

**In this newsletter:**

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- **Start of the 2<sup>nd</sup> BIOQIC cohort**

We are very happy to present our new cohort! Although it has been a challenging year resulting from the unfortunate Covid-19 Pandemic restrictions, BIOQIC was successful to announce 15 open PhD positions for its 2<sup>nd</sup> cohort towards the end of 2019. We received 70 applications, 39% of which were from women and 57% from men (4% unknown). Of the selected candidates, 31% were women and 69% were men. Among the applications from 22 different nationalities, the majority was from Germany and Iran (24% each). 9 PhD positions were filled initially through the assessment center, the 6 remaining positions were filled after further recruitment. In the second cohort, 5 of 15 doctoral researchers are female (33%) while the rest is male (67%). The 15 doctoral researchers are (Fig. 1, from upper left to lower right): Sherine Brahma, Chiara Manini, Yasmine Safrdou, Guilhem Claude, Edengenet Mashilla Dejene, Matthias Anders, Jakob Jordan,

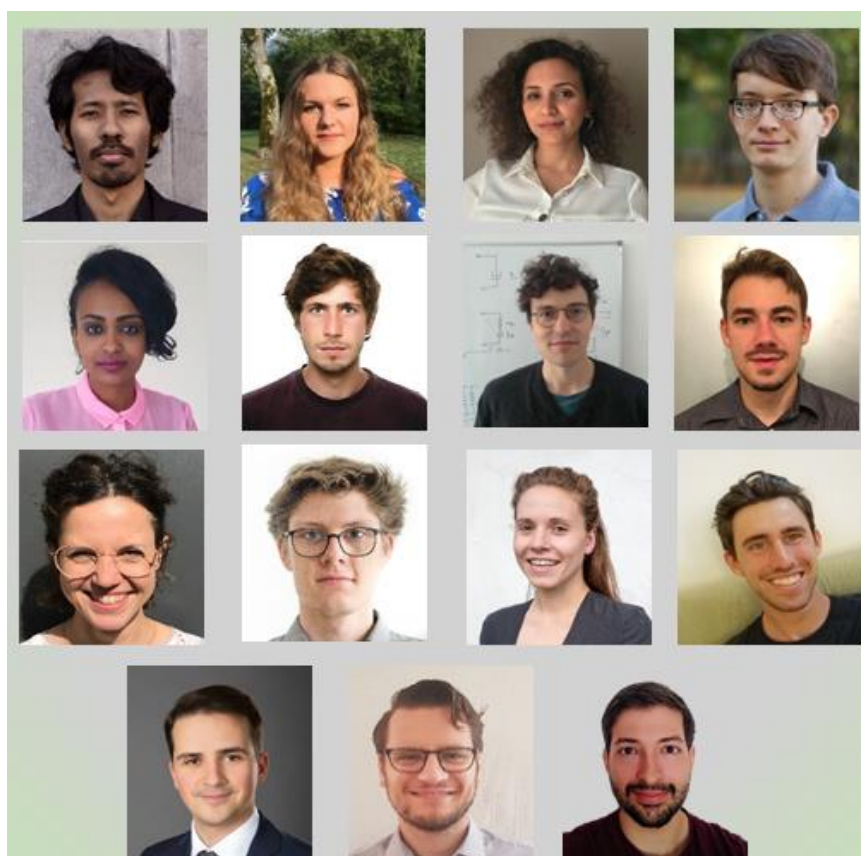


Fig. 1: PhD students of the 2nd cohort

Bernhard Föllmer, Katja Degenhardt, Tom Meyer, Simone Hufnagel, Thomas Hadler, Federico Biavati, Felix Krüger, and David Hernandez.

