

BIOGRAPHICAL SKETCH

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NAME: Thorsten Alexander Bley

eRA COMMONS USER NAME (credential, e.g., agency login): Bley_T

POSITION TITLE: Chairman, Department of Diagnostic and Interventional Radiology, University of Würzburg

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Westfalian-Wilhelms-University of Muenster, Germany	Medical Doctor (MD)	06/1999	Medicine
Westfalian-Wilhelms-University of Muenster, Germany	Doctorate (PhD)	03/2000	Medicine
Albert-Ludwig University of Freiburg, Germany	Radiology board certification	05/2005	Radiology
Albert-Ludwig University of Freiburg, Germany	venia legendi	06/2006	Radiology
Department of Radiology, UW - Madison, USA	Visiting Professor	2008 / 2009	Radiology
University Hospital Hamburg-Eppendorf, Germany	Chief Senior Physician	2009 – 2013	Radiology
Julius-Maximilians University Wuerzburg, Germany	Chairman, Department Diagnostic & Interventional Radiology	since 04/2013	Radiology

A. Personal Statement

I am a board certified radiologist and chairmen of the Department of Diagnostic and Interventional Radiology, University of Würzburg, Germany.

During my broad-based diagnostic and interventional radiology training at the University of Freiburg, Germany, I have gained interest in scientific studies and have started to engage in scientific work of local research groups, mainly in cardiovascular topics with the group of Juergen Hennig. Following my board examination, I have started my own scientific working group in cardiovascular imaging and filed my first patent. In 2008 I accepted a visiting professorship at the Department of Radiology at the University of Wisconsin-Madison, USA to work with Dr. Tom Grist, Dr. Charles Mistretta and Dr. Scott Reeder.

In 2009 I returned to Germany to work with Dr. Gerd Adam in the Department of Diagnostic and Interventional Radiology of Hamburg-Eppendorf and sharpened my interventional skills, mainly in vascular and hepatic interventions including aortic stenting, peripheral vascular revascularization and embolization, TIPS placement, TACE, PTCD and SIRT.

My scientific focus has been on imaging large vessel vasculitis (LVV) since 2003. My group inaugurated a high-resolution MRI protocol for non-invasive assessment of mural inflammatory changes in giant cell arteritis (GCA). Following various studies that have proven its validity, this technique has been incorporated in the European League against Rheumatism (EULAR) recommendations for imaging in LVV and in the German multidisciplinary AWMF guidelines for GCA. Multiple scientific manuscripts, book chapters and scientific presentations at national and international meetings on imaging GCA have been authored and coauthored by myself and members of my group.

With this broad training in Diagnostic and Interventional Radiology and thorough scientific experience including own research grants from the Deutsche Forschungsgemeinschaft (DFG), I was recruited to my current position

as chairman of the Department of Diagnostic and Interventional Radiology at the University of Wuerzburg in 2013, where Conrad Wilhelm Roentgen has discovered X-rays 125 years ago.

In this position I have three major goals:

- 1) provide best medical service to our patients at the highest university level possible
- 2) support young scientists in their scientific career and engage myself in research projects
- 3) teach medical students and residents best medical practice in Radiology

With my personal experience and scientific track record in large vessel vasculitis imaging and with my current position as chairman of a large academic Radiology Department I feel to be in a very good position to contribute to the research outlined in this NIH grant application.

Relevant research projects include:

- a. Klink T, Geiger J, Both M, Ness T, Heinzelmann S, Reinhard M, Holl-Ulrich K, Duwendag D, Vaith P, **Bley TA**. Giant cell arteritis: diagnostic accuracy of MR imaging of superficial cranial arteries in initial diagnosis-results from a multicenter trial. *Radiology*. 2014 Dec;273(3):844-52
- b. **Bley TA**, Francois C, Reeder SB, Johnson K, Consigny D, Grist TM, Wieben O. Non-Invasive Assessment of Transstenotic Pressure Gradients in Porcine Renal Artery Stenoses using vastly undersampled Phase Contrast MRA. *Radiology*. 2011 Oct;261(1):266-73.
- c. **Bley TA**, Duffek CC, Francois CJ, Schiebler ML, Acher CW, Mell M, Grist TM, Reeder SB. Presurgical localization of the artery of Adamkiewicz with time-resolved 3.0-T MR angiography. *Radiology*. 2010 Jun;255(3):873-81.
- d. **Bley TA**, Chase PJ, Reeder SB, Francois CJ, Shinki K, Tefera G, et al. Endovascular abdominal aortic aneurysm repair: nonenhanced volumetric CT for follow-up. *Radiology*. 2009 Oct;253(1):253-62.
- e. **Bley TA**, Uhl M, Carew J, Markl M, Schmidt D, Peter HH, Langer M, Wieben O. Diagnostic value of high-resolution MR imaging in giant cell arteritis. *AJNR Am J Neuroradiol*. 2007 Oct;28(9):1722-7.

