributing VIPER students highlighted in *italics*

- **Performance of sofosbuvir and NITD008 in extrahepatic neuronal cells against HEV.** *M. Jagst*, A. Gömer, D. Todt and E. Steinmann. Antiviral Research (2024) https://www.sciencedirect.com/science/article/pii/S0166354224001311
- **Combined Analysis of Multi-Study miRNA and mRNA Expression Data Shows Overlap of Selected miRNAs Involved in West Nile Virus Infections.** *F. L. Böge*, S. Ruff, S. Hemandhar Kumar, M. Selle, S. Becker and K. Jung. Genes (2024) https://www.mdpi.com/2073-4425/15/8/1030
- **Modeling extrahepatic hepatitis E virus infection in induced human primary neurons**. *M. Jagst*, A. Gömer, S. Augustyniak, M. Klöhn, A. Rehm, R. G. Ulrich, V. Bader, K. F. Winklhofer, Y. Brüggemann, R. Gold, B. Gisevius, D. Todt and E. Steinmann. PNAS (2024) https://www.pnas.org/doi/10.1073/pnas.2411434121
- **Detection of Double-Stranded RNA Intermediates During SARS-CoV-2 Infections of Syrian Golden Hamsters with Monoclonal Antibodies and Its Implications for Histopathological Evaluation of In Vivo Studies.** *G. Beythien*, *M. de le Roi*, S. Stanelle-Bertram, F. Armando, *L. Heydemann*, M. Rosiak, S. Becker, M. M. Lamers, *F. K. Kaiser*, B. L. Haagmans, M. Ciurkiewicz, G. Gabriel, A. D. M. E. Osterhaus, and W. Baumgärtner. International Journal of Molecular Sciences (2024) https://www.mdpi.com/1422-0067/25/21/11425

The full list of publications is available at our homepage:

www.tiho-hannover.de/forschung/forschungsprofil/forschungskooperationen-und-netzwerke/viper-grk-2485/publications

Outlook and announcements

After this successful and eventful fifth year for VIPER and the eventful and labor intensive second and third year for the second cohort of VIPER students, there are many great events coming up in the future.

We will start the new year with the last network meeting for the second cohort.
This will be followed by the second VIPER Symposium on virus research in February. At this two-day event, experts from all fields of virus research will share their latest research achievements and the VIPER students will also have the opportunity to present their projects to a large audience of experts.

In April, the third VIPER cohort will start. We are already looking forward to welcome all the new motivated PhD students that we will support on their way to becoming a recognized scientist in virus research over the next three years.

We are excited about all the upcoming network meetings, VIPER classes and individual training courses that we will continue to organize for our third cohort of students.

For further information about VIPER, please visit our website: www.rtg-viper.com

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