

**BIOQIC - An overview of 2021:**

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- **Funding of the second BIOQIC term**

The most important milestone in 2021 was the funding of the second term of BIOQIC. After extensive preparations by the BIOQIC board, the PIs, and all of the PhD students, the assessment by the DFG took place in February. Due to the Covid-19 pandemic, the assessment took place online via the platform Cisco Webex, organized by the DFG. BIOQIC was evaluated as 'excellent' and was awarded with another 4,5 years of funding. The second term of BIOQIC runs from the first of October 2021 until end of March 2026. Based on this extension, the third cohort of PhD students is expected to start with the new projects in spring 2023. We are happy to have the experienced scientists and PIs Prof. Anja Hennemuth (Charité), Prof. Gabrielle Steidl (TU Berlin) and Dr. Jing Guo (Charité) on board, who have been added to the team of core PIs to replace Prof. Gitta Kutyniok and Prof. Jan Laufer who left Berlin for other calls, and Prof. Matthias Taupitz who is the leading PI of CRC1340 Matrix in Vision that was established in July 2018. Prof. Anja Hennemuth became the new member of the executive committee, which meets once a month to discuss important current topics. All PIs remain associated to BIOQIC. We would like to thank all PIs and PhD students very much for their enormous efforts!

- **BIOQIC colloquia**

Last year in December, the first BIOQIC colloquium took place via MS Teams and was concluded by an end-of-the-year online celebration. This year, we had an even better celebration, the BIOQIC Days 2021. Taking place at the end of October, we had the chance to physically meet each other again; more about the BIOQIC days follows in the next section.

The 2021 online colloquia took place in April and June. At each colloquium, five PhD students of the 2<sup>nd</sup> cohort presented their projects in a 25-minute presentation with discussion. The presentations were chaired by the PhD students. The first colloquium, in 2020, was followed by a separate meeting with strategy discussions for the PhD students that presented their projects at the colloquium. The strategy meetings were between the PhD students and their supervisor(s), the BIOQIC coordinator(s), BIOQIC chairperson and/or vice chairperson, and an additional external person of choice by the PhD student. At the 2<sup>nd</sup> and 3<sup>rd</sup> colloquium in 2021, the strategy meetings followed the open colloquium presentations and were as such integrated into the colloquium program.

This made it easier for the PhD students and supervisors, as well as the other persons involved, to organize and to follow up on the presentations.

The 3rd colloquium in June was followed by an after-colloquium dinner at the restaurant Weltwirtschaft. A delicious menu with pizza or vegetarian gnocchi, specially made for BIOQIC, was enjoyed on the terrace of the Haus der Kulturen der Welt.

## • **BIOQIC Days 2021**

Thanks to the Covid-19 situation at that time, which allowed for physical events to take place with strict hygiene measures, the BIOQIC Days were held from October 28-29 at the Inselhotel in Potsdam. It was great to finally see everyone in person! The event was also available online via MS Teams. On the first day, the PhD students of the 2<sup>nd</sup> cohort presented their projects and discussed about their results and ideas with peers and PIs.



The sessions were chaired by PhD students, who performed excellently! Highlight was the presentation by Prof. Markus Antonietti, director of the Max Planck Institute of Colloids and Interfaces in Potsdam. His talk about environmental issues and the discussion afterwards was found very inspiring by the participants of the BIOQIC Days. The first day was concluded by a get-together with musical accompaniment by the duo "Roy Wilde and Golda Heart".



The second day consisted of talks by those associated PhD students who participated. They introduced their PhD topics and had the opportunity to interact and cooperate with other BIOQIC members, which was very much appreciated. In the afternoon, the final event was a boat tour on the lakes of Potsdam. The weather was brilliant and a delicious finger food buffet was enjoyed on the outside deck of the MS Königswald of the Weisse Flotte shipping company.



- **Other events in 2021**

Next to the colloquia with strategy meetings and the BIOQIC Days 2021, continuous BIOQIC seminars and Journal Clubs took place on a regular basis, on Tuesdays from 16:00-17:00 h, online via MS Teams.