B. Positions and Honors

2013 - present	Chairman, Department of Diagnostic & Interventional Radiology, University of Würzburg, Germany
2009 - 2013	Chief Senior Physician, Department of Diagnostic & Interventional Radiology, University of Hamburg, Germany
2008 - 2009	Visiting Professor, Department of Radiology, University of Wisconsin- Madison, USA
1999 - 2007	Resident and Fellow, Department of Diagnostic & Interventional Radiology, University of Freiburg, Germany

Other Experiences and Memberships of Scientific Societies

Radiological Society of North America, member

European Society of Radiology, member

German Roentgen Society (DRG), member & Q3 Instructor (Cardiac CT and MRI)

German Society of Interventional Radiology, member & instructor (modules A, B, C, D)

Bavarian Roentgen Society (BRG), member

Honors and Research Recognition Awards

2005 **Coolidge Award**, GE Healthcare, Germany

2005 **Eugen-Graetz Award**, University Freiburg, Germany

2008 **IRIYA Program**, Radiological Society of North America, USA

2009 **Lauterbur Award**, Society of Computed Body Tomography and MR, USA

2009 **Juhl-Cameron Award**, University of Wisconsin- Madison, USA

2009 **Young Investigator Award**, German Roentgen Society, DRG, Germany

2010 **Best Scientific Paper Award**, European Society of Radiology, ESR, Austria

2011 **Roentgenring Award**, German Röntgen Society, DRG, Germany

2015 **Albert Kölliker Teaching Award**, Julius-Maximilians University Wuerzburg, Germany

2020 **Albert Kölliker (online) Teaching Award**, Julius-Maximilians University Wuerzburg, Germany

C. Contributions to Science

1. **MRI assessment of disease extent and activity in giant cell arteritis (GCA).** We inaugurated a high resolution MRI protocol for noninvasive assessment of GCA. This technique has been used to quantify inflammatory involvement of the intra- and extradural cranial and extracranial arteries. Mural thickness and contrast enhancement and luminal changes were used to determine disease activity, disease extent and vascular damage in systemic vasculitides. This technique has been incorporated in European and German imaging recommendations.
 - a. Siemonsen S, Brekenfeld C, Holst B, Kaufmann-Buehler AK, Fiehler J, **Bley TA**. 3T MRI reveals extra- and intracranial involvement in giant cell arteritis. *AJNR Am J Neuroradiol*. 2015 Jan;36(1):91-7.
 - b. Klink T, Geiger J, Both M, Ness T, Heinzelmann S, Reinhard M, Holl-Ulrich K, Duwendag D, Vaith P, **Bley TA**. Giant cell arteritis: diagnostic accuracy of MR imaging of superficial cranial arteries in initial diagnosis-results from a multicenter trial. *Radiology*. 2014 Dec;273(3):844-52.
 - c. **Bley TA**, Reinhard M, Hauenstein C, Markl M, Warnatz K, Hetzel A, Uhl M, Vaith P, Langer M. Comparison of duplex sonography and high-resolution magnetic resonance imaging in the diagnosis of giant cell (temporal) arteritis. *Arthritis Rheum*. 2008 Aug;58(8):2574-8.
 - d. **Bley TA**, Markl M, Schelp M, Uhl M, Frydrychowicz A, Vaith P, Peter HH, Langer M, Warnatz K. Mural inflammatory hyperenhancement in MRI of giant cell (temporal) arteritis resolves under corticosteroid treatment. *Rheumatology (Oxford)*. 2008 Jan;47(1):65-7.
 - e. **Bley TA**, Wieben O, Uhl M, Thiel J, Schmidt D, Langer M. High-resolution MRI in giant cell arteritis: imaging of the wall of the superficial temporal artery. *AJR Am J Roentgenol*. 2005 Jan;184(1):283-7.

2. **Magnetic Particle Imaging (MPI) for cardiovascular indications.** We used this new tomographic Imaging method based on the background-free magnetic field detection of a tracer agent composed of superparamagnetic iron oxide nanoparticles to quantify vascular stenoses and to perform real-time percutaneous transluminal angioplasty and to guide stenting in a phantom model.
 - a. Herz S, Vogel P, Kampf T, Ruckert MA, Veldhoen S, Behr VC, **Bley TA**. Magnetic Particle Imaging for Quantification of Vascular Stenoses: A Phantom Study. *IEEE Trans Med Imaging*. 2018 Jan;37(1):61-67.
 - b. Herz S, Vogel P, Kampf T, Dietrich P, Veldhoen S, Rückert MA, Kickuth R, Behr VC, **Bley TA**. Magnetic Particle Imaging-Guided Stenting. *J Endovasc Ther*. 2019 Aug;26(4):512-519.
 - c. Herz S, Vogel P, Dietrich P, Kampf T, Rückert MA, Kickuth R, Behr VC, **Bley TA**. Magnetic Particle Imaging Guided Real-Time Percutaneous Transluminal Angioplasty in a Phantom Model. *Cardiovasc Intervent Radiol*. 2018 Jul;41(7):1100-1105.
 - d. Vogel P, Kampf T, Herz S, Rückert MA, **Bley TA**, Behr VC. Parallel magnetic particle imaging. *Rev Sci Instrum*. 2020 Apr 1;91(4):045117.

