


MATTHIAS WALLE (he/him)

Dr. sc. ETH Zürich — McCaig Institute, University of Calgary, Canada

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 [Google Scholar](#)

PERSONAL INFORMATION

Language Certificates

German: C2. Abitur (native)	07/13
English: C1. German Academic Exchange Service (DAAD)	07/19
French: B1. Diplôme d'études en langue française (DELF)	06/11

Nationality German

Work permits European Union, Canada (work permit, applying for permanent residency)

ORCID 0000-0003-3250-8143

EDUCATION

ETH Zürich

Doctoral studies (Dr. sc. ETH Zürich) Department of Health Sciences and Technology supervised by Prof. Dr. Ralph Müller. 03/20 – 09/23

Technical University Munich

Master of Science (M.Sc., Dipl.-Ing.) Mechanical Engineering. 08/17 – 02/20

Bachelor of Science (B.Sc.) Mechanical Engineering. 10/13 – 07/17

Research stays abroad

1. University of Calgary, McCaig Institute. 06/23 – 09/23
2. University of Sheffield, Mellanby Centre for Musculoskeletal Research. 11/22 – 11/22
3. IBM Research Zurich, Artificial Intelligence and Automation. 08/21 – 12/21
4. Harvard Medical School, Beth Israel Deaconess Medical Center. 08/19 – 01/20
5. University of Technology Sydney, Faculty of Science. 03/19 – 07/19
6. ETH Zürich, Department of Health Sciences and Technology. 08/18 – 12/18

RESEARCH EXPERIENCES

Postdoctoral Fellowship, McCaig Institute, University of Calgary. 10/23 – 10/25

Digital analysis of bone remodelling to understand the effects of high-dose vitamin D supplementation.

- This study aims to use advanced computational techniques combined with large-scale imaging and clinical data to analyze the complex biological effects of vitamin D on bone metabolism.

Doctoral Studies, Institute for Biomechanics, ETH Zürich. 03/20 – 09/23

Mechanoregulation of bone remodelling in diabetes mellitus using HR-pQCT in vivo patient data.

- I developed bone imaging and computational methods for mechanobiological bone remodelling studies that can be run on desktop computers in the hospital/laboratory environment.

Master's Thesis, Beth Israel Deaconess Medical Center, Harvard Medical School. <i>Effects of microscopic spatial complexity and heterogeneity on trabecular bone modulus.</i> - I conducted this project to describe continuity within the trabecular bone network, to possibly further the understanding of the intrinsic material properties of trabecular bone, by combining local morphology and micro-finite element analysis.	08/19 – 01/20
Bachelor's Thesis, Institute of Micro Technology and Medical Device Technology, TU Munich. <i>A relational database for medical device certification.</i> - I developed a database tool to guide small to medium businesses through the medical device approval process, ensuring compliance with international and national regulations.	11/17 – 02/18

PROFESSIONAL INDUSTRY EXPERIENCES

Intern at Aesculap AG, Front End Innovation. - Worked on a sterile technology system including prototype design, testing, and negotiations with suppliers.	04/17 – 10/17
Software Engineer at MathWorks, Technical Support. - Advertised internal and external clients on the development of software solutions and applications using the computing software MATLAB and Simulink.	10/16 – 03/17

GRANTS, FELLOWSHIPS, AWARDS

Grants

1. Planning and Dissemination Grant – Institute Community Support, Canadian Institutes of Health Research. Title: <i>Developing a novel tool for non-invasive vertebral strength assessment at the spine based on computed tomography.</i> Role: Co-applicant. Team: Sarah Mankse, Danielle Whittier, Andrew Burghardt, Kathryn Stok, Michael Kuczynski, Serena Bonaretti, Steven Boyd. Status: Under review.	08/24 \$20000
2. A-MEDICO, University of Calgary. Title: <i>Developing a novel tool for non-invasive vertebral strength assessment at the spine based on computed tomography.</i> Role: Grant writing. Team: Steven Boyd. Status: Funded.	04/23 – 08/23 \$77200
3. Alberta Spine Foundation Grant, University of Calgary. <i>Developing a machine learning model of the spine for clinical applications from computed tomography.</i> Role: Grant writing. Team: Steven Boyd, Ganesh Swamy, Fred Nicholls, Peter Salat, Carrie Ye, Michael Monument. Status: Funded.	01/25 – 12/26 \$75000

