

International Workshop „Magnetic Resonance Studies“
(Project number: 81p6)

Final Report

The goal of this project was to organize international workshop on Magnetic Resonance Imaging and Spectroscopy 2018 and to familiarize the audience with the scientific projects and recent advances on four medical research sites focused on magnetic resonance imaging and spectroscopy in Austria and Czech Republic. These traditional workshops are organized by participating groups from Vienna and Prague since 1995. Last year we have reached out towards participants from Technical University Graz, Medical University Graz, Karls Franzens University Graz and Institute of Scientific Measurement, Czech Academy of Sciences, Brno. Following their active participation and enthusiastic feedback the preparation of this year workshop could not leave them out.

The workshop held this year took place in Nové Hradky, Czech Republic from May 16th to May 18th 2018 at Conference Centre, Center for Nanobiology and Structural Biology. It was attended by 56 scientists from both countries (by Aktion financially supported 30 people from Austria and 17 people from Czech Republic). Overall a great mix of young scientists at all graduation levels visiting and participating at the workshop for the first time up to senior scientists returning to the workshop regularly was achieved and sparked lively presentations and discussions from different fields of medical MR research. This year again thirteen graduate or undergraduate students could present (total number of presentations 36) their research ideas or results of their work for the first time to an international audience. They especially valued the possibility to give their talks within this motivated and friendly platform. Voluntary feedback from some of the students but also senior participants is also enclosed at the end of this report.

The emphasis of the scientific part of the meeting was given to three senior guest lecturers (Günther Helms, Lund University, SWE: Sodium MRI on a 7T Philips scanner. Is it worth its salt?; Alexander Rauscher, University of British Columbia, Vancouver, CAD: Magnetic Tissue Properties and Martin Hrubý, Institute of Macromolecular Chemistry, Czech Academy of Sciences, Prague, CZE: Polymer contrast agents for magnetic resonance imaging - Quo vadis?) and further presentations given by graduate and postgraduate students on the topic of their projects in six scientific sessions. The focus was laid on:

- i) Dynamic contrast enhancement magnetic resonance imaging, Drug delivery systems
- ii) Advances and new approaches in MR hardware and software – coil design
- iii) Functional magnetic resonance imaging/¹H-³¹P spectroscopy
- iv) Magnetic resonance imaging of tumors, liver, sentinel nodes and heart
- v) Water/fat separation
- vi) MR signal post processing

The complete program of the workshop with the list of participants is attached (Program_Aktion_2018_final_NH.pdf).

The talk of Martin Vit (Prg/Vie) drawn special attention as he has presented the results of cooperation on MR hardware development which was ignited at last year workshop between Drs. Jiráček (Prg) and Laistler (Vie). In his case, Mr. Vit is currently visiting MUW and working on the development of radio-frequency MR probes which will be used for further experiments at both sites. Similarly Dr. Korinek (Brno) presented results of processing and segmentation of subcutaneous and brown adipose tissue MRI data acquired in the cooperation with Dr. Krssak (MUW) at research facilities in Vienna. This cooperation will be further prolonged during his stay at the High Field MR Centre in Vienna (June – December 2018) which is supported by internal research grant of Czech Academy of Sciences.

To increase the motivation and quality of presentations by junior researchers two of them are regularly endowed by "Presentation Award". This time both awards went to Vienna. Presentations of Mrs. Beata Bachratá, M.Sc. and Mr. Lukas Hingerl, M.Sc. were elected by jury composed from senior researchers from all sites.

We were also very glad to welcome Mrs. Hanzlova from Dum Zahranicnych Sluzeb, Prague who visited our workshop this year. She presented the AKTION AUT-CZE grant scheme and discussed special actions of this scheme with interested participants in person during the breaks and social event.

The workshop further aimed at discussions and consultations of problems with MR sequences and data evaluation and preparation of joint projects. Here we can name the project "Improvement in liver disease diagnosis using advanced quantitative methods of magnetic resonance" including texture of liver MRI supported by Wissenschaftlich-Technische Zusammenarbeit (WTZ) Österreich-Tschechien 2018-2019 grant scheme. First results of this cooperation were presented by Y. Albahesh, BSc. and further steps were discussed by Drs. Dezortová, Hájek and Krssak and Robinson.

