MATTHIAS WALLE (he/him)

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

matthias.walle@ucalgary.ca wallematthias.github.io LinkedIn 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. 08/19 – 01/20
Effects of microscopic spatial complexity and heterogeneity on trabecular bone modulus.
- 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.

Bachelor's Thesis, Institute of Micro Technology and Medical Device Technology, TU Munich. 11/17 – 02/18
A relational database for medical device certification.
- I developed a database tool to guide small to medium businesses through the medical device approval process, ensuring compliance with international and national regulations.

PROFESSIONAL INDUSTRY EXPERIENCES

Intern at Aesculap AG, Front End Innovation. 04/17 – 10/17
- Worked on a sterile technology system including prototype design, testing, and negotiations with suppliers.

Software Engineer at MathWorks, Technical Support. 10/16 – 03/17
- Advertised internal and external clients on the development of software solutions and applications using the computing software MATLAB and Simulink.

GRANTS, FELLOWSHIPS, AWARDS

Grants

1. **Planning and Dissemination Grant – Institute Community Support, Canadian Institutes of Health Research.** 08/24 $20000
   Title: *Developing a novel tool for non-invasive vertebral strength assessment at the spine based on computed tomography.*
   Role: Co-applicant.
   Team: Sarah Mankse, Danielle Whittier, Andrew Burghardt, Kathryn Stok, Michael Kuczynski, Serena Bonaretti, Steven Boyd.
   Status: **Funded**.

2. **A-MEDICO, University of Calgary**. 04/23 – 08/23 $77200
   Title: *Developing a novel tool for non-invasive vertebral strength assessment at the spine based on computed tomography.*
   Role: Grant writing.
   Team: Steven Boyd.
   Status: **Funded**.

3. **Alberta Spine Foundation Grant, University of Calgary**. 01/25 – 12/26 $75000
   Developing a machine learning model of the spine for clinical applications from computed tomography.
   Role: Grant writing.
   Team: Steven Boyd, Ganesh Swamy, Fred Nicholls, Peter Salat, Carrie Ye, Michael Monument.
   Status: **Funded**.

Scholarships and fellowships

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

Awards

1. **ETH Medal for outstanding doctoral thesis, 2024.** 11/2024
   Awarded to the top 8% of graduates at ETH Zurich. CHF 2000
2. **Young investigator award, ASBMR 2024.** 07/24
   Investigating the Time-Dependent Recovery of Spaceflight-Induced Bone Resorption in Astronauts. 09/2024 US-$ 1000
3. **Hartmut H. Malluche early career investigator award, ISBM 2024.** 10/2024
   Investigating the Time-Dependent Recovery of Spaceflight-Induced Bone Resorption in Astronauts. US-$ 1500
4. **Special training opportunities fund, McCaig Institute, University of Calgary.** 08/23
   Workshop on open data in musculoskeletal imaging. Role: awardee C-$1000
5. **Best poster award, 26th congress of the European Society of Biomechanics.** 07/20
   Plate and Rod networks describe load transfer in trabecular bone. €300

TEACHING EXPERIENCE

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

Guest lectures

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

ADVISORY AND SUPERVISORY RESPONSIBILITIES

Teaching assistants

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

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

ACADEMIC CITIZEN- AND LEADERSHIP

Institutional service

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 Muscoskeletal 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 in review) 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. **Committee Member**, Dr. Jon Meddings Leadership Awards, 2024, University of Calgary. 11/24
2. **Poster judge,** 16th Annual Leaders in Medicine Symposium, University of Calgary. 11/24
3. **Junior session moderator**, Clinical Bone Imaging, 16th Congress of the International Society of Bone Morphometry 2024, Toronto, ON, Canda 09/24
4. **Abstract judge**, Summer Student Symposium 2024, McCaig Institute, University of Calgary. 07/24
5. **Session moderator**, T. Chen Fong fellow and resident presentations. Department of Radiology, University of Calgary, research day 2024 05/24
6. **Oral presentation judge**, Dr. Marvin Fritzler Nidus Award 2024. McCaig Institute Research Day, University of Calgary. 04/24
7. **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). 01/24
   2nd workshop of the open and reproducible musculoskeletal imaging research (ORMIR) community.
2. **Fundamentals of mechanical testing and computational modelling of bone** (4 days). 02/22
   University Medical Center, Hamburg-Eppendorf, Germany.
3. **Basics of RNA isolation using spin column-based extraction kits** (4 days). 04/22
   Qiagen, Hilden, Germany.
4. **Scientific writing course** (3 days). 02/22
   University of Southern Denmark, Odense, Denmark.
5. **Computing on a scientific cluster & writing fast(er) Python code workshops** (4 days). 11/21
   Scientific IT Services, ETH Zürich, Switzerland.
6. **Summer school biomedical imaging** (10 days). 09/21
   ETH Zürich, Switzerland.
7. **Professional development programme** (5 days) 03/21
   on collaboration, leadership, innovation, public and patient engagement, presentation skills. Tesselle Development, Sheffield, United Kingdom.

8. **Developing scientific writing skills at doctoral level** (1 day). 09/20
   Dr. Simon Milligan, University of Zürich, ETH Zürich, Switzerland.
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). 08/20
    Sandra Hundseder, ETH Zürich, Switzerland.
11. **Think ahead summer school on research communication and implicit bias** (2 days). 07/20
    Tesselle Development, Sheffield, United Kingdom.
12. **Design to value and negotiation strategy** (2 days). 06/18
    McKinsey, Munich, Germany.
13. **Soft skills workshop** (3 days). 09/13
    Center of Key Competencies, TU Munich, Germany.

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

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

OUTREACH

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

5. **M. Walle** and L. Emini. *Characterizing the bone phenotype of a polygenetic mouse model of type 2 diabetes.* HubLE exchange interview, international federation of musculoskeletal research, huble.org. 05/22
6. **M. Walle**. *Mechanobiology in diabetes patients*. 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. 09/21
8. C. Ledoux, **M. Walle**, R. Müller, C.J. Collins. *Insights into bone processes*. The Globe article, 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. 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**, 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 press, 12/24.
2. **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.
3. **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.
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 1H magnetic resonance imaging on pathologic rat bones by solid-state 1H ZTE sequence with water and fat suppression.* Journal of Magnetic Resonance Imaging, JMRI, 2024.
5. 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.
6. D.E. Whittier*, **M. Walle***, D. Schenk, P.R. Atkins, C.J. Collins, P. Zysset, K. Lippuner, R. Müller. *A multi-stackregistration technique to improve measurement accuracy and precision across longitudinal HR-pQCT scans.* Bone, 2023. (*equal contribution).
7. **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.
8. 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.
9. **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.
10. **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. Ost. Rep., 2022.

11. **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.
12. 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. 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.