A new feature was introduced to the Journal Clubs, i.e. that the supervisor should be present and support the PhD student by highlighting the importance of the paper and explaining her or his view. New Journal Club guidelines, such as an elaborate introduction and the integration of given questions into the paper presentation, were also added. These new Journal Club features were introduced in order to stimulate a more lively discussion among the PhD students. One of the BIOQIC seminar highlights were two special presentations by Prof. Marvin Doyley from University of Rochester, USA, invited BIOQIC guest scientist from July-September 2021. Prof. Doyley gave a talk about reconstructive elastography and ultrasound beamforming. He is involved in the BIOQIC project on ultrasound elastography, through implementation of plane wave imaging. During his two months stay he supported this work with his extensive experience in this field. Other seminars were, amongst others, by Dr. Nima Siboni from DeepMetis AI, on research grant opportunities abroad by Dr. Julia Ihde from the Alexander von Humboldt-Stiftung, on entrepreneurship experiences by BIOQIC member Prof. Kay Raum, and about third party funding by Dr. Christian Renner from the DFG.

Additional events organized by BIOQIC were:

- Online statistics courses by Prof. Shравan Vasishth from Potsdam University, March-April
- Online workshop 'Communication and Rhetoric: Make an impact! Confident scientific online communication and presentation' by Dr. Jane Bormeister, Atelier für Rhetorik, June-July

- **Gender equality news**

In January 2021, BIOQIC became a partner of METIS, Gender Equality & Family Friendliness in Research Alliances at Humboldt-Universität zu Berlin. An introduction of METIS and its offers was given in an online BIOQIC seminar in March by Dr. Verena Bunkus.

In 2021, Edengenet Mashilla Dejene and Simone Hufnagel, both PhD students of the second cohort, were elected by their peers and appointed as members of the BIOQIC GEFA panel, Gender- and Family-life-related aspects. The current GEFA panel members are: Prof. Jeanette Schulz-Menger, Prof. Ingolf Sack, Dr. Judith Bergs, Yavuz Oguz Uca, Edengenet Mashilla Dejene, and Simone Hufnagel, so four women and two men. In 2022, a budget of 15000 Euro is available for equality measures. Examples of such measures are home office equipment for parents of young children, child supervision during off-peak hours, or mentoring for women in science. More than half of the budget in 2022 is reserved for PhD students of the 2<sup>nd</sup> cohort and for associated PhD students and other young scientists from BIOQIC. Membership contribution to METIS is also paid from this budget. In case you have recently become a parent, or are about to become one, or if you are interested in special support for female scientists, please contact us for a consultation meeting.

### • **Events in 2022**

For 2022, BIOQIC is preparing an interesting curriculum and we are communicating with the PhD students in order to come up with a tailored program. We are looking forward to our events in the new year, the program of which includes:

- Online BIOQIC seminar by Dr. Sarah Spreckelmeyer: January 18
- Online BIOQIC seminar, introduction of Charité Welcome Center for international PhD students and time for questions: February 1
- Journal clubs by and for PhD students of the 2<sup>nd</sup> cohort and their supervisors
- 4<sup>th</sup> BIOQIC colloquium: February 8 – new: tandem PhD – PI presentations
- 5<sup>th</sup> and 6<sup>th</sup> colloquium: April 5 and July 12, respectively (dates to be confirmed and announced)
- BIOQIC Days 2022: September 29-30
- And more to come, ideas welcome!

### • **Yavuz leaves BIOQIC management team**

After more than a year of being part of the BIOQIC management team, together with Judith Bergs, Yavuz Oguz Uca's contract at Charité ends by the end of this year. His support, especially during the hectic period of the BIOQIC assessment and extension, was enormous and we thank him greatly for this! Due to his experience as a first cohort PhD student, he has been an excellent mentor and mediating person for the PhD students. Yavuz has also been having regular meetings with the student representatives Yasmine Safraou and Tom Meyer, contributing to improving BIOQIC based on the feedback from PhD students. In addition, he was involved in organizing the BIOQIC seminars and colloquia in 2021 and implemented new formats for these. These tasks will be taken over by Judith Bergs from the next year. We are currently exploring the possibilities to keep Yavuz involved in BIOQIC.