Scholarships and fellowships

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| 1. Alberta Innovates Postdoctoral Fellowship, University of Calgary.
Title: <i>Enhanced digital analysis of bone remodelling to understand the effects of high-dose vitamin D supplementation.</i> | 10/23 – 09/25
\$140000 |
| 2. Marie Skłodowska-Curie Action (MSCA) Horizon 2020, ETH Zürich.
Title: <i>Innovative training network for research into bone fragility in diabetes in europe – towards a personalised medicine approach.</i> FIDELIO (EU 860989). | 01/20 – 12/23
€187000 |
| 3. Swiss-European mobility programme SEMP Erasmus+, ETH Zürich.
Title: <i>Development of an in vivo mouse model of vertebral defects combined with time-lapsed micro-CT imaging and real-time micro-finite element analysis.</i> | 08/18 – 12/18
CHF 2200 |
| 4. MATLAB Student Ambassador scholarship, MathWorks Germany.
MATLAB student ambassador scholarship honouring leadership of the student group <i>STUDLab.</i> | 04/18 – 07/19
€ 3600 |

Awards

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| 1. Young investigator award, ASBMR 2024.
Investigating the Time-Dependent Recovery of Spaceflight-Induced Bone Resorption in Astronauts. | 07/24
US-\$ 1000 |
| 2. Hartmut H. Malluche early career investigator award, ISBM 2024.
Investigating the Time-Dependent Recovery of Spaceflight-Induced Bone Resorption in Astronauts. | US-\$ 1500 |
| 3. Special training opportunities fund, McCaig Institute, University of Calgary.
<i>Workshop on open data in musculoskeletal imaging.</i> Role: awardee | 08/23
C-\$1000 |
| 4. Best poster award, 26th congress of the European Society of Biomechanics.
<i>Plate and Rod networks describe load transfer in trabecular bone.</i> | 07/20
€300 |

TEACHING EXPERIENCE

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| 1. Senior teaching assistant, Imaging and Computing in Medicine, ETH Zürich.
- Preparation, implementation and instruction of six flipped classroom sessions, co-supervision and coordination of undergraduate tutors, and managing the course moodle page (200 students). | 03/20 – 09/23 |
| 2. Examiner, Orthopaedic Biomechanics, ETH Zürich.
- Oral examination of bachelor students on topics in mechanical and structural engineering of the musculoskeletal system alongside the analysis and design of orthopaedic solutions (50 students). | 09/21 – 12/21 |
| 3. Teaching assistant, Principles of Modern Information Technology I and II, TU Munich.
- Developed and presented exercises on modern information technology to engineering students (800 students). | 10/16 – 03/17 |

Guest lectures

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| 1. M. Walle. <i>Modelling and simulations.</i> Guest lecture, Medical Imaging Applications (MDSC 689.11), University of Calgary, Calgary, Canada. | 03/24 |
| 2. M. Walle. <i>Bones under pressure: how mechanical forces influence bone remodelling in diabetes.</i> Guest lecture, Mechanobiology (ME 602), Boise State University, Boise, Idaho, USA. | 11/23 |

ADVISORY AND SUPERVISORY RESPONSIBILITIES

Teaching assistants

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| 1. V. Tütsch, M.Sc. Health Sciences and Technology, ETH Zürich. | 02/21 – 05/22 |
| 2. D. Windisch, M.Sc. Health Sciences and Technology, ETH Zürich. | 02/21 – 05/22 |
| 3. V. Kecheliev, M.Sc. Health Sciences and Technology, ETH Zürich. | 02/21 – 05/22 |
| 4. A. Arizzi, M.Sc. Health Sciences and Technology, ETH Zürich. | 02/21 – 05/21 |
| 5. J. Kendall, M.Sc. Mechanical Engineering, ETH Zürich. | 02/21 – 05/21 |

