

Sebastian Mußnig

Academic Degree: MD (Dr. med. univ.), PhD

Nationality: Austria

Current Residence: Vienna, Austria

Email: sebastian.mussnig@meduniwien.ac.at

Web: <https://hd-research.net>

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Work Experience

2026-05 - present: Assistant physician (40h), Medical University of Vienna, Department of Medicine III, Division for Nephrology & Dialysis

2025-10 - 2026-04: Postgraduate researcher (40h), Medical University of Vienna, Department of Medicine III, Division for Nephrology & Dialysis

2024-10 - 2025-09: Postgraduate researcher (40h), University of Western Ontario, Schulich School of Medicine & Dentistry, Department of Medical Biophysics

2023-07 - 2025-09: Postgraduate researcher (30h), Medical University of Vienna, Center for Public Health, Department of Epidemiology

2020-11 - 2023-06: Student researcher (12h), Medical University of Vienna, Department of Medicine III, Division for Nephrology & Dialysis

Education

2023-09 - 2026-04: Medical University of Vienna, PhD UN094 Program *Medical Physics*

Doctoral thesis: *Monitoring Chronic Fluid and Sodium Overload Among People on Maintenance Hemodialysis* (grade 1 [excellent]; supervisors Manfred Hecking & Franz Kainberger)

2017-10 - 2023-07: Medical University of Vienna, Diploma Studies in Human Medicine UN202

ECTS-weighted GPA: 1.14; Diploma thesis: *Bioimpedance Spectroscopy in Pulmonary Hypertension: An Exploratory Retrospective Study* (grade 1 [excellent]; supervisors Roman Reindl-Schwaighofer, & Manfred Hecking)

Research Affiliations

HD & Co Research Group (Group Leader: Manfred Hecking)

2020-11 - 2023-06; 2025-10 - present: Medical University of Vienna, Department of Medicine III, Division for Nephrology & Dialysis (Department Head: Rainer Oberbauer)

2023-07 - 2025-09: Medical University of Vienna, Center for Public Health, Department of Epidemiology (Department Head: Eva Schernhammer)

Kidney Clinic Research Unit (Group Leader: Christopher W. McIntyre)

2025-09 - present: Ongoing remote collaboration

2024-10 - 2025-09: University of Western Ontario, Schulich School of Medicine & Dentistry, Department of Medical Biophysics (Department Head: John Ronald)

Scholarship (ORCID - Google Scholars - Web of Science - ResearchGate)

Research summary: My primary research expertise lies in fluid management in hemodialysis, which so far has involved pathophysiological examinations, technical developments of bioimpedance spectroscopy, and interventional trials. During my research fellowship in London (Canada), I have conducted investigations into ^{23}Na MRI-derived cardiac sodium deposits in hemodialysis patients.

Original Articles (First Author, Co-Author):

