CURRICULUM VITAE – CONRAD MERKLE

PERSONAL INFORMATION

Merkle, Conrad William

Date of birth: November 20, 1989

Nationality: USA

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INSTITUTION

Medical University of Vienna

Center for Medical Physics and Biomedical Engineering

Währinger Gürtel 18-20, 4L

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Numbers at a Glance	
ORCID: 0000-0002-2465-4100	
Scopus ID: 55926281300	
Papers (peer-reviewed)	27
Number of citations[1]	598
H-index[1]	12

[1] *from Scopus 25.07.2024*

SCIENTIFIC CONTRIBUTIONS

My primary contributions to my field have been to improve the functionality of optical coherence tomography (OCT) for preclinical or clinical research without requiring additional or more expensive OCT hardware. To that end, I have studied the use of exogenous contrast agents and spectroscopic processing for enhancing the OCT signal and extracting new biomarkers in small-animal eye and brain models *in vivo*. In addition to these contributions, I have also been awarded an ERC Starting Grant to pursue new technological developments in medical imaging. The focus of this grant will be on novel imaging technologies for tumor spheroids to improve personalized treatment of cancer.

MAIN RESEARCH INTERESTS

- **Optics**: biomedical applications, optical coherence tomography, contrast agents
- **Medical physics**: retinal imaging for diagnostics, vascular imaging, functional imaging
- **Preclinical research**: small animal eye and brain disease models, clinical translation of methods
- **Clinical research**: personalized medicine, cancer diagnostics, tumor spheroids
- **Image processing**: spectroscopic analysis, quantitative assessment of dynamics

EDUCATION

2012 – 2018 **PhD** in Biomedical Engineering, University of California, Davis
Designated Emphasis in Biophotonics and Bioimaging
Dissertation Titled: "**Quantitative Optical coherence tomography methods for functional microvascular imaging"**

2008 – 2012 **BS** in Bioengineering, University of Maryland, College Park
Gemstone and Honors Programs – Thesis-based

RESEARCH EXPERIENCE

2020 – Present **Postdoctoral Associate (Universitätsassistent)** - Center for Medical Physics and Biomedical Engineering, Medical University of Vienna, Austria

2018 – 2020 **Postdoctoral Fellow** - Center for Medical Physics and Biomedical Engineering, Medical University of Vienna, Austria

2013 – 2018 **Graduate Student Researcher** – Department of Biomedical Engineering, University of California, Davis, USA

2011 – 2012 **Volunteer Researcher** - Food and Drug Administration at White Oak, USA

2008 – 2012 **Gemstone Student Researcher** – University of Maryland, College Park, USA

TEACHING ACTIVITIES

Lecturer or teacher for 6 different courses at the Medical University of Vienna. I have taught in both English and German and have an average of 1.57 teaching hours per semester since starting in Winter semester 2019 (as of March 2024).

INSTITUTIONAL RESPONSIBILITIES

2023 – Present **Junior Supervisor** – UN094 Medical Physics Program

2019 – Present **Member and current co-head (2021-2024) of the ZMPBMT Science Board at MUW**, which identifies topics of interest and/or need and addresses them through seminars and events

RESEARCH FUNDING – Third Party Peer Reviewed

FWF Stand-Alone Project Grant (2022-2026) - 374,472€

"Improved Biomarker Detection for Eye Disease with Contrast- and Stimulation-Enhanced Optical Coherence Tomography (CaSE-OCT)"

Role: Principal Investigator

ERC Starting Grant 2024 (planned 2025-2029) - 1,494,125.00 €

"Total Optical Coherence Characterization for Automated Tumor Analysis (TOCCATA)"

Role: Principal Investigator

Other Awards and Honors

Seal of Excellence (top 15%) for Marie Skłodowska-Curie call H2020-MSCA-IF-2018 (2018)

ÖFG International Communication Travel Grant (2023) – 700 €

TOP 10 PUBLICATIONS – Citation Numbers from Scopus 25.07.2024

 # Cited | Publication

109 S. P. Chong, **C. W. Merkle**, D. F. Cooke, T. Zhang, H. Radhakrishnan, L. Krubitzer, and V. J. Srinivasan, "Noninvasive, in vivo imaging of subcortical mouse brain regions with 1.7 μm optical coherence tomography," Opt. Lett. 40(21), 4911 (2015). **DOI: 10.1364/OL.40.004911**