Scientific supervision

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| 1. M. Kamphuis. <i>Human bone mechanoregulation based on high-resolution quantitative computed tomography</i> . Research Internship, MSc Biomedical Engineering, University of Technology Eindhoven. | 05/22 – 08/22 |
| 2. M. Marzetta. <i>An automated registration approach for multi-stack time-lapsed imaging using high-resolution peripheral quantitative computed tomography</i> . Bachelor Thesis, B.S. Computational Science and Engineering, ETH Zürich. | 03/22 – 09/22 |
| 3. D. Windisch. <i>In vivo repeatability of time-lapsed bone remodelling analysis of the distal radius and tibia</i> . Research Internship, M.S. Health Sciences and Technology, ETH Zürich. | 02/22 – 05/22 |
| 4. C. Weidlich. <i>Validation of mechanoregulation methods of human studies: impact of cortical and trabecular segmentation</i> . Master Thesis, M.S. Mechanical Engineering, ETH Zürich. | 10/21 – 05/22 |
| 5. A. Sachan. <i>Agent-based simulations of the effects of treatment on diabetic vs non-diabetic bone</i> . Bachelor Thesis, B.Tech., IIT Bombay, India. | 08/21 – 05/22 |
| 6. D. Windisch. <i>Automated mechanoregulation pipeline for human studies: image registration module</i> . Practical Internship, M.S. Health Sciences and Technology, ETH Zürich. | 10/21 – 02/22 |
| 7. J. Heim. <i>Quality control of HR-pQCT based bone mechanoregulation analysis</i> . Semester Project, M.S. Biomedical Engineering, ETH Zürich. | 07/21 – 10/21 |
| 8. P. Steiner. <i>Suppression of subject motion induced artefacts in HR-pQCT scans using deep neural networks</i> . Master Thesis, M.S. Mechanical Engineering, ETH Zürich. | 06/21 – 12/21 |
| 9. A. Sachan. <i>Multiphysics simulations of diabetic bone and procedure for inclusion of new pathways</i> . Research Internship, B.Tech. IIT Bombay, India, ETH Zürich. | 05/21 – 07/21 |
| 10. C. Weidlich. <i>Digital biopsy representative region extraction in human radii</i> . Semester Project, M.S. Mechanical Engineering, ETH Zürich. | 02/21 – 05/21 |
| 11. D. Eggemann. <i>Characterisation of image quality in HR-pQCT scans using a deep-learning-based classification method</i> . Semester Project, M.S. Electrical Engineering, ETH Zürich. | 02/21 – 06/21 |

ACADEMIC CITIZEN- AND LEADERSHIP

Institutional service

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| 1. Chair , International Society of Bone Morphometry (ISBM) Young investigator Committee. | 24-Present |
| 2. Postdoc representative , McCaig Trainee Committee, University of Calgary. | |
| 3. Community member , Open and Reproducible Musculoskeletal Imaging Research Community (ORMIR) | 23-Present |
| 4. HubLE editor , International Federation of Musculoskeletal Research Societies (IFMRS) | 22-Present |
| 5. Committee member , International Society of Bone Morphometry (ISBM) Young Investigator Committee. | 22-24 |

Active professional society memberships

1. Engineer in Training, Professional Engineers of Alberta (APEGA, application submitted)	24-Present
2. European Society of Biomechanics (ESB)	20-24
3. European Calcified Tissue Society (ECTS)	20-24
4. American Society of Bone and Mineral Research (ASBMR)	20-Present
5. International Society of Bone Morphometry (ISBM)	23-Present

Peer review contributions

1. Bone (IF 2024: 4.1)	23-Present
2. Nature Communications (IF 2024: 16.6)	23-Present
3. Frontiers in Endocrinology (IF 2024: 5.6)	23-Present
4. The Journal of Bone and Mineral Research (IF 2023: 6.2)	22-Present
5. Annals of Biomedical Engineering (IF 2022: 3.8)	22-Present

Other leadership roles

1. Junior session moderator , Clinical Bone Imaging, 16 th Congress of the International Society of Bone Morphometry 2024, Toronto, ON, Canada	09/24
2. Abstract judge , Summer Student Symposium 2024, McCaig Institute, University of Calgary.	07/24
3. Session moderator , T. Chen Fong fellow and resident presentations. Department of Radiology, University of Calgary, research day 2024	05/24
4. Oral presentation judge , Dr. Marvin Fritzler Nidus Award 2024. McCaig Institute Research Day, University of Calgary.	04/24
5. Poster judge , Cumming School of Medicine Research Day, University of Calgary, 2024.	05/24

