

Alexander R Moschen

Biographical sketch

I graduated in 2004 from the Medical University Innsbruck, Austria with an intercalated MD thesis on the RANK/RANKL/OPG system in inflammatory bowel diseases. Three years of postdoctoral training were received in Professor Tilg's Gastroenterology Research Laboratory in Innsbruck. Subject of my PhD thesis was the impact of adipose tissue-derived mediators (adipocytokines) on inflammation and leukocyte biology. I completed my clinical training in Internal Medicine at the University Hospital Innsbruck. After my board exams, I accepted a 12 months Senior Clinical Fellowship in January 2012 at the Department of Medicine of the Addenbrooke's Hospital, University of Cambridge (UK). Returning to Innsbruck in 2013, I completed my specialty training in Gastroenterology and Hepatology and started my own research group and became head of the newly founded Christian Doppler Laboratory for Mucosal Immunology in January 2017, where we investigate mechanisms that underlie inflammation at the intestinal mucosal surface and particularly pathways that maintain a mutualistic relationship between the most complex and densely populated habitat of the microbiota and the intestinal immune systems. To address these questions, we are engage animal models of intestinal inflammation in genetically modified animals in combination with quantitative biochemical and imaging approaches and we hold and develop a comprehensive and prospective human biobank in IBD under valid ethical approval.

Curriculum vitae

Medical University Innsbruck
Christian Doppler Laboratory for Mucosal Immunology
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Date of birth	December 8, 1978
Place of birth	Innsbruck, Austria
Citizenship	Austrian

Education

1997	Matura (A levels), Gymnasium of the Franciscans, Hall i.T., Austria
1998	Military Services, Military Music Tyrol, Head: Oberst Prof. Hans Eibl
2004	MD graduation, Medical University Innsbruck, Austria
2007	PhD graduation, Medical University Innsbruck, Austria
2012	Specialist diploma for general Internal Medicine (consultant physician)
2013	"Habilitation" (professoral thesis) in Internal Medicine, Medical University Innsbruck
2015	Specialist diploma for Gastroenterology and Hepatology (consultant gastroenterologist)

Career History

2002-2004	Research Assistant with Prof. Herbert Tilg, Gastroenterology Research Laboratory, Medical University Innsbruck
2004-2007	Postdoctoral research fellow and PhD student, Gastroenterology Research Laboratory, Medical University Innsbruck, Austria
2007-2012	'Senior' postdoctoral research fellow, Christian Doppler Research Laboratory for

2012-2013 Gut Inflammation (head: Prof. H. Tilg), AND
Fellowship (clinical lecturer) in General Internal Medicine, Department of Internal Medicine, Medical University Innsbruck, Austria
Visiting Clinical Fellow in Prof. Kaser's group for mucosal immunology, AND
Senior Clinical Fellow in Gastroenterology and Endoscopy, Division of Gastroenterology, Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust

2013-2017 Assistant Professor of Medicine and Senior Scientist, Medical University Innsbruck

2017-ongoing Associate Professor of Medicine and Senior Scientist, Medical University Innsbruck

2017-ongoing Head of Christian Doppler Research Laboratory for Mucosal Immunology.

Fellowships, Awards Paracelsus award (2016)
Otto-Kraupp award for Austria's prime medical habilitation 2013 (2014)
Rising Star Award of the United European Gastroenterology (2014)
sanofi-aventis award (2011)

Publications Number of publications=90, h-index=39, cited>10,000

Patents None

Other Functions Reviewer for: Gastroenterology, Hepatology, Gut, Journal of Hepatology, Am J Gastroenterology, PlosOne, SFP, Eur J Nutr etc.
Austrian Representative at the European Crohn's Colitis Organisation (ECCO)
Designate head of the Working Group Inflammatory Bowel Diseases of the Austrian Society of Gastroenterology and Hepatology
Member of: ECCO, United European Gastroenterology, ÖGGH, ÖGIM, Austrian Microbiome Initiative

Research Interests

Host pathogen interaction at the epithelial border of the gastrointestinal mucosal border, mechanisms involved in homeostasis, inflammation and tissue regeneration and repair.

Funds obtained (in €, 5 most important ones)

Tiroler Wissenschaftsfonds, 2015 (Co-Antrag mit Prof. Kapferer)	EUR 25.000	TWF	2010-2017
Christian Doppler Research Society 2016	EUR 800,000	CDG	2017-2023
Unrestricted Research Grant (Biöse)	EUR 60,000		2017-2018
Medizinischer Forschungs Fonds	EUR 15,000	MFF	2018
Aniversary Fund of the Austrian National Bank	EUR 140,000	ÖNB	2018-2021

PhD students since 2013

Name (PhD Program)	Title of PhD thesis	Start	Graduation	publications
Romana Gerner (IDMM)	Pbef1/Nampt in experimental colitis	2013	2017	9
Sophie Macheiner (IDMM)	IFIH1-deficiency results in a cell-type specific alteration of autophagic	2015	ongoing	3

	activity in response to stimulation with <i>S. typhimurium</i>			
Simon Reider (IDMM)	Unraveling biomarkers of treatment response to biologic therapies in inflammatory bowel disease	2017	ongoing	1
Bernhard Texler (DSC)	Mechanistic insides of <i>Alistipes</i> -induced intestinal inflammation and colitis-associated cancer	2017	ongoing	0

International collaborators

	Project	Joint public.	Host lab for stay abroad
Arthur Kaser (University of Cambridge, UK)	intestinal epithelial cell biology	14	yes

Alexander Moschen; 10 most important scientific publications

- Gerner RR, Klepsch V, Macheiner S, Arnhard K, Adolph TE, Grander C, Wieser V, Pfister A, Moser P, Hermann-Kleiter N, Baier G, Oberacher H, Tilg H, **Moschen AR** (2017). NAD metabolism fuels human and mouse intestinal inflammation. **Gut**. 2017 Sep 6. pii: gutjnl-2017-314241. doi: 10.1136/gutjnl-2017-314241. [Epub ahead of print]
- Moschen AR**, Gerner RR, Wang J, Klepsch V, Adolph TE, Reider SJ, Hackl H, Pfister A, Schilling J, Moser PL, Kempster SL, Swidsinski A, Orth Höller D, Weiss G, Baines JF, Kaser A, Tilg H. Lipocalin 2 Protects from Inflammation and Tumorigenesis Associated with Gut Microbiota Alterations. **Cell Host Microbe**. 2016 Apr 13;19(4):455-69. doi: 10.1016/j.chom.2016.03.007.
- Ballak DB, van Diepen JA, **Moschen AR**, Jansen HJ, Hijmans A, Groenhof GJ, Leenders F, Bufler P, Boekschoten MV, Müller M, Kersten S, Li S, Kim S, Eini H, Lewis EC, Joosten LA, Tilg H, Netea MG, Tack CJ, Dinarello CA, Stienstra R (2014). IL-37 protects against obesity-induced inflammation and insulin resistance. **Nat Commun**. Sep 3;5:4711. doi: 10.1038/ncomms5711.
- Kiechl S, Wittmann J, Giaccari A, Knoflach M, Willeit P, Bozec A, **Moschen AR**, Muscogiuri G, Sorice GP, Kireva T, Summerer M, Wirtz S, Luther J, Mielenz D, Billmeier U, Egger G, Mayr A, Oberhollenzer F, Kronenberg F, Orthofer M, Penninger JM, Meigs JB, Bonora E, Tilg H, Willeit J, Schett G (2013). Blockade of receptor activator of nuclear factor - κ B (RANKL) signaling improves hepatic insulin resistance and prevents development of diabetes mellitus. **Nat Med**. 19: 358-363. doi: 10.1038/nm.3084.
- Moschen AR**, Gerner R, Schroll A, Fritz T, Kaser A, Tilg H (2011): A key role for Pre-B cell colony-enhancing factor in experimental hepatitis; **Hepatology** 54: 675-686. doi: 10.1002/hep.24416.
- Nairz M, Schroll A, **Moschen AR**, Sonnweber T, Theurl M, Theurl I, Taub N, Jamnig C, Neutrauer D, Huber LA, Tilg H, Moser PL, Weiss G (2011): Erythropoietin contrastingly affects bacterial infection and experimental colitis by inhibiting nuclear factor- κ B-inducible immune pathways; **Immunity** 34:61-74. doi: 10.1016/j.immuni.2011.01.002.
- Moschen AR**, Fritz T, Clouston AD, Rebhan I, Bauhofer O, Barrie HD, Powell EE, Kim SH, Dinarello CA, Bartenschlager R, Jonsson JR, Tilg H (2011): Interleukin-32: a new proinflammatory cytokine involved in hepatitis C virus-related liver inflammation and fibrosis; **Hepatology** 53:1819-1829. doi: 10.1002/hep.24285.

