

## CV Pavel Kovarik, PhD, Prof. of Immunobiology

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<http://www.mfpl.ac.at/groups/mfpl-group/group-info/kovarik.html>

**Place of Birth** Brno, Czech Republic

### Areas of research

The research of the lab addresses the regulation of immune responses in the following areas:

**1) Responses of the innate immune system to the human pathogen *Streptococcus pyogenes*.** This project characterizes key events of the innate immune response to infection with *S. pyogenes* using animal models and *in vitro* infections. Bacterial components as well as immune cell receptors critically involved in the host defense are examined.

**2) Role of mRNA decay in inflammation, infection and immune homeostasis.** The project focuses on regulatory circuit that controls the timely removal of inflammatory mRNAs by the mRNA-destabilizing protein tristetraprolin (TTP). The role of TTP in models of inflammatory and infectious diseases (employing conditional TTP ablation) is also investigated.

**3) Control of transcription of inflammatory genes by the Jak-Stat signaling pathway.** In this project the transcription cycle and the regulation of transcription initiation by Stat1 and the Mediator complex is investigated. The aim is to reveal the mechanism that continuously couples the transcription intensity to the strength of external inflammatory signals.

### Career details

#### Current position

2012 - present Professor of Immunobiology, MFPL, University of Vienna, Austria  
2009 - present Deputy head at the Department of Microbiology and Immunobiology, MFPL, University of Vienna

#### Previous positions

2003 – 2011 Group leader and Associate Professor, tenured, MFPL, University of Vienna  
2003 “Venia legendi” (Habilitation) in Immunobiology, University of Vienna MFPL, University of Vienna  
2000 - 2003 Assistant Professor, tenure track, Institute of Microbiology and Genetics, University of Vienna  
1996 - 1999 Postdoc, Thomas Decker laboratory (JAK-STAT signaling) Institute of Microbiology and Genetics, University of Vienna  
1995 Postdoc, Lisa Ballou laboratory (S6 kinase signaling) Institute of Molecular Pathology, Vienna  
2009 - present Deputy head at the Department of Microbiology and Immunobiology, MFPL, University of Vienna

#### Career-related activities

2016 - present Member of MFPL communication committee  
2015 - present Scientific coordinator for MFPL Next Generation Sequencing Facility  
2014 - present Elected representative of the faculty to Faculty Committee  
2013 - present Scientific coordinator for MFPL Animal Infection Unit Institute of Microbiology and Genetics, University of Vienna  
1994 Consultant on “Environmental Impact of Biotechnology in Agriculture” for “United Nations Biotechnology Risk Assessment Division”, Vienna

## Education

1990 - 1995	PhD in biochemistry, PhD thesis "Molecular Cloning and Characterization of Genes for Microtubule-associated Proteins of the Yeast <i>S. cerevisiae</i> ", supervisor Prof. Helmut Ruis, Institute of Biochemistry and Molecular Cell Biology, University of Vienna
1984 - 1989	M.Sc. (Magister Diploma) in Biochemistry, University of Vienna, Austria
1981 - 1982	Studies of Molecular Biology, University of Brno, Czech Republic

## Teaching activities (university level)

**Courses and lectures in Bachelor, Master and PhD studies at the University of Vienna (for full list and details see "[courses Pavel Kovarik](#)"):**

Basic bioinformatics course	2 h/week, winter and summer term
Introductory lecture in Molecular cell biology	1 h/week, winter term
Proseminar in Immunobiology	1 h/week, summer term
Practical course in Immunobiology	3 h/week, winter term
Advanced techniques in immunology	1 h/every other week, winter term
Research topics in immunology	1 h/every other week, winter term
Infection biology lecture	2 h/summer term
Selected chapters in immunology	2 h/week, winter term

## PhD & Master's thesis supervision

12 PhD theses completed  
6 PhD theses ongoing  
18 Master's theses completed  
2 Master's theses ongoing

## Public awareness and public education activities

Lecture "Inflammation: the light and the dark side of the immune response" for public within the winter term 2016 Science talk series organized by Vienna Public Education School ([Volkshochschule](#))

Introduction into the immune response for interested public at the University of Vienna [Campus Festival 2015](#), an event of the University of Vienna dedicated to the 650 anniversary of this oldest university in German speaking countries. The purpose of the event was to popularize science in the public by bringing together scientists and interested laymen. The scope included face-to-face discussions taking place in small groups at "park benches".

Lecture "A combination of craft and creativity as prerequisite for PhD" at 2013 annual conference about PhD training organized by the Doktorandenzentrum of the University of Vienna.

Lecture "Why do we get sore throat?" (2010 – 2014) for school children within the annual "[University for Children](#)" event organized by the University of Vienna

## Reviewing activities

Reviewer for scientific journals: Nature Immunology, Cell Host & Microbe, PLoS Pathogens, PLoS One, EMBO J, PNAS, Mol Syst Biol, JBC, MCB, Science Signaling, RNA Biology, Oncogene, Oncotarget, J Immunology, EJB

Reviewer for grant and fellowship institutions: Medical Research Council UK, Wellcome Trust UK, ANR France, BMRC Singapore, SRA Slovenia, GACR Czech Republic, INFECT-ERA

Reviewer for career promotion at University of Colorado, Medical University of Vienna, Charles University Prague

Reviewer of PhD theses (national & international): >30

**Publications – cumulative: [PubMed link](#)**

**Publications citation analysis ([Google Scholar link](#)):** Total citations: 4282; h-index: 28

**Publications (peer reviewed, last 5 years)**

- Gamradt, P., Yun, X., Gratz, N., Duncan, K., Kobzik, L., Högler, S., **Kovarik, P.**, Decker, T., and A.M. Jamieson. 2016. The influence of myeloid cell death on host resilience to bacterial infections. *PLoS Pathogens*, *accepted*
- Sedlyarov, V., J. Fallmann, F. Ebner, J. Huemer, L. Sneezum, M. Ivin, K. Kreiner, A. Tanzer, C. Vogl, I. Hofacker, and **P. Kovarik**. 2016. Tristetraprolin binding site atlas in the macrophage transcriptome reveals a switch for inflammation resolution. *Mol Syst Biol*. 13;12(5):868. (doi: 10.15252/msb.20156628)
- Castiglia, V., A. Piersigilli, F. Ebner, M. Janos, O. Goldmann, U. Dambock, A. Kroger, S. Weiss, S. Knapp, A. M. Jamieson, C. Kirschning, U. Kalinke, B. Strobl, M. Muller, D. Stoiber, S. Lienenklaus, and **P. Kovarik**. 2016. Type I Interferon Signaling Prevents IL-1beta-Driven Lethal Systemic Hyperinflammation during Invasive Bacterial Infection of Soft Tissue. *Cell Host Microbe* 19: 375-387.(doi: 10.1016/j.chom.2016.02.003) [featured by editorial preview](#)
- Fallmann, J., V. Sedlyarov, A. Tanzer, **P. Kovarik**, and I. L. Hofacker. 2016. AREsite2: an enhanced database for the comprehensive investigation of AU/GU/U-rich elements. *Nucleic Acids Res* 44: D90-95.(doi: 10.1093/nar/gkv1238)
- Wiesauer, I., C. Gaumannmuller, I. