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# *Curriculum Vitae*

## *Thomas Stöggel*

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## **1 Biography**

- born on the 1<sup>st</sup> of May 1977 in Saalfelden - Austria
- brothers: Roland and Wolfgang
- married to Mag. Julia Stöggel (2007)
- children: Laura Magdalena (2008), Finn-Christopher (2010) and Nora Kristina (2012)

## 2 Education

### 2.1 School Education

1983-1987	Primary School Saalfelden,
1987-1995	Comprehensive Secondary School, HIB Saalfelden, 1987 1995; Final Exam: 1995
1995-1996	Austrian Army

### 2.2 Academic and Sport Career

#### **ACADEMICS:**

1996-2001	University studies of a) Sports Science at the Philosophical Faculty at the University of Salzburg and b) Mathematics at the Faculty of Natural Sciences at the University of Salzburg
2001	Masters degree in both studies (Diploma Mag. Phil.)
2001-2006	Ph.D. study in the field of Sport Science and Kinesiology; University of Salzburg (passed with distinction on 21 <sup>st</sup> Dec. 2006)
2004-2012	Member of the Christian Doppler Laboratory "Biomechanics in Skiing"
2006-2007	Practical year as a teacher at the BORG Nonntal in Mathematics (7 <sup>th</sup> class, advised by Ms. Weidenholzer) and Physical Education (5 <sup>th</sup> class, advised by Andreas Oberhauser)
2007-2011	University Assistant at the Department of Sport Science and Kinesiology, University of Salzburg. Post Doc Study
12 <sup>th</sup> April 2011	Habilitation University of Salzburg - Associate Professor. Venia Docendi: "Training Science" and "Biomechanics"
Since 2011:	Associate professor at the University of Salzburg - Department of Sport Science and Kinesiology – permanent full position
2011-2014	Part time employment as a guest researcher/professor at the Midsweden University Östersund (Swedish Winter Sports Research Centre)
2020-2022	Sport Scientific Consultation of the Austrian Cross-Country Skiing National Team
<b>Since 2019:</b>	<b>Full Professor in Sport Science University of Salzburg</b>
2019 - 2024:	President of the International College of Science and Skiing (ICSS)
<b>Since 2019:</b>	<b>Head of Research &amp; Development /Science and Diagnostics Team at the Red Bull Athlete Performance Center</b>

#### **SPORTS:**

1993-2008	Austrian National Team Cross-Country Skiing: 14 times Austrian Champion; Top 20 rankings in the World Cup; World Championships Oberstorf 2005 and Sapporo 2007
2000-2014:	Inline Speedskating Marathon: Austrian Champion Marathon 2013; Former Austrian record holder Marathon Distance (53:40,0).
1987 ff:	Academic champion in decathlon; Regional champion youths "Land Salzburg, Bezirk Pinzgau" in Running, Athletics, Alpine skiing, Tennis, Swimming and Gymnastics.

## 3 Current Areas of Research

- Effectiveness of various endurance training concepts in elite athletes (High-intensity Training; High-Volume Training; Sprint-Interval Training; Mixed approaches; Shock Cycles)
- The role of strength and strength training in endurance sports
- Neuromuscular performance and biomarkers during load monitoring of endurance and team sports for load control and injury prevention.
- From lab to the field – transfer of laboratory diagnostics to measurements during training and competition in the field

- Digital motion, sensor and wearable technology in elite sports
- Quantification of race demands of various Red Bull associated sports

## 4 Current Publications (2022-2024)

- Born, D. P., Lorentzen, J., Björklund, G., Stöggl, T., & Romann, M. (2024). Variation vs. specialization: the dose-time-effect of technical and physiological variety in the development of elite swimmers. *BMC Res Notes*, *17*(1), 48. <https://doi.org/10.1186/s13104-024-06706-x>
- Stöggl, T. L., Strepp, T., Wiesinger, H. P., & Haller, N. (2024). A training goal-oriented categorization model of high-intensity interval training. *Front Physiol*, *15*, 1414307. <https://doi.org/10.3389/fphys.2024.1414307>
- Blumkaitis, J. C., Nunes, N., Strepp, T., Tomaskovic, A., Wenger, M., Widauer, H., Aglas, L., Simon, P., Stoggl, T. L., & Haller, N. (2024). Exploring sex differences in blood-based biomarkers following exhaustive exercise using bioinformatics analysis. *Biol Sport*, *41*(3), 105-118. <https://doi.org/10.5114/biolSport.2024.132998>
- Born, D. P., Björklund, G., Lorentzen, J., Stöggl, T., & Romann, M. (2024). Specialize Early and Select Late: Performance Trajectories of World-Class Finalists and International- and National-Class Swimmers. *Int J Sports Physiol Perform*, *19*(2), 164-172. <https://doi.org/10.1123/ijssp.2023-0171>
- Born, D. P., Stöggl, T., Lorentzen, J., Romann, M., & Björklund, G. (2024). Predicting future stars: Probability and performance corridors for elite swimmers. *J Sci Med Sport*, *27*(2), 113-118. <https://doi.org/10.1016/j.jsams.2023.10.017>
- Uda, S., Miyamoto, N., Hirose, K., Nakano, H., Stöggl, T., Linnamo, V., Lindinger, S., & Takeda, M. (2024). Cross-Country Ski Skating Style Sub-Technique Detection and Skiing Characteristic Analysis on Snow Using High-Precision GNSS. *Sensors (Basel)*, *24*(18). <https://doi.org/10.3390/s24186073>
- Strepp, T., Blumkaitis, J. C., Sareban, M., Stöggl, T. L., & Haller, N. (2024). Training Intensity Distribution of a 7-Day HIIT Shock Microcycle: Is Time in the "Red Zone" Crucial for Maximizing Endurance Performance? A Randomized Controlled Trial. *Sports Med Open*, *10*(1), 97. <https://doi.org/10.1186/s40798-024-00761-1>
- Strepp, T., Blumkaitis, J. C., Haller, N., & Stöggl, T. L. (2024). Adding LIT to HIIT: Is Low-Intensity Training Vital for Endurance-Trained Athletes during a 7-day HIIT Shock Microcycle? *Med Sci Sports Exerc*, *56*(8), 1408-1421. <https://doi.org/10.1249/MSS.0000000000003435>
- Pasquale, C., Baschung Pfister, P., Kuhn, M., & Stöggl, T. (2024). Validity and Reliability of the Orthelligent Pro Sensor for Measuring Single-Leg Vertical Jump Height in Healthy Athletic Adults. *Sensors (Basel)*, *24*(12). <https://doi.org/10.3390/s24123699>
- Stöggl, T. L., Strepp, T., Blumkaitis, J., Schmuttermair, A., Wahl, P., & Haller, N. (2023). Unraveling the mystery of isocaloric endurance training - Influence of exercise modality, biological sex, and physical fitness. *Metabolism*, *144*, 155582. <https://doi.org/10.1016/j.metabol.2023.155582>
- Lasshofer, M., Seifert, J., Wörndle, A. M., & Stöggl, T. (2023). Heel riser height and slope gradient influence the physiology of ski mountaineering-A laboratory study. *Front Physiol*, *14*, 1159728. <https://doi.org/10.3389/fphys.2023.1159728>
- Stöggl, R., Müller, E., & Stöggl, T. (2023). Technique and maximal skiing speed for youth cross-country skiing performance. *Front Sports Act Living*, *5*, 1133777. <https://doi.org/10.3389/fspor.2023.1133777>
