

# SUPPLEMENTARY MATERIAL

for the BioTechMed-Graz (BTM) flagship project

## “Immunomodulatory and Antiproliferative Bioactivities of the Bacterial Secretome in Gastrointestinal Disease and Therapy”

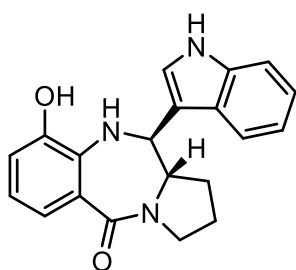


Figure 1: Chemical Structure of Tilivalline

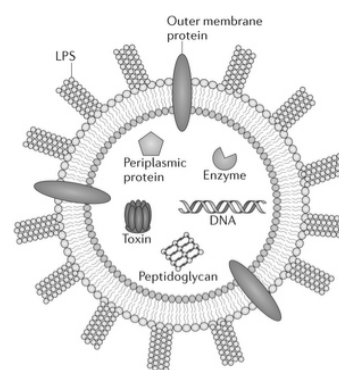


Figure 2: Structure and content of a membrane vesicle derived from a Gram-negative bacterium. Taken from Kaparakis-Liaskos et. al. Nat. Rev. Immunol. 2015. 15, 375–387

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# Curriculum Vitae – Univ.-Prof. Dr. rer. nat. Rolf Breinbauer

## 1 – Person / Allgemeine Angaben

<b>Name</b>	Rolf Breinbauer, Univ.-Prof. Dr. rer. nat., *28.11.1970, male
<b>Nationality</b>	Austrian
<b>Address</b>	Institut für Organische Chemie, Technische Universität Graz Stremayrgasse 9, A-8010 Graz, Austria Phone: +43 (0) 316 873 32400, E-Mail: <a href="mailto:breinbauer@tugraz.at">breinbauer@tugraz.at</a>
<b>Position</b>	Full professor

## 2 – Academic Education / Akademische Ausbildung mit Abschluss

1995 - 1998	PhD thesis: “Metal Colloids as Catalysts“ Max-Planck-Institut für Kohlenforschung, Mülheim/Ruhr and University of Bochum, Germany (“summa cum laude”)
1989 - 1995	Study in Technical Chemistry, Vienna University of Technology, Austria diploma exams: “with distinction” including the diploma thesis (04-10/1994): “Enantioselektive Pd-katalysierte allylische Substitution von Indenyl-Substraten.“ University of Heidelberg, Germany

## 3 – Scientific Degrees / Wissenschaftliche Abschlüsse

1998	Promotion (Dr. rer. nat.), University of Bochum
1995	Diploma (Technical Chemistry), Vienna University of Technology

## 4 – Academic Appointments / Beruflicher Werdegang ab Studienabschluss

since 2007	Full Professor, Institute of Organic Chemistry, Graz University of Technology, Austria
2005 - 2007	Professor (W2), Institute of Organic Chemistry, University of Leipzig, Germany
2003 - 2005	Junior Professor for Organic and Bioorganic Chemistry, University of Dortmund, Germany
2000 - 2005	Group Leader, Max-Planck-Institute for Molecular Physiology, Dortmund, Germany
1998 - 1995	Post-doctoral Fellow, Department of Chemistry and Chemical Biology, Harvard University, Cambridge/MA, USA

## 5 – Additional information / Sonstiges

since 2011	Member of the Scientific Board (Kuratorium), Austrian Science Fund (FWF)
since 2008	Member of the Selection Committee for Scholarships of the Austrian Academy of Sciences
since 2008	Key Research in the Austrian Centre of Industrial Biotechnology
2002 - 2005	Member of the Scientific Council of the Max-Planck-Society, and Member of the Biological-Medical Section of the Max-Planck-Society, Germany

**6 – Honors • Awards / Preise und Auszeichnungen**


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2007	Call for Full Professorship Organic Chemistry, University of Linz/A
2002	Thieme Chemistry Journal Award
2000 - 2003	Liebig-Scholarship (Fonds der Chemischen Industry
1998 – 1999	Erwin-Schrödinger-Post-doctoral Fellowship

**7 – Externally funded projects / geförderte Drittmittelprojekte (last 5 years)**


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2015 - 2018	International project I 2712 - Austrian Science Fund (FWF) “Electrooxidative Synthesis of Bis- and Oligoarenes” amount of funding: 174 k€
2015 - 2018	Stand-alone project P 28286 - Austrian Science Fund (FWF) “Development of Small Molecule Inhibitors Targeting Human Adipose Triglyceride Lipase” amount of funding: 356 k€
2014 - 2017	ERA-Synbio Project I 1722 - Austrian Science Fund (FWF) “A twofold retrosynthetic implementation of a novel biochemical pathway (RETROBIO)” amount of funding: 155 k€
2014 – 2017	principal investigator in the international PhD program “Doktoratskolleg DK: Molecular Enzymology” W901 - funding period 4 - Austrian Science Fund (FWF) total amount of funding: 4.200 k€ for 15 principal investigators
2012 – 2015	Innovative Medicines Initiative (Chem 21) – European Union “Biocatalytic Synthesis of Active Pharmaceutical Ingredients” amount of funding: 216 k€
2011 – 2014	ERA-Chemistry Project I 668 - Austrian Science Fund (FWF) “Exploring and Controlling Phenazine Biosynthesis with Chemical Biology” amount of funding: 150 k€
2011 – 2014	principal investigator in the international PhD program “Doktoratskolleg DK: Molecular Enzymology” W901 - funding period 3- Austrian Science Fund (FWF) total amount of funding: 4.000 k€ for 17 principal investigators
2010 – 2019	Key researcher in Austrian Centre of Industrial Biotechnology, COMET-K2 (FFG) amount of funding: 800 k€
2008 – 2011	principal investigator in the international PhD program “Doktoratskolleg DK: Molecular Enzymology” W901 - funding period 2- Austrian Science Fund (FWF) total amount of funding: 3.420 k€ for 15 principal investigators

**8 – Publications / Publikationen**

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- R. Birner-Gruenberger, **R. Breinbauer**. Tracking protein S-fatty acylation with proteomics. ChemBioChem. 2016, 17. DOI: 10.1002/cbic.201600314, accepted
- R. Breinbauer**, M. Peters. Future Directions of Modern Organic Synthesis. in A. Zagfros (Ed.) “From Biosynthesis to Total Synthesis”, Wiley, Hoboken, 2016, 519-547.
- C. M. Pichler, J. Krysiak, **R. Breinbauer**. Target identification of covalently binding drugs by activity-based protein profiling (ABPP). Bioorg. Med. Chem. 2016, DOI: 10.1016/j.bmc.2016.03.050

- P. Aschauer, S. Rengachari, J. Lichtenegger, M. Schittmayer, K. M. Das, N. Mayer, **R. Breinbauer**, R. Birner-Gruenberger, C. C. Gruber, R. Zimmermann; K. Gruber, M. Oberer\*. Crystal structure of the *Saccharomyces cerevisiae* monoglyceride lipase Yju3p. *Biochim. Biophys. Acta*. 2016. DOI: 10.1016/j.bbali.2016.02.005, accepted
- A. Pellis, K. Haernvall, C. M. Pichler, G. Ghazaryan, **R. Breinbauer**, G. M. Guebitz. Enzymatic hydrolysis of poly(ethylene furanoate). *J. Biotechnol.* 2016, DOI: 10.1016/j.jbiotec.2016.02.006, accepted
- J. Pletz, B. Berg, **R. Breinbauer**. A General and Direct Reductive Amination of Aldehydes and Ketones with Electron-Deficient Anilines. *Synthesis* 2016, 48, 1301-1317. DOI: 10.1055/s-0035-1561384
- C. Doler, M. Schweiger, R. Zimmermann, **R. Breinbauer**. Chemical Genetic Approaches for the Investigation of Neutral Lipid Metabolism. *ChemBioChem*. 2016, 17, 358–377. DOI: 10.1002/cbic.201500501
- M. Trobe, **R. Breinbauer**. Improved and Scalable Synthesis of Building Blocks for the Modular Synthesis of Teraryl-based alpha-Helix Mimetics. *Monatsh. Chem.* 2016, 147, 509-521. DOI: 10.1007/s00706-015-1599-0
- R. Breinbauer**, M. Peters. Reductions of Carboxylic Acids and Derivatives. in O. Hammerich, B. Speiser (Eds.) "Organic Electrochemistry", CRC Press, Boca Raton, 2016, 1249-1265.
- M. A. Pribasnig, I. Mrak, G. F. Grabner, U. Taschler, O. Knittelfelder, B. Scherz, T. O. Eichmann, C. Heier, L. Grumet, J. Kowaliuk, M. Romauch, S. Holler, F. Anderl, H. Wolinski, A. Lass, **R. Breinbauer**, G. Marsche, J. M. Brown, R. Zimmermann.  $\alpha/\beta$  Hydrolase Domain-Containing 6 (ABHD6) Degrades the Late Endosomal/Lysosomal Lipid Bis(monoacylglycero)phosphate. *J. Biol. Chem.* 2015, 290, 29869-29881. DOI : 10.1074/jbc.M115.669168
- X. Yu, N. Guttenberger, E. Fuchs, M. Peters, H. Weber, **R. Breinbauer**. Diversity-Oriented Synthesis of a Library of Star-Shaped 2H-Imidazolines. *ACS Comb. Sci.* 2015, 17, 682–690. DOI: 10.1021/acscmbosci.5b00107
- J. Ivkovic, C. Lembacher-Fadum, **R. Breinbauer**. A rapid and efficient one-pot method for the reduction of N-protected alpha-amino acids to chiral alpha-amino aldehydes using CDI/DIBAL-H. *Org. Biomol. Chem.* 2015, 13, 10456-10460. DOI: 10.1039/C5OB01838B
- M. Leybold, P. W. Wallace, M. Kljajic, M. Schittmayer, J. Pletz, C. Illaszewicz-Trattner, G. M. Guebitz, R. Birner-Gruenberger, **R. Breinbauer**. A robust and simple protocol for the synthesis of arylfluorophosphonates. *Tetrahedron Lett.* 2015, 56, 5619-5622. DOI 10.1016/j.tetlet.2015.08.061
- K. Fesko, G. A. Strohmeier, **R. Breinbauer**. Expanding the threonine aldolase toolbox for the asymmetric synthesis of tertiary  $\alpha$ -amino acids. *Appl. Microbiol. Biotechnol.* 2015, 99, 9651-9661. DOI 10.1007/s00253-015-6803-y
- A. Pellis, E. Herrero Acero, H. Weber, M. Obersriebnig, **R. Breinbauer**, E. Srebotnik, G. M. Guebitz. Biocatalyzed approach for the surface functionalization of poly(L-lactic acid) films using hydrolytic enzymes. *Biotechnol. J.* 2015, 10, 1739-1749. DOI: 10.1002/biot.201500074
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- R. Birner-Gruenberger, **R. Breinbauer**. Weighing the Proteasome for Covalent Modifications. *Chem. Biol.* 2015, 22, 315-316. DOI: 10.1016/j.chembiol.2015.03.003

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- U. Taschler, R. Schreiber, C. Chitraju, G. F. Grabner, M. Romauch, H. Wolinski, G. Haemmerle, **R. Breinbauer**, R. Zechner, A. Lass, R. Zimmermann. Adipose triglyceride lipase is involved in the mobilization of triglyceride and retinoid stores of the hepatic stellate cells. *Biochim. Biophys. Acta, Mol. Cell Biol. Lipids* 2015, 1851, 937-945. DOI: 10.1016/j.bbailip.2015.02.017
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- J. Rentner, **R. Breinbauer**, M. Gruber-Khadjawi. *Enzymes in Organic Synthesis*. Kirk-Othmer Encyclopedia of Chemical Technology, John-Wiley&Sons, 2014, 43 pages. DOI: 10.1002/0471238961.0514262526011119.a01.pub2
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- S. M. Pratter, J. Ivkovic, R. Birner-Gruenberger, **R. Breinbauer**, K. Zangger, G. D. Straganz. More than just a Halogenase: Modification of Fatty Acyl Moieties by a Trifunctional Metal Enzyme. *ChemBioChem* 2014, 15, 567-574. DOI: 10.1002/cbic.201300345
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- J. M. Krysiak, J. Kreuzer, P. Macheroux, A. Hermetter, S.A. Sieber, **R. Breinbauer**. Novel activity-based probes for studying the activity of flavin-dependent oxidases and for the protein target profiling of MAO-inhibitors. *Angew. Chem.* 2012, 124, 7142–7147; *Angew. Chem. Int. Ed.* 2012, 51, 7035-7040. DOI: 10.1002/anie.201201955
- J. Krysiak, **R. Breinbauer**. Activity Based Protein Profiling for Natural Product Target Discovery. *Topics Curr. Chem.* 2012, 324, 43-84. DOI: 10.1007/128\_2011\_289
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- R. Breinbauer**, M. Mentel. Combinatorial Chemistry and the Synthesis of Compound Libraries. in A. C. A. Roque (Ed.) "Ligand-Macromolecular Interactions in Drug Discovery: Methods and Protocols, Methods in Molecular Biology, Vol. 572", Humana Press, New York, 2010, 73-80. DOI: 10.1007/978-1-60761-244-5\_5
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- R. Breinbauer**, I. R. Vetter, H. Waldmann. From protein domains to drug candidates – natural products as guiding principles in compound library design and synthesis *Angew. Chem.* 2002, 114, 3002-3015; *Angew. Chem. Int. Ed.* 2002, 41, 2878-2890.
- M. T. Reetz, M. Winter, **R. Breinbauer**, T. Thurn-Albrecht, W. Vogel. Size-selective electrochemical preparation of surfactant-stabilized Pd- Ni- and Pt/Pd colloids. *Chem. Eur. J.* 2001, 7, 1084-1094.
- R. Breinbauer**, E. N. Jacobsen. Cooperative asymmetric catalysis with dendrimer bound [Co(salen)] catalysts. *Angew. Chem.* 2000, 112, 3750-3753; *Angew. Chem. Int. Ed.* 2000, 39, 3604-3607.
- E. N. Jacobsen, **R. Breinbauer**. Nickel comes full cycle. *Science* 2000, 287, 437-438.
- M. T. Reetz\*, **R. Breinbauer**, P. Wedemann, P. Binger. Nanostructured nickel-clusters as catalysts in [3+2]-cycloaddition reactions. *Tetrahedron* 1998, 54, 1233-1240.
- M. T. Reetz, **R. Breinbauer**, K. Wanninger. Suzuki and Heck reactions catalyzed by preformed palladium clusters and palladium/ nickel clusters. *Tetrahedron Lett.* 1996, 37, 4499-4502.