Table 1: PhD students of the 2<sup>nd</sup> cohort, their projects and supervisors

PhD student	PhD Project	Supervisors
Sherine Brahma	Uncertainty assessment of machine learning for cardiac MR parameter mapping	Steidl Schäffter Schulz-Menger
Guilhem Claude	m-Terphenyl isocyanide complexes for myocardial imaging	Abram Brenner Spreckelmeyer
Edengenet Mashilla Dejene	Multiparametric motion-compensated PET-MR	Brenner Kolbitsch Makowski
Katja Degenhardt	Development of a 4D flow acquisition technique for accurate whole heart velocity quantification at 7 Tesla	Schulz-Menger Schmitter Schäffter
Chiara Manini	Multimodal Quantitative Cardiac Valve Imaging	Hennemuth Kühne Schulz-Menger
Matthias Anders	Multiparametric cardiac MR with real-time viscoelasticity quantification.	Sack Schulz-Menger Hennemuth
Tom Meyer	Ultrasound elastography of the heart towards imaging-based quantification of cardiac pressure	Fischer Tzschätzsch Sack
Yasmine Safrdou	Quantification of the biophysical properties of the liver in correlation with microstructural and vascular changes using multimodal imaging.	Guo Fischer Sack
Jakob Jordan	Multimodal microscopic elastography by optical methods and MRI	Sack Guo Schröder
Bernhard Föllmer	Automated quantification of the configuration and composition of calcified coronary artery plaques towards assessment of plaque mechanics	Dewey Samek Sack
Simone Hufnagel	Motion-corrected 3D high-resolution cardiac T1-mapping	Schäffter Kolbitsch Schulz-Menger
Federico Biavati (PhD/MD)	Coronary calcium score quantification as a predictor of cardiovascular risk	Dewey Kachelriess Stober
Felix Krüger	Quantification and characterization of cardiac fat infiltration using ultra-high magnetic fields	Schäffter Schmitter Schulz-Menger
David Hernandez	MRI-based thermometry with hyperpolarized xenon for optimized CEST MRI	Schröder Taupitz Schäffter
Thomas Hadler	Automated assessment of quantification precision of myocardial micro structure in cardiovascular magnetic resonance to allow quality control	Schulz-Menger Hennemuth Kolbitsch

In the 2<sup>nd</sup> cohort, 7 different nationalities are represented as depicted on the world map below (Fig. 2): German, 9; Indian, 1; French, 1; Ethiopian, 1; Italian, 1; Colombian, 1; Tunisian, 1.

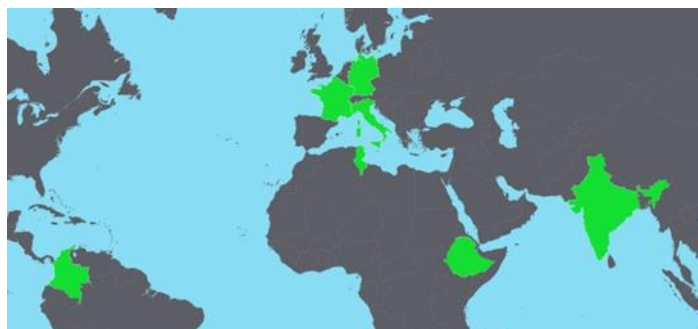


Fig. 2: Nationalities represented within the 2<sup>nd</sup> cohort of BIOQIC PhD students

In June, the introduction seminar series started with an overview of BIOQIC and its educational program, presented by Ingolf Sack (chair) and Judith Bergs (coordinator). The introductory courses (table 2) were mandatory for the new PhD students.



Fig. 3: Impression of the virtual BIOQIC seminars

An advantage was the recording of most seminars, making them available for all members. After the introduction program, journal clubs (see next paragraph) will start. The journal clubs will take place twice a month, presented by the students accompanied by their supervisors. To increase scientific interactions between the cohorts, the journal clubs will be intermitted by other seminars from former PhD students or seminars

aiming to develop soft skills. In addition to the online seminars, BIOQIC also offers a subscription for DataCamp, the most intuitive virtual learning platform for data science.