- Thorwartl, C., Tschopp, A., Lasshofer, M., Holzer, H., Zirkel, M., Hammer, M., Stadlober, B., & Stöggl, T. (2023). Technique-Dependent Relationship between Local Ski Bending Curvature, Roll Angle and Radial Force in Alpine Skiing. *Sensors (Basel)*, *23*(8). <https://doi.org/10.3390/s23083997>
- Jonsson Karstrom, M., Stöggl, T., Ohlsson, M. L., McGawley, K., & Laaksonen, M. S. (2023). Kinematical effects of rifle carriage on roller skiing in well-trained female and male biathletes. *Scand J Med Sci Sports*, *33*(4), 444-454. <https://doi.org/10.1111/sms.14276>
- Haller, N., Reichel, T., Zimmer, P., Behringer, M., Wahl, P., Stöggl, T., Krüger, K., & Simon, P. (2023). Blood-Based Biomarkers for Managing Workload in Athletes: Perspectives for Research on Emerging Biomarkers. *Sports Med*. <https://doi.org/10.1007/s40279-023-01866-5>
- Haller, N., Behringer, M., Reichel, T., Wahl, P., Simon, P., Krüger, K., Zimmer, P., & Stöggl, T. (2023). Blood-Based Biomarkers for Managing Workload in Athletes: Considerations and Recommendations for Evidence-Based Use of Established Biomarkers. *Sports Med*, *53*(7), 1315-1333. <https://doi.org/10.1007/s40279-023-01836-x>
- Born, D. P., Björklund, G., Lorentzen, J., Stöggl, T., & Romann, M. (2023). Specialize Early and Select Late: Performance Trajectories of World-Class Finalists and International- and National-Class Swimmers. *Int J Sports Physiol Perform*, 1-9. <https://doi.org/10.1123/ijssp.2023-0171>
- Born, D. P., Stöggl, T., Lorentzen, J., Romann, M., & Björklund, G. (2023). Predicting future stars: Probability and performance corridors for elite swimmers. *J Sci Med Sport*. <https://doi.org/10.1016/j.jsams.2023.10.017>
- Genitrini, M., Fritz, J., Stöggl, T., & Schwameder, H. (2023). Performance Level Affects Full Body Kinematics and Spatiotemporal Parameters in Trail Running-A Field Study. *Sports (Basel)*, *11*(10). <https://doi.org/10.3390/sports11100188>
- Arundale, A. J. H., McNulty, R., Snyder, C., O'Brien, J., & Stöggl, T. (2023). Injury, Training, Biomechanical, and Physiological Profiles of Professional Breakdancers. *Int J Sports Phys Ther*, *18*(5), 1123-1135. <https://doi.org/10.26603/001c.87762>
- Haller, N., Kranzinger, S., Kranzinger, C., Blumkaitis, J. C., Strepp, T., Simon, P., Tomaskovic, A., O'Brien, J., Düring, M., & Stöggl, T. (2023). Predicting Injury and Illness with Machine Learning in Elite Youth Soccer: A Comprehensive Monitoring Approach over 3 Months. *J Sports Sci Med*, *22*(3), 476-487. <https://doi.org/10.52082/jssm.2023.476>
- Gonaus, C., Müller, E., Stöggl, T., & Birklbauer, J. (2023). Determining the effect of one decade on fitness of elite Austrian youth soccer players using propensity score matching. *Front Sports Act Living*, *5*, 1186199. <https://doi.org/10.3389/fspor.2023.1186199>
- Andersson, E. P., Stöggl, T. L., Bachl, P., & Osborne, J. O. (2023). The effect of exercise hyperpnea on gross efficiency and anaerobic capacity estimates during a 3-min cycle time trial. *J Appl Physiol (1985)*, *134*(2), 253-263. <https://doi.org/10.1152/japophysiol.00517.2022>
- Ganthaler, A., Guggenberger, A., Stoggl, W., Kranner, I., & Mayr, S. (2023). Elevated nutrient supply can exert worse effects on Norway spruce than drought, viewed through chemical defence against needle rust. *Tree Physiol*, *43*(10), 1745-1757. <https://doi.org/10.1093/treephys/tpad084>