7. *Associations of fluid overload with ambulatory blood pressure and pulse wave characteristics in hemodialysis patients undergoing targeted fluid management.* **Mussnig S**, Naar L, Theodorakopoulou M, Niknam Saeidi J, Beige J, Keane D, Schneditz D, Sarafidis P, Wassertheurer S, Mayer CC, Hecking M. *Clin Kidney J.* Major revision 2026-06.
6. *Myocardial sodium accumulation measured by sodium MRI in patients on hemodialysis.* **Mussnig S**, Tan JL, Deleaval P, Wilk B, Hecking M, Nagel AM, Thiessen JD, Scholl TJ, McIntyre CW, Akbari A. In submission 2026-06.
5. *Fluid management based on bioimpedance, blood volume and patient reports: A quality improvement project in maintenance hemodialysis.* **Mussnig S**, Naar L, Krenn S, Brosch F, Schneditz D, Beige J, Hecking M. *Kidney Med.* Volume 0, Issue 0, 101217. doi: 10.1016/j.xkme.2025.101217
4. *Longitudinal Patterns of Fluid Overload, Blood Volume and Vascular Refilling: a Prospective Study in Patients on Maintenance Hemodialysis.* **Mussnig S**, Krenn S, Waller M, Schmiedecker M, Kurnikowski A, Niknam J, Naar L, Mayer CC, Keane D, Schneditz D, Hecking M, Pstras L. *Clinical Kidney Journal*, 2025;; sfaf199, <https://doi.org/10.1093/ckj/sfaf199>.
3. *Volume and body composition in hemodialysis patients: a bioimpedance study assessing differences by sex.* **Mussnig S**, Niknam J, Matthias C, Widmer S, Gülmez D, Krenn S, Lorenz M, Chazot C, Wabel P, Schneditz D, Hecking M. *Kidney Med.* 2024 May 16;6(7):100837. PMID: 38957221. doi: 10.1016/j.xkme.2024.100837.
2. *Assessment of Bioimpedance Spectroscopy Devices: A Comparative Study and Error Analysis of Gold-Plated Copper Electrodes.* **Mussnig S**, Krenn S, Hecking M, Wabel P. *Physiol Meas.* 2024 Feb 5;45(2). doi: 10.1088/1361-6579/ad205b. PMID: 38237199.
1. *Differences in bioimpedance-derived fluid status between two versions of the Body Composition Monitor.* **Mussnig S**, Schmiedecker M, Waller S, Paschen C, Schneditz D, Hecking M, Krenn S. *Nutrition.* 2023 Jun 14;114:112131. doi: 10.1016/j.nut.2023.112131. Epub ahead of print. PMID: 37467529.
16. *Effects of Pre-Dialysis Fluid Overload, Intradialytic Relative Blood Volume Levels and Cumulative Ultrafiltration Volume on Pulse Wave-Derived Features during Hemodialysis: Results from a Longitudinal Cohort Study.* Krenn S, Pstras L, **Mussnig S**, Kurnikowski A, Wassertheurer S, Hecking M, Mayer CC. *Kidney Blood Press Res.* 2026 May 12:1-26. doi: 10.1159/000552495. Epub ahead of print. PMID: 42118704.
15. *Volume status in dialysis patients at extreme body habitus: a prospective observational study.* Keane DF, Trinca D, **Mussnig S**, Krenn S, Hecking M, Schneditz D. *J Nephrol.* 2026 Mar 16:aaajaf018. doi: 10.1093/joneph/aaajaf018. Epub ahead of print. PMID: 41837792.
14. *Reduction of pruritus and depression using longitudinal patient-reported outcome measures in hemodialysis: A quality improvement project.* Naar L, **Mussnig S**, Niknam J, Brosch F, Mayer CC, Beige J, Hecking M. *J Patient Rep Outcomes.* 2026 Jan 21;10(1):11. doi: 10.1186/s41687-026-01003-6. PMID: 41563679; PMCID: PMC12827871.
13. *The dry-weight dilemma: Survey results based on a qualitative interview study on fluid overload in hemodialysis.* Rathkolb V, Krauß J, **Mussnig S**, Krenn S, Matthias C, Mayfurth H, Tinhof V, Copic D, Waller M, Lorenz M, Schmaldienst S, Kropiunigg U, Keane D, Hecking M. *Kidney Med.* 2026 Mar 10;8(5):101320. doi: 10.1016/j.xkme.2026.101320. PMID: 42004650; PMCID: PMC13091120.

