Martina Schweiger

Model System Officer

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SCIENTIFIC & ACADEMIC CAREER

since 2023	Associate professor, University of Graz, Austria
2018-2023	Assistant professor, University of Graz, Austria
since 2014	*Venia docendi* (lecture qualification) in Molecular Biology and Biochemistry
2010-2018	Postdoctoral researcher at the University of Graz, Austria
2011	Postdoctoral researcher at the Gladstone Institute of Virology and Immunology, San Francisco, USA
2005-2009	Ph.D. thesis, University of Graz, Austria
2000-2005	Studies of Molecular Biology, University of Graz, Austria

MAIN AREA OF RESEARCH

Adipose tissue is a highly flexible and plastic organ that controls whole body energy homeostasis. Upon environmental challenges like cold exposure or fasting, adipose tissue undergoes massive cellular and metabolic remodeling to ensure tissue- and whole-body integrity. The research of Martina Schweiger focuses on the mechanisms that regulate metabolic flexibility in adipose tissue and how these mechanisms are impaired upon ageing and metabolic disease. Immune cells, specifically macrophages, constitute major cell types in adipose tissue and are important modulators of metabolic plasticity. In previous research, Martina Schweiger's lab discovered a complex communication axis involving macrophages, neurons and adipocytes that regulates adipose tissue metabolism. This axis is compromised in cancer-associated cachexia. During the MetAGE project she is investigating how macrophages contribute to the detrimental effects of aging and the beneficial effects of caloric restriction on adipose tissue function.

ADDITIONAL RESEARCH ACTIVITIES *(most important)*

Since 2021	Acquisition of three third-party funded research grants (~ € 800.000), 2 granted patents and one trademark (Atglistatin©)
Since 2019	Member of the ethics committee, University of Graz
Present	Member of the research cluster "BioHealth", the research alliance "BioTechMed Graz", the Austrian Atherosclerosis Society (AAS), and the Austrian Society for Molecular Biosciences and Biotechnology (ÖGMBT).
Present	Ad-hoc reviewer for Nature Communications, JCI, BBA - Molecular and Cell Biology of Lipids, BioFactors, Molecular Metabolism, Molecular Genetics and Metabolism, Cell stress, and PLOS ONE
Since 2019	13 invited and 6 selected talks at national and international conferences.

Selected Invited Talks

05/2023	"Neuro-Immuno-Metabolic cues guiding adipose tissue catabolic remodeling". BATenergy Conference, Hamburg

04/2023 "Keeping Fat in Balance: The crucial Role of Adipose Tissue in maintaining systemic Energy Homoeostasis". Symposium of translational nutritional medicine, Technical University Munich, Germany

2022 "Immune-sympathetic neuron communication guides adipose tissue browning in cancer-associated cachexia". International Conference on Cachexia, Sarcopenia and Muscle Wasting, Lisbon, Portugal

2021 "Withering away, mechanisms of adipose tissue atrophy in cancer associated cachexia". Helmholtz Diabetes Center, Munich, Germany

MOST IMPORTANT PUBLICATIONS

1. Chrysostomou SE, Eder S, Pototschnig I, Mayer AL, Derler M, Mussbacher M, Schauer S, Zhang D, Yan D, Liu G, Hoefler G, Weichhart T, Vesely PW, Zhang L, Schweiger M*. R-ketorolac ameliorates cancer-associated cachexia and prolongs survival of tumour-bearing mice. **J Cachexia Sarcopenia Muscle.** 2024 Feb 1. doi: 10.1002/jcsm.13422.

2. Pototschnig I, Feiler U, Diwoky C, Vesely PW, Rauchenwald T, Paar M, Bakiri L, Pajed L, Hofer P, Kashofer K, Sukhbaatar N, Schoiswohl G, Weichhart T, Hoefler G, Bock C, Pichler M, Wagner EF, Zechner R, Schweiger M*. Interleukin-6 initiates muscle- and adipose tissue wasting in a novel C57BL/6 model of cancer-associated cachexia. **J Cachexia Sarcopenia Muscle.** 2023 Feb;14(1):93-107. doi: 10.1002/jcsm.13109.

3. Xie H, Heier C, Meng X, Bakiri L, Pototschnig I, Tang Z, Schauer S, Baumgartner VJ, Grabner GF, Schabbauer G, Wolinski H, Robertson GR, Hoefler G, Zeng W, Wagner EF, Schweiger M*, Zechner R*. An immune-sympathetic neuron communication axis guides adipose tissue browning in cancer-associated cachexia. **Proc Natl Acad Sci U S A.** 2022 Mar 1;119(9):e2112840119. doi: 10.1073/pnas.2112840119.

4. Grabner GF, Xie H, Schweiger M*, Zechner R*. Lipolysis: cellular mechanisms for lipid mobilization from fat stores. **Nature Metabolism** 2021 Nov. doi: 10.1038/s42255-021-00493-6.

5. Xie H, Heier C, Kien B, Vesely PW, Tang Z, Sexl V, Schoiswohl G, Strießnig-Bina I, Hoefler G, Zechner R*, Schweiger M*. Adipose triglyceride lipase activity regulates cancer cell proliferation via AMP-Kinase and mTOR signaling. **BBA Mol Cell Biol Lipids.** 2020. May 20, doi 10.1016/j.bbalip.2020.158737.

6. Schreiber R, Xie H, Schweiger M*. Of mice and men: The physiological role of adipose triglyceride lipase (ATGL). **BBA Mol Cell Biol Lipids.** 2019 Jun;1864(6):880-899. doi: 10.1016/j.bbalip.2018.10.008.

7. Schweiger M**, Romauch M*, Schreiber R, Grabner GF, Hütter S, Kotzbeck P, Benedikt P, Eichmann TO, Yamada S, Knittelfelder O, Diwoky C, Doler C, Mayer N, De Cecco W, Breinbauer R, Zimmermann R, Zechner R. Pharmacological inhibition of adipose triglyceride lipase corrects high-fat diet-induced insulin resistance and hepatosteatosis in mice. **Nature communications**, 8: 14859, 2017 Mar 22, DOI: 10.1038/ncomms14859.

8. N. Mayer*, M. Schweiger*, M. Romauch, G.F. Grabner, T.O. Eichmann, E. Fuchs, J. Ivkovic, C. Heier, I. Mrak, A. Lass, G. Höfler, C. Fledelius, R. Zechner, R. Zimmermann and R. Breinbauer; Development of small-molecule inhibitors targeting adipose triglyceride lipase. **Nature Chemical Biology** 9(12) October 2013, DOI: 10.1038/nchembio.1359

9. Martina Schweiger*, Margret Paar, Christina Eder, Janina Brandis, Elena Moser, Gregor Gorkiewicz, Franz P.W. Radner, Irina Cornaciu, Monika Oberer, Sander Kersten, Rudolf Zechner, Robert Zimmermann, and Achim Lass; G0/G1 switch gene-2 regulates human adipocyte lipolysis by affecting activity and localization of adipose triglyceride lipase. **J. Lipid Res.** 53(11):2307-17 August 2012, DOI: 10.1194/jlr.M027409

10. Schweiger, M.*; Schreiber, R.*; Haemmerle, G.; Lass, A.; Fledelius, C.; Jacobsen, P.; Tornqvist, H.; Zechner, R.; Zimmermann, R.; Adipose triglyceride lipase and hormone-sensitive lipase are the major enzymes in adipose tissue triacylglycerol catabolism. **J Biol Chem.** 281(52):40236-41 January 2007, DOI: 10.1074/jbc.M608048200.