Table 2: Introductory seminars for the 2<sup>nd</sup> cohort

Date	Time	Name	Seminar title
Tue June 2	16-17h	I Sack & J Bergs	Introduction to BIOQIC and our scientific and educational approaches
Tue June 9	16-17h	I Sack	Viscoelastic properties of soft tissues - the physics of living matter I
Tue June 16	16-17h	H Tzschätzsch	Sonography
Tue June 23	16-17h	M. Dewey	Good Scientific Practice
Tue June 30	16-17h	M. Dewey	CT
Tue July 7	16-17h	U. Abram	Tracer chemistry I
Tue July 14	16-17h	J. Schulz- Menger	Cardiovascular MR part I
Tue July 21	16-17h	L. Schröder	CEST NMR and MRI - Less (Signal) is More (Diagnostic Value)
Tue July 28	16-17h	J. Schulz- Menger	Cardiovascular MR part II
Tue Aug 4	16-17h	U. Abram	Tracer chemistry II
Tue Aug 11	16-17h	G. Kutyniok	Pros and Cons of Deep Learning in Medical Imaging
Tue Aug 18	16-17h	U. Tölch (BIH QUEST Center)	Reproducibility
Tue Aug 25	16-17h	T. Schaeffter	Scientific Methods
Tue Sept 1	16-17h	T. Schaeffter	Quantitative MRI
Tue Sept 8	16-17h	T. Schaeffter	Research Ethics Committees (REC)
Tue Sept 15	16-17h	I. Przesdzing (BIH QUEST Center)	Electronic lab book
Tue Oct 06	16-17h	K. Raum	Quantitative Imaging and Manipulation of Tissues and Cells
Tue Oct 13	16-17h	W. Samek	Explainable Machine Learning
Tue Oct 20	16-17h	S. McCann (BIH QUEST Center)	Systematic review and meta-analysis
Tue Nov 03	16-17h	E. Bobrov (BIH QUEST Center)	Research data management
Tue Nov 17	16-17h	A. Hennemuth	Quantitative Functional Image Analysis
Tue Nov 24	16-17h	J. Bernarding	Diffusion imaging
Tue Dec 1	16-17h	J. Guo	Magnetic Resonance Elastography (MRE) and perfusion

Due to the ongoing Covid-19 pandemic restrictions, 2020's BIOQIC Days had to be converted into a one-day virtual event. The BIOQIC Day (click [here](#) for the program) was nevertheless very successful. All students presented their projects for the first time, and were chaired by their peers.

## • New coordinator, student representatives & official consultation hours

From the first of November, Yavuz Oguz Uca, who was a PhD student in the first cohort, has started as a Postdoc in the Elastography Research Group. Together with Judith Bergs, Yavuz is also responsible for the management and coordination of BIOQIC activities. A warm welcome to Yavuz!

In November, the students of the 2<sup>nd</sup> cohort elected the new BIOQIC student representatives. Yasmine Safrdou and Tom Meyer will be representing all PhD, MD/PhD, and the associated doctoral students of the new cohort for issues of general organization, quality assurance and strategic development of the BIOQIC PhD program. BIOQIC congratulates the freshly elected student representatives and wishes them the best of luck!

In order to improve our activities in assisting the students and to provide guidance, we have designated Thursdays from 14:00 to 17:00 as BIOQIC official consultation hours. Should you wish to book a session with us to discuss about your questions, requests or concerns, we will be available via MS-Teams. Of course, you are always welcome to approach us via email at any times.



## • **Renewal of BIOQIC**

In the beginning of October, the BIOQIC management board submitted the renewal proposal and report to apply for the next round of 4,5 year funding for BIOQIC. We thank all our PIs for their cooperation and the work they put into the proposal. The virtual renewal assessment by DFG will take place on February 23, 2021. The rehearsal for this event is scheduled for February 8, 2021. We will have 5 groups consisting of 5-6 PhD students/postdocs in each group to represent BIOQIC. Of those PhD students/postdocs, 3 members will be from the 2<sup>nd</sup> and 2 members will be from the 1<sup>st</sup> cohort, who will be accompanied by associated PhD students and/or postdocs. Further instructions to all involved BIOQIC members will follow.

## • **BIOQIC colloquia and journal clubs**


On December 3, the first virtual BIOQIC colloquium took place via MS Teams. The program is found below.