Thank you all for the cooperation and nice times in 2021 and we wish you happy holidays and the best for the New Year! Please stay healthy!

Dr. Judith Bergs & Yavuz Oguz Uca,  
BIOQIC Coordinators

Prof. Ingolf Sack,  
BIOQIC Chair

You can read all news also on <https://bioqic.de/> or follow us on Twitter: <https://twitter.com/bioqic>

*Next pages: BIOQIC awards, announcements, and publications in 2021*

- **BIOQIC awards and other announcements in 2021**

With pride, we announce the awards that our members received in 2021 (see below). Congratulations to the awardees and elected members of 2021!

- November: the BIH QUEST Null Results AWARD went to BIOQIC-associated Ph.D. student, Helge Herthum for his publication "In vivo stiffness of multiple sclerosis lesions is similar to that of normal-appearing white matter".
- September: Prof. Ingolf Sack and Dr. Jing Guo have been awarded the 'Innovation Award' of the German Society for Biomedical Engineering (DGBMT) and Family Klee Foundation for Tomoelastography.
- March: BIOQIC publication "Separation of fluid and solid shear wave fields and quantification of coupling density by magnetic resonance poroelastography" by Ledia Lilaj et al. was listed as the Editor's pick in Magnetic Resonance in Medicine (MRM).
- March: Ledia Lilaj, member of the MR elastography group lead by Ingolf Sack, was elected as Trainee Representative of the ISMRM MR Elastography Study Group Committee.

- **BIOQIC publications 2021**

As in the previous years, our BIOQIC members published an enormous amount of peer reviewed scientific papers. In 2021, 33 papers were published and counting! It was therefore another very fruitful year for BIOQIC in terms of publication output. We are looking forward to what the new year brings us in terms of interesting novelties, please keep us updated. Congratulations go to all authors!

- Mangarova DB, Bertalan G, Jordan J, Brangsch J, Kader A, Möckel J, Adams LC, Sack I, Taupitz M, Hamm B, Makowski MR, Braun J.

Microscopic multifrequency magnetic resonance elastography of ex vivo abdominal aortic aneurysms for extracellular matrix imaging in a mouse model  
Acta Biomater. 2021

[Link](#)

- Sauer F, Fritsch A, Grosser S, Pawlizak S, Kießling T, Reiss-Zimmermann M, Shahryari M, Müller WC, Hoffmann KT, Käs JA, Sack I.

Whole tissue and single cell mechanics are correlated in human brain tumors  
Soft Matter 2021

[Link](#)

- Herthum H, Hetzer S, Scheel M, Shahryari M, Braun J, Paul F, Sack I.

In vivo stiffness of multiple sclerosis lesions is similar to that of normal-appearing white matter.  
Acta Biomater. 2021

[Link](#)

- Jordan JEL, Bertalan G, Meyer T, Tzschätzsch H, Gauert A, Bramè L, Herthum H, Safrrou Y, Schröder L, Braun J, Hagemann AIH, Sack I.

Microscopic multifrequency MR elastography for mapping viscoelasticity in zebrafish.  
Magn Reson Med. 2021

[Link](#)