8. **Moschen ARR**, Molnar C, Geiger S, Graziadei I, Ebenbichler CF, Weiss H, Kaser S, Kaser A, Tilg H (2010): Anti-inflammatory effects of excessive weight loss: potent suppression of adipose interleukin 6 and tumour necrosis factor alpha expression; **Gut** 59:1259-1264. doi: 10.1136/gut.2010.214577.
9. **Moschen AR**, Molnar C, Wolf AM, Weiss H, Graziadei I, Kaser S, Ebenbichler CF, Stadlmann S, Moser PL, Tilg H (2009): Effects of weight loss induced by bariatric surgery on hepatic adipocytokine expression; **J Hepatol** 51: 765-777. doi: 10.1016/j.jhep.2009.06.016.
10. **Moschen AR**, Kaser A, Enrich B, Mosheimer B, Theurl M, Niederegger H, Tilg H (2007): Visfatin, an adipocytokine with proinflammatory and immunomodulating properties; **J Immunol** 178:1748-1758.

Alexander Moschen; all publications since 2013

Original articles

1. Miehsler W, Dejaco C, Gröchenig HP, Fuchssteiner H, Högenauer C, Kazemi-Shirazi L, Maier H, Mayer A, **Moschen AR**, Reinisch W, Petritsch W, Platzer R, Steiner P, Tilg H, Vogelsang H, Wenzl H, Novacek G. (2018) [Second Austrian consensus on the safe use of anti-TNF α -antibodies in patients with inflammatory bowel diseases]. **Z Gastroenterol**. 2018 Mar;56(3):275-302. doi: 10.1055/s-0044-100044.
2. Grabherr F, Grander C, Adolph TE, Wieser V, Mayr L, Enrich B, Macheiner S, Sangineto M, Reiter A, Viveiros A, Zoller H, Bufler P, **Moschen AR**, Dinarello CA, Tilg H. Ethanol-mediated suppression of IL-37 licenses alcoholic liver disease. (2017) **Liver Int**. 2017 Nov 29. doi: 10.1111/liv.13642. [Epub ahead of print]
3. Gerner RR, Klepsch V, Macheiner S, Arnhard K, Adolph TE, Grander C, Wieser V, Pfister A, Moser P, Hermann-Kleiter N, Baier G, Oberacher H, Tilg H, **Moschen AR** (2017). NAD metabolism fuels human and mouse intestinal inflammation. **Gut**. 2017 Sep 6. pii: gutjnl-2017-314241. doi: 10.1136/gutjnl-2017-314241. [Epub ahead of print]
4. Klepsch V, Gerner RR, Klepsch S, Olson WJ, Tilg H, **Moschen AR**, Baier G, Hermann-Kleiter N (2017). Nuclear orphan receptor NR2F6 as a safeguard against experimental murine colitis. **Gut**. 2017 Aug 4. pii: gutjnl-2016-313466. doi: 10.1136/gutjnl-2016-313466. [Epub ahead of print]
5. Thöni V, Pfister A, Melmer A, Enrich B, Salzmann K, Kaser S, Lamina C, Ebenbichler CF, Hackl H, Tilg H, **Moschen AR** (2017). Dynamics of Bile Acid Profiles, GLP-1, and FGF19 After Laparoscopic Gastric Banding. **J Clin Endocrinol Metab**. 2017 Aug 1;102(8):2974-2984. doi: 10.1210/jc.2017-00235.
6. Grander C, Adolph TE, Wieser V, Lowe P, Wrzosek L, Gyongyosi B, Ward DV, Grabherr F, Gerner RR, Pfister A, Enrich B, Ciocan D, Macheiner S, Mayr L, Drach M, Moser P, **Moschen AR**, Perlemuter G, Szabo G, Cassard AM, Tilg H (2017). Recovery of ethanol-induced *Akkermansia muciniphila* depletion ameliorates alcoholic liver disease. **Gut**. May 26. pii: gutjnl-2016-313432. doi: 10.1136/gutjnl-2016-313432. [Epub ahead of print]
7. Ress C, **Moschen AR**, Thoeni V, Ebenbichler CF, Weiss H, Molnar C, Weiss G, Tilg H, Kaser S (2017) Effect of weight loss on heme oxygenase-1 tissue expression. **Diabetes Metab**. Jan 24. pii: S1262-3636(16)30561-4. doi: 10.1016/j.diabet.2016.11.004. [Epub ahead of print]
8. Wieser V, Adolph TE, Grander C, Grabherr F, Enrich B, Moser P, **Moschen AR**, Kaser S, Tilg H (2016). Adipose type I interferon signalling protects against metabolic dysfunction. **Gut**. Dec 23. pii: gutjnl-2016-313155. doi: 10.1136/gutjnl-2016-313155. [Epub ahead of print]
9. Schaefer B, Würtinger P, Finkenstedt A, Braithwaite V, Viveiros A, Effenberger M, Sulzbacher I, **Moschen AR**, Griesmacher A, Tilg H, Vogel W, Zoller H (2016). Choice of High-Dose