Professional development and training activities

1. Sharing and curating open data in musculoskeletal imaging research (4 days). 2 nd workshop of the open and reproducible musculoskeletal imaging research (ORMIR) community.	01/24
2. Fundamentals of mechanical testing and computational modelling of bone (4 days). University Medical Center, Hamburg-Eppendorf, Germany.	02/22
3. Basics of RNA isolation using spin column-based extraction kits (4 days). Qiagen, Hilden, Germany.	04/22
4. Scientific writing course (3 days). University of Southern Denmark, Odense, Denmark.	02/22
5. Computing on a scientific cluster & writing fast(er) Python code workshops (4 days). Scientific IT Services, ETH Zürich, Switzerland.	11/21
6. Summer school biomedical imaging (10 days). ETH Zürich, Switzerland.	09/21
7. Professional development programme (5 days) on collaboration, leadership, innovation, public and patient engagement, presentation skills. Tesselle Development, Sheffield, United Kingdom.	03/21
8. Developing scientific writing skills at doctoral level (1 day). Dr. Simon Milligan, University of Zürich, ETH Zürich, Switzerland.	09/20
9. How to critically appraise real-world evidence in medicine (1 day). Dr. Andrea Burden, ETH Zürich, Switzerland.	12/20
10. Invigilating online examinations (1 day). Sandra Hundseder, ETH Zürich, Switzerland.	08/20

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| 11. Think ahead summer school on research communication and implicit bias (2 days).
Tesselle Development, Sheffield, United Kingdom. | 07/20 |
| 12. Design to value and negotiation strategy (2 days).
McKinsey, Munich, Germany. | 06/18 |
| 13. Soft skills workshop (3 days).
Center of Key Competencies, TU Munich, Germany. | 09/13 |

Research engagement activities (presentations for research, industry, and clinical audiences)

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| 1. M. Walle. <i>Non-invasive automatic assessment of vertebral strength in cancer patients with and without bone metastasis.</i> Department of Radiology Research Day, University of Calgary, Calgary, Canada, 2024. | 05/24 |
| 2. M. Walle. <i>Bones under pressure: how mechanical forces influence bone remodelling in diabetes.</i> McCaig Seminar Series 2023-24, Calgary, Canada. | 11/23 |
| 3. M. Walle. <i>Please don't move: assessing and addressing motion challenges in high-resolution CT imaging in vivo with deep learning.</i> Advanced Medical Imaging Seminar Series 2023-24, Calgary, Canada. | 10/23 |
| 4. M. Walle. <i>Are bones with diabetes less responsive to mechanical loading?</i> FIDELIO Annual meeting 2023, Sheffield, UK. | 04/23 |
| 5. M. Walle. <i>Advanced computational tools for HR-pQCT image analysis.</i> FIDELIO Annual meeting 22, Dresden, Germany. | 06/22 |
| 6. M. Walle. <i>Mechanoregulation of bone remodelling in diabetes mellitus.</i> Colloquium in Biomechanics, ETH Zürich, Switzerland. | 05/22 |
| 7. M. Walle. <i>Please don't move: Motion artefacts during HR-pQCT scanning.</i> Colloquium in Biomechanics, ETH Zürich, Switzerland. | 11/21 |
| 8. M. Walle. <i>Mechanoregulation of bone remodelling in type 2 diabetes using HR-pQCT in vivo patient data.</i> Invited speaker, FIDELIO Annual meeting 21, online. | 07/21 |
| 9. M. Walle. <i>Physiological load estimation based on time-lapsed HR-pQCT images.</i> Colloquium in Biomechanics, ETH Zürich, Switzerland. | 04/21 |

OUTREACH

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| 1. M. Walle <i>Bone Health Research - Navigating a Difficult 'Joint' Venture.</i> Humour us! Knowledge Translation Through Comedy Competition. University of Calgary (Winner: 200 C-\$ prize) | 09/24 |
| 2. R. Mitchell and M. Walle, <i>Effects of microgravity on bone health.</i> Interview for the Minority Introduction to Engineering, and Science at the Massachusetts Institute of Technology (MIT MITES). | 07/24 |
| 3. M. Walle. <i>Time-lapsed HR-pQCT and bone mechanoregulation.</i> FIDELIO webinar, YouTube.com . | 12/22 |
| 4. M. Walle and D. Carro-Vazquez. <i>Effect of denosumab on circulating microRNAs after 2 years of treatment in postmenopausal women.</i> HubLE exchange interview, international federation of musculoskeletal research, huble.org . | 05/22 |
| 5. M. Walle and L. Emini. <i>Characterizing the bone phenotype of a polygenetic mouse model of type 2 diabetes.</i> HubLE exchange interview, international federation of musculoskeletal research, huble.org . | 05/22 |
| 6. M. Walle. <i>Mechanobiology in diabetes patients.</i> Project video, YouTube.com . | 02/22 |