M. T. Reetz, S. A. Quaiser, **R. Breinbauer**, B. Tesche. A new strategy in heterogenous catalysis: the design of cortex-catalysts. *Angew. Chem.* 1995, 107, 2956-2958; *Angew. Chem. Int. Ed. Engl.* 1995, 34, 2728-2730.

## 9 – Patents / Patente

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M. Schweiger, M. Romauch, R. Zimmermann, N. Mayer, **R. Breinbauer**. ATGListatin and pharmaceutical composition comprising the same. 2015. US9206115 B2

M. Schweiger, M. Romauch, R. Zimmermann, N. Mayer, E. Fuchs, **R. Breinbauer**. 2014. Lipase inhibitors. WO2014114649 A1

P. J. L. M. Quaedflieg, T. Nuijens, G. Strohmeier, **R. Breinbauer**, H. Schroeder. 2013. Enzymatic peptide synthesis. WO 2013135786 A1

H. Waldmann, M. Köhn, **R. Breinbauer**, D. Nüsse, E. Voges. 2007. Entwicklung einer ortsspezifischen, chemoselektiven, und gerichteten photochemischen Mikrostrukturierungstechnik für bio- und materialwissenschaftlichen Anwendungen [z.B. zur Herstellung von Mikroarrays]. DE 102005032038A1

## 10 – Selected oral presentations (invited only) / ausgewählte Vorträge (nur Einladungen)

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“Synthesis of Tool Compounds for the Investigation of Lipid Metabolism and Biosynthetic Pathways”. EMBO Conference – Chemical Biology, Heidelberg (Germany). August 2014

“Synthesis of Tool Compounds for Target Identification and Target Validation”. DECHEMA - 8th Status Seminar Chemical Biology, Frankfurt (Germany). January 2013

“Synthesis of Tool Compounds in Chemical Biology”. 15th International Conference, ISCBC, Rajkot (India). February 2011

“The Tale of Two Enantiomers – Synthesis of Tool Compounds for Chemical Biology”. Gordon Research Conference “High Throughput Chemistry and Chemical Biology”, Les Diablerets (Switzerland). June 2010

„ Synthesis of Heterocyclic Tool Compounds for Chemical Biology“. 13th Blue Danube Symposium on Heterocyclic Chemistry, Bled (Slovenia). Sept. 2009

„Electrons as a Reagent in Solid Phase Organic Synthesis“. 2nd International Symposium on Organic Electron Transfer Chemistry, Yokohama (Japan). January 2007

„New Methods for Ligation and Immobilization of Peptides and Proteins“. 1st European Chemistry Congress (EUCHEMS), Budapest (Hungary). August 2006

# Curriculum Vitae – Univ.-Prof. Dr. med. univ. Gregor Gorkiewicz

## 1 – Person / Allgemeine Angaben

<b>Name</b>	Gorkiewicz, Gregor, *22.12.1971, male
<b>Nationality</b>	Austrian
<b>Address</b>	Institute of Pathology; Medical University of Graz; Auenbruggerplatz 25, 8036 Graz; Austria. Phone: +43-316-385-83649; Fax: +43-316-385-13432; Email: <a href="mailto:gregor.gorkiewicz@medunigraz.at">gregor.gorkiewicz@medunigraz.at</a>
<b>Position</b>	Full Professor

## 2 – Academic Education / Akademische Ausbildung mit Abschluss

2010	Board certification in Pathology
1990 - 1999	Study of Medicine, Karl-Franzens University of Graz, Austria; (thesis: "Typing of campylobacters according to sequence variation in the 16S rRNA gene").

## 3 – Scientific Degrees / Wissenschaftliche Abschlüsse

2014	Habilitation in Pathology, Medical University of Graz, Austria
July 1999	M.D. degree

## 4 – Academic Appointments / Beruflicher Werdegang ab Studienabschluss

2015-present	Professor for Medical Microbiome Research, Medical University of Graz, Austria
2015-2016	Sabbatical Univ. of Hohenheim, Dept. of Nutrigenomics, Stuttgart, Germany
2011- 2015	Assistant Professor of Pathology, Medical University of Graz
2014	Habilitation in Pathology, Medical University of Graz, Austria
2010	Board certification in Pathology
2009	Resident in Internal Medicine, Department of Internal Medicine, Division of Gastroenterology and Hepatology, Medical University of Graz (Head: Univ. Prof. Dr. G. Krejs)
2005 – 2009	Resident in Pathology, Institute of Pathology, Medical University of Graz (Heads: Univ. Prof. Dr. H. Denk; Univ. Prof. Dr. G. Höfler)
2004 – 2005	Resident in Medical Microbiology, Institute of Hygiene, Medical University of Graz (Head: Univ. Prof. DDr. E. Marth)
2000 & 2002	Visiting Professor at the Institute of Molecular Biology, Biochemistry and Microbiology, Karl Franzens University of Graz
1999 - 2004	Postdoctoral Fellow, Institute of Molecular Biology, Biochemistry and Microbiology, Karl Franzens University of Graz (Head: Univ. Prof. Dr. R. Zechner)

## 5 – Additional information / Sonstiges

since 2010	Laboratory head: Infectious diseases molecular diagnostics laboratory; Institute of Pathology, Medical University Graz
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## 6 – Honors ▪ Awards / Preise und Auszeichnungen

2005 Best oral presentation, 13<sup>th</sup> International Workshop on Campylobacter, Helicobacter and related Organisms, Gold Coast, Australia

## 7 – Externally funded projects / geförderte Drittmittelprojekte

2012-2020 principal investigator in the international PhD program “Doktoratskolleg DK: Molecular Fundamentals of Inflammation funding period 1 & 2; Austrian Science Fund (FWF) W1241; amount of funding: 612.000 €/ PI

2015-2016 BioTechMed (Federal Ministry of Science, Research & Economy); Post-Doc pool “Metagenomics for functional analyses and modeling of microbiome data” total amount of funding: 127.000€

2008-2011 Stand-alone project P20479-B05 Austrian Science Fund (FWF) “Analysis of *Campylobacter fetus* virulence mechanisms”; total amount of funding: 225.000 €

## 8 – Publications / Publikationen

Al-Zoughbi W, Pichler M, **Gorkiewicz G**, Guertl-Lackner B, Haybaeck J, Jahn SW, Lackner C, Liegl-Atzwanger B, Popper H, Schauer S, Nusshold E, Kindt AS, Trajanoski Z, Speicher MR, Haemmerle G, Zimmermann R, Zechner R, Vesely PW, Hoefler G. Loss of adipose triglyceride lipase is associated with human cancer and induces mouse pulmonary neoplasia. *Oncotarget*. 2016. doi: 10.18632/oncotarget.9418.

Krause R, Halwachs B, Thallinger GG, Klymiuk I, **Gorkiewicz G**, Hoenigl M, Prattes J, Valentin T, Heidrich K, Buzina W, Salzer HJ, Rabensteiner J, Prüller F, Raggam RB, Meinitzer A, Moissl-Eichinger C, Högenauer C, Quehenberger F, Kashofer K, Zollner-Schwetzel I. Characterisation of *Candida* within the Mycobiome/Microbiome of the Lower Respiratory Tract of ICU Patients. *PLoS One*. 2016;11(5):e0155033.

Graaf-van Bloois Lv, Miller WG, Yee E, **Gorkiewicz G**, Forbes KJ, Zomer AL, Wagenaar JA, Duim B. *Campylobacter fetus* Subspecies Contain Conserved Type IV Secretion Systems on Multiple Genomic Islands and Plasmids. *PLoS One*. 2016;11(4):e0152832.

Radnai B, Sturm EM, Stančić A, Jandl K, Labocha S, Ferreirós N, Grill M, Hasenoehrl C, **Gorkiewicz G**, Marsche G, Heinemann Á, Högenauer C, Schicho R. Eosinophils Contribute to Intestinal Inflammation via Chemoattractant Receptor-homologous Molecule Expressed on Th2 Cells, CRTH2, in Experimental Crohn's Disease. *J Crohns Colitis*. 2016. pii: jjw061.

Fröhlich EE, Farzi A, Mayerhofer R, Reichmann F, Jačan A, Wagner B, Zinser E, Bordag N, Magnes C, Fröhlich E, Kashofer K, **Gorkiewicz G**, Holzer P. Cognitive impairment by antibiotic-induced gut dysbiosis: Analysis of gut microbiota-brain communication. *Brain Behav Immun*. 2016. pii: S0889-1591(16)30040-X.

Kienesberger, S; Cox, LM; Livanos, A; Zhang, XS; Chung, J; Perez-Perez, GI; **Gorkiewicz G**, G; Zechner, EL; Blaser, MJ. Gastric *Helicobacter pylori* infection affects local and distant microbial populations and host responses. *Cell Rep*. 2016;14(6):1395-407.

Till, H; Castellani, C; Moissl-Eichinger, C; **Gorkiewicz, G**; Singer, G Disruptions of the intestinal microbiome in necrotizing enterocolitis, short bowel syndrome, and Hirschsprung's associated enterocolitis. *Front Microbiol*. 2015; 6: 1154-1154.

Montalban-Arques, A; De Schryver, P; Bossier, P; **Gorkiewicz, G**; Mulero, V; Gatlin, DM; Galindo-Villegas, J Selective Manipulation of the Gut Microbiota Improves Immune Status in Vertebrates. *Front Immunol*. 2015; 6: 512-512.

Bashir M; Prietl B; Tauschmann M; Mautner SI; Kump PK; Treiber G; Wurm, P; **Gorkiewicz, G**; Högenauer C; Pieber TR Effects of high doses of vitamin D3 on mucosa-associated

