



Richard Haindl

Assistant Professor,
Medical University of Vienna

- March 15, 1988, Baden
- Europastraße 26, Austria
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- Austrian

Academic Profile —

- 0000-0003-3471-0986
- Publications
- LinkedIn

Languages —

- German ● ● ● ● ●
- English ● ● ● ● ●

Hard Skills —

- Project Management
- Programming
- Computer-aided design
- Data Analysis
- Technical Writing

Soft Skills —

- Problem solving
- Attention to Detail
- Time Management
- Interpersonal Skills
- Leadership

Work Experience

- 2022 – now** **University Assistant - (Assistant Professor)** CMPBME, Medical University of Vienna, Austria
 Building a scientific career through the acquisition of research funding and mentoring of PhD and master's students. My current primary focus lies in the development of **specialized imaging techniques** to address critical imaging requirements in the field of microbiology, particularly in the areas of **biofilms and host-pathogen interactions**.
- 2021 – 2022** **Senior Research Fellow** CCEB, Nanyang Technological University, Singapore
 Development of novel ocular imaging methods for rodents with a focus on scleral imaging to tackle the unknown pathophysiology of myopia (Pramanik and Schmetterer, SERI-NTU Advanced Ocular Engineering (STANCE) Laboratory). Special ultrasonic transducers are employed for **photoacoustic imaging** and the IR wavelength regimen is utilized for **optical coherence tomography** to enable the required imaging depth.
 Apart from strengthening my previously acquired skills in all areas, my project **planning skills** considerably improved due to the short project time. I acquired a high level of **computer-aided design** skills, owing to the fact that rodent and special transducer mounts required novel designs. I greatly extended my **scientific network** and successfully started new **collaborations**, allowing me to partially **mentor** a PhD student from another lab during the process of extending the capabilities of the ophthalmic imaging system.
- 2017 – 2021** **Postdoctoral Researcher** CMPBME, Medical University of Vienna, Austria
 Research and development of novel multimodal imaging techniques (**Photoacoustic and optical coherence imaging**) for *in-vivo* small animal, pharmaceutical compound and drug imaging with exogenous and endogenous contrast (Leitgeb/Drexler Lab).
 I gained great **optical system design experience**, especially concerning multimodal integration and instrument scalability. Skills for **animal handling** (e.g. ethics, transportation, anesthesia, fixation and sample preparation) were acquired alongside with increased knowledge on chemical safety regulations. In addition to **Labview** programming, **data analysis, machine and deep learning** with Python became of importance, fostering my **programming** skills in those areas. I strengthened my **interpersonal skills** by building a scientific network and participated in several collaborations with companies and universities. I supervised several PhD and MSc students, enhancing my **time management** and **leadership** skills.
- 2013 – 2017** **Research Assistant** CMPBME, Medical University of Vienna, Austria
 Development of new optical imaging modalities in the field of ophthalmology (Hitzenberger Lab). Retinal blood flow measurement required a new phase sensitive imaging approach to avoid major and inaccurate pre-assumptions. Therefore, I developed a novel **multichannel Doppler optical coherence tomography** system featuring three independent active illumination and detection channels. Building such a system honed my skills in **optical engineering**, as optical alignment procedures and **optical system design** are particularly challenging and require **attention to detail**.
 I planned and led several clinical studies. This involved **project management** and the development of an ethics protocol, as well as direct contact to the local ethics committee and protocol submission to the Austrian Agency for Health and Food Safety (AGES).

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About Me

I have a curious mindset and strive for knowledge and active skill development to help foster our understanding in biomedical research. Currently, I'm eager to delve into microbiology, especially since volumetric and high throughput imaging needs are not well addressed in this field. I am particularly interested into biofilms, non-tuberculosis mycobacteria and tuberculosis.

In a team, I inspire and motivate colleagues, which results in engaging and productive collaborations. I'm comfortable to work in or lead a team, but I also take pleasure in working on specific tasks or alone.


During breaks or in my free time you will often find me asking for various exotic or traditional foods of all cultures to enjoy together, since I'm always interested in memorable 'challenges'.