- Intravenous Iron Preparation Determines Hypophosphatemia Risk. **PLoS One.** Dec 1;11(12):e0167146. doi: 10.1371/journal.pone.0167146.
10. Willeit P, Skroblin P, **Moschen AR**, Yin X, Kaudewitz D, Zampetaki A, Barwari T, Whitehead M, Ramírez CM, Goedeke L, Rotllan N, Bonora E, Hughes AD, Santer P, Fernández-Hernando C, Tilg H, Willeit J, Kiechl S, Mayr M (2017). Circulating MicroRNA-122 Is Associated With the Risk of New-Onset Metabolic Syndrome and Type 2 Diabetes. **Diabetes** Feb;66(2):347-357. doi: 10.2337/db16-0731. Epub 2016 Nov 29.
 11. Gerner RR, Feistritz C, **Moschen AR**, Kircher B, Moser P, Tilg H, Nachbaur D (2016). Treatment With α -1-Antitrypsin for Steroid-Refractory Acute Intestinal Graft-Versus-Host Disease: A Report of 2 Cases. **Transplantation** Dec;100(12):e158-e159.
 12. Wieser V, Adolph TE, Enrich B, Moser P, **Moschen AR**, Tilg H (2017). Weight loss induced by bariatric surgery restores adipose tissue PNPLA3 expression. **Liver Int.** Feb;37(2):299-306. doi: 10.1111/liv.13222.
 13. **Moschen AR**, Gerner RR, Wang J, Klepsch V, Adolph TE, Reider SJ, Hackl H, Pfister A, Schilling J, Moser PL, Kempster SL, Swidsinski A, Orth Höller D, Weiss G, Baines JF, Kaser A, Tilg H (2016). Lipocalin 2 Protects from Inflammation and Tumorigenesis Associated with Gut Microbiota Alterations. **Cell Host Microbe.** Apr 13;19(4):455-69. doi: 10.1016/j.chom.2016.03.007.
 14. Wieser V, Tymoszuk P, Adolph TE, Grander C, Grabherr F, Enrich B, Pfister A, Lichtmanegger L, Gerner R, Drach M, Moser P, Zoller H, Weiss G, **Moschen AR**, Theurl I, Tilg H (2016). Lipocalin 2 drives neutrophilic inflammation in alcoholic liver disease. **J Hepatol.** Apr;64(4):872-80. doi: 10.1016/j.jhep.2015.11.037.
 15. Novacek G, Dejaco C, Gröchenig HP, Högenauer C, Knoflach P, Miehsler W, **Moschen AR**, Petritsch W, Vogelsang H, Tilg H (2016). Vedolizumab in der Behandlung der Colitis ulcerosa und des Morbus Crohn - ein Konsensus der Arbeitsgruppe "Chronisch Entzündliche Darmerkrankungen" der Österreichischen Gesellschaft für Gastroenterologie und Hepatologie. **Z Gastroenterol.** May;54(5):456-67. doi: 10.1055/s-0042-103694.
 16. Nairz M, Schroll A, Haschka D, Dichtl S, Sonnweber T, Theurl I, Theurl M, Lindner E, Demetz E, Aßhoff M, Bellmann-Weiler R, Müller R, Gerner RR, **Moschen AR**, Baumgartner N, Moser PL, Talasz H, Tilg H, Fang FC, Weiss G (2015). Lipocalin-2 ensures host defense against Salmonella Typhimurium by controlling macrophage iron homeostasis and immune response. **Eur J Immunol.** 45(11):3073-86.
 17. Thiele M, Kerschbaumer RJ, Tam FW, Völkel D, Douillard P, Schinagl A, Kühnel H, Smith J, McDaid JP, Bhangal G, Yu MC, Pusey CD, Cook HT, Kovarik J, Magelky E, Bhan A, Rieger M, Mudde GC, Ehrlich H, Jilma B, Tilg H, **Moschen AR**, Terhorst C, Scheiflinger F (2015). Selective Targeting of a Disease-Related Conformational Isoform of Macrophage Migration Inhibitory Factor Ameliorates Inflammatory Conditions. **J Immunol.** 1;195(5):2343-52.
 18. Kienzl-Wagner K*, **Moschen AR***, Geiger S, Bichler A, Aigner F, Brandacher G, Pratschke J, Tilg H (2015). The role of lipocalin-2 in liver regeneration. **Liver Int**;35(4):1195-202.
 19. Kump PK, Krause R, Steininger C, Gröchenig HP, Moschen AR, Madl C, Novacek G, Allerberger F, Högenauer C (2014). [Recommendations for the use of faecal microbiota transplantation "stool transplantation": consensus of the Austrian Society of Gastroenterology and Hepatology (ÖGGH) in cooperation with the Austrian Society of Infectious Diseases and Tropical Medicine]. **Z Gastroenterol.** 52(12):1485-92. doi: 10.1055/s-0034-1385562.
 20. Demetz E, Schroll A, Auer K, Heim C, Patsch JR, Eller P, Theurl M, Theurl I, Theurl M, Seifert M, Lener D, Stanzl U, Haschka D, Asshoff M, Dichtl S, Nairz M, Huber E, Stadlinger M,