### **1st Virtual BIOQIC Colloquium & end-of-the year celebration (MS Teams)**

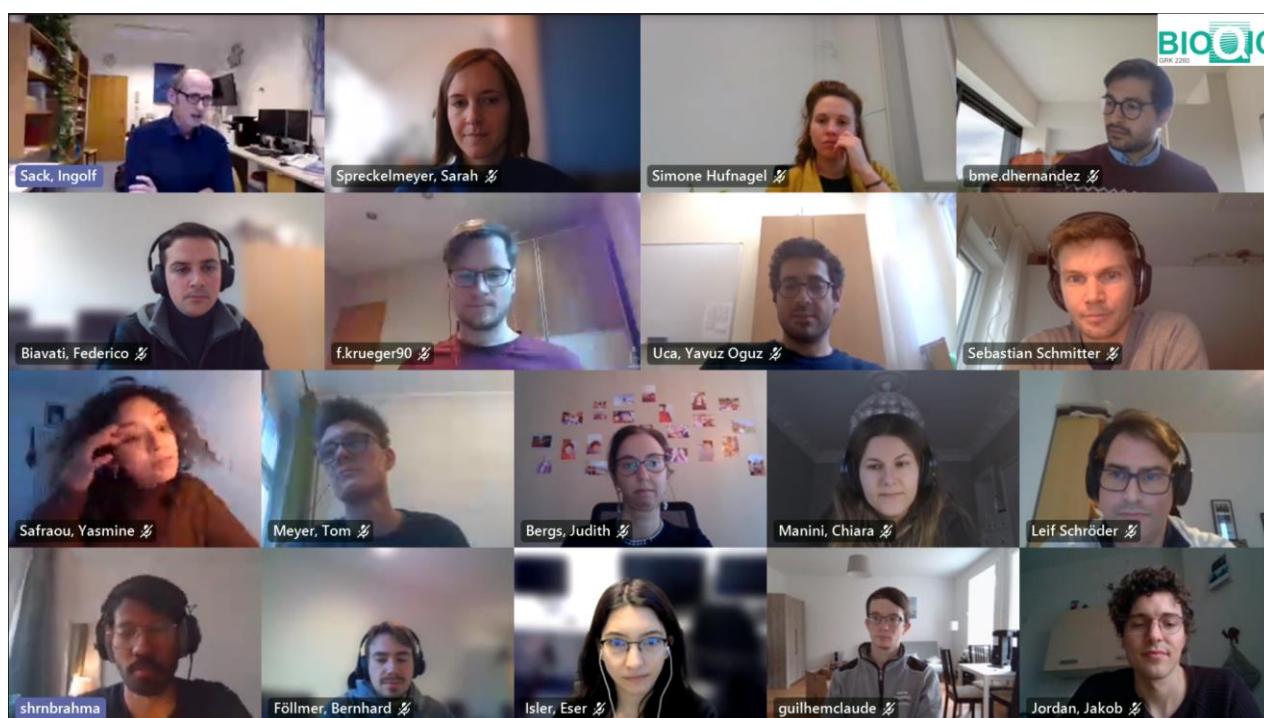


Thursday 03.12.2020

13:00	Welcome and Introduction	
13:10-14:25	<b>Session 1 – cardiac imaging</b> Chair: David Hernandez, Co-chair: Yasmine Safraou	
13:10-13:35	Chiara Manini	Multimodal Quantitative Cardiac Valve Imaging
13:35-14:00	Felix Krüger	Quantification and characterization of cardiac fat infiltration using ultra-high magnetic fields
14:00-14:25	Sherine Brahma	Uncertainty assessment of machine learning for cardiac MR parameter mapping
14:25-14:40	Break	
14:40-17:00	<b>Session 2 – biophysical properties &amp; MRI-based thermometry</b> Chair: Chiara Manini, Co-chair: Felix Krüger	
14:40-15:05	Yasmine Safraou	Quantification of the biophysical properties of the liver in correlation with microstructural and vascular changes using multimodal imaging
15:05-15:30	David Hernandez	MRI-based thermometry with hyperpolarized xenon for optimized CEST MRI
15:30-17:00	BIOQIC Virtual Team Building Activity	
17:00-17:10	Closing Remarks	


[@bioqic](https://twitter.com/bioqic)

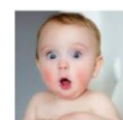
The 1<sup>st</sup> Virtual BIOQIC Colloquium started with scientific talks given by 5 PhD students, which hosted fruitful discussions. The program ended with entertaining virtual team-building activities organized by the coordinators. In the 'do it yourself (DiY)' challenge, the students were assigned into teams of five, in which they had to communicate and coordinate among themselves to come up with an imaginatively built composition from the items within their home-office-based working environments. Finally, they were asked to draw their work, and present them in a story-telling format. In the 'guess-the-picture' quiz, the students had to guess childhood and other pictures. This was a great fun, and a good occasion for the 2<sup>nd</sup> cohort to get to know each other better.