89 S. P. Chong, **C. W. Merkle**, C. Leahy, H. Radhakrishnan, and V. J. Srinivasan, "Quantitative microvascular hemoglobin mapping using visible light spectroscopic Optical Coherence Tomography," Biomed. Opt. Express 6(4), 1429 (2015). **DOI: 10.1364/BOE.6.001429**

60 S. P. Chong, **C. W. Merkle**, C. Leahy, and V. J. Srinivasan, "Cerebral metabolic rate of oxygen (CMRO_2) assessed by combined Doppler and spectroscopic OCT," Biomed. Opt. Express 6(10), 3941 (2015). **DOI: 10.1364/BOE.6.003941**

42 B. Baumann, **C. W. Merkle**, R. A. Leitgeb, M. Augustin, A. Wartak, M. Pircher, and C. K. Hitzenberger, "Signal averaging improves signal-to-noise in OCT images: But which approach works best, and when?" Biomed. Opt. Express 10(11), 5755-5775 (2019). **DOI: 10.1364/BOE.10.005755**

37 J. Zhu, **C. Merkle**, M. Bernucci, S. Chong, and V. Srinivasan, "Can OCT Angiography Be Made a Quantitative Blood Measurement Tool?," Appl. Sci. 7(7), 687 (2017). **DOI: 10.3390/app7070687**

33 **C. W. Merkle** and V. J. Srinivasan, "Laminar microvascular transit time distribution in the mouse somatosensory cortex revealed by Dynamic Contrast Optical Coherence Tomography," Neuroimage 125, 350–362 (2016). **DOI: 10.1016/j.neuroimage.2015.10.017**

22 **C. W. Merkle**, C. Leahy, and V. J. Srinivasan, "Dynamic contrast optical coherence tomography images transit time and quantifies microvascular plasma volume and flow in the retina and choriocapillaris," Biomed. Opt. Express 7(10), 4289 (2016). **DOI: 10.1364/BOE.7.004289**

22 D. J. Harper, T. Konegger, M. Augustin, K. Schützenberger, P. Eugui, A. Lichtenegger, **C. W. Merkle**, C. K. Hitzenberger, M. Glösmann, and B. Baumann, "Hyperspectral optical coherence tomography for in vivo visualization of melanin in the retinal pigment epithelium," Journal of Biophotonics 12(12), e201900153 (2019). **DOI: 10.1002/jbio.201900153**

20 M. T. Bernucci, **C. W. Merkle**, and V. J. Srinivasan, "Investigation of artifacts in retinal and choroidal OCT angiography with a contrast agent," Biomed. Opt. Express 9(3), 1020–1040 (2018). **DOI: 10.1364/BOE.9.001020**

19 J. Gesperger, A. Lichtenegger, T. Roetzer, M. Salas, P. Eugui, D.J. Harper, **C.W. Merkle**, M. Augustin, B. Kiesel, P.A. Mercea, G. Widhalm, B. Baumann, and A. Woehrer, "Improved Diagnostic Imaging of Brain Tumors by Multimodal Microscopy and Deep Learning," Cancers 12(7), 1806 (2020). **DOI: 10.3390/cancers12071806**

INTERNATIONAL PRESENTATIONS – First Author

Photonics West – 2015 (Poster), 2016-2024 (Oral)

ARVO Annual Meeting – 2016 (Poster), 2019-2021 (Poster)

Frontiers in Optics – 2020 (Oral)

BRAIN & BRAIN PET – 2017 (Oral)

OTHER ACTIVITIES

Guest Editor for a special issue of Photonics (ISSN 2304-6732)

"OCT Technology Advances and Their Applications in Disease Studies"

Career breaks, diverse career paths and major life events

In 2021 I took one month of parental leave for the birth of my son, during which I was not working. I took an additional 7 months of parental leave in 2022 to care for my son, during which I worked a limited 4 hours per week to maintain teaching and administrative obligations. In 2024, I took one month of parental leave for the birth of my daughter, during which I was not working.