12. *Urinary Peptidomic Profiling In Post-Acute Sequelae of SARS-CoV-2 Infection: A Case-Control Study.* Gülmez D, Siwy J, Kurz K, Wendt R, Banasik M, Peters B, Dudoignon E, Depret F, Salgueira M, Nowacki E, Kurnikowski A, **Mussnig S**, Krenn S, Gonos S, Löffler-Ragg J, Weiss G, Mischak H, Hecking M, Schernhammer E, Beige J; UriCoV Working Group. *Proteomics.* 2025 Nov 21:e70074. doi: 10.1002/pmic.70074. Epub ahead of print. PMID: 41273049.
11. *Burden of obesity in patients undergoing dialysis, and hopes associated with semaglutide treatment for transplant listing: An interview study.* Vanek L, Stix E, Kurnikowski A, Krenn S, **Mussnig S**, Niknam J, Hecking M. *Diabetes Obes Metab.* 2025 Nov;27(11):6743-6747. doi: 10.1111/dom.70011. Epub 2025 Aug 25. PMID: 40855623; PMCID: PMC12515747.
10. *Semaglutide in patients with kidney failure and obesity undergoing dialysis and wishing to be transplanted: A prospective, observational, open-label study.* Vanek L, Kurnikowski A, Krenn S, **Mussnig S**, Hecking M. *Diabetes Obes Metab.* 2024 Dec;26(12):5931-5941. doi: 10.1111/dom.15967. Epub 2024 Oct 7. PMID: 39375862.
9. *The weighing process in patients on hemodialysis: an opportunity to improve volume management.* Niknam J, **Mussnig S**, Matthias C, Waller M, Keil N, Krenn S, Beige J, Schneditz D, Hecking M. *Clin Kidney J.* 2024. sfae275. <https://doi.org/10.1093/ckj/sfae275>.
8. *Patient and Caregiver Perspectives on Gender Disparity in Chronic Kidney Disease: Questionnaire Survey, Based on an Interview Study.* Vanek L, Gülmez D, Kurnikowski A, Krenn S, **Mussnig S**, Lewandowski M, Gauckler P, Pirklbauer M, Horn S, Brunner M, Zitt E, Kirsch B, Windpessl M, Eller K, Odler B, Aringer I, Wiesholzer M, Stamm T, Jauré A, Hecking M. *Am J Nephrol.* 2024 Aug 27;55(5):561-582. doi: 10.1159/000540850. Epub ahead of print. PMID: 39191222.
7. *Continuous insulin therapy to prevent post-transplant diabetes mellitus: a randomized controlled trial.* Kurnikowski A, Werzowa J, Hödlmoser S, Krenn S, Paschen C, **Mussnig S**, Tura A, Harreiter J, Krebs M, Song P, Eller K, Pascual J, Budde K, Hecking M, Schwaiger E. *Kidney Med.* 2024 Jun 21;6(8):100860. doi: 10.1016/j.xkme.2024.100860. PMID: 39157193; PMCID: PMC11326904.
6. *Day-to-day variability in euvolemic body mass.* Schneditz D, Hofmann P, Krenn S, **Mussnig S**, Hecking M. *Ren Fail.* 2023;45(2):2273421. doi: 10.1080/0886022X.2023.2273421. Epub 2023 Nov 13. PMID: 37955103; PMCID: PMC10653631.
5. *Estimation of absolute blood volume in hemodialysis patients: a numerical algorithm for assessing blood volume increase after dialysate bolus infusion.* Pstras L, Krenn S, Waniewski J, Schmiedecker M, **Mussnig S**, Niknam J, Wabel P, Mayer CC, Schneditz D, Hecking M. *Biomed Signal Process Control.* 2024 Feb;88:105440. doi: 10.1016/j.bspc.2023.105440.
4. *Bioimpedance-derived euvolemic weight varies in hemodialysis patients - challenging the fixed target weight concept.* Waller M, Krenn S, **Mussnig S**, Schmiedecker M, Niknam-Saeidi J, Mayer CC, Wabel P, Schneditz D, Chazot C, Hecking M. *Nephrol Dial Transplant.* 2023 Sep 14:gfad206. doi: 10.1093/ndt/gfad206. Epub ahead of print. PMID: 37708039.
3. *Ultrafiltration-induced decrease in relative blood volume is larger in hemodialysis patients with low specific blood volume: Results from a dialysate bolus administration study.* Schmiedecker M, Krenn S, Waller M, Paschen C, **Mussnig S**, Niknam J, Wabel P, Mayer CC, Hecking M, Schneditz D. *Hemodial Int.* 2023 Apr;27(2):174-183. doi: 10.1111/hdi.13066. Epub 2023 Jan 26. PMID: 36703281.
2. *Revisiting the concept of constant tissue conductivities for volume estimation in dialysis patients using bioimpedance spectroscopy.* Schneditz D, **Mussnig S**, Krenn S, Hecking M. *Int J Artif Organs.* 2023 Feb;46(2):67-73. doi: 10.1177/03913988221145457. Epub 2022 Dec 22. PMID: 36550616.
1. *The systemic renin-angiotensin system in COVID-19.* Reindl-Schwaighofer R, Hödlmoser S, Domenig O, Krenn K, Eskandary F, Krenn S, Schörgenhofer C, Rumpf B, Karolyi M, Traugott MT, Abrahamowicz A, Tinhof V, Mayfurth H, Rathkolb V, **Mußnig S**, Schmölz L, Ullrich R, Heinzl A, König F, Binder C, Bonderman D, Strassl R, Puchhammer-Stöckl E, Gorkiewicz G, Aberle JH, Jilma B, Wenisch C, Poglitsch M, Oberbauer R, Zoufaly A, Hecking M. *Sci Rep.* 2022 Nov 22;12(1):20117. doi: 10.1038/s41598-022-24628-1. PMID: 36418458; PMCID: PMC9684482.