7. Scientifica: Zurich Science Days. Demonstration and tour through the laboratory for bone biomechanics to give young children and teenagers insights into simulations of cellular processes in bone, [scientifica.ch](https://www.scientifica.ch). 09/21
8. C. Ledoux, **M. Walle**, R. Müller, C.J. Collins. *Insights into bone processes*. The Globe article, [ethz.ch](https://www.ethz.ch). 09/21
9. Andreasen C. Møller and **M. Walle**. *Tissue-level mechanical stimuli drive bone formation and resorption in humans and mice*. HubLE exchange interview, international federation of musculoskeletal research, [huble.org](https://www.huble.org). 06/21

INVITED RESEARCH TALKS

1. **M. Walle**. *Mechanoregulation of bone remodelling in diabetes using HR-pQCT in vivo patient data*. Invited Speaker, 50th Annual European Calcified Tissue Society Congress (ECTS 2023), Open Forum: type 1 and 2 diabetes and bone health - results from the FIDELIO research training network, Liverpool, UK, 05/2023.

PEER-REVIEWED PUBLICATIONS

Original articles

1. **M. Walle**, D. Yeritsyan, M. Abbasian, R. Oftadeh, R. Müller, A. Nazarian. *A graph model to describe the network connectivity of trabecular plates and rods*. Front. Bioeng. Biotechnol., 2024.
2. **M. Walle**, A. Duseja, D.E. Whittier, T. Vilaca, M. Paggiosi, R. Eastell, R. Müller, C.J. Collins. *Bone remodeling and responsiveness to mechanical stimuli in individuals with type 1 diabetes mellitus*. JBMR, 2024.
3. V. B. Kassey, **M. Walle**, J. Egan, D. Yeritsyan, I. Beeram, Y. Wu, B.D. Snyder, E.K. Rodriguez, J.L. Ackerman, A. Nazarian. *Quantitative 1H magnetic resonance imaging on pathologic rat bones by solid-state 1H ZTE sequence with water and fat suppression*. Journal of Magnetic Resonance Imaging, JMIR, 2024.
4. V.B. Kassey, **M. Walle**, J. Egan, D. Yeritsyan, I. Beeram, Y. Wu, B.D. Snyder, E.K. Rodriguez, J.L. Ackerman, A. Nazarian. *Quantitative 31P Magnetic resonance imaging on pathologic rat bones by ZTE sequence at 7T*. Bone, 2024.
5. D.E. Whittier*, **M. Walle***, D. Schenk, P.R. Atkins, C.J. Collins, P. Zysset, K. Lippuner, R. Müller. *A multi-stack registration technique to improve measurement accuracy and precision across longitudinal HR-pQCT scans*. Bone, 2023. (*equal contribution).
6. **M. Walle**, D.E. Whittier, D. Schenk, P.R. Atkins, P. Christen, M. Blauth, P. Zysset, K. Lippuner, R. Müller, C.J. Collins. *Precision of bone mechanoregulation assessment using longitudinal HR-pQCT*. Bone, 2023.
7. F.C. Marques, D. Boaretti, **M. Walle**, A.C. Scheuren, F.A. Schulte, R. Müller. *Mechanostat parameters estimated from time-lapsed in vivo micro-computed tomography data of mechanically driven bone adaptation are logarithmically dependent on loading frequency*. Front. Bioeng. Biotechnol., 2023.
8. **M. Walle**, D. Eggemann, P.R. Atkins, K. J.J. Kendall, Stock, R. Müller, C.J. Collins. *Motion grading of high-resolution quantitative computed tomography supported by deep convolutional neural networks*. Bone, 2022.
9. **M. Walle**, D.E. Whittier, M. Frost, R. Müller, C.J. Collins. *Meta-analysis of diabetes mellitus-associated differences in bone structure assessed by high-resolution peripheral quantitative computed tomography*. Curr. Osteoporos. Rep., 2022.
10. **M. Walle**, F.C. Marques, N. Ohs, M. Blauth, R. Müller and C.J. Collins. *Bone mechanoregulation allows subject-specific load estimation based on time-lapsed micro-CT and HR-pQCT in Vivo*. Front. Bioeng. Biotechnol., 2021.
11. A. Malhotra, **M. Walle**, G.R. Paul, G.A. Kuhn and R. Müller. *Application of subject-specific adaptive mechanical loading for bone healing in a mouse tail vertebral defect*. Sci. Rep., 2021.