- gut microbiome vary between regions of the human gastrointestinal tract. *Eur J Nutr.* 2016; 55(4):1479-89.
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- Seidel, MG; Hirschmugl, T; Gamez-Diaz, L; Schwinger, W; Serwas, N; Deutschmann, A; **Gorkiewicz, G**; Zenz, W; Windpassinger, C; Grimbacher, B; Urban, C; Boztug, K Long-term remission after allogeneic hematopoietic stem cell transplantation in LPS-responsive beige-like anchor (LRBA) deficiency. *J Allergy Clin Immunol.* 2015; 135(5):1384-1390
- Herzog, KA; Schneditz, G; Leitner, E; Feierl, G; Hoffmann, KM; Zollner-Schwetz, I; Krause, R; **Gorkiewicz, G**; Zechner, EL; Högenauer, C Genotypes of *Klebsiella oxytoca* isolates from patients with nosocomial pneumonia are distinct from those of isolates from patients with antibiotic-associated hemorrhagic colitis. *J Clin Microbiol.* 2014; 52(5):1607-1616
- Kienesberger, S; Sprenger, H; Wolfgruber, S; Halwachs, B; Thallinger, GG; Perez-Perez, GI; Blaser, MJ; Zechner, EL; **Gorkiewicz, G\*** Comparative Genome Analysis of *Campylobacter fetus* Subspecies Revealed Horizontally Acquired Genetic Elements Important for Virulence and Niche Specificity. *PLoS One.* 2014; 9(1):e85491-e85491 [\* corresponding author]
- Schneditz, G; Rentner, J; Roier, S; Pletz, J; Herzog, KA; Bucker, R; Troeger, H; Schild, S; Weber, H; Breinbauer, R; **Gorkiewicz, G**; Högenauer, C; Zechner, EL Enterotoxicity of a nonribosomal peptide causes antibiotic-associated colitis. *Proc Natl Acad Sci U S A.* 2014; 111(36):13181-13186
- Gorkiewicz G\***; Thallinger GG; Trajanoski S; Lackner S; Stocker G; Hinterleitner T; Gully C; Högenauer C. Alterations in the colonic microbiota in response to osmotic diarrhea. *PLoS One.* 2013; 8(2):e55817-e55817 [\* corresponding author]
- Halwachs, B; Höftberger, J; Stocker, G; Snajder, R; **Gorkiewicz, G**; Thallinger, GG High-Troughput Characterization and Comparison of Microbial Communities. *Biomed Tech (Berl).* 2013; 3(6):
- Kump, PK; Gröchenig, HP; Lackner, S; Trajanoski, S; Reicht, G; Hoffmann, KM; Deutschmann, A; Wenzl, HH; Petritsch, W; Krejs, GJ; **Gorkiewicz, G\***; Högenauer, C Alteration of intestinal dysbiosis by fecal microbiota transplantation does not induce remission in patients with chronic active ulcerative colitis. *Inflamm Bowel Dis.* 2013; 19(10):2155-2165 [\* corresponding author]
- Seper, A; Hosseinzadeh, A; **Gorkiewicz, G**; Lichtenegger, S; Roier, S; Leitner, DR; Röhm, M; Grutsch, A; Reidl, J; Urban, CF; Schild, S *Vibrio cholerae* evades neutrophil extracellular traps by the activity of two extracellular nucleases. *PLoS Pathog.* 2013; 9(9):e1003614-e1003614
- Tauschmann, M; Prietl, B; Treiber, G; **Gorkiewicz, G**; Kump, P; Högenauer, C; Pieber, TR Distribution of CD4(pos) -, CD8(pos) - and regulatory T cells in the upper and lower gastrointestinal tract in healthy young subjects. *PLoS One.* 2013; 8(11):e80362-e80362
- Gorkiewicz, G**; Trajanoski, S; Högenauer, C *Bradyrhizobium enterica* in cord colitis syndrome. *N Engl J Med.* 2013; 369(19):1866-1867 [letter with original data]
- Belaj, K; Gary, T; Eller, P; Deutschmann, H; Beham-Schmid, C; **Gorkiewicz, G**; Brodmann, M A case of upper extremity deep vein thrombosis due to Kikuchi Fujimoto disease. *Vasa.* 2012; 41(5):371-374
- Krones, E; Petritsch, W; Valentin, T; Durchschein, F; **Gorkiewicz, G**. Visceral dissemination of herpes zoster with multiple ulcers in the upper gastrointestinal tract of an apparently immunocompetent patient. *Endoscopy.* 2012; 44 Suppl 2 UCTN(9):E302-E303

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- Sprenger, H; Zechner, EL; **Gorkiewicz, G\*** So close and yet so far - Molecular Microbiology of *Campylobacter fetus* subspecies. *Eur J Microbiol Immunol (Bp).* 2012; 2(1): 66-75. [\* corresponding author]
- Das, SK; Eder, S; Schauer, S; Diwoy, C; Temmel, H; Guertl, B; **Gorkiewicz, G**; Tamilarasan, KP; Kumari, P; Trauner, M; Zimmermann, R; Vesely, P; Haemmerle, G; Zechner, R; Hoefler, G Adipose triglyceride lipase contributes to cancer-associated cachexia. *Science.* 2011; 333(6039):233-238
- Gary T; Seinost G; Hafner F; **Gorkiewicz G**; Brodmann M Cystic medial necrosis Erdheim Gsell as a rare reason for spontaneous rupture of the ascending aorta. *Vasa.* 2011; 40(2): 147-149.
- Kienesberger S; Schober Trummler C; Fauster A; Lang S; Sprenger H; **Gorkiewicz G\***; Zechner EL Interbacterial macromolecular transfer by the *Campylobacter fetus* subsp. *venerealis* type IV secretion system. *J Bacteriol.* 2011; 193(3):744-758 [\* corresponding author]
- Kienesberger S; **Gorkiewicz G**; Wolinski H; Zechner EL New molecular microbiology approaches in the study of *Campylobacter fetus*. *Microb Biotechnol.* 2011; 4(1): 8-19.
- Amrein K; Posch U; Langner C; **Gorkiewicz G**; Högenauer C Transfusion-associated graft-versus-host disease presenting as severe high-volume diarrhoea in a patient with Goodpasture's syndrome. *Intensive Care Med.* 2010; 36(7):1271-1272
- Gorkiewicz, G\***; Kienesberger, S; Schober, C; Scheicher, SR; Güllly, C; Zechner, R; Zechner, EL A genomic island defines subspecies-specific virulence features of the host-adapted pathogen *Campylobacter fetus* subsp. *venerealis*. *J Bacteriol.* 2010; 192(2): 502-517. [\* corresponding author]
- Joainig, MM; **Gorkiewicz, G**; Leitner, E; Weberhofer, P; Zollner-Schwetz, I; Lippe, I; Feierl, G; Krause, R; Hinterleitner, T; Zechner, EL; Högenauer, C Cytotoxic effects of *Klebsiella oxytoca* strains isolated from patients with antibiotic-associated hemorrhagic colitis or other diseases caused by infections and from healthy subjects. *J Clin Microbiol.* 2010; 48(3):817-824
- Schoiswohl G; Schweiger M; Schreiber R; **Gorkiewicz G**; Preiss-Landl K; Taschler U; Zierler KA; Radner FP; Eichmann TO; Kienesberger PC; Eder S; Lass A; Haemmerle G; Alsted TJ; Kiens B; Hoefler G; Zechner R; Zimmermann R Adipose triglyceride lipase plays a key role in the supply of the working muscle with fatty acids. *J Lipid Res.* 2010; 51(3):490-499
- Gorkiewicz G\***, Kienesberger S., Schober C, Scheicher SR, Güllly C, Zechner R, Zechner EL. 2010. A genomic island defines subspecies-specific virulence features of the host-adapted pathogen *Campylobacter fetus* subsp. *venerealis*. *J Bacteriol* 192: 502-517. \* *corresponding author*
- Gorkiewicz G.** 2009. Nosocomial and antibiotic-associated diarrhoea caused by organisms other than *Clostridium difficile*. *Int J Antimicrob Agents* 33: S37-S41.
- Gürtl B, Kratky D, Guelly C, Zhang L, **Gorkiewicz G**, Das SK, Tamilarasan KP, Hoefler G. 2009. Apoptosis and fibrosis are early features of heart failure in an animal model of metabolic cardiomyopathy. *Int J Exp Pathol.* 90(3):338-46.
- Zollner-Schwetz I, Högenauer C, Joainig M, Weberhofer P, **Gorkiewicz G**, Valentin T, Hinterleitner TA, Krause R. 2008. Role of *Klebsiella oxytoca* in antibiotic-associated diarrhea. *Clin Infect Dis* 47: e74-e78.
- Kienesberger S, **Gorkiewicz G**, Joainig MM, Scheicher SR, Leitner E, Zechner EL. 2007.

- Development of experimental genetics tools for *Campylobacter fetus*. *Appl Environ Microbiol* 73: 4619-4630.
- Högenauer C, Langner C, Beubler E, Lippe IT; Schicho R, **Gorkiewicz G**, Krause R, Gerstgrasser N, Krejs GJ, Hinterleitner TA. 2006. *Klebsiella oxytoca* as a causative organism of antibiotic-associated hemorrhagic colitis. *N Engl J Med* 355: 2418-2426.
- Haemmerle G, Lass A, Zimmermann R, **Gorkiewicz G**, Meyer C, Rozman J, Heldmaier G, Maier R, Theussl C, Eder S, Kratky D, Wagner EF, Klingenspor M, Höfler G, Zechner R. 2006. Defective lipolysis and altered energy metabolism in mice lacking adipose triglyceride lipase. *Science* 312: 734-737.
- Lass A, Zimmermann R, Haemmerle G., Riederer M, Schoiswohl G, Schweiger M, Kienesberger P, Strauss JG, **Gorkiewicz G**, Zechner R. 2006. Adipose triglyceride lipase-mediated lipolysis of cellular fat stores is activated by CGI-58 (ABHD5) and defective in Chanarin-Dorfman Syndrome. *Cell Metab* 3: 309-319.
- Eisner A, Feierl G, **Gorkiewicz G**, Dieber F, Kessler HH, Marth E, Köfer J. 2005. High prevalence of VanA-type vancomycin-resistant Enterococci in Austrian poultry. *Appl Environ Microbiol.* 71(10):6407-9.
- Eisner A, **Gorkiewicz G**, Feierl G, Leitner E, Köfer J, Kessler HH, Marth E. 2005. Identification of glycopeptide-resistant enterococci by VITEK 2 system and conventional and real-time polymerase chain reaction. *Diagn Microbiol Infect Dis.* 53(1):17-21.
- Krause R, Auner HW, **Gorkiewicz G**, Wölfler A, Daxboeck F, Linkesch W, Krejs GJ, Wenisch C, Reisinger EC. 2004. Detection of catheter-related bloodstream infections by the differential-time-to-positivity method and gram stain-acridine orange leukocyte cytospin test in neutropenic patients after hematopoietic stem cell transplantation. *J Clin Microbiol.* 42(10):4835-7.
- Czermak C, Lehofer M, Wagner EM, Prietl B, **Gorkiewicz G**, Lemonis L, Rohrhofer A, Legl T, Schauenstein K, Liebmann PM. 2004. Reduced dopamine D3 receptor expression in blood lymphocytes of smokers is negatively correlated with daily number of smoked cigarettes: a peripheral correlate of dopaminergic alterations in smokers. *Nicotine Tob Res.* 6(1):49-54.
- Gorkiewicz G\***, Feierl G, Schober C, Dieber F, Köfer J, Zechner R, Zechner EL. 2003. Species-specific identification of campylobacters by partial 16S rRNA gene sequencing. *J Clin Microbiol.* 41(6):2537-46. \* *corresponding author*
- Krause R, Ramschak-Schwarzer S, **Gorkiewicz G**, Schnedl WJ, Feierl G, Wenisch C, Reisinger EC. 2002. Recurrent septicemia due to *Campylobacter fetus* and *Campylobacter lari* in an immunocompetent patient. *Infection.* 30(3):171-4.
- Gorkiewicz G\***, Feierl G, Zechner R, Zechner EL. 2002. Transmission of *Campylobacter hyointestinalis* from a pig to a human. *J Clin Microbiol.* 40(7):2601-5. \* *corresponding author*

### **9 – Selected oral presentations (invited only) / ausgewählte Vorträge (nur Einladungen)**

- The human microbiome and the development of colorectal cancer; 27th European Congress of Pathology. SEP 5-9, 2015; Belgrade, Serbia.
- The human gut microbiome – a promising diagnostic & therapeutic target; 27th European Congress of Pathology; SEP 5-9, 2015; Belgrade, Serbia.
- The Microbiom Österreichischen Gesellschaft für Gastroenterologie und Hepatologie (ÖGGH), Jahrestagung & Fortbildungskurs ; JUN 18-20; Salzburg, AUSTRIA.
- Diagnostic microbiota analysis possibilities & experiences, 2nd Theodor Escherich Symposium for Medical Microbiome Research; OKT 19; Graz, AUSTRIA.

- Immunpathologie der Spondylarthritiden aus der Sicht des Mikrobiota Spezialisten, From Bench to Bedside – Translationale Immunologie; MAI 23-24, 2014; Graz, AUSTRIA.
- Theorie der probiotischen Therapie; 1. Deutsche Mikrobiom-Tage der Deutschen Gesellschaft für Probiotische Medizin; SEP 26-27, 2014; Berchtesgaden, GERMANY.
- Diagnostic microbiome analysis; Nutritional lecture series; DEZ 16, 2014; Univ. Hohenheim, Stuttgart, GERMANY.
- Mikrobiom "Hope or Hype in der Gastroenterologie" 17. Gastroenterologisch-Hepatologisches Wintertreffen; MAR 18-21, 2014; Galtür, AUSTRIA.
- Early Mucosal Changes in Gastro Esophageal Reflux Disease – Histology; 2013; -Falk Workshop, Falk Symposium 189 on GERD and Eosinophilic Esophagitis; SEP 5-7; Graz, AUSTRIA.
- Pathophysiologie der Tumorkachexie; Arbeitsgemeinschaft für klinische Ernährung "Ernährung bei Tumorerkrankungen"; JAN 24, 2013; Wien, Austria.
- Pathophysiology of the GI microbiota; Annual meeting, Austrian Society for Antimicrobial Chemotherapy, joint with the Paul Ehrlich Society and the Slovenian Society of Chemotherapy; NOV 30-DEZ 1, 2012; Wien, Austria.
- Gastrointestinales-Mikrobiom und Immunsystem; OEPROM - Oesterreichische Gesellschaft fuer Probiotische Medizin; Dez 1, 2012; Wien, Austria
- Intestinal microbiota & immune system; abstract book. 2012; -43rd Annual Meeting - Austrian Society for Internal Medicine (OEGIM); SEP 17-19, 2012; Graz, Austria.
- Medicine meets microbial ecology understanding gastrointestinal diseases by microbial community analysis; -4th Annual Meeting - Austrian Association of Molecular Life Sciences and Biotechnology; SEP 17-19, 2012; Graz, Austria.
- Detection of microorganisms by new generation sequencing 26th Meeting of the Adriatic Society of Pathology; Jun 30- Jul 1, 2012; Split, Croatia.
- Comparative genetic analysis of Campylobacter fetus subspecies: model system for bacterial niche specificity and mucosal infection; -CampyGerms Campylobacter Conference ; OKT 14-15, 2011; Göttingen, Germany.
- Colonic microbiota alterations during diarrhea and new agents of antibiotic associated colitis Novartis Research Seminar; JAN 21, 2010; Siena, ITALY.
- Gastrointestinal microbiota in health and disease. Recent insights into this undiscovered biosphere by high-throughput pyrosequencing 4th Genome Sequencer FLX User Conference; JUN 15-17, 2010; Athens, GREECE.
- Colonic microbiota in health and disease. Recent insights into this undiscovered biosphere by high-throughput pyrosequencing Roche, GS Junior workshop; JUN 1, 2010; Vilvoorde, BELGIUM.
- Analysis of the human gut microbiota by massively parallel DNA pyrosequencing. -22nd European Congress of Pathology; SEP 4-9, 2009; Florence, ITALY.
- Nosocomial and antibiotic-associated diarrhoea, other agents than Clostridium difficile ISC International Conference - New Views on Clostridium difficile infections; 26-27.9.2008; Leipzig, Germany.
- Recent advances in molecular medicine Translating molecular technologies into clinical practice Siemens Corporate Research Symposium; MAY 29, 2008; Princeton, USA.
- Bedeutung der normalen Darmflora für Gesundheit und Krankheitsentstehung 39. ÖGIM Jahrestagung; 17-20.9.2008; Graz, Austria.