Programming

 Python

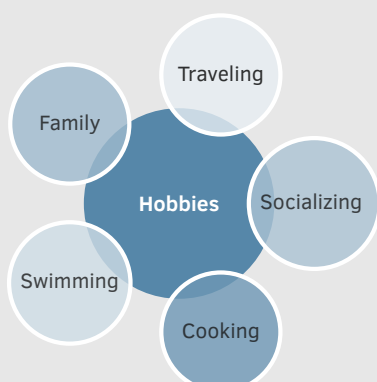
 Labview

 Latex

 Matlab

 C++

Hobbies



Selected Publications

- 2023
IF: 5.8
Ultra-High-Resolution Optical Coherence Tomography for the investigation of thin multilayered pharmaceutical coatings
M. Wolfgang, A. Kern, S. Deng, S. Stranzinger, M. Liu, W. Drexler, R. Leitgeb, R. Haindl
International Journal of Pharmaceutics
- 2023
IF: 5.6
Visible light photoacoustic ophthalmoscopy and near-infrared-II optical coherence tomography in the mouse eye
R. Haindl, V. Bellemo, P. Rajendran, B. Tan, M. Liu, B.S. Lee, Q. Zhou, R.A. Leitgeb, W. Drexler, L. Schmetterer, M. Pramanik
APL Photonics
- 2021
IF: 4.5
Ultra-high-resolution 3D optical coherence tomography reveals inner structures of human placenta-derived trophoblast organoids
A. Deloria, S. Haider, B. Dietrich, V. Kunihs, S. Oberhofer, M. Knöfler, R. Leitgeb, M. Liu, W. Drexler, R. Haindl
IEEE Transactions on Biomedical Engineering, [front cover](#), [featured](#)
- 2020
IF: 3.4
Functional optical coherence tomography and photoacoustic microscopy imaging for zebrafish larvae
R. Haindl, A. J. Deloria, C. Sturtzel, H. Sattmann, W. Rohringer, B. Fischer, M. Andreana, A. Unterhuber, T. Schwerte, M. Distel, W. Drexler, R. Leitgeb, and M. Liu
Biomedical Optics Express
- 2020
IF: 8.4
NIR nanoprobe-facilitated cross-referencing manifestation of local disease biology for dynamic therapeutic response assessment
Z. Wang, X. Ai, Z. Zhang, Y. Wang, X. Wu, R. Haindl, E. KL Yeow, W. Drexler, M. Gao, B. Xing
Chemical Science

Research Grants

- 2023
Funded
1.47 M€
VIRAL: Viral Infectiology Research with Advanced Laboratory models
ISIDORe Joint research activities (JRA) Task 3.3: Label-free 3D imaging pipeline for organoids,
[Task leader](#)
The aim of the VIRAL joint research project is to bring together different expert groups that will develop novel ex vivo models (which includes the use of ex vivo tissues and organoids) to study viral infections in order to fill gaps in the currently offered ERINHA (European Infrastructure on Highly Pathogenic Agents) services
- 2021
Funded
6.2 M€
REAP: Revealing drug tolerant persister cells in cancer using contrast enhanced optical coherence and photoacoustic tomography
H2020-ICT36-2020 Disruptive Photonics Technologies,
[Task leader and member of the technical committee](#)
The overall objective of REAP is to reveal drug tolerant persister cells in breast cancer both *in-vitro* and *in-vivo* by contrast enhanced multimodal optical imaging of relevant preclinical models.

Fellowships and Awards

- 2017
SPIE Best Student Paper
European Conferences on Biomedical Optics
- 2015
YSA Best Poster Presentation
Medical University of Vienna
- 2015
ARVO MIT Outstanding Poster Award Finalist
ARVO Annual Meeting
- 2015
ARVO International Travel Grant
ARVO Annual Meeting
- 2012/2013
Member of the Dean's list -
outstanding academic performance
University of Vienna

Memberships

- Austrian Bioimaging ESMI
MIC
SPIE
Correlative Multimodal Imaging
European Society for Molecular Imaging
Medical Imaging Cluster, Microscopy and Advanced Optical Imaging
Society of Photo-Optical Instrumentation Engineers