3. **Self-gated non-contrast-enhanced functional lung (SENCEFUL) MR imaging** was combined for morphologic and functional lung imaging by utilizing a (SENCEFUL) magnetic resonance imaging for quantitative ventilation imaging in patients with cystic fibrosis. We found less ventilation in upper lung parts in patients with CF in correlation with hyperinflation and airway obstruction. Ultrashort echotime (UTE) sequences were improved the signal yield in spiral 3-dimensional (3D) UTE-MRI in pediatric patients.
 - a. Veldhoen S, Weng AM, Knapp J, Kunz AS, Stäb D, Wirth C, Segerer F, Hebestreit H, Malzahn U, Köstler H, **Bley TA**. Self-gated Non-Contrast-enhanced Functional Lung MR Imaging for Quantitative Ventilation Assessment in Patients with Cystic Fibrosis. *Radiology*. 2017 Apr;283(1):242-251.
 - b. Veldhoen S, Heidenreich JF, Metz C, Petritsch B, Benkert T, Hebestreit HU, **Bley TA**, Köstler H, Weng AM. Three-dimensional Ultrashort Echotime Magnetic Resonance Imaging for Combined Morphologic and Ventilation Imaging in Pediatric Patients With Pulmonary Disease. *J Thorac Imaging*. 2021 Jan;36(1):43-51.

- c. Mendes Pereira L, Wech T, Weng AM, Kestler C, Veldhoen S, **Bley TA**, Köstler H. UTE-SENCEFUL: first results for 3D high-resolution lung ventilation imaging. *Magn Reson Med*. 2019 Apr;81(4):2464-2473.
- d. Kestler C, Weng AM, Kunz AS, Laubmeier M, Wirth C, Köstler H, **Bley TA**, Veldhoen S. Acute Pulmonary Artery Embolism Detected by Noncontrast Functional Lung Magnetic Resonance Imaging. *Circ Cardiovasc Imaging*. 2016 Feb;9(2):e004141.

4. High resolution MR- and CT Angiography for vascular anatomy and physiology. We have shown that noninvasive transstenotic pressure gradients derived from high-spatial- and temporal-resolution four-dimensional magnetic resonance flow measurements correlate well with invasive measurements obtained from endovascular pressure wires with digital subtraction angiographic guidance in an animal study. We were able to localize the artery of Adamkiewicz with high resolution time resolved MRA prior to reimplantation of the feeding intercostal artery, lumbar artery, or both during aortic aneurysm repair. We were able to identify endoleaks causing more than 2% volumetric increase by volumetric analysis of nonenhanced computed tomography as the sole method for follow up endovascular abdominal aortic aneurysm repair (EVAR).

- a. **Bley TA**, François CJ, Schiebler ML, Wieben O, Takei N, Brittain JH, Del Rio AM, Grist TM, Reeder SB. Non-contrast-enhanced MRA of renal artery stenosis: validation against DSA in a porcine model. *Eur Radiol*. 2016 Feb;26(2):547-55.
- b. **Bley TA**, Francois C, Reeder SB, Johnson K, Consigny D, Grist TM, Wieben O. Non-Invasive Assessment of Transstenotic Pressure Gradients in Porcine Renal Artery Stenoses using vastly undersampled Phase Contrast MRA. *Radiology*. 2011 Oct;261(1):266-73.
- c. **Bley TA**, Duffek CC, Francois CJ, Schiebler ML, Acher CW, Mell M, Grist TM, Reeder SB. Presurgical localization of the artery of Adamkiewicz with time-resolved 3.0-T MR angiography. *Radiology*. 2010 Jun;255(3):873-81.
- d. **Bley TA**, Chase PJ, Reeder SB, Francois CJ, Shinki K, Tefera G, et al. Endovascular abdominal aortic aneurysm repair: nonenhanced volumetric CT for follow-up. *Radiology*. 2009 Oct;253(1):253-62.

Complete List of Published Work in MyBibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/thorsten.bley.1/bibliography/public/>

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

Deutsche Forschungsgemeinschaft, DFG Bley (PI), BL 1132/1-3 submitted 2020
 Title: Therapy monitoring in giant Cell arteritis: Ways to Precision Medicine
 Monitor disease activity and vascular damage by noninvasive MRI assessment of mural inflammatory changes of the aorta and large arteries under steroids and tocilizumab treatment, compare with laboratory biomarkers and identify epigenetic profiles of complicated cases.

Completed Research Support

Deutsche Forschungsgemeinschaft, DFG Bley (PI), BL 1132/1-1 (2009-2013)
 Title: Systemic vasculitis diagnostic with moving table MRI
 Comprehensive assessment of arterial lumen and vessel wall of cranial, cervical, thoracic and abdominal arteries in patients with giant cell arteritis.

Deutsche Forschungsgemeinschaft, DFG Bley (PI), BL 1132/1-2 (2014-2019)
 Title: MRI assessment of intracranial arteries in patients with systemic vasculitides
 Develop a high resolution MRI protocol including a 3D sequence with isotropic voxel of 500µm and dedicated orthogonal reconstructions for specific evaluation of inflammatory mural changes in the intracranial arteries in patients with giant cell arteritis.