# Curriculum Vitae – ao Univ.-Prof. Dr. med. Univ. Christoph Högenauer

## 1 – Person / Allgemeine Angaben

<b>Name</b>	Christoph Högenauer, aoUniv.-Prof. Dr. med. univ., *12.02.1971, male
<b>Nationality</b>	Austria
<b>Address</b>	Department of Internal Medicine, Division of Gastroenterology and Hepatology, Medical University of Graz, Auenbruggerplatz 15, 8036 Graz, Austria Phone: +43 (0) 316 385 81786, E-Mail: <a href="mailto:christoph.hoegenauer@medunigraz.at">christoph.hoegenauer@medunigraz.at</a>
<b>Position</b>	associate professor, attending physician for Gastroenterology and Hepatology

## 2 – Academic Education / Akademische Ausbildung mit Abschluss

1990 - 1997	School of Medicine (Rigorousstudium Medizin O201), Karl-Franzens University Graz
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## 3 – Scientific Degrees / Wissenschaftliche Abschlüsse

2005	Habilitation (Internal Medicine), Medical University of Graz
1997	Promotion (Dr. med. univ.), Karl-Franzens University Graz

## 4 – Academic Appointments / Beruflicher Werdegang ab Studienabschluss

since 2012	Head of the “Theodor Escherich research unit for microbiome research” at the Medical University of Graz
2010	Board certification for Intensive Care Medicine
2007	Board certification for Gastroenterology and Hepatology
2005	Board certification for Internal Medicine
since 2005	Associate Professor and Attending Physician, Division of Gastroenterology and Hepatology, Department of Internal Medicine, Medical University of Graz, Austria
2000 - 2005	Fellow, Division of Gastroenterology, Department of Internal Medicine, Karl-Franzens University Graz, Austria. Chairman: Guenther Krejs, M.D.
1998 - 2000	Clinical Research Fellow for Gastroenterology, Baylor University Medical Center, Department of GI-Research, Dallas, TX, USA. Chairman: J.S. Fordtran, M.D.
1997 - 1998	Resident, Institute of Pathology and Department of Internal Medicine, University Graz, and Department of Psychiatry, Wagner Jauregg Hospital Linz, Austria

## 5 – Additional information / Sonstiges

since 2015	Head of the inflammatory bowel disease working group of the Austrian Society for Gastroenterology and Hepatology (ÖGGH)
since 2013	National representative of Austria for the European Crohn’s and Colitis Organisation (ECCO)



2007-2011 Head of the infectious diseases working group of the Austrian Society for Gastroenterology and Hepatology (ÖGGH)

## 6 – Honors ▪ Awards / Preise und Auszeichnungen

2007 Paracelsus-award, Austrian Society for Internal Medicine

## 7 – Externally funded projects / geförderte Drittmittelprojekte

### Principal Investigator:

- 2015 - ongoing Industrial sponsored academic research supported by industrial partner: Seres Therapeutics Inc., Cambridge USA  
Fecal Microbiota Transplantation for Ulcerative Colitis  
total amount of funding: € 233.300
- 2011 – 2014 Stand-alone project, project number: 14321, anniversary funds of the Österreichische Nationalbank: Typing of *Klebsiella oxytoca* Strains in Relation to Toxin-Production and their Association with Colitis  
total amount of funding: € 109.600
- 2007 – 2009 Stand-alone project: Hygiene Fonds Medical University of Graz : Role of *Klebsiella oxytoca* in the pathogenesis of antibiotic-associated colitis and other types of diarrhea and colitis  
total amount of funding: € 82.000

### Co-Investigator:

- 2015- current FWF- Programme Clinical Research: Colonic bacterial dysbiosis as a cause of infant proctocolitis. A prospective controlled study (P.I.: Karl Martin Hoffman, M.D. Department of Paediatrics, Medical University of Graz: € 244.000)
- 2016- current FWF- Programme Clinical Research: GPR55 and its lysophospholipid ligand: a potential proinflammatory and oncogenic axis in the colon (P.I.: Rudolf Schicho, Ph.D. Institute of Experimental and Clinical Pharmacology, Medical University of Graz: € 218.200)

## 8 – Publications / Publikationen

- Krause R, Halwachs B, Thallinger GG, Klymiuk I, Gorkiewicz G, Hoenigl M, Prattes J, Valentin T, Heidrich K, Buzina W, Salzer HJ, Rabensteiner J, Prüller F, Raggam RB, Meinitzer A, Moissl-Eichinger C, **Högenauer C**, Quehenberger F, Kashofer K, Zollner-Schwetz I. Characterisation of *Candida* within the Mycobiome/Microbiome of the Lower Respiratory Tract of ICU Patients. PLoS One. 2016 May 20;11(5):e0155033. doi: 10.1371/journal.pone.0155033
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- Prattes J, Raggam RB, Vanstraelen K; Rabensteiner J, **Högenauer C**, Krause R, Prüller, F, Wölfler A, Spriet I, Hoenigl M. Chemotherapy-Induced Intestinal Mucosal Barrier Damage: a Cause of Falsely Elevated Serum 1,3-Beta-d-Glucan Levels? J Clin Microbiol. 2016; 54(3):798-801
- Novacek G, Dejaco C, Gröchenig HP, **Högenauer C**, Knoflach P, Miehsler W, Moschen A, Petritsch W, Vogelsang H, Tilg H. 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. Zeitschrift für Gastroenterologie 2016 May;54(5):456-67. doi: 10.1055/s-0042-103694.

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- Stadlbauer V, Leber B, Lemesch S, Trajanoski S, Bashir M, Horvath A, Tawdrous M, Stojakovic T, Fauler G, Fickert P, **Högenauer C**, Klymiuk I, Stiegler P, Lamprecht M, Pieber TR, Tripolt NJ, Sourij H. *Lactobacillus casei* Shirota Supplementation Does Not Restore Gut Microbiota Composition and Gut Barrier in Metabolic Syndrome: A Randomized Pilot Study. *PLoS One*. 2015 Oct 28;10(10):e0141399. doi: 10.1371/journal.pone.0141399
- Bashir M, Prietl B, Tauschmann M, Mautner SI, Kump PK, Treiber G, Wurm P, Gorkiewicz G, **Högenauer C**, Pieber TR. Effects of high doses of vitamin D3 on mucosa-associated gut microbiome vary between regions of the human gastrointestinal tract. *European Journal of Nutrition* 2016 Jun;55(4):1479-89. doi: 10.1007/s00394-015-0966-2.
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- Leitner E, Zarfel G, Luxner J, Herzog K, Pekard-Amenitsch S, Hoenigl M, Valentin T, Feierl G, Grisold AJ, **Högenauer C**, Sill H, Krause R, Zollner-Schwetz I. Contaminated handwashing sinks as the source of a clonal outbreak of KPC-2-producing *Klebsiella oxytoca* on a hematology ward. *Antimicrobial Agents and Chemotherapy* 2015 Jan;59(1):714-6. doi: 10.1128/AAC.04306-14.
- Wenzl HH, Primas C, Novacek G, Teml A, Offerlbauer-Ernst A, **Högenauer C**, Vogelsang H, Petritsch W, Reinisch W. Withdrawal of Long-Term Maintenance Treatment with Azathioprine Tends to Increase Relapse Risk in Patients with Crohn's Disease. *Digestive Diseases and Science* 2015 May;60(5):1414-23. doi: 10.1007/s10620-014-3419-5.
- Durchschein F, Schreiber F, **Högenauer C**. Video capsule endoscopy in familial adenomatous polyposis: capsule entrapment in an anal stenosis. *Endoscopy* 2014;46 Suppl 1:E529-30. doi: 10.1055/s-0034-1377640
- Kump P, Krause R, Steininger C, Gröchenig HP, Moschen A, Madl C, Novacek G, Allerberger F, **Högenauer C**. Empfehlungen zur Anwendung der fäkalen Mikrobiotatransplantation „Stuhltransplantation“: Konsensus der Österreichischen Gesellschaft für Gastroenterologie und Hepatologie (ÖGGH) in Zusammenarbeit mit der Österreichischen Gesellschaft für Infektiologie und Tropenmedizin (OEGIT). *Zeitschrift für Gastroenterologie* 2014;52:1485-92. doi: 10.1055/s-0034-1385562
- Kump PK, Krause R, Allerberger F, **Högenauer C**. Fecal microbiota transplantation - the Austrian approach. *Clinical Microbiology and Infection* 2014;20: 1106-11. doi: 10.1111/1469-0691.12801.
- Schneditz G, Rentner J, Roier S, Pletz J, Herzog KA, Bückner R, Troeger H, Schild S, Weber H, Breinbauer R, Gorkiewicz G, **Högenauer C**, Zechner EL. Enterotoxicity of a nonribosomal peptide causes antibiotic-associated colitis. *Proceedings of the National Academy of Science of the United States of America* 2014;111:13181-6. doi: 10.1073/pnas.1403274111.
- Högenauer C**, Kump PK, Krause R. Tempered Enthusiasm for Fecal Transplantation? *Clinical Infectious Diseases* 2014;59:1348-9 doi: 10.1093/cid/ciu567.
- Jahnel J, Fickert P, Hauer AC, **Högenauer C**, Avian A, Trauner M. Inflammatory bowel disease alters intestinal bile acid transporter expression. *Drug Metabolism & Disposition* 2014;42:1423-31. doi: 10.1124/dmd.114.058065.

- Sturm EM, Radnai B, Jandl K, Stančić A, Parzmair GP, **Högenauer C**, Kump P, Wenzl H, Petritsch W, Pieber TR, Schuligoi R, Marsche G, Ferreirós N, Heinemann A, Schicho R. Opposing Roles of Prostaglandin D2 Receptors in Ulcerative Colitis. *Journal of Immunology* 2014;193:827-39. doi: 10.4049/jimmunol.1303484.
- Klymiuk I, **Högenauer C**, Halwachs B, Thallinger GG, Fricke WF, Steininger C. A physicians' wish list for the clinical application of intestinal metagenomics. *PLoS Medicine* 2014;11:e1001627. doi: 10.1371/journal.pmed.1001627.
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- from 1997 to 2007: A population-based study. *Journal of Crohns and Colitis* 2013; 7(1):58-69. doi: 10.1016/j.crohns.2012.03.012.
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imatinib (STI 571): effect of low dosage in an advanced tumour with exon 11 mutation. *European Journal of Gastroenterology and Hepatology* 2003; 15: 323-327.

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**Högenauer C**, Santa Ana CA, Porter JL, Millard M, Gelfand A, Rosenblatt RL, Prestidge CB, Fordtran JS. Active intestinal chloride secretion in human carriers of cystic fibrosis mutations: an evaluation of the hypothesis that heterozygotes have subnormal active intestinal chloride secretion. *American Journal of Human Genetics* 2000; 67: 1422-1427.

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## **9 – Selected oral presentations (invited only) / ausgewählte Vorträge (nur Einladungen)**

“Any future for fecal transplant as treatment strategy for IBD?”. Falk Symposium 201; Gut-Liver Interactions: From IBD to NASH, March 11 – 12, 2016, Innsbruck, AUSTRIA

“Mikrobiom, mukosales Immunsystem und Stuhltransplantation bei CED”. IBD Dach - in Diskussion; 15.-16. January 2016; Berlin, GERMANY. 2016.