- Moschen AR**, Li X, Pallweber P, Scharnagl H, Stojakovic T, März W, Kleber ME, Garlaschelli K, Uboldi P, Catapano AL, Stellaard F, Rudling M, Kuba K, Imai Y, Arita M, Schuetz JD, Pramstaller PP, Tietge UJ, Trauner M, Norata GD, Claudel T, Hicks AA, Weiss G, Tancevski I (2014). The arachidonic acid metabolome serves as a conserved regulator of cholesterol metabolism. **Cell Metab**; 20(5):787-98.
21. Ballak DB, van Diepen JA, **Moschen AR**, Jansen HJ, Hijmans A, Groenhof GJ, Leenders F, Bufler P, Boekschoten MV, Müller M, Kersten S, Li S, Kim S, Eini H, Lewis EC, Joosten LA, Tilg H, Netea MG, Tack CJ, Dinarello CA, Stienstra R (2014). IL-37 protects against obesity-induced inflammation and insulin resistance. **Nat Commun**; 5:4711. doi: 10.1038/ncomms5711.
 22. Tancevski I, Nairz M, Duwensee K, Auer K, Schroll A, Heim C, Feistritzer C, Hofer J, Gerner RR, **Moschen AR**, Heller I, Pallweber P, Li X, Theurl M, Demetz E, Wolf AM, Wolf D, Eller P, Ritsch A, Weiss G (2014): Fibrates ameliorate the course of bacterial sepsis by promoting neutrophil recruitment via CXCR2. **EMBO Mol Med**. 2014 Apr 22;6(6):810-20.
 23. Novacek G, Dejaco C, Knoflach P, **Moschen AR**, Petritsch W, Vogelsang H, Reinisch W (2014): Adalimumab for the treatment of ulcerative colitis--a consensus report by the working group inflammatory bowel diseases of the Austrian Society of Gastroenterology and Hepatology. **Z Gastroenterol**. 2014 Feb;52(2):204-11.
 24. **Moschen AR**, Wieser V, Gerner RR, Bichler A, Enrich B, Moser P, Ebenbichler CF, Kaser S, Tilg H (2013). Adipose tissue and liver expression of SIRT1, 3, and 6 increase after extensive weight loss in morbid obesity. **J Hepatol**. 59:1315-1322.
 25. Kiechl S, Wittmann J, Giaccari A, Knoflach M, Willeit P, Bozec A, **Moschen AR**, Muscogiuri G, Sorice GP, Kireva T, Summerer M, Wirtz S, Luther J, Mielenz D, Billmeier U, Egger G, Mayr A, Oberhollenzer F, Kronenberg F, Orthofer M, Penninger JM, Meigs JB, Bonora E, Tilg H, Willeit J, Schett G (2013). Blockade of receptor activator of nuclear factor - κ B (RANKL) signaling improves hepatic insulin resistance and prevents development of diabetes mellitus. **Nat Med**. 19: 358-363.