- Möckel J, Brangsch J, Reimann C, Kaufmann JO, Sack I, Mangarova DB, Kader A, Taupitz M, Adams LC, Keller S, Ludwig A, Hamm B, Botnar RM, Makowski MR. Assessment of Albumin ECM Accumulation and Inflammation as Novel In Vivo Diagnostic Targets for Multi-Target MR Imaging. *Biology (Basel)*. 2021  
[Link](#)
- Gültekin E, Wetz C, Braun J, Geisel D, Furth C, Hamm B, Sack I, Marticorena Garcia SR. Added Value of Tomoelastography for Characterization of Pancreatic Neuroendocrine Tumor Aggressiveness Based on Stiffness. *Cancers (Basel)*. 2021  
[Link](#)
- Vieira Silva R, Morr AS, Mueller S, Koch SP, Boehm-Sturm P, Rodriguez-Sillke Y, Kunkel D, Tzschätzsch H, Kühl AA, Schnorr J, Taupitz M, Sack I and Infante-Duarte C  
Contribution of Tissue Inflammation and Blood-Brain Barrier Disruption to Brain Softening in a Mouse Model of Multiple Sclerosis  
*Front. Neurol.* 2021  
[Link](#)
- Hu J, Guo J, Pei Y, Hu P, Li M, Sack I, Li W.  
Rectal Tumor Stiffness Quantified by In Vivo Tomoelastography and Collagen Content Estimated by Histopathology Predict Tumor Aggressiveness.  
*Front Oncol.* 2021  
[Link](#)
- Garczyńska K, Tzschätzsch H, Assili S, Kühl AA, Häckel A, Schellenberger E, Berndt N, Holzhütter HG, Braun J, Sack I, Guo J  
Effect of post-mortem interval and perfusion on the biophysical properties of ex vivo liver tissue investigated longitudinally by MRE and DWI  
*Front. Phys.* 2021  
[Link](#)
- Kreft B, Tzschätzsch H, Shahryari M, Haffner P, Braun J, Sack I, Streitberger KJ  
Non-invasive detection of intracranial hypertension by novel ultrasound time-harmonic elastography  
*Invest. Radiol.* 2021  
[Link](#)
- Reiter R, Loch F, Kamphues C, Bayerl C, Marticorena S, Siegmund B, Kuehl A, Hamm B, Braun J, Sack I, Asbach P  
Feasibility of Intestinal MR Elastography in Inflammatory Bowel Disease  
*J. Magn. Reson. Imag.* 2021  
[Link](#)
- Reiter R, Shahryari M, Tzschätzsch H, Hass M, Bayerl C, Siegmund B, Hamm B, Asbach P, Braun J, Sack I  
Influence of fibrosis progression on the viscous properties of in vivo liver tissue elucidated by shear wave dispersion in multifrequency MR elastography  
*J. Mechan. Behav. Biomed. Mat.* 2021  
[Link](#)
- Lilaj L, Herthum H, Meyer T, Shahryari M, Bertalan G, Caiazzo A, Braun J, Fischer T, Hirsch S, Sack I  
Inversion recovery MR elastography of the human brain for improved stiffness quantification near fluid-solid boundaries.  
*Magn. Reson. Med.* 2021  
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- Reiter R, Shahryari M, Tzschätzsch H, Klatt D, Siegmund B, Hamm B, Braun J, Sack I, Asbach P. Spatial heterogeneity of hepatic fibrosis in primary sclerosing cholangitis vs. viral hepatitis assessed by MR elastography. Sci Rep. 2021  
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- Werner P, Taupitz M, Schröder L, Schuenke P. An NMR relaxometry approach for quantitative investigation of the transchelation of gadolinium ions from GBCAs to a competing macromolecular chelator. Scientific Reports 2021  
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- Herthum H, Shahryari M, Tzschätzsch H, Schrank F, Warmuth C, Görner S, Hetzer S, Neubauer H, Pfeuffer J, Braun J, Sack I. Real-time multifrequency MR elastography of the human brain reveals rapid changes in viscoelasticity in response to the Valsalva maneuver. Frontiers in Bioengineering and Biotechnology 2021  
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- Jacobi A, Ariza de Schellenberger A, Herbig M, Uca YO, Guck J, Sack I. Real-time deformability cytometry detects leukocyte stiffening after gadolinium-based contrast agent exposure. Investigative Radiology 2021
- Ippoliti M, Lukas M, Brenner W, Schatka I, Furth C, Schaeffter T, Makowski MR, Kolbitsch C. Respiratory motion correction for enhanced quantification of hepatic lesions in simultaneous PET and DCE-MR imaging. Physics and Engineering in Medicine 2021  
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- Chen D, Schaeffter T, Kolbitsch C, Kofler A. Ground-truth-free deep learning for artefacts reduction in 2D radial cardiac cine MRI using a synthetically generated dataset. Physics in Medicine & Biology 2021  