“The true test – distinguishing CDI from an IBD flare”. United European Gastroenterology Week (UEGW); October 15-19, 2015; Barcelona, SPAIN.

“Why do we need to down-manipulate gut microbiota in diverticular disease?”. EAGEN Postgraduate course - advance on gut microbiota and fecal microbiota transplantation; September 10-11, 2014; Rome, ITALY..

“Fecal Transplantation - Procedure and Technical Issues”. EAGEN Postgraduate course - advance on gut microbiota and fecal microbiota transplantation; September 10-11, 2014; Rome, ITALY.

“Fecal transplantation in IBD”. 4th Postgraduate Course in IBD, Swiss IBD Net; November 20-22, 2014; Ermatingen, SWITZERLAND.

„Veränderungen der Darmmikroflora beim Reizdarmsyndrom“. 69. Jahrestagung der Deutschen Gesellschaft für Gastroenterologie, Verdauungs- und Stoffwechselkrankheiten; September 17-20, 2014; Leipzig, GERMANY

“*Klebsiella oxytoca* as a Cause of Antibiotic-Associated Colitis”. Infectious Diseases Society of America (IDSA) annual meeting, October 4-7, 2007 an Diego, USA

# Curriculum Vitae – Assoz. Univ.-Prof. Dr. rer. nat. Stefan Schild

## 1 – Person / Allgemeine Angaben

<b>Name</b>	Schild Stefan, Assoz. Univ.-Prof. Dr. rer. nat., *16.04.1976, male
<b>Nationality</b>	German
<b>Address</b>	Institut für Molekulare Biowissenschaften, Karl-Franzens Universität Humboldtstrasse 50, 1 <sup>st</sup> floor, 8010 Graz, Austria Phone: +43 (0) 316 380 1970, E-Mail: <a href="mailto:stefan.schild@uni-graz.at">stefan.schild@uni-graz.at</a>
<b>Position</b>	associate professor

## 2 – Academic Education / Akademische Ausbildung mit Abschluss

2002 - 2005	PhD thesis: “Role of the Lipopolysaccharide of pathogenic <i>Vibrio cholerae</i> strains in Virulence and Differentiation to environmental isolates.” Department of Hygienics and Microbiology, University of Würzburg, Germany
1996 - 2002	Study in Biology, University of Würzburg, Germany diploma exams: “very good with honors” including the diploma thesis (05/ 2001 - 01/ 2002): “Characterization of LPS core oligosaccharide biosynthesis gene products of <i>Vibrio cholerae</i> .” Research Center for Infectious Diseases, University of Würzburg, Germany

## 3 – Scientific Degrees / Wissenschaftliche Abschlüsse

2011	Habilitation (Microbiology), University of Graz
2005	Promotion (Dr. rer. nat.), University of Würzburg
2002	Diploma (Biology), University of Würzburg

## 4 – Academic Appointments / Beruflicher Werdegang ab Studienabschluss

since 2011	Associate Professor, Institute of Molecular Biosciences, University of Graz, Austria
2010 - 2011	Assistant Professor, Institute of Molecular Biosciences, University of Graz, Austria
2008 - 2010	University Assistant, Institute of Molecular Biosciences, University of Graz, Austria
2005 - 2008	Howard Hughes Medical Institute (HHMI) research associate in the lab of Dr. Andrew Camilli, Department of Molecular Biology & Microbiology, Tufts University, Boston, MA, USA

## 5 – Additional information / Sonstiges

since 2013	member of the ethic commission for animal research, Institute of Molecular Biosciences, University of Graz, Austria
since 2011	co-representative for biological safety BSL-2 and genetically modified organisms (GMOs), Institute of Molecular Biosciences, University of Graz, Austria

since 2008	Coordinator of animal research for the Dept. of Microbiology, Institute of Molecular Biosciences, University of Graz, Austria
since 2000	trained in special courses on laboratory animals certified by GV-Solas/FELASA, category B
1997 - 2002	Member of the students council of the faculty of Biology, University of Wuerzburg, Germany
	1998 - 1999 Speaker of the students council

## 6 – Honors ▪ Awards / Preise und Auszeichnungen

2014	Innovation award, Science Park Graz
2011	Travel award from the Land Steiermark
2009	Publication award from the Heinrich-Jörg Stiftung
2002 – 2005	PhD fellowship from the “Studienstiftung des deutschen Volkes”

## 7 – Externally funded projects / geförderte Drittmittelprojekte

starting in 2016	Stand-alone project P 27654 - Austrian Science Fund (FWF) “Characterization of genes induced during biofilm formation of <i>Vibrio cholerae</i> ” total amount of funding: 325.815,00 €
since 2016	FFG Basis project – industrial partner: “Origimm Biotechnology GmbH”, “Immunotherapy against <i>P. acnes</i> for treatment of acne vulgaris and implant associated infections” total amount of funding: 65.364,00 €/ year
2014 – 2017	principal investigator in the international PhD program “Doktoratskolleg DK: Molecular Enzymology” W901 - funding period 4 - Austrian Science Fund (FWF) total amount of funding: 4.200.000,00 € for 15 principal investigators
2013 – 2018	Stand-alone project P 25691 - Austrian Science Fund (FWF) “Outer membrane vesicles derived from Gram-negative enteric pathogens” total amount of funding: 305.760,00 €
2011 – 2015	Stand-alone project P 22986 - Austrian Science Fund (FWF) “Gene regulation in dynamic biofilms of <i>Vibrio cholerae</i> ” total amount of funding: 281.883,00 €
2011 – 2014	principal investigator in the international PhD program “Doktoratskolleg DK: Molecular Enzymology” W901 - funding period 3- Austrian Science Fund (FWF) total amount of funding: 4.000.000,00 € for 17 principal investigators

## 8 – Publications / Publikationen

- Pressler, K, Vorkapic, D, Lichtenegger S, Malli, G, Barilich, BP, Cakar F, Zingl FG, Reidl J, Feldman MF, **Schild S**. 2016. AAA+ proteases and their role in distinct stages along the *Vibrio cholerae* lifecycle. Int J Med Microbiol. In press, doi:10.1016/j.ijmm.2016.05.013
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- Leitner DR, Zingl FG, **Schild S**. 2015. A Glimpse on Outer Membrane Vesicles as Vaccine Candidates. J Vaccines Vaccin. 6:293. doi:10.4172/2157-7560.1000293.



- Vorkapic, D., Pressler, K., **Schild, S.** 2016. Multifaceted roles of extracellular DNA in bacterial physiology. *Curr Genet.* 62(1):71-9. doi: 10.1007/s00294-015-0514-x.
- Gumpfenberger T, Vorkapic D, Zingl FG, Pressler K, Lackner S, Seper A, Reidl J, **Schild S.** 2016. Nucleoside uptake in *Vibrio cholerae* and its role in the transition fitness from host to environment *Mol Microbiol.* Feb;99(3):470-83. doi: 10.1111/mmi.13143.
- Leitner DR, Lichtenegger S, Temel P, Zingl FG, Ratzberger D, Roier S, Schild-Prüfert K, Feichter S, Reidl J, **Schild S.** 2015. A combined vaccine approach against *Vibrio cholerae* and ETEC based on outer membrane vesicles. *Front Microbiol.* 6 (823) 10.3389/fmicb.2015.00823
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- Seper A, Pressler K, Kariisa A, Haid AG, Roier S, Leitner DR, Reidl J, Tamayo R, **Schild S.** 2014. Identification of genes induced in *Vibrio cholerae* in a dynamic biofilm system. *Int J Med Microbiol.* 304(5-6):749-763.
- Lichtenegger S, Bina I, Roier S, Bauernfeind S, Keidel K, **Schild S,** Anthony M, Reidl J. Characterization of lactate utilization and its implication on the physiology of *Haemophilus influenzae*. *Int J Med Microbiol.* 304(3-4):490-8.
- Seper A, Hosseinzadeh A, Gorkiewicz G, Lichtenegger S, Roier S, Leitner DR, Rohm M, Grutsch A, Reidl J, Urban CF, **Schild S.** 2013. *Vibrio cholerae* Evades Neutrophil Extracellular Traps by the Activity of Two Extracellular Nucleases. *PLoS Pathog* 9:e1003614.
- Leitner DR, Feichter S, Schild-Prüfert K, Rechberger GN, Reidl J, **Schild S.** 2013. Lipopolysaccharide modifications of a cholera vaccine candidate based on outer membrane vesicles reduce endotoxicity and reveal the major protective antigen. *Infect Immun* 81:2379-2393.
- Lees-Miller RG, Iwashkiw JA, Scott NE, Seper A, Vinogradov E, **Schild S,** Feldman MF. 2013. A common pathway for O-linked protein-glycosylation and synthesis of capsule in *Acinetobacter baumannii*. *Mol Microbiol* 89:816-830.
- Roier S, Fenninger JC, Leitner DR, Rechberger GN, Reidl J, **Schild S.** 2013. Immunogenicity of *Pasteurella multocida* and *Mannheimia haemolytica* outer membrane vesicles. *Int J Med Microbiol* 303:247-256.
- Moisi M, Lichtenegger S, Tutz S, Seper A, **Schild S\***, Reidl J\*. 2013. Characterizing the Hexose-6-Phosphate Transport System of *Vibrio cholerae*, a Utilization System for Carbon and Phosphate Sources. *J Bacteriol* 195:1800-1808. \*shared corresponding authors
- Roier S, Leitner DR, Iwashkiw J, Schild-Prüfert K, Feldman MF, Krohne G, Reidl J, **Schild S.** 2012. Intranasal Immunization with Nontypeable *Haemophilus influenzae* Outer Membrane Vesicles Induces Cross-Protective Immunity in Mice. *PLoS One* 7:e42664.
- Fengler VH, Boritsch EC, Tutz S, Seper A, Ebner H, Roier S, **Schild S,** Reidl J. 2012. Disulfide bond formation and ToxR activity in *Vibrio cholerae*. *PLoS One* 7:e47756.

- Iwashkiw JA, Seper A, Weber BS, Scott NE, Vinogradov E, Stratilo C, Reiz B, Cordwell SJ, Whittall R, **Schild S**, Feldman MF. 2012. Identification of a general O-linked protein glycosylation system in *Acinetobacter baumannii* and its role in virulence and biofilm formation. PLoS Pathog 8:e1002758.
- Seper A, Fengler VH, Roier S, Wolinski H, Kohlwein SD, Bishop AL, Camilli A, Reidl J, **Schild S**. 2011. Extracellular nucleases and extracellular DNA play important roles in *Vibrio cholerae* biofilm formation. Mol Microbiol 82:1015-1037.
- Bishop AL, **Schild S**, Patimalla B, Klein B, Camilli A. 2010. Mucosal immunization with *Vibrio cholerae* outer membrane vesicles provides maternal protection mediated by antilipoplysaccharide antibodies that inhibit bacterial motility. Infect. Immun. 78:4402-4420.
- Moisi M, Jenul C, Butler SM, New A, Tutz S, Reidl J, Klose KE, Camilli A, **Schild S**. 2009. A novel regulatory protein involved in motility of *Vibrio cholerae*. J Bacteriol 191:7027-7038.
- Schild S**, Nelson EJ, Bishop AL, Camilli A. 2009. Characterization of *Vibrio cholerae* outer membrane vesicles as a candidate vaccine for cholera. Infect Immun 77:472-484.
- Schild S**, Bishop AL, Camilli A. 2008. Ins and Outs of *Vibrio cholerae*. Microbe 3:131-136.
- Nelson EJ, Chowdhury A, Flynn J, **Schild S**, Bourassa L, Shao Y, LaRocque RC, Calderwood SB, Qadri F, Camilli A. 2008. Transmission of *Vibrio cholerae* is antagonized by lytic phage and entry into the aquatic environment. PLoS Pathog 4:e1000187.
- Schild S**, Nelson EJ, Camilli A. 2008. Immunization with *Vibrio cholerae* outer membrane vesicles induces protective immunity in mice. Infect Immun 76:4554-4563.
- Tamayo R, **Schild S**, Pratt JT, Camilli A. 2008. Role of cyclic Di-GMP during el tor biotype *Vibrio cholerae* infection: characterization of the in vivo-induced cyclic Di-GMP phosphodiesterase CdpA. Infect Immun 76:1617-1627.
- Song T, Mika F, Lindmark B, Liu Z, **Schild S**, Bishop A, Zhu J, Camilli A, Johansson J, Vogel J, Wai SN. 2008. A new *Vibrio cholerae* sRNA modulates colonization and affects release of outer membrane vesicles. Mol Microbiol 70:100-111.
- Schild S**, Tamayo R, Nelson EJ, Qadri F, Calderwood SB, Camilli A. 2007. Genes induced late in infection increase fitness of *Vibrio cholerae* after release into the environment. Cell Host Microbe 2:264-277.
- Berg T, **Schild S**, Reidl J. 2007. Regulation of the chitobiose-phosphotransferase system in *Vibrio cholerae*. Arch Microbiol 187:433-439.
- Schild S**, Lamprecht AK, Fourestier C, Lauriano CM, Klose KE, Reidl J. 2005. Characterizing lipopolysaccharide and core lipid A mutant O1 and O139 *Vibrio cholerae* strains for adherence properties on mucus-producing cell line HT29-Rev MTX and virulence in mice. Int J Med Microbiol 295:243-251.
- Schild S**, Lamprecht AK, Reidl J. 2005. Molecular and functional characterization of O antigen transfer in *Vibrio cholerae*. J Biol Chem 280:25936-25947.
- Schild S**, Reidl J. 2003. *Vibrio cholerae*: Ursache und Wirkung. BIOSpektrum 4:360-361.
- Nesper J, Kraiss A, **Schild S**, Blass J, Klose KE, Bockemuhl J, Reidl J. 2002. Comparative and genetic analyses of the putative *Vibrio cholerae* lipopolysaccharide core oligosaccharide biosynthesis (*wav*) gene cluster. Infect Immun 70:2419-2433.
- Nesper J\*, **Schild S**\*, Lauriano CM\*, Kraiss A, Klose KE, Reidl J. 2002. Role of *Vibrio cholerae* O139 surface polysaccharides in intestinal colonization. Infect Immun 70:5990-5996. \*shared first authors