Review articles

26. Gorkiewicz G, **Moschen AR**. Gut microbiome: a new player in gastrointestinal disease. (2018) **Virchows Arch**. 2018 Jan;472(1):159-172. doi: 10.1007/s00428-017-2277-x.
27. **Moschen AR**, Adolph TE, Gerner RR, Wieser V, Tilg H (2017). Lipocalin-2: A Master Mediator of Intestinal and Metabolic Inflammation. **Trends Endocrinol Metab**. May;28(5):388-397. doi: 10.1016/j.tem.2017.01.003.
28. Tilg H, **Moschen AR**, Roden M (2017). NAFLD and diabetes mellitus. **Nat Rev Gastroenterol Hepatol**. Jan;14(1):32-42. doi: 10.1038/nrgastro.2016.147. Epub 2016 Oct 12.
29. Tilg H, **Moschen AR**, Szabo G (2016). Interleukin-1 and inflammasomes in alcoholic liver disease/acute alcoholic hepatitis and nonalcoholic fatty liver disease/nonalcoholic steatohepatitis. **Hepatology**. Sep;64(3):955-65. doi: 10.1002/hep.28456.
30. Grander C, Grabherr F, **Moschen AR**, Tilg H (2016). Non-Alcoholic Fatty Liver Disease: Cause or Effect of Metabolic Syndrome. **Visc Med**. Oct;32(5):329-334. Epub 2016 Sep 16.
31. Tilg H, **Moschen AR** (2015). Food, immunity, and the microbiome. **Gastroenterology**; 148(6):1107-19.
32. Tilg H, **Moschen AR** (2014). Mechanisms behind the link between obesity and gastrointestinal cancers. **Best Pract Res Clin Gastroenterol**; 28(4):599-610.

33. Tilg H, **Moschen AR** (2014). Microbiota and diabetes: an evolving relationship. **Gut**; 63(9):1513-21.
34. Tilg H, **Moschen AR** (2014): Evolving therapies for non-alcoholic steatohepatitis. **Expert Opin Drug Discov.** Jun; 9(6):687-96
35. Gerner RR, **Moschen AR**, Tilg H (2013). Targeting T and B lymphocytes in inflammatory bowel diseases: lessons from clinical trials. **Dig Dis.** 31:328-35.
36. Gerner RR, Wieser V, **Moschen AR**, Tilg H (2013). Metabolic inflammation: role of cytokines in the crosstalk between adipose tissue and liver. **Can J Physiol Pharmacol.** 91:867-72.
37. Wieser V, Gerner R, **Moschen AR**, Tilg H (2013). Liver complications in inflammatory bowel diseases. **Dig Dis.** 31: 233-8.
38. **Moschen AR**, Kaser S, Tilg H (2013). Non-alcoholic steatohepatitis: a microbiota-driven disease. **Trends Endocrinol Metab.** PMID: 23827477
39. Tilg H, **Moschen AR** (2013). Gut microbiota: Malnutrition and microbiota-a new relationship? **Nat Rev Gastroenterol Hepatol.** 16;10: 261-262.