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- Marticorena Garcia SR, Althoff CE, Dürr M, Halleck F, Budde K, Grittner U, Burkhardt C, Jöhrens K, Braun J, Fischer T, Hamm B, Sack I, Guo J. Tomoelastography for Longitudinal Monitoring of Viscoelasticity Changes in the Liver and in Renal Allografts after Direct-Acting Antiviral Treatment in 15 Kidney Transplant Recipients with Chronic HCV Infection. Journal of Clinical Medicine 2021  
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- Zhao J, Kader A, Mangarova DB, Brangsch J, Brenner W, Hamm B, Makowski MR. Dynamic Contrast-Enhanced MRI of Prostate Lesions of Simultaneous [68Ga]Ga-PSMA-11 PET/MRI: Comparison between Intraprostatic Lesions and Correlation between Perfusion Parameters. Cancers 2021  
[Link](#)
- Prezado Y, Hirayama R, Matsufuji N, Inaniwa T, Martínez-Rovira I, Seksek O, Bertho A, Koike S, Labiod D, Pouzoulet F, Polledo L, Warfving N, Liens A, Bergs J, Shimokawa T. A Potential Renewed Use of Very Heavy Ions for Therapy: Neon Minibeam Radiation Therapy. Cancers 2021  
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- Mayer J, Wurster T, Schaeffter T, Landmesser U, Morguet A, Bigalke B, Hamm B, Brenner W, Makowski M, Kolbitsch C  
Imaging coronary plaques using 3D motion-compensated [<sup>18</sup>F]NaF PET/MR  
European Journal of Nuclear Medicine and Molecular Imaging 2021  
[Link](#)
- Kreft B, Bergs J, Shahryari M, Danyel L, Hetzer S, Braun J, Sack I, Tzschätzsch H  
Cerebral Ultrasound Time-Harmonic Elastography Reveals Softening of the Human Brain Due to Dehydration  
Frontiers in Physiology 2021  
[Link](#)
- Waeldchen S, Macdonald J, Hauch S, Kutyniok G  
The Computational Complexity of Understanding Binary Classifier Decisions  
Journal of Artificial Intelligence Research 2021  
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- Ludwig J, Speier P, Seifert F, Schaeffter T, Kolbitsch C  
Pilot tone-based motion correction for prospective respiratory compensated cardiac cine MRI  
Magnetic Resonance in Medicine 2021  
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- Lilaj L, Fischer T, Guo J, Braun J, Sack I, Hirsch S  
Separation of fluid and solid shear wave fields and quantification of coupling density by magnetic resonance poroelastography  
Magnetic Resonance in Medicine 2021  
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- Herthum H, Dempsey SCH, Samani A, Schrank F, Shahryari M, Warmuth C, Tzschätzsch H, Braun J, Sack I  
Superviscous properties of the in vivo brain at large scales  
Acta Biomaterialia 2021  
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Three-dimensional static and dynamic parallel transmission of the human heart at 7 T  
NMR in Biomedicine 2021  
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- Dietrich S, Aigner CS, Kolbitsch C, Mayer J, Ludwig J, Schmidt S, Schaeffter T, Schmitter S  
3D Free-breathing multichannel absolute B+1 Mapping in the human body at 7T  
Magnetic Resonance in Medicine 2021  
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How histopathologic changes in pediatric nonalcoholic fatty liver diseases influence in vivo liver stiffness  
Acta Biomater 2021  
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- Mayer J, Wurster T, Schaeffter T, Landmesser U, Morguet A, Bigalke B, Hamm B, Brenner W, Makowski M, Kolbitsch C  
Imaging coronary plaques using 3D motion-compensated [<sup>18</sup>F]NaF PET/MR  
Eur J Nucl Med Mol Imaging 2021  
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- Kreft B, Bergs J, Shahryari M, Danyel L, Hetzer S, Braun J, Sack I, Tzschätzsch H  
Cerebral Ultrasound Time-Harmonic Elastography Reveals Softening of the Human Brain Due to Dehydration  
Front Physiol 2021

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Congratulations to all students and co-authors who published their work in 2020!!

Publications are periodically posted on our website: <https://bioqic.de/publications/>

For publications (including conference contributions), please refer to BIOQIC in your acknowledgements:

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Please make sure to inform BIOQIC Management & Coordination Office on your accepted papers and conference presentations!