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**9 – Patents / Patente**

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Roier S, Reidl J, **Schild S**. 2012. Vaccine against Pasteurellaceae. EP 2505208

**Schild S**, Nelson EJ, Camilli A. 2008. Cholera Vaccines. PCT/US08/879,292

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**10 – Selected oral presentations (invited only) / ausgewählte Vorträge (nur Einladungen)**

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"From outer membrane vesicles to nanoparticles: Therapeutic approaches to fight bacterial infections". University of Stuttgart Hohenheim. May 2015

"They are out there – OMVs as vaccine candidates". International Graduate School 1409, University Muenster. December 2014

"OMVs - Vaccine against Pasteurellaceae". Biovaria Munich. June 2013

"There and Back again: A Vibrio's tale". Research summit in Obergurgl of the DFG research program „Host-Adapted Metabolism of Bacterial Pathogens“. October 2012

"Outer membrane vesicles as vaccine candidates". New York University – Dept. of Medicine. September 2011.

"Bacterial pathogenesis of the gastrointestinal tract: *Vibrio cholerae* and cholera". University of Wuerzburg - Symposium Infectious Diseases. March 2010

"Microbial Pathogenesis: *Vibrio cholerae* and *Clostridium difficile*". Copenhagen – Symposium by MIMS. January 2010

"The facultative pathogen *Vibrio cholerae*: Insights into the lifecycle and a new vaccine approach". University of Umea. June 2009

"Research in the times of cholera". University of Osaka. March 2009

"Outer membrane vesicles: A novel vaccine candidate for cholera". Frontiers in *Vibrio* research. 82nd Annual Congress of Japanese Society of Bacteriology. March 2009

# Curriculum Vitae – Univ.-Prof. Dr. med.univ. Herbert Strobl

## 1 – Person / Allgemeine Angaben

<b>Name</b>	Strobl, Herbert Univ.-Prof. Dr. med.univ., *15.11.1964, male
<b>Nationality</b>	Austrian
<b>Address</b>	Institut für Pathophysiologie und Immunologie, Med Uni Graz Heinrichstrasse 31A, 8010 Graz, Austria Phone: +43 (0) 6767576195, E-Mail: <a href="mailto:herbert.strobl@medunigraz.at">herbert.strobl@medunigraz.at</a>
<b>Position</b>	Professor, chairman

## 2 – Academic Education / Akademische Ausbildung mit Abschluss

1998-2001	Post doctoral fellow, Department of Molecular Pharmacology, Stanford University (Laboratory of Garry P Nolan), CA, USA
1984-1991	Study of Medicine, MD, University of Vienna, Austria

## 3 – Scientific Degrees / Wissenschaftliche Abschlüsse

2002	Habilitation (Immunology), University of Vienna
1999	Board certification in Immunology (Austrian Doctor's association)
1991	Promotion (Dr. med. Univ.), University of Vienna

## 4 – Academic Appointments / Beruflicher Werdegang ab Studienabschluss

2015- present	Chairman, Institute of Pathophysiology and Immunology, MUG
2015-present	Member of Senat of Medical University of Graz
2012-present	Full Professor of Immunology, Institute of Pathophysiology and Immunology, Medical University Graz, Austria
2001-2012	Associate Professor, Head of Division “Molecular biology of hematopoietic stem cells and dendritic cells”; Institute of Immunology, Medical University Vienna, Austria (2001-2004 VIRCC at Novartis, A-1230; 2004-2012 VCC, A-1090)
1996-1998	Clinical training in internal medicine, gynecology and surgery, AKH Vienna, Krankenhaus Lainz, Vienna
1994-1998	Lab Head, Institute of Immunology-VIRCC at Novartis Research Institute, University of Vienna
1991-1994	Research fellow and MD specialization in Immunology, Institute of Immunology, University of Vienna (PI Walter Knapp)

## 5 – Additional information / Sonstiges

2009-present	Subcommittee member IUIS nomenclature of blood monocytes and dendritic cells
2014-present	Board member of the Lanyar Foundation, Graz
2015-present	Member of Senat of Medical University of Graz

## 6 – Honors ▪ Awards / Preise und Auszeichnungen (selected)

- 2000 START Prize, FWF, Austria
- 2008 Member of the Austrian Academy of Science (Junge Kurie)
- 2013 Karl Landsteiner Prize to Lab publication (Bauer, JEM 2012)
- 2014 Karl Landsteiner Prize to Lab publication (Yasmin, JEM 2013)

## 7 – Externally funded projects / geförderte Drittmittelprojekte

- 2016-2019 FWF W1241 Doktoratskolleg MOLIN 2<sup>nd</sup> funding period  
total amount of funding: 185.300 € / principal investigator
- 2013-2017 FWF P2572 Role of microRNAs in epidermal Langerhans cell differentiation  
total amount of funding: 308.000 €
- 2009-2012 FWF P22058 Lineage commitment of epidermal Langerhans dendritic cells  
total amount of funding: 368.000 €
- 2007-2017 FWF W1212 Doktoratskolleg IAI, funding periods 1-3,  
amount of funding: 542.000 € / principal investigator
- 2007-2010 FWF P19425 Transcriptional control of human dendritic cell development  
total amount of funding: 351.000 €
- 2006-2009 OeNB 12111 Immune regulation through signal integration by dendritic cells  
total amount of funding: 70.000 €
- 2005-2009 FWF F23 Establishment and maintenance of immunological tolerance (SFB)  
total amount of funding: 453.000 €
- 2003-2005 OeNB 10294 identification of immune-regulatory signalling circuits  
total amount of funding: 70.000 €
- 2001-2007 FWF Y156 Functional genomics of human dendritic cell development (START)  
total amount of funding: 1.090.000 €

## 8 – Publications / Publikationen

- Madhura, M; Majdic, O; Cejka, P; Jutz, S; Puck, A; Gerwien, J; Steinberger, P; Zlabinger, G; **Strobl, H**; Stöckl, J; Engagement of distinct epitopes on CD43 induces different co-stimulatory pathways in human T cells. 2016. Immunology, in press
- Jimenez, K; Khare, V; Evstatiev, R; Kulnigg-Dabsch, S; Jambrich, M; **Strobl, H**; Gasche, C. Increased expression of HIF2 $\alpha$  during iron deficiency-associated megakaryocytic differentiation. J Thromb Haemost. 2015; 13(6):1113-1127
- Koffel, R; Meshcheryakova, A; Warszawska, J; Hennig, A; Wagner, K; Jorgl, A; Gubi, D; Moser, D; Hladik, A; Hoffmann, U; Fischer, MB; van den Berg, W; Koenders, M; Scheinecker, C; Gesslbauer, B; Knapp, S; **Strobl, H**. Monocytic cell differentiation from band-stage neutrophils under inflammatory conditions via MKK6 activation (vol 124, pg
- Fric, J; Lim, CX; Mertes, A; Lee, BT; Viganò, E; Chen, J; Zolezzi, F; Poidinger, M; Larbi, A; **Strobl, H**; Zelante, T; Ricciardi-Castagnoli, P. Calcium and Calcineurin-NFAT Signaling Regulate Granulocyte-Monocyte Progenitor Cell Cycle via Flt3-L. Stem Cells. 2014; 32(12):3232-3244
- Köffel, R; Meshcheryakova, A; Warszawska, J; Hennig, A; Wagner, K; Jörgl, A; Gubi, D; Moser, D; Hladik, A; Hoffmann, U; Fischer, MB; van den Berg, W; Koenders, M; Scheinecker, C; Gesslbauer, B; Knapp, S; **Strobl, H** Monocytic cell differentiation from band-stage neutrophils under inflammatory conditions via MKK6 activation. Blood. 2014; 124(17):2713-2724
- Konradi, S; Yasmin, N; Haslwanter, D; Weber, M; Gesslbauer, B; Sixt, M; **Strobl, H**. Langerhans cell maturation is accompanied by induction of N-cadherin and the

- transcriptional regulators of epithelial-mesenchymal transition ZEB1/2. *Eur J Immunol.* 2014; 44(2):553-560
- Strobl, H.** Inflammatory Langerhans cell differentiation. *Blood.* 2014; 124(15):2319-2320
- Yasmin, N; Bauer, T; Modak, M; Wagner, K; Schuster, C; Köffel, R; Seyerl, M; Stöckl, J; Elbe-Bürger, A; Graf, D; **Strobl, H.** Identification of bone morphogenetic protein 7 (BMP7) as an instructive factor for human epidermal Langerhans cell differentiation. *J Exp Med.* 2013; 210(12):2597-2610
- Yasmin, N; Konradi, S; Eisenwort, G; Schichl, YM; Seyerl, M; Bauer, T; Stöckl, J; **Strobl, H.**  $\beta$ -Catenin promotes the differentiation of epidermal Langerhans dendritic cells. *J Invest Dermatol.* 2013; 133(5):1250-1259
- Bauer, T; Zagórska, A; Jurkin, J; Yasmin, N; Köffel, R; Richter, S; Gesslbauer, B; Lemke, G; **Strobl, H.** Identification of Axl as a downstream effector of TGF- $\beta$ 1 during Langerhans cell differentiation and epidermal homeostasis. *J Exp Med.* 2012; 209(11):2033-2047
- Steinleitner, K; Rampetsreiter, P; Köffel, R; Ramanathan, G; Mannhalter, C; **Strobl, H;** Wieser, R. EVI1 and MDS1/EVI1 Expression During Primary Human Hematopoietic Progenitor Cell Differentiation into Various Myeloid Lineages. *Anticancer Res.* 2012; 32(11):4883-4889
- Torzicky, M; Viznerova, P; Richter, S; **Strobl, H;** Scheinecker, C; Foedinger, D; Riedl, E. Platelet endothelial cell adhesion molecule-1 (PECAM-1/CD31) and CD99 are critical in lymphatic transmigration of human dendritic cells. *J Invest Dermatol.* 2012; 132(4):1149-1157
- Eisenwort, G; Jurkin, J; Yasmin, N; Bauer, T; Gesslbauer, B; **Strobl, H.** Identification of TROP2 (TACSTD2), an EpCAM-like molecule, as a specific marker for TGF- $\beta$ 1-dependent human epidermal Langerhans cells. *J Invest Dermatol.* 2011; 131(10):2049-2057
- Matutes, E; Pickl, WF; Van't Veer, M; Morilla, R; Swansbury, J; **Strobl, H;** Attarbaschi, A; Hopfinger, G; Ashley, S; Bene, MC; Porwit, A; Orfao, A; Lemez, P; Schabath, R; Ludwig, WD. Mixed-phenotype acute leukemia: clinical and laboratory features and outcome in 100 patients defined according to the WHO 2008 classification. *Blood.* 2011; 117(11):3163-3171
- Jurkin, J; Schichl, YM; Koeffel, R; Bauer, T; Richter, S; Konradi, S; Gesslbauer, B; **Strobl, H.** miR-146a is differentially expressed by myeloid dendritic cell subsets and desensitizes cells to TLR2-dependent activation. *J Immunol.* 2010; 184(9):4955-4965
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- Steiner, M; Attarbaschi, A; Dworzak, M; **Strobl, H;** Pickl, W; Kornmüller, R; Haas, O; Gadner, H; Mann, G; Austrian Berlin-Frankfurt-Münster Study Group. Cytochemically myeloperoxidase positive childhood acute leukemia with lymphoblastic morphology treated as lymphoblastic leukemia. *J Pediatr Hematol Oncol.* 2010; 32(1):e4-e7
- van Zijl, F; Mall, S; Machat, G; Bauer, T; Pirker, C; **Strobl, H;** Berger, W; Bilban, M; Mikulits, W. A UNIQUE HUMAN MODEL OF EPITHELIAL TO MESENCHYMAL TRANSITION REVEALS AXL AS A KEY REGULATOR OF HEPATOCELLULAR CARCINOMA PROGRESSION. *J Hepatol.* 2010; 52: S351-S352.
- Ziegler-Heitbrock, L; Ancuta, P; Crowe, S; Dalod, M; Grau, V; Hart, DN; Leenen, PJ; Liu, YJ; MacPherson, G; Randolph, GJ; Scherberich, J; Schmitz, J; Shortman, K; Sozzani, S;