Original articles in submission (manuscripts can be provided on request)

1. **M. Walle**, L. Gabel, D.E. Whittier, A. Liphardt, P.A. Hulme, M. Heer, S.R. Zwart, S.M. Smith, J.D. Sibonga, S.K. Boyd. *Tracking of spaceflight-induced bone remodelling reveals 'expiry dates' for recovery of resorption sites in humans*. Science Advances adq3632, in revision, 05/2024.
2. D.E. Whittier, **M. Walle**, P.R. Atkins, C.J. Collins, M.A. Zumstein, P. Christen, K. Lippuner, R. Müller. Structural alterations during fracture healing lead to void spaces developing in surrounding bone microarchitecture. *Under internal review*, 2024.

PEER-REVIEWED CONFERENCE ABSTRACTS

Oral podium presentations

1. **M. Walle**, L. Gabel, D.E. Whittier, A. Liphardt, P.A. Hulme, M. Heer, S.R. Zwart, S.M. Smith, J.D. Sibonga, S.K. Boyd. *Investigating the time-dependent recovery of spaceflight-induced bone resorption in astronauts*. 16th Congress of the International Society of Bone Morphometry, Toronto, ON, Canada, October 3-6, 2024.
2. **M. Walle**, L. Gabel, D.E. Whittier, A. Liphardt, P.A. Hulme, M. Heer, S.R. Zwart, S.M. Smith, J.D. Sibonga, S.K. Boyd. *Investigating the time-dependent recovery of spaceflight-induced bone resorption in astronauts*. ASBMR, Toronto, ON, Canada, September 27-30, 2024.
3. **M. Walle**, L. Gabel, D.E. Whittier, A. Liphardt, P.A. Hulme, M. Heer, S.R. Zwart, S.M. Smith, J.D. Sibonga, S.K. Boyd. *Timelapsed HR-pQCT of local remodelling sites reveals coupling of bone formation and resorption sites during spaceflight and recovery of Earth*. The 24th International Workshop on Quantitative Musculoskeletal Imaging, The Barossa Valley, South Australia November 3-8, 2024.
4. **M. Walle**, D.E. Whittier, S.K. Boyd, R. Müller and C. J. Collins. *Measuring bone remodelling in vivo: does voxel size really matter?* Annual Alberta Biomedical Engineering Conference 2023, Banff, Alberta, Canada, 2023.
5. **M. Walle**, D. Eggemann, P.R. Atkins, K. Stock, R. Müller, C.J. Collins. *Integration of artificial intelligence into diagnostic imaging: convolutional neural network-supported HR-pQCT visual grading*. 9th World Congress of Biomechanics, July 10-14, 2022, Taipei, Taiwan.
6. P. Y. Steiner, **M. Walle**, M. Rigotti, D.E. Whittier, C. McLennan, P. R. Atkins, R. Müller, C. J. Collins. *Correction of motion artefacts in HR-pQCT using cycle-consistent adversarial networks*. Abstracts 27th Congress of the European Society of Biomechanics, Porto, Portugal, June 26-29, 2022.
7. D.E. Whittier, **M. Walle**, P. Christen, P.R. Atkins, C. Collins, M. Blauth, K. Lippuner, R. Müller. *Changes in loading during fracture healing do not impact bone microarchitecture of the unfractured wrist*. Abstracts 27th Congress of the European Society of Biomechanics (ESB), Porto, Portugal, June 26-29, 2022.
8. **M. Walle**, D.E. Whittier, C. Weidlich, D.O. Windisch, P.R. Atkins, P. Christen, M. Blauth, K. Lippuner, R. Müller, C.J. Collins. *Time-lapsed HR-pQCT allows monitoring local bone remodelling events at various follow-up time-points in vivo*. The 23rd International Workshop on Quantitative Musculoskeletal Imaging, June 13-17, 2022, Noordwijk, Netherlands.
9. **M. Walle**, F.C. Marques, N. Ohs, M. Blauth, R. Müller and C. J. Collins. *Bone mechanoregulation allows subject-specific in vivo estimation of microstructural tissue loading history*. 26th Congress of the European Society of Biomechanics, July 11-14, 2021, Milan, Italy.