Review Articles:

10 tips how to prevent and treat hemodynamic instability during hemodialysis. **Mussnig S**, Georgianos P, Hecking M, Schneditz D, Battaglia Y, Combe C, Liakopoulos V, Franssen C. Clin Kidney J. Under review 2026-06.

Fluid Volume Estimation by Bioimpedance: Methodological Caveats and Clinical Interpretation. **Mussnig S**, Schneditz D, Keane D, McIntyre CW, Hecking M. Am J Nephrol. 2025 Nov 6:1-21. doi: 10.1159/000549268. Epub ahead of print. PMID: 41196823.

Editorials & Commentary:

Progress in the Measurement of Absolute Blood Volume and Interpretation of the Hemodynamic Response to Ultrafiltration. Schneditz D, **Mussnig S**, Krenn S, Keane DF, Hecking M. ASAIO J. 2026 Jan 1;72(1):3-6. doi: 10.1097/MAT.0000000000002569. Epub 2025 Oct 17. PMID: 41102892.

Mechanistic Basis for Intradialytic Hypertension with Hemodialysis. Hecking M, **Mussnig S**, Chazot C. Clin J Am Soc Nephrol. 2024 Mar 1;19(3):283-285. doi: 10.2215/CJN.0000000000000408. Epub 2024 Jan 24. PMID: 38265791; PMCID: PMC10937007.

Letters:

Is Anything Gained From Estimating Blood Volume in Hemodialysis From Extracellular Volume Divided by a Constant Factor? **Mussnig S**, Krenn S, Keane D, Hecking M, Schneditz D. Hemodial Int. 2025 Jul 7. doi: 10.1111/hdi.70008. Epub ahead of print. PMID: 40620083.

Estimation of Absolute Blood Volume Using Online Dialysate Dilution: More Questions. Schneditz D, **Mussnig S**, Krenn S, Keane D, Hecking M. ASAIO J. 2025 Jul 17. doi: 10.1097/MAT.0000000000002502. Epub ahead of print. PMID: 40673610.

Does low pre-dialysis blood volume increase survival? – A call for caution. Krenn S, Schneditz D, Keane D, **Mussnig S**, Hecking M. Int J Artif Organs. 2025 Jun 19:3913988251351523. doi: 10.1177/03913988251351523. Epub ahead of print. PMID: 40538132.

Dialysate Sodium and Mortality: 140 mmol/L at Hemodialysis Initiation by Default? Hecking M, Karaboyas A, Krenn S, **Mussnig S**, Beige J, Chazot C, Pecoits-Filho R, Rayner H, Port FK. J Am Soc Nephrol. 2024 Jul 1;35(7):972-973. doi: 10.1681/ASN.0000000000000371. Epub 2024 Jun 6. PMID: 38949884; PMCID: PMC11230718.