- Strobl, H**; Zembala, M; Austyn, JM; Lutz, MB. Nomenclature of monocytes and dendritic cells in blood. *Blood*. 2010; 116(16):e74-e80
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- Platzer, B; Richter, S; Kneidinger, D; Waltenberger, D; Woisetschläger, M; **Strobl, H**. Aryl hydrocarbon receptor activation inhibits in vitro differentiation of human monocytes and Langerhans dendritic cells. *J Immunol*. 2009; 183(1):66-74
- Richter, S; Platzer, P; Woisetschläger, M; Waltenberger, D; **Strobl, H**. ARYL HYDROCARBON RECEPTOR ACTIVATION PERTURBS MYELOID SUBLINEAGE DIFFERENTIATION BY INHIBITING PU.1 UPREGULATION. *HAEMATOL-HEMATOL J*. 2009; 94: 3-3.
- Jurkin, J; Gobel, F; Taschner-Mandl, S; Lang, R; **Strobl, H**. A functional genetic approach to identify factors involved in Langerhans cell differentiation. *WIEN KLIN WOCHENSCHR*. 2008; 120: 81-81.
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- Richter, S; Platzer, B; Waltenberger, D; Woisetschläger, M; **Strobl, H**. Aryl hydrocarbon receptor (AhR) activation perturbs myeloid sublineage differentiation by inhibiting PU.1 upregulation. *WIEN KLIN WOCHENSCHR*. 2008; 120: 95-96.
- Strehl, S; Nebral, K; König, M; Harbott, J; **Strobl, H**; Ratei, R; Struski, S; Bielgorai, B; Lessard, M; Zimmermann, M; Haas, OA; Izraeli, S. ETV6-NCOA2: a novel fusion gene in acute leukemia associated with coexpression of T-lymphoid and myeloid markers and frequent NOTCH1 mutations. *Clin Cancer Res*. 2008; 14(4):977-983
- Jörgl, A; Platzer, B; Taschner, S; Heinz, LX; Höcher, B; Reisner, PM; Göbel, F; **Strobl, H**. Human Langerhans-cell activation triggered in vitro by conditionally expressed MKK6 is counterregulated by the downstream effector RelB. *Blood*. 2007; 109(1):185-193
- Taschner, S; Koesters, C; Platzer, B; Jörgl, A; Ellmeier, W; Benesch, T; **Strobl, H**. Down-regulation of RXRalpha expression is essential for neutrophil development from granulocyte/monocyte progenitors. *Blood*. 2007; 109(3):971-979
- Heinz, LX; Platzer, B; Reisner, PM; Jörgl, A; Taschner, S; Göbel, F; **Strobl, H**. Differential involvement of PU.1 and Id2 downstream of TGF-beta1 during Langerhans-cell commitment. *Blood*. 2006; 107(4):1445-1453
- Mann, G; Attarbaschi, A; Steiner, M; Simonitsch, I; **Strobl, H**; Urban, C; Meister, B; Haas, O; Dworzak, M; Gadner, H; Austrian Berlin-Frankfurt-Münster (BFM) Group. Early and reliable diagnosis of non-Hodgkin lymphoma in childhood and adolescence: contribution of cytomorphology and flow cytometric immunophenotyping. *PEDIATR HEMATOL ONCOL*. 2006; 23(3): 167-176.
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- Scholz, W; Platzer, B; Schumich, A; Höcher, B; Fritsch, G; Knapp, W; **Strobl, H**. Initial human myeloid/dendritic cell progenitors identified by absence of myeloperoxidase protein expression. *Exp Hematol*. 2004; 32(3):270-276
- Hertel, L; Lacaille, VG; **Strobl, H**; Mellins, ED; Mocarski, ES. Susceptibility of immature and mature Langerhans cell-type dendritic cells to infection and immunomodulation by human cytomegalovirus. *J Virol*. 2003; 77(13):7563-7574
- Strobl, H**. Molecular mechanisms of dendritic cell sublineage development from human hematopoietic progenitor/stem cells. *Int Arch Allergy Immunol*. 2003; 131(2):73-79
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- Riedl, E; Stöckl, J; Majdic, O; Scheinecker, C; Knapp, W; **Strobl, H**. Ligation of E-cadherin on in vitro-generated immature Langerhans-type dendritic cells inhibits their maturation. *Blood*. 2000; 96(13):4276-4284
- Riedl, E; Stöckl, J; Majdic, O; Scheinecker, C; Rappersberger, K; Knapp, W; **Strobl, H**. Functional involvement of E-cadherin in TGF-beta 1-induced cell cluster formation of in vitro developing human Langerhans-type dendritic cells. *J Immunol*. 2000; 165(3):1381-1386
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## 9 – Patents / Patente

Strobl, H. 2002. US6498034 B1: Method of producing dendritic cells, assignee: Novartis AG

## 10 – Selected oral presentations (invited only) / ausgewählte Vorträge (nur Einladungen)

ENII-EFIS conference, Capo Caccia, Sardinia, Italy, May 20-25, 2006

European Macrophage and Dendritic Cell Society (EMDS) and DC-THERA European Network of Excellence , Brescia 17<sup>th</sup> to 20<sup>th</sup> September 2008

2nd European Congress of Immunology (ECI 2009), 13.-16. September 2009, Berlin - ICC

11<sup>th</sup> International Workshop on Langerhans Cells, Sept 3<sup>rd</sup> to 6<sup>th</sup>, 2009, Funchal, Madeira, Portugal

6<sup>th</sup> International Aachen Symposium on Cytokine Signalling, organized by SFB 542 and RWTH Aachen April 23-24, 2010

12th International Workshop on Langerhans cells, Innsbruck, Austria November 3. - 6. 2011

Keystone symposium: TGF-beta in immune responses-from bench to bedside, January 7-12, 2011

13. intl Workshop on Langerhans cells, Amsterdam. 10.-13.10.2013.

Keystone symposium: Understanding dendritic cell biology to advance disease therapy, March 3-8, 2013

Else-Körner-Lecture, Würzburg, July 18, 2016

Keystone symposium: TGF-beta in immunity, inflammation and cancer, January 9-13, 2017

# Curriculum Vitae – Ao. Univ.-Prof. Dr. rer. nat. Ellen L. Zechner

## 1 – Person / Allgemeine Angaben

<b>Name</b>	Ellen L. Zechner, Ao. Univ.-Prof. Dr. rer. nat.,
<b>Nationality</b>	USA and AUT
<b>Address</b>	Institute of Molecular Biosciences, University of Graz Humboldtstrasse 50, 1 <sup>st</sup> floor, 8010 Graz, Austria Phone: +43 (0) 316 380 5624, E-Mail <a href="mailto:ellen.zechner@uni-graz.at">ellen.zechner@uni-graz.at</a>
<b>Position</b>	associate professor

## 2 – Academic Education / Akademische Ausbildung mit Abschluss

1986 -1991	Ph.D. in Molecular Biology, Sloan-Kettering Division, Cornell University, Graduate School of Medical Sciences, New York, USA
1979-1983	B.A. degree in Chemistry and Biology, Oberlin College, Oberlin, USA

## 3 – Scientific Degrees / Wissenschaftliche Abschlüsse

2001	Habilitation (Molecular Microbiology), University of Graz
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## 4 – Academic Appointments / Beruflicher Werdegang ab Studienabschluss

Sept. 2016-2020	Vice President of the Austrian Science Fund (FWF), Biology and Medicine Section
2011-Sept 2016	Austrian Science Fund (FWF), Full Member of the <i>Kuratorium</i> Fields of Genetics, Microbiology and Biotechnology
since 2015	Vice Dean of the Natural Sciences Faculty, University of Graz
since 2001	Ao. University Professor, Institute of Molecular Biosciences, University of Graz,
1999 - 2001	Assistant Professor, Institute of Molecular Biosciences, University of Graz
1994 -1999	University Assistant, Institute of Microbiology, University of Graz
1992 - 1994	Postdoctoral fellow, Institute of Microbiology, University of Graz

## 5 – Additional information / Sonstiges

since 2013	Advisory Board, <i>Doktoratskolleg</i> Molecular Fundamentals of Inflammation (MOLIN), Medical University of Graz
since 2016	NAWI-Graz Steering Committee, University of Graz / Technical University of Graz cooperative research and teaching program
since 2016	Supervisory Board, Doctoral Academy Graz
2009 - 2016	Spokesperson for the University of Graz core research area “Molecular Enzymology and Physiology”
2007 - 2016	Director, Doctoral School of Molecular Biology and Biochemistry, University of Graz
2006 - 2015	University of Graz representative, COIMBRA Universities’ Task Force “Doctoral Studies and Research”

2006 - 2008	Treasurer, International Society for Plasmid Biology and other Mobile Genetic Elements
since 2005	Director of the FWF-financed <i>Doktoratskolleg</i> Molecular Enzymology, University of Graz and Graz University of Technology, Austria
Since 2004	Trustee, Brian M. Wilkins Research Fund

## **6 – Honors - Awards / Preise und Auszeichnungen**

2014/ 2015	Prizes awarded for Schneditz, G. et al. (2014) Enterotoxicity of a nonribosomal peptide causes antibiotic-associated colitis. <i>Proc Natl Acad Sci U S A</i> 111: 13181-13186  (10,000 €) Top Abstract award, United European Gastroenterologists, Berlin  (4,000 €) Wewalka Prize, Salzburg
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## **7 – Selected externally funded projects (last 5 yrs only) / geförderte Drittmittelprojekte**

2015 - 2016	BioTechMed-Graz: Bacterial Metabolite signal molecules in the intestinal microbiota: Who is talking? Who is listening? total amount of funding: 155.000,00 €
2014 - 2019	FWF: W901 Doktoratskolleg: Molecular Enzymology (Director) total amount of funding (in period 4): 5.170.000,00 € for 15 principal investigators
2011 – 2016	Stand-alone project P24016 - Austrian Science Fund (FWF) “Regulation of the initiation of bacterial type IV secretion” total amount of funding: 326.400,00 €
2011 – 2014	EFRE / Land Steiermark: “Bacterial type IV protein translocation and Catheter-associated urinary tract infections” total amount of funding: 390.000,00 €
2009 - 2012	Stand-alone project P 21434 - Austrian Science Fund (FWF) “Genetic analysis of bacterial biofilm formation and migration on urethral catheters” (co-PI with A. Reisner) total amount of funding: 276,180,00 €
2011 – 2014	FWF: W901 Doktoratskolleg: Molecular Enzymology (Director) total amount of funding (in period 3): 4.044.972,00 € for 17 principal investigators

## **8 – Publications / Publikationen**

- Gruber, CJ, Lang, S, Rajendra, VKH, Nuk, M, Raffl, S, Schildbach JF, **Zechner EL**. 2016. “Conjugative DNA transfer is enhanced by plasmid R1 partitioning proteins”. *Frontiers in Molecular Biosciences*, in press.
- Kienesberger, S., L. M. Cox, A. Livanos, X.-S. Zhang, J. Chung, G. I. Perez-Perez, G. Gorkiewicz, **E. L. Zechner** & M. J. Blaser 2016. Gastric *Helicobacter pylori* infection affects local and distant microbial populations and host responses. *Cell Rep* 14(6):1395-407 doi: 10.1016/j.celrep.2016.01.017
- Schneditz, G., J. Rentner, S. Roier, J. Pletz, K. A. Herzog, R. Bucker, H. Troeger, S. Schild, H. Weber, R. Breinbauer, G. Gorkiewicz, C. Högenauer & **E. L. Zechner**, 2014. Enterotoxicity of a nonribosomal peptide causes antibiotic-associated colitis. *Proc Natl Acad Sci U S A* 111: 13181-13186.
- Kienesberger, S., H. Sprenger, S. Wolfgruber, B. Halwachs, G. G. Thallinger, G. I. Perez-Perez, M. J. Blaser, **E. L. Zechner**, and G. Gorkiewicz. 2014. Comparative genome