- Born, D. P., Stacker, I., Romann, M., & Stöggl, T. (2022). Competition age: does it matter for swimmers? *BMC Res Notes*, *15*(1), 82. <https://doi.org/10.1186/s13104-022-05969-6>
- Staunton, C. A., Swaren, M., Stöggl, T., Born, D. P., & Björklund, G. (2022). The Relationship Between Cardiorespiratory and Accelerometer-Derived Measures in Trail Running and the Influence of Sensor Location. *Int J Sports Physiol Perform*, *1*-10. <https://doi.org/10.1123/ijsp.2021-0220>
- Stöggl, T., & Holmberg, H. C. (2022). A Systematic Review of the Effects of Strength and Power Training on Performance in Cross-Country Skiers. *J Sports Sci Med*, *21*(4), 555-579. <https://doi.org/10.52082/jssm.2022.555>
- Haller, N., Blumkaitis, J. C., Strepp, T., Schmuttermair, A., Aglas, L., Simon, P., Neuberger, E., Kranzinger, C., Kranzinger, S., O'Brien, J., Ergoth, B., Raffetseder, S., Fail, C., Düring, M., & Stöggl, T. (2022). Comprehensive training load monitoring with biomarkers, performance testing, local positioning data, and questionnaires - first results from elite youth soccer. *Front Physiol*, *13*, 1000898. <https://doi.org/10.3389/fphys.2022.1000898>
- Haller, N., Hubler, E., Stöggl, T., & Simon, P. (2022). Evidence-Based Recovery in Soccer - Low-Effort Approaches for Practitioners. *J Hum Kinet*, *82*, 75-99. <https://doi.org/10.2478/hukin-2022-0082>
- Venek, V., Kranzinger, C., Jungreitmayr, S., Ring-Dimitriou, S., Schwameder, H., & Stöggl, T. (2022). Influence of 2 Digital Exercise Modules of a Multimodal System on Balance and Leg Strength Under Consideration of Use Adherence: Prospective Cohort Study. *JMIR Form Res*, *6*(9), e36805. <https://doi.org/10.2196/36805>
- Andersson, E. P., Bachl, P., Schmuttermair, A., Staunton, C. A., & Stöggl, T. L. (2022). Anaerobic work capacity in cycling: the effect of computational method. *Eur J Appl Physiol*, *122*(12), 2637-2650. <https://doi.org/10.1007/s00421-022-05038-7>
- Lasshofer, M., Seifert, J., Wörndle, A. M., & Stöggl, T. (2022). Heel riser height and slope gradient influence the kinematics and kinetics of ski mountaineering-A laboratory study. *Front Sports Act Living*, *4*, 886025. <https://doi.org/10.3389/fspor.2022.886025>
- Dobler, F., Bachl, P., Stöggl, T., & Andersson, E. P. (2022). Physiological Responses and Performance During a 3-Minute Cycle Time Trial: Standard Paced Versus All-Out Paced. *Int J Sports Physiol Perform*, *1*-7. <https://doi.org/10.1123/ijsp.2022-0105>
- Thorwartl, C., Kröll, J., Tschopp, A., Holzer, H., Teufel, W., & Stöggl, T. (2022). Validation of a Sensor-Based Dynamic Ski Deflection Measurement in the Lab and Proof-of-Concept Field Investigation. *Sensors (Basel)*, *22*(15). <https://doi.org/10.3390/s22155768>
- Venek, V., Kranzinger, S., Schwameder, H., & Stöggl, T. (2022). Human Movement Quality Assessment Using Sensor Technologies in Recreational and Professional Sports: A Scoping Review. *Sensors (Basel)*, *22*(13). <https://doi.org/10.3390/s22134786>
- Haller, N., Tomaskovic, A., Stöggl, T., Simon, P., & Neuberger, E. (2022). Feasibility of Cell-Free DNA Measurement from the Earlobe during Physiological Exercise Testing. *Diagnostics (Basel)*, *12*(6). <https://doi.org/10.3390/diagnostics12061379>
- Born, D. P., Romann, M., & Stöggl, T. (2022). Start Fast, Swim Faster, Turn Fastest: Section Analyses and Normative Data for Individual Medley. *J Sports Sci Med*, *21*(2), 233-244. <https://doi.org/10.52082/jssm.2022.233>
- Wiesinger, H. P., Buchecker, M., Müller, E., Stöggl, T., & Birklbauer, J. (2022). Decreased Postural Complexity in Overweight to Obese Children and Adolescents: A Cross-Sectional Study. *Front Hum Neurosci*, *16*, 850548. <https://doi.org/10.3389/fnhum.2022.850548>