Books:

10. Dialysetechnik. Schneditz D, **Mussnig S**, Hecking M. In J. Werner (Ed.), Band 9 Automatisierte Therapiesysteme. Berlin, Boston: De Gruyter, to appear 2026.

Case Reports:

Multimodal and Exercise-Based Management in a Complex Hemodialysis Patient. Josse M, Penny JD, **Mussnig S**, McIntyre CW. BMJ Case Reports. Major revision 2026-01.

Honors & Prizes

2024-10 - 2025-09: Marietta-Blau Grant, OeAD Austrian Agency for Education and Internationalisation.

2024-03 - 2024-06: NaturTalente high-potential programm, University of Vienna.

2022-12 & 2023-12: Merit Scholarship, Medical University of Vienna.

2022-10 - 2023-09: MDPHD Excellency Program, Medical University of Vienna.

Presentations

2026-06-05: 63th Congress of the European Renal Association 2026, Glasgow (United Kingdom). Topic: *Associations of post-dialysis fluid overload with interdialytic blood pressure and pulse wave characteristics in maintenance hemodialysis (4 min)*

2025-06-05: 62th Congress of the European Renal Association 2025, Vienna (Austria). Topic: *Fluid management in hemodialysis based on apparative methods and patient-reported outcome measures: A quality improvement project (4 min)*

2025-01-25 Dialysis Masterclass, Vienna (Austria). Topic: *Bioimpedance in Hemodialysis: Principles and Application (60 min)*

2024-05-24: 61th Congress of the European Renal Association 2024, Stockholm (Sweden). Topic: *Sex differences in bioimpedance-spectroscopy-derived fluid status and body composition of maintenance hemodialysis patients (2 min)*

2024-04-24: Lecture for dialysis nurses, Vienna (Austria). Topic: *Fluid Management in Hemodialysis (90 min)*

2024-01-25: Weidener NephroTreff sponsored by CSL Vifor, Weiden (Germany). Topic: *Hypo- and Hypervolemia (30 min)*

2023-10-05: 15th Annual Meeting of the German Society of Nephrology, Berlin (Germany). Topics: *Euvolemia - Never Give Up!, Blood-Volume-Monitor Data Extraction, A Comparison of Two Bioimpedance Spectroscopy Devices (10 min)*

2023-06-17: 60th Congress of the European Renal Association 2023, Milan (Italy). Topic: *Comparison of Two Bioimpedance Spectroscopy Devices (2 min)*

2023-05-04: Brodovy Dny 2023 - Annual Meeting of the Czech Society of Nephrology, Mikulov (Czech Republic). Topic: *Fluid Management in Hemodialysis (20 min)*

2022-10-07: Annual Meeting of the Austrian Society of Hypertension and Nephrology, Vienna (Austria). Topic: *Differences in the measured overhydration of hemodialysis patients between two versions of the Body Composition Monitor (5 min)*

2022-05-04: Research Symposium: The Future of Hemodialysis (& review board of WWTF grant LS20-079), Vienna (Austria). Topic: *BCM - old vs. new (15 min)*

Ad-Hoc Reviewer

American Journal of Nephrology, BMC Nephrology, Clinical Kidney Journal, Hemodialysis International, The International Journal of Artificial Organs, Renal Failure

Skills & Interests

Languages: German (Native), English (Fluent), French (B2)

Technical Skills:

Programming: R (+++), Python (++), Matlab (+), SQL (+)

Word processing: MS Office (+++), LaTeX (+)

Content creation: Final Cut (+++), Blender (++)

Other: 3D Slicer (++)

Interests: Saxophone (Classical & Jazz), Film, Composition, Writing

Other: Good Clinical Practice Certificate (2024-10); Driver's License B (Austria), G (Canada)