Flash podium/hybrid presentations

1. D.E. Whittier, **M. Walle**, C. Ledoux, P.R. Atkins, C.J. Collins, J.A. Holtmann, M.A. Zumstein, P. Christen, K. Lippuner, R. Müller. *fracture healing leads to localized structural bone loss quantified using void space analysis*. Abstracts ASBMR 2023 Annual Meeting, Vancouver, Canada, J. Bone Miner. Res., 2023.

2. **M. Walle**, D.E. Whittier, D. Schenk, M. Blauth, P. Zysset, K. Lippuner, R. Müller, C.J. Collins. *In vivo repeatability of bone mechanoregulation assessment using longitudinal high-resolution peripheral quantitative computed tomography*. Abstracts 50th Annual European Calcified Tissue Society Congress, Liverpool, UK, 05/15-18, JBMR Plus: Volume 7, Issue S3, 2023.
3. D.E. Whittier, **M. Walle**, C. Ledoux, J. Holtmann, C.J. Collins, K. Lippuner, R. Müller. *Early bone remodelling during fracture healing measured by HR-pQCT is a determinant of long-term bone mineral density*. Abstracts 50th Annual European Calcified Tissue Society Congress, Liverpool, UK, 05/15-18, JBMR Plus: Volume 7, Issue S3, 2023.
4. **M. Walle**, D. Whittier, R. Müller, C.J. Collins. *HR-pQCT measures of bone microarchitecture in type 1 and type 2 diabetes mellitus: systematic review and meta-analysis*. European Calcified Tissue Society Congress 2022, 07-10 May, 2022, Helsinki, Finland.
5. **M. Walle**, M. Abbasian, D. Yeritsyan, R. Oftadeh, A. Nazarian. *plate and rod networks describe load transfer in trabecular bone*. 26th Congress of the European Society of Biomechanics, July 11-14, 2021, Milan, Italy.
6. **M. Walle**, F. C. Marques, N. Ohs, R. Müller, and C. J. Collins. *3D physiological load estimation based on time-lapsed HR-pQCT images*. Abstracts ASBMR 2020 Annual Meeting, Seattle, USA, J. Bone Miner. Res., 2020.

Poster presentations

1. **M. Walle**, B. Matheson, A. Abbott, C. Ye, M. Monument, S.K. Boyd. *Non-invasive automatic assessment of vertebral strength in cancer patients with and without bone metastasis*. ASBMR, Toronto, ON, Canada, September 27-30, 2024.
2. **M. Walle**, A. Duseja, D.E. Whittier, T. Vilaca, M. Paggiosi, R. Eastell, R. Müller, C.J. Collins. *Bone remodelling and responsiveness to mechanical stimuli in type 1 diabetes mellitus: the role of neuropathy*. Abstracts ASBMR 2023 Annual Meeting, Vancouver, Canada, J. Bone Miner. Res., 2023.
3. V. Kassey, **M. Walle**, J. Egan, D. Yeritsyan, Y. Wu, B.D. Snyder, E.K. Rodriguez, J.L. Ackerman and A. Nazarian. *A versatile MRI post-processing package with graphical user interface in MATLAB*. 63rd ENC, April 24-29, 2022, Orlando, Florida, USA.
4. **M. Walle**, D. Eggemann, P.R. Atkins, K. Stock, Müller, C.J. Collins. *Operator-independent characterisation of image quality in HR-pQCT scans using a fully automated convolutional neural network-based classification method*. ORS 2022 Annual Meeting, February 4 – 8, 2022, Tampa, Florida, USA.
5. V. Kassey, **M. Walle**, J. Egan, D. Yeritsyan, Y. Wu, B. Snyder, E. Rodriguez, J. Ackerman, A. Nazarian. *A combined solid-state ¹H and ³¹P magnetic resonance imaging to assess bone mineral and matrix densities in rat bones*. Abstracts 2021 ISMRM & SMRT Annual Meeting, International Society for Magnetic Resonance in Medicine.
6. D. Eggemann, **M. Walle**, P. Atkins, K. Stock, R. Müller, and C. J. Collins. *Operator-independent characterization of image quality in HR-pQCT scans using a fully automated convolutional neural network-based classification method*. Abstracts ASBMR 2021 Annual Meeting, Toronto, Canada, J. Bone Miner. Res., 2021.
7. **M. Walle**, F. C. Marques, N. Ohs, M. Blauth, R. Müller and C. J. Collins. *Tissue-level mechanical stimuli drive bone formation and resorption in humans and mice*. Digital Congress of the European Calcified Tissue Society, 05/6-8, 2021, online.