- Stöggl, T. L., Blumkaitis, J. C., Strepp, T., Sareban, M., Simon, P., Neuberger, E. W. I., Finkenzeller, T., Nunes, N., Aglas, L., & Haller, N. (2022). The Salzburg 10/7 HIIT shock cycle study: the effects of a 7-day high-intensity interval training shock microcycle with or without additional low-intensity training on endurance performance, well-being, stress and recovery in endurance trained athletes-study protocol of a randomized controlled trial. *BMC Sports Sci Med Rehabil*, *14*(1), 84. <https://doi.org/10.1186/s13102-022-00456-8>
- Missmann, M., Aron, G., Stöggl, T., Pirchl, M., Grote, V., & Fischer, M. J. (2022). Effect of Unilateral Shoulder Disorder on the Stance Phase of Human Gait. *ScientificWorldJournal*, *2022*, 8205879. <https://doi.org/10.1155/2022/8205879>
- Harbour, E., Stöggl, T., Schwameder, H., & Finkenzeller, T. (2022). Breath Tools: A Synthesis of Evidence-Based Breathing Strategies to Enhance Human Running. *Front Physiol*, *13*, 813243. <https://doi.org/10.3389/fphys.2022.813243>
- Haller, N., Stanin, T., Strepp, T., Trutschnig, W., Mroz, T., Stöggl, T. (2024). *Holistic Training Load Monitoring in Elite Youth Soccer* [Poster Presentation]. American College of Sports Medicine Annual Meeting, Boston.
- Blumkaitis, J., Strepp, T., Tomaskovic, A., Widauer, H., Aglas, L., Simon, P., Stöggl, T., Haller, N. (2023). *Biological Sex Differences in Blood-Based Biomarkers After Physiological Exercise Testing in Endurance-Trained Athletes* [Poster Presentation]. American College of Sports Medicine Annual Meeting Denver.
- Haller, N., Strepp, T., Stöggl, T. (2023). *Effects of Isocaloric Endurance Exercise on Fat Metabolism and Enjoyment* [Oral Presentation]. American College of Sports Medicine Annual Meeting Denver
- Haller, N. (2023). *Keynote Lecture: Load monitoring in sports and its application in the field of winter sports* [Keynote Lecture]. 9th International Congress on Science and Skiing, Saalbach-Hinterglemm.
- Wiesinger, H. P., Stöggl, T., Strepp, T., Kilzer, F., Schmuttermair, A., Blumkaitis, J., Hopkins, W., Haller, N. (2023). *Meta-Analyses of the Effect of High-Intensity Interval Training on Performance-Related Measures in Elite Athletes* [Poster Presentation]. European College of Sports Science, Paris.
- Haller, N., Stöggl, T., Strepp, T., Kilzer, F., Schmuttermair, A., Blumkaitis, J., Hopkins, W., Wiesinger, H.-P. (2023). *Relationships between Changes in Performance-related Measures following High-Intensity Interval Training in Elite Athletes derived via Meta-regression Analyses* [Poster Presentation]. European College of Sports Science, Paris.
- Tomaskovic, A., Strepp, T., Blumkaitis, J., Stöggl, T., Neuberger, E., Simon, P., Haller, N. (2023). *Zirkulierende zellfreie DNA als Biomarker für die Vorhersage von muskulären Verletzungen* [Poster Presentation]. Sports Medicine and Health Summit, Hamburg.
- Buchecker, M., Wiesinger, H. P., Müller, E., Stöggl, T., & Birklbauer, J. (2022, 2022). *Overweight/obesity in childhood and adolescence involves a reduction in postural complexity* 27<sup>th</sup> Annual Congress of the European College of Sport Science (ECSS), Sevilla.
- Wiesinger, H. P., Thorwartl, C., Müller, E., & Stöggl, T. (2022, 2022). *Acute effects of electrostatic charging on endurance performance. A double-blind, randomised, placebo-controlled cross-over design.* 27<sup>th</sup> Annual Congress of the European College of Sport Science (ECSS), Sevilla.
- Strepp, T., Haller, N., & Stöggl, T. (2022, 2022). *Oxygen uptake and heart rate based time-in-zone analysis of four isocaloric high-intensity interval trainings with respect to fitness level and sex* 27<sup>th</sup> Annual Congress of the European College of Sport Science (ECSS), Sevilla.
- Kranzinger, S., Kranzinger, C., Snyder, C., & Stöggl, T. (2022, 2022). *Predicting the rate of fatigue during skiing on a ski treadmill based on ergospirometric data* 27<sup>th</sup> Annual Congress of the European College of Sport Science (ECSS), Sevilla.
- Stöggl, T. (2022, 2022). *Modern methodologies and concepts for training and competition load monitoring: possibilities and challenges* 27<sup>th</sup> Annual Congress of the European College of Sport Science (ECSS), Sevilla.