Higher Education

2013 – 2017, Graduation Date: 30.05.2017	PhD, Medical Physics Thesis title: "Multibeam Doppler Optical Coherence Tomography". Supervisor: C. K. Hitzemberger. Development of novel optical coherence tomography systems for early diagnosis of several severe eye diseases like glaucomatous optic neuropathy.	CMPBME, Medical University of Vienna, Austria
2010 – 2013, Graduation Date: 12.03.2013	MSc, Physics Thesis title: "Vergleich von optischen bzw. thermo-optischen Methoden zur Bestimmung von schwarzem bzw. elementarem Kohlenstoff im urbanen Aerosol". Supervisor: R. Hitzemberger. Instrument intercomparison concerning black and elemental carbon concentrations and their seasonal fluctuation in the urban atmosphere.	Faculty of Physics, University of Vienna, Austria
2007 – 2010, Graduation Date: 14.10.2010	BSc, Physics Thesis title: "Filtration von Nanopartikeln". Supervisor: Wladyslaw Szymanski. Filter penetration tests with generated monodisperse nanoparticles produced by electro-spray ionization with a parallel differential mobility analyzer for particle size selection.	Faculty of Physics, University of Vienna, Austria

Professional and Scholarly Activities

Session Chair ECBO 2023	Advances in Eye Imaging: Functional and Animal <i>Conference 12632, Session 5, 26th June</i> Room 4, 16:00 - 17:15	
Session Chair SPIE 2023	Machine Learning and Image Processing <i>Conference 12367, Session 11, 1st February</i> Room 201, 13:00 - 14:45	
EU project 2021 – 2024	REAP <i>H2020</i> Technical committee member and task leader	
Editorship 2021 – 2023	Applied Sciences <i>MDPI</i> Topic Editor	
Editorship 2021	Applied Sciences <i>Optical Coherence Tomography in Medical Diagnostics</i> Guest Editor	
Invited talk ECBO 2017	Dual modality optical coherence and photoacoustic microscopy with an akinetic acoustic sensor for direct reflection mode imaging <i>R. Haindl, S. Preißer, M. Andreana, W. Rohringer, E. Rank, Z. Chen, B. Fischer, W. Drexler, M. Liu</i> European Conferences on Biomedical Optics, 2017	
Teaching Winter Term 2020	Biomedical Optical Imaging <i>Journal Club. Complete course preparation and chairing of the seminar. 2 ECTS points.</i> Teacher evaluation. Medical University of Vienna	
Teaching Summer Term 2020	Biomedical Optical Imaging <i>Journal Club. Complete course preparation and chairing of the seminar. 2 ECTS points.</i> Teacher evaluation. Medical University of Vienna	

Teaching Summer Term 2020	Multimodal Optical Imaging <i>Doctoral Students Seminar. Complete course preparation and chairing of the seminar. 2 ECTS points.</i> Medical University of Vienna
Teaching Winter Term 2019	Optical Coherence Photoacoustic Imaging <i>Journal Club. Complete course preparation and chairing of the seminar. 2 ECTS points.</i> Medical University of Vienna
Teaching Winter Term 2019	Principles of Optics, a hands-on class <i>Doctoral Students Seminar. Complete course preparation, chairing of the seminar and preparation of the hands-on material. 2 ECTS points.</i> Medical University of Vienna
Teaching Summer Term 2019	Optical Coherence Photoacoustic Imaging <i>Journal Club. Complete course preparation and chairing of the seminar. 2 ECTS points.</i> Teacher evaluation. Medical University of Vienna
Teaching Summer Term 2019	Geometrical and Physical Optics <i>Lecture. Complete course preparation and lecturing of the geometrical optics part of the class. Exam preparation and chairing of the exam. Evaluation and grading of students. 3 ECTS points.</i> Medical University of Vienna
Teaching Summer Term 2019	Principles of Optics, a hands-on class <i>Doctoral Students Seminar. Complete course preparation, chairing of the seminar and preparation of the hands-on material. 2 ECTS points.</i> Teacher evaluation. Medical University of Vienna

Publication summary and contributions to international conferences

Eighteen peer reviewed publications, cited 490 times, h-index 13 (as of 03.2024, Google Scholar). More than 30 contributions to international conferences (SPIE Photonics West, ARVO annual meeting, ARVO imaging in the eye, European Molecular Imaging Meeting, OSA Biomedical Optics, SPIE/OSA European Conferences on Biomedical Optics, European Aerosol Conference, AAAR annual conference). Sixteen conference contributions as first or last author.