## Challenge: Do it Yourself (DiY)



## Guess-the-picture quiz



Next on the program are the journal clubs, the first one will start on December 15 by Matthias Anders and Ingolf Sack. Through the journal clubs, PhD students will learn to think critically and to think about how to show and write their scientific findings.

## • **BIOQIC publications 2020**

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

- Garczynska K, Tzschätzsch H, Kühl AA, Morr AS, Lilay L, Häckel A, Schellenberger E, Berndt N, Holzhütter HG, Braun J, Sack I, Guo J  
Front. Physiol 2020  
[Link](#)
- Zhao J, Mangarova D. B, Brangsch J, Kader A, Hamm B, Brenner W, Makowski M  
Correlation between Intraprostatic PSMA Uptake and MRI PI-RADS of [<sup>68</sup>Ga]Ga-PSMA-11 PET/MRI in Patients with Prostate Cancer: Comparison of PI-RADS Version 2.0 and PI-RADS Version 2.1  
Cancers 2020  
[Link](#)
- Shahryari M, Meyer T, Warmuth C, Herthum H, Bertalan G, Tzschätzsch H, Stencel L, Lukas S, Lilaj L, Braun J, Sack I  
Reduction of breathing artifacts in multifrequency magnetic resonance elastography of the abdomen.  
Magn Reson Med. 2020  
[Link](#)
- Uca Y, Hallmann D, Hesse B, Seim C, Stolzenburg N, Pietsch H, Schnorr J, Taupitz M  
Microdistribution of Magnetic Resonance Imaging Contrast Agents in Atherosclerotic Plaques Determined by LA-ICP-MS and SR-μXRF Imaging  
Mol Imaging Biol 2020  
[Link](#)
- Dewey M, Siebes M, Kachelrieß M, Kofoed K, Maurovich-Horvat P, Nikolaou K, Bai W, Kofler A, Manka R, Kozerke S, Chiribiri A, Schaeffter T, Michallek F, Bengel F, Nekolla S, Knaapen P, Lubberink M, Senior R, Tang M, Piek J, van de Hoef T, Martens J, Schreiber L  
Clinical quantitative cardiac imaging for the assessment of myocardial ischaemia  
Nature reviews cardiology 2020  
[Link](#)
- Kofler A, Haltmeier M, Schaeffter T, Kachelrieß M, Dewey M, Wald C, Kolbitsch  
Neural networks-based regularization for large-scale medical image reconstruction  
Physics in Medicine & Biology 2020  
[Link](#)
- Wink C, Bassenge J, Ferrazzi G, Schaeffter T, Schmitter S  
4D flow imaging with UNFOLD in a reduced FOV.  
Magn Reson Med. 2020  
[Link](#)
- Paysen H, Loewa N, Stach A, Wells J, Kosch O, Twamley S, Makowski M, Schaeffter T, Ludwig A, Wiekhorst F  
Cellular uptake of magnetic nanoparticles imaged and quantified by magnetic particle imaging.  
Scientific Reports 2020  
[Link](#)
- Mangarova D, Brangsch J, Mohtashamdolatshahi A, Kosch O, Paysen H, Wiekhorst F, Klopffleisch R, Buchholz R, Karst U, Taupitz M

Ex vivo magnetic particle imaging of vascular inflammation in abdominal aortic aneurysm in a murine model

Scientific Reports 2020

[Link](#)

- Ferrazzi G, Bassenge J, Mayer J, Ruh A, Roujol S, Ittermann B, Schaeffter T, Cordero-Grande L, Schmitter S

Autocalibrated cardiac tissue phase mapping with multiband imaging and k-t acceleration

Magn Reson Med 2020

[Link](#)

- Mohtashamdolatshahi A, Kratz H, Kosch O, Hauptmann R, Stolzenburg N, Wiekhorst F, Sack I, Hamm B, Taupitz M, Schnorr J

In vivo magnetic particle imaging: angiography of inferior vena cava and aorta in rats using newly developed multicore particles

Scientific Reports 2020

[Link](#)

- Aldo J, Biavati F, Michallek F, Stober S, Dewey M

Automatic prostate and prostate zones segmentation of magnetic resonance images using DenseNet-like U-net

Scientific Reports 2020

[Link](#)