- Stöggl, T. (2022, 2022). *Digital Sports and Sensor Technology in Elite Sports: Possibilities & Challenges* WCPASS, Vienna.
- Stöggl, T. (2022, 2022). *A Practice-2-Science and Science-2-Practice approach in 20 years of research in sport science* ÖSG, Salzburg.
- Blumkaitis, J., Aglas, L., Haller, N., Strepp, T., Wenger, M., Stöggl, T. (2022). *Blood-based Biomarker Monitoring in a 7-Day High-Intensity Interval Training Shock Microcycle* [Poster Presentation]. 18th International Biochemistry of Exercise Conference (IBEC),
- Tomaskovic, A., Strepp, T., Blumkaitis, J., Stöggl, T., Neuberger, E., Simon, P., Haller, N. (2022). *Cell-free DNA as a biomarker for injury prediction* [Poster-Oral Presentation]. European College of Sports Science,
- Haller, N. S., T., Strepp, T., Blumkaitis, J., Schmuttermair, A., Kilzer, F., Wiesinger, H.-P. (2022). *High-Intensity Interval Training In Elite Athletes. A Meta-Analysis Of Effects On VO2max* [Poster Presentation]. American College of Sports Medicine Annual Meeting San Diego.
- Kranzinger, S., Kranzinger, C., Haller, N., Stöggl, T. . (2022). *Illness Prediction of Elite Youth Soccer Players Based on Blood-Based Biomarker Data and Machine Learning Models* [Oral Presentation]. European College of Sports Science, Sevilla.
- Haller, N., Wahl, P., Stöggl, T. (2022). *Invited Session: How good are we in quantifying Training/Competition Load, Fatigue and Performance?—New insights: Up-coming blood-based biomarkers for monitoring load, fatigue, and recovery* [Invited Speaker]. European College of Sports Science, Sevilla.
- Strepp, T., Haller, N., Stöggl, T. (2022). *Oxygen uptake and heart rate based time-in-zone analysis of four isocaloric high-intensity interval trainings with respect to fitness level and sex* [Oral Presentation]. 27th European College of Sport Science-Annual Meeting, Paris.
- Strepp, T., Blumkaitis, J., Haller, N., Stöggl, T. (2022). *Sensortechnologie in der Trainingssteuerung: Praxisbeispiel HIT-Schockzyklus* [Oral Presentation]. ÖSG Tagung 2022: Sport-Wissen-schaff[f]t-Praxis,
- Strepp, T., Haller, N., & Stöggl, T. (2022). *Sensortechnologie in der Trainingssteuerung: Praxisbeispiel HIT-Schockzyklus* ÖSG Tagung 2022: Sport-Wissen-schaff[f]t-Praxis,
- Stöggl, T., & Wiesinger, H. P. (2023, 18.-22.03.2023). *Book of Abstracts ICSS 2023. 9th International Congress on Science and Skiing (ICSS), Saalbach/Hinterglemm - AUT.*
- Strepp, T., Blumkaitis, J., Haller, N., Stöggl, T. (2023). *Effects of a 7-Day HIIT shock microcycle with or without additional low-intensity training on maximal oxygen uptake and time trial performance—randomized controlled trial.* 28th European College of Sport Science-Annual Meeting,
- Strepp, T., Blumkaitis, J., Haller, N., & Stöggl, T. (2023). *Effects of a physiological exercise test and a HIIT shock microcycle on muscle fatigue measured with a novel device - case study on acute and chronic changes.* International Congress on Science and Skiing,