Publication list

Haindl, R., V. Bellemo, P. Rajendran, B. Tan, M. Liu, B. S. Lee, Q. Zhou, R. A. Leitgeb, W. Drexler, L. Schmetterer, and M. Pramanik: *Visible light photoacoustic ophthalmoscopy and near-infrared-II optical coherence tomography in the mouse eye.* In: *APL Photonics* 8.10 (Oct. 2023), p. 106108. DOI: 10.1063/5.0168091.

Wolfgang, M., A. Kern, S. Deng, S. Stranzinger, M. Liu, W. Drexler, R. Leitgeb, and **R. Haindl**: *Ultra-high-resolution optical coherence tomography for the investigation of thin multilayered pharmaceutical coatings.* In: *International Journal of Pharmaceutics* 643 (2023), p. 123096. DOI: <https://doi.org/10.1016/j.ijpharm.2023.123096>.

Deloria, A. J., S. Haider, B. Dietrich, V. Kunihs, S. Oberhofer, M. Knöfler, R. Leitgeb, M. Liu, W. Drexler, and **R. Haindl**: *Ultra-High-Resolution 3D Optical Coherence Tomography Reveals Inner Structures of Human Placenta-Derived Trophoblast Organoids.* In: *IEEE Transactions on Biomedical Engineering* 68.8 (2021), pp. 2368–2376. DOI: 10.1109/TBME.2020.3038466.

Deng, S., **R. Haindl**, E. Zhang, P. Beard, E. Scheuringer, C. Sturtzel, Q. Li, A. J. Deloria, H. Sattmann, R. A. Leitgeb, Y. Yuan, L. Schmetterer, M. Pramanik, M. Distel, W. Drexler, and M. Liu: *An optical coherence photoacoustic microscopy system using a fiber optic sensor.* In: *APL Photonics* 6.9 (Sept. 2021), p. 96103. DOI: 10.1063/5.0059351.

Leitgeb, R. A., F. Placzek, E. A. Rank, L. Krainz, **R. Haindl**, Q. Li, M. Liu, M. Liu, A. Unterhuber, T. Schmoll, and W. Drexler: *Enhanced medical diagnosis for dOCTors: a perspective of optical coherence tomography*. In: *Journal of Biomedical Optics* 26.10 (Oct. 2021), pp. 1–47. DOI: 10.1117/1.JBO.26.10.100601.

Li, Q., W. Rohringer, S. Preißer, M. T. Erkkilä, **R. Haindl**, H. Sattmann, M. Liu, B. Fischer, R. Leitgeb, and W. Drexler: *Depixelation of coherent fiber bundle imaging by fiber-core-targeted scanning*. In: *Applied Optics* 60.26 (2021), pp. 7955–7962. DOI: 10.1364/AO.430537.

Liu, M., A. J. Deloria, **R. Haindl**, Q. Li, G. Szakacs, A. Csiszar, S. Schrittwieser, P. Muellner, R. Hainberger, B. Pelaz, E. Polo, P. Del Pino, A. Penttinen, M. Guina, T. Niemi, K. Meiburger, F. Molinari, C. Menhard, J. Heidelin, V. Andresen, D. Geuzebroek, and W. Drexler: *REAP: revealing drug tolerant persister cells in cancer using contrast enhanced optical coherence and photoacoustic tomography*. In: *Journal of Physics: Photonics* 3.2 (2021), p. 21001. DOI: 10.1088/2515-7647/abf02f.