- Grunwald A, Scholtysik C, Hagenbach A, Abram U

One Ligand, One Metal, Seven Oxidation States: Stable Technetium Complexes with the "Kläui Ligand"

Inorg Chem. 2020

[Link](#)

- Mayer J, Brown R, Thielemans K, Ovtchinnikov E, Pasca E, Atkinson D, Gillman A, Marsden P, Ippoliti M, Makowski M, Schaeffter T, Kolbitsch C

Flexible numerical simulation framework for dynamic PET-MR data

Physics in Medicine & Biology 2020

[Link](#)

- Asbach P, Ro SR, Aldo J, Snellings J, Reiter R, Lenk J, Köhlitz T, Haas M, Guo J, Hamm B, Braun J, Sack I

In Vivo Quantification of Water Diffusion, Stiffness, and Tissue Fluidity in Benign Prostatic Hyperplasia and Prostate Cancer

Invest Radiol. 2020

[Link](#)

- Schaafs LA, Schrank F, Warmuth C, Steffen IG, Braun J, Hamm B, Sack I, Elgeti T

Steady-State Multifrequency Magnetic Resonance Elastography of the Thoracic and Abdominal Human Aorta-Validation and Reference Values

Invest Radiol. 2020

[Link](#)

- Mura J, Schrank F, Sack I

An analytical solution to the dispersion-by-inversion problem in magnetic resonance elastography

Magn Reson Med. 2020

[Link](#)



- Kofler A, Dewey M, Schaeffter T, Wald C, Kolbitsch C  
Spatio-Temporal Deep Learning-Based Undersampling Artefact Reduction for 2D Radial Cine MRI With Limited Training Data  
IEEE TMI 2020  
[Link](#)
- Kreft B, Tzschätzsch H, Schrank F, Bergs J, Streitberger KJ, Wäldchen S, Hetzer S, Braun J, Sack I  
Time-Resolved Response of Cerebral Stiffness to Hypercapnia in Humans  
Ultrasound Med Biol 2020  
[Link](#)
- Ovtchinnikov E, Brown R, Kolbitsch C, Pasca E, Costa-Luis C, Gillman AG, Thomas BA, Efthimiou N, Mayer J, Wadhwa P, Ehrhardt MJ, Ellis S, Jørgensen JS, Matthews J, Prieto C, Reader AJ, Tsoumpas C, Turner M, Atkinson D, Thielemans K  
SIRF: Synergistic Image Reconstruction Framework  
Computer Physics Communications 2020  
[Link](#)
- Burkhardt C, Tzschätzsch H, Schmuck R, Bahra M, Jürgensen C, Pelzer U, Hamm B, Braun J, Sack I, Marticorena Garcia SR  
Ultrasound Time-Harmonic Elastography of the Pancreas: Reference Values and Clinical Feasibility  
Invest Radiol 2020  
[Link](#)
- Wang S, Millward JM, Hanke-Vela L, Malla B, Pilch K, Gil-Infante A, Waiczies S, Mueller S, Boehm-Sturm P, Guo J, Sack I, Infante-Duarte C  
MR Elastography-Based Assessment of Matrix Remodeling at Lesion Sites Associated Clinical Severity in a Model of Multiple Sclerosis  
Front Neurol 2020  
[Link](#)
- 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  
Magn Reson Med 2020  
[Link](#)
- Marticorena Garcia S, Zhu L, Gültekin E, Schmuck R, Burkhardt C, Bahra M, Geisel D, Shahryari M, Braun J, Hamm B, Jin Z, Sack I, Guo J  
Tomoelastography for Measurement of Tumor Volume Related to Tissue Stiffness in Pancreatic Ductal Adenocarcinomas  
Invest Radiol 2020  
[Link](#)
- Uca Y, Taupitz M  
Glycosaminoglycans as Novel Targets for in vivo Contrast-Enhanced Magnetic Resonance Imaging of Atherosclerosis  
J Cardiol Cardiovasc Med 2020  
[Link](#)

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

*xxx gratefully acknowledges funding from the German Research Foundation (GRK2260, BIOQIC)*

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

- **Future events**

February 8, 2021: Rehearsal BIOQIC Assessment

February 23, 2021: BIOQIC Assessment

Next BIOQIC colloquium: to be announced

Thank you all for the cooperation and nice times in 2020 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/>