The workshop was complemented by social event for all participants in the evening of May 17th with tour to the nearby Monastery of The Divine Mercy and Buquoy tomb.

Total price for accommodation of participants from Austria and Czech Republic, hire charge of conference room, sound system, and transport of some participants and data projector was 181928 CZK (Czech partner) and 2220 EUR (Austrian partner).

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Voluntary feedback

Hier mein Feedback für den Report:

The Czech-Austrian MR Workshop is the perfect opportunity to learn more about the research focuses of other groups in the Czech Republic or Austria and to strengthen the collaboration between different research labs, e.g. the TU Graz/University of Graz and the Medical University in my case. Besides pursuing collaborative projects, I can personally benefit from the Workshop in multiple ways: I can practice my presentation skills, share some ideas concerning my ongoing PhD project and discuss about it with experienced researchers. There is also the possibility to get an accreditation of this Workshop at my home university (Université Paris-Sud).

Liebe Grüße,
Lena Nohava (Ph.D. Student)

Dear Prof. Martin,

thanks for the invitation and the good organization. It was very interesting to see how the works of the experienced colleagues were going. Discussing the ideas with each other and getting some recommendations or rather critics was also an important point. That motivated me to go on and to improve my work.

Thank you very much. Best regards

Yamen Albahesh (cand. B.Sc.)

This was my first meeting and I was really impressed by the quality of the presented work. It is good that everyone gets to see every talk. This broadened my horizon, especially with respect to image reconstruction and spectroscopy.

Alex Rauscher, Ph.D.

I happily comply. It is always an inspiration to meet old colleagues (20 years since I first met Milan H and Martin B at Karolinska MR Center) and younger folks in an informal and inspirational setting. It is an excellent opportunity to keep in touch with what's going on in fields that I have left behind (MRS) and get help to move into new fields (Cheers, Alex R!). For these three days, the Aktion felt like a big research group where one could help out with advice and being helped (Cheers, Korbinian E!) Besides, even as a senior, I quite like the to talk about work-in-progress (Na MRI) to frightfully clever younger gals and lads. So thank you Aktion and corporate sponsors, but most of all you Dan and Martin, for making this possible.

G. Helms, Ph.D.

Especially for me was very interesting that many experiments (even those from abroad) encounter problems with radiofrequency coils. However, my supervisor Daniel Jirak has already gained this experience. He also recommended to agree with the Czech group on my upcoming dissertation about RF coils for MR. To gain experiences, I talked with people from Vienna on the seminar last year and managed to work on my dissertation in Excellence MR centrum in Vienna, with specialized MR RF laboratory and a group of RF experts. This year, I presented my work on the Aktion 2018 seminary. Part of this work was from Czech other from Vienna. I believe that this connection of two different workplaces was essential for the progress of my work.

Martin Vít (Ph.D. Student)

The Austrian-Czech workshop 2018 was the first conference where I had the chance to present my ongoing master thesis. It was a great opportunity to practice a talk in front of an interested group and clarify emerging questions. The workshop also is a good occasion get to know colleagues and their research topic and I am glad that there was enough time for discussions with them.

Best regards,

Michael Obermann , B.Sc.

On 16th-18th of May I was participating in AKTION workshops. That was my first international workshop before starting PhD studies and an excellent preparation.

My presentation helped me to overcome stress from performing and gave a chance to discuss about my work. The discussion was beneficial and led to better understanding of the given topic and finding new solution for its future upgrade and possibilities. Presentations of other participants during the sessions were very interesting and gave me a wide overview of new methods. This exchange of ideas and methodology is beneficial for better understanding of other branches and can lead to cooperation. Open discussion, after the presentations session, gave us a chance (especially for students) to get to know each other and talk about our impressions from the presentations. Thanks of the perfect organisation we could enjoy that time fully and I'm looking forward for next workshops.

Natalia Ziółkowska (Ph.D. Student)