- analysis of *Campylobacter fetus* subspecies revealed horizontally acquired genetic elements important for virulence and niche specificity. *PLoS One* **9**:e85491.
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- Gibert, M., Juarez, A., **Zechner, E. L.**, Madrid, C., Balsalobre, C., 2014. TrhR, TrhY and HtdA, a novel regulatory circuit that modulates conjugation of the IncHI plasmids. *Mol Microbiol*. 94: 1146-1161
- Lang, S., C. J. Gruber, S. Raffl, A. Reisner, and **EL Zechner**. 2014. A common requirement for the relaxosome of plasmid R1 in multiple activities of the conjugative type IV secretion system. *J Bacteriol* **196**: 2108-2121.
- Redzej, A., A. Ilangovan, S. Lang, C. J. Gruber, M. Topf, K. Zangger, **E. L. Zechner**, and G. Waksman. 2013. Structure of a translocation signal domain mediating conjugative transfer by type IV secretion systems. *Mol Microbiol* 89:324-333. doi: 10.1111/mmi.12275.
- Sprenger, H, **Zechner, EL**, Gorkiewicz, G., 2012. So close and yet so far - Molecular microbiology of *Campylobacter fetus* subspecies. *Eur J of Microbiol Immunol* 2012, 2 (1), 66-75. DOI:10.1556/EuJMI.2.2012.1.10
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- Lang, S.; Kirchberger, P.C.; Gruber, C.J.; Redzej, A.; Raffl, S.; Zellnig, G.; Zangger, K.; **Zechner, EL**, 2011. An activation domain of plasmid R1 Tral protein delineates stages of gene transfer initiation. *Mol Microbiol*, 82 (5), 1071-1085. DOI:10.1111/j.1365-2958.2011.07872.x
- Kienesberger, S., Schober Trummler, C., Fauster, A., Lang, S., Sprenger, H., Gorkiewicz and **E. L. Zechner**. 2011. Interbacterial Macromolecular Transfer by the *Campylobacter fetus* subsp. *venerealis* Type IV Secretion System. *J. Bacteriol.* 193:744-58.
- Lang, S., K. Gruber, S. Mihajlovic, R. Arnold, C. J. Gruber, S. Steinlechner, A. Jehl, T. Rattei, K. U. Fröhlich, and **E. L. Zechner**. 2010. Molecular recognition determinants for type IV secretion of diverse families of conjugative relaxases. *Mol. Microbiol.* 78:1539-1555.
- F. de la Cruz, L.S. Frost, R.J. Meyer and **E.L. Zechner**. 2010. Conjugative DNA Metabolism in Gram-negative Bacteria" *FEMS Microbiol. Rev.* 34:18-40.
- G. Gorkiewicz, Kienesberger, S., Schober, C., Scheicher, S.R., Gully, C., Zechner, R. and **E. L. Zechner**. 2010. A Genomic Island defines subspecies-specific Virulence Features of the host adapted Pathogen *Campylobacter fetus* subsp. *venerealis*. *J. Bacteriol.* 192:502-17.
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- Blaser, M. J., Newell, D. G., Thompson, S. A., and **E. L. Zechner**. 2008. Pathogenesis of *Campylobacter fetus*. In *Campylobacter*, 3rd Ed. (I. Nachamkin, C.M. Szymanski, and M. J. Blaser, eds) ASM Press, Washington, D.C., pp401-28. ISBN-13: 9781555814373
- Kienesberger, S., Gorkiewicz, G., Joainig, M. M., Scheicher, S. R., Leitner, E., **Zechner, E. L.** 2007. Development of experimental genetic tools for *Campylobacter fetus*. *Appl Environ Microbiol.* 73, 4619-30.

- Reisner, A., Krogfelt, K. A., Klein, B. M., **Zechner, E. L.**, Molin, S. 2006. In vitro biofilm formation of commensal and pathogenic *Escherichia coli* strains: impact of environmental and genetic factors. *J Bacteriol.* 188, 3572-81.
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- Reisner A, Haagensen JA, Schembri MA, **Zechner EL**, Molin S. Development and maturation of *Escherichia coli* K-12 biofilms. *Mol Microbiol.* 2003 May;48(4):933-46.
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- Schröder G, Krause S, **Zechner EL**, Traxler B, Yeo HJ, Lurz R, Waksman G, Lanka E. TraG-like proteins of DNA transfer systems and of the *Helicobacter pylori* type IV secretion system: inner membrane gate for exported substrates? *J Bacteriol.* 2002 May;184(10):2767-79.
- Karl W, Bamberger M, **Zechner EL.** Transfer protein TraY of plasmid R1 stimulates Tral-catalyzed oriT cleavage in vivo. *J Bacteriol.* 2001 Feb;183(3):909-14.
- Grohmann E, Moscoso M, **Zechner EL**, del Solar G, Espinosa M. In vivo definition of the functional origin of leading strand replication on the lactococcal plasmid pFX2. *Mol Gen Genet.* 1998 Oct;260(1):38-47.
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- Zechner EL**, Wu CA, Marians KJ. Coordinated leading- and lagging-strand synthesis at the Escherichia coli DNA replication fork. II. Frequency of primer synthesis and efficiency of primer utilization control Okazaki fragment size. *J Biol Chem.* 1992 Feb 25;267(6):4045-53.
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- Zechner EL**, Wu CA, Marians KJ. Coordinated leading- and lagging-strand synthesis at the Escherichia coli DNA replication fork. III. A polymerase-primase interaction governs primer size. *J Biol Chem.* 1992 Feb 25;267(6):4054-63.



**Patents of the consortium members (complete list)**

<b>Authors</b>	<b>Patent Information</b>	<b>Year</b>
Schweiger M, Romauch M, Zimmermann R, Mayer N, <b>Breinbauer R.</b>	US9206115 B2: ATGListatin and pharmaceutical composition comprising the same	2015
Schweiger M, Romauch M, Zimmermann R, Mayer N, Fuchs E, <b>Breinbauer R.</b>	WO2014114649 A: Lipase inhibitors.	2014
Quaedflieg PJLM, Nuijens T, Strohmeier G, <b>Breinbauer R</b> , Schroeder H.	WO 2013135786 A1: Enzymatic peptide synthesis.	2013
Waldmann H, Köhn M, <b>Breinbauer R</b> , Nüsse D, Voges E.	DE 102005032038A1: Entwicklung einer ortsspezif., chemoselekt., und gerichteten photochem. Mikrostrukturierungstechnik für bio- und material-wissenschaftl. Anwendungen.	2007
Roier S, Reidl J, <b>Schild S.</b>	EP 2505208: Vaccine against Pasteurellaceae.	2012
<b>Schild S</b> , Nelson EJ, Camilli A.	WO2009049013 A2: Cholera Vaccines.	2008
<b>Strobl H</b>	US6498034 B1: Method of producing dendritic cells, assignee: Novartis AG	2002

**Research grants of the consortium members (complete list)**

PI	Funding Org.	Project Number	Research topic	Amount funded [kEuro]	Funding Period
Breinbauer, Schild, Zechner	FWF/ University Support	W901	DK Molecular Enzymology, funding period 4, (Director: E. Zechner)	322 / PI	2014-2017
Breinbauer, Schild, Zechner	FWF/ University Support	W901	DK Molecular Enzymology, funding period 3, (Director: E. Zechner)	237 / PI	2011-2014
Breinbauer Zechner	FWF/ University Support	W901	DK Molecular Enzymology, funding period 2, (Director: E. Zechner)	228 / PI	2008-2011
Gorkiewicz Strobl	FWF/ University Support	W1241	DK Molecular fundamentals of Inflammation, funding period 2	185 / PI	2016-2019
Breinbauer	FWF	I 2712	Electrooxidative Synthesis of Bis- and Oligoarenes	174	2015-2018
Breinbauer	FWF	P 28286	Development of Small Molecule Inhibitors Targeting Human Adipose Triglyceride Lipase	356	2015-2018
Breinbauer	FFG	COMET-K2	Austrian Centre of Industrial Biotechnology	350	2015-2019
Breinbauer	FWF	I 1722-B22	A twofold retrosynthetic implementation of a novel biochemical pathway (RETROBIO)	155	2014-2017
Breinbauer	EU	Inn. Med. Initiative (Chem 21)	Biocatalytic Synthesis of Active Pharmaceutical Ingredients (Coordinator: Prof. N. J. Turner, Manchester/UK)	216	2012-2015
Breinbauer	FWF	I 668-N17	Exploring and Controlling Phenazine Biosynthesis with Chemical Biology	140	2011-2014

Breinbauer	FWF	TRP TRP 4-B19	Development of Inhibitors of ATGL (Coordinator: PD R. Zimmermann, KFU Graz)	63	2010-2013
Breinbauer	FFG	COMET-K2	Austrian Centre of Industrial Biotechnology	650	2010-2014
Breinbauer	FFG	A3-plus	Safe Hydrogen Storage (with Proionic, OMV)	29	2010-2011
Breinbauer	FFG/BMWF	GEN-AU	PLACEBO (Coordinator: Prof. Superti-Furga, CeMM Vienna) Subproject 3: Chemical Libraries	194	2008-2012
Gorkiewicz Zechner	FWF	P20479	Comparative Analysis of <i>Campylobacter fetus</i> virulence mechanisms	234	2008-2013
Gorkiewicz	FWF/ University Support	W1241	DK Molecular fundamentals of Inflammation, funding period 1	185 / PI	2013-2016
Gorkiewicz	BioTechMed-Graz	-	Metagenomics for functional analyses and modeling of microbiome data	127	2015-2016
Högenauer	Seres Therapeutics Inc., Cambridge USA	-	Fecal Microbiota Transplantation for Ulcerative Colitis	233	Since 2015
Högenauer	ÖNB	14321	Typing of <i>Klebsiella oxytoca</i> Strains in Relation to Toxin-Production and their Association with Colitis	110	2011-2014
Högenauer	Hygiene Fonds, University Support	-	Role of <i>Klebsiella oxytoca</i> in the pathogenesis of antibiotic-associated colitis and other types of diarrhea and colitis	82	2007-2009
Schild	FWF	P 27654	Characterization of <i>Vibrio cholerae</i> biofilms	329	2016 - 2021
Schild	FWF	P 25691	Outer membrane vesicles of enteric pathogens	306	2013-2018

Schild	FWF	P 22986	Gene regulation in dynamic biofilms	282	2011-2015
Strobl	FWF	P 22058	Lineage commitment of epidermal Langerhans dendritic cells	368	2009-2012
Strobl	FWF	P 25720	Role of microRNAs in epidermal Langerhans cell differentiation	308	2013-2017
Strobl	FWF	W 1212	DK Inflammation and Immunity, funding periods 1-3	542 / PI	2007-2017
Zechner	University Support	-	Bacterial communication and competition in the human intestine	193	2016-2019
Zechner	BioTechMed-Graz	-	Bacterial metabolite signal molecules in the intestinal microbiota	155	2014-2017
Zechner	FWF	P24016	Regulation of the initiation of bacterial type IV secretion	326	2011-2016
Zechner	EU EFRE / County of Styria	-	Bacterial type IV protein translocation and Catheter-associated urinary tract infections	310	2011-2014
Zechner	FWF	P21434	Genetic analysis of bacterial biofilm formation and migration on urethral catheters (co-PI: A. Reisner)	276	2009-2012

**Prizes and awards of the consortium members (complete list)**

PI	Prize/ Award	Year
Breinbauer, Gorkiewicz, Högenauer, Schild, Zechner	Wewalka Prize 2015, Salzburg + Top Abstract Prize 2014, United European Gastroenterologists, Berlin for the publication: Schneditz G, Rentner J, Roier S, Herzog KAT, Bückner R, Tröger H, <b>Schild S</b> , Weber H, <b>Breinbauer R</b> , <b>Gorkiewicz G</b> , <b>Högenauer C</b> , <b>Zechner EL</b> . 2014. Enterotoxigenicity of a nonribosomal peptide causes antibiotic-associated colitis. PNAS. 111(36):13181-13186.	2015 and 2014
Breinbauer	Thieme Chemistry Journal Award	2000
Breinbauer	Liebig Scholarship (Fonds der Chemischen Industrie, Frankfurt)	2000
Breinbauer	Call for Full Professorship Organic Chemistry, University of Linz/A	2007
Högenauer	Paracelsus-award, Austrian Society for Internal Medicine	2007
Schild	Innovation Award, Life Science Park Styria, Graz	2014
Schild	Travel award from the Land Steiermark	2011
Schild	Publication award from the Heinrich-Joerg Stiftung	2009
Schild	PhD Travel award to the DGHM 2006 from the University of Wuerzburg	2006
Schild	PhD fellowship from the "Studienstiftung des deutschen Volkes"	2002 - 2005
Strobl	Karl Landsteiner Prize to Strobl lab publication Bauer, JEM 2012	2013
Strobl	Karl Landsteiner Prize to Strobl lab publication Yasmin, JEM 2013	2014

**Examples of Leadership in industrial innovation of the consortium members (complete list)**

PI	Project	Period
Breinbauer	Key Researcher in COMET-K2-Center Austrian Centre of Industrial Biotechnology (Industrial Cooperation with DSM, Sandoz, Bisy GmbH)	2000-2019
Schild	Research collaborator and advisor of “Origimm Biotechnology GmbH”, Vienna, including Basis program project 853729 – FFG Austria, “Immunotherapy against <i>P. acnes</i> for treatment of acne vulgaris and implant associated infections” Academic and clinical consortium members: T. Decker (University of Vienna, Austria), D. Stoiber-Sakaguchi (University of Vienna, Austria), O. A. Olexeyev (Umea University, Sweden), A. Trampuz (Charite University of Medicine, Berlin, Germany), <b>S. Schild (University of Graz, Austria)</b>	since 2016
Gorkiewicz, Högenauer	Research collaboration with industrial partner Seres Therapeutics Inc., Cambridge USA. “Fecal Microbiota Transplantation for Ulcerative Colitis”	2015-2017