Haindl, R., A. J. Deloria, C. Sturtzel, H. Sattmann, W. Rohringer, B. Fischer, M. Andreana, A. Unterhuber, T. Schwerte, M. Distel, W. Drexler, R. Leitgeb, and M. Liu: *Functional optical coherence tomography and photoacoustic microscopy imaging for zebrafish larvae*. In: *Biomedical Optics Express* 11.4 (2020), pp. 2137–2151. DOI: 10.1364/B0E.390410.

Haindl, R., M. Duell, S. Gloor, J. Dahdah, J. Ojeda, C. Sturtzel, S. Deng, A. Joyce Deloria, Q. Li, M. Liu, M. Distel, W. Drexler, and R. Leitgeb: *Ultra-high-resolution SD-OCM imaging with a compact polarization-aligned 840 nm broadband combined-SLED source*. In: *Biomedical Optics Express* 11.6 (2020), pp. 3395–3406. DOI: 10.1364/B0E.394229.

Wang, Z., X. Ai, Z. Zhang, Y. Wang, X. Wu, **R. Haindl**, E. K. L. Yeow, W. Drexler, M. Gao, and B. Xing: *NIR nanoprobe-facilitated cross-referencing manifestation of local disease biology for dynamic therapeutic response assessment*. In: *Chemical Science* 11.3 (2020), pp. 803–811. DOI: 10.1039/C9SC04909F.

Beer, F., A. Wartak, **R. Haindl**, M. Gröschl, B. Baumann, M. Pircher, and C. K. Hitzenberger: *Conical scan pattern for enhanced visualization of the human cornea using polarization-sensitive OCT*. In: *Biomedical Optics Express* 8.6 (2017), pp. 2906–2923. DOI: 10.1364/B0E.8.002906.

Haindl, R., S. Preisser, M. Andreana, W. Rohringer, C. Sturtzel, M. Distel, Z. Chen, E. Rank, B. Fischer, W. Drexler, and M. Liu: *Dual modality reflection mode optical coherence and photoacoustic microscopy using an akinetic sensor*. In: *Optics Letters* 42.21 (2017), pp. 4319–4322. DOI: 10.1364/OL.42.004319.

Wartak, A., M. Augustin, **R. Haindl**, F. Beer, M. Salas, M. Laslandes, B. Baumann, M. Pircher, and C. K. Hitzenberger: *Multi-directional optical coherence tomography for retinal imaging*. In: *Biomedical Optics Express* 8.12 (2017), pp. 5560–5578. DOI: 10.1364/B0E.8.005560.

Haindl, R., W. Trasischker, A. Wartak, B. Baumann, M. Pircher, and C. K. Hitzenberger: *Total retinal blood flow measurement by three beam Doppler optical coherence tomography*. In: *Biomed. Opt. Express* 7.2 (Feb. 2016), pp. 287–301. DOI: 10.1364/B0E.7.000287.

Wartak, A., **R. Haindl**, W. Trasischker, B. Baumann, M. Pircher, and C. K. Hitzenberger: *Active-passive path-length encoded (APPLE) Doppler OCT*. In: *Biomedical Optics Express* 7.12 (2016), pp. 5233–5251. DOI: 10.1364/B0E.7.005233.

Felberer, F., M. Rechenmacher, **R. Haindl**, B. Baumann, C. K. Hitzenberger, and M. Pircher: *Imaging of retinal vasculature using adaptive optics SLO/OCT*. In: *Biomedical Optics Express* 6.4 (2015), pp. 1407–1418. DOI: 10.1364/B0E.6.001407.

Haindl, R., W. Trasischker, B. Baumann, M. Pircher, and C. K. Hitzenberger: *Three-beam Doppler optical coherence tomography using a facet prism telescope and MEMS mirror for improved transversal resolution*. In: *Journal of modern optics* 62.21 (2015), pp. 1781–1788. DOI: 10.1080/09500340.2014.983569.

Trasischker, W., S. Zotter, T. Torzicky, B. Baumann, **R. Haindl**, M. Pircher, and C. K. Hitzenberger: *Single input state polarization sensitive swept source optical coherence tomography based on an all single mode fiber interferometer*. In: *Biomedical Optics Express* 5.8 (2014), pp. 2798–2809. DOI: 10.1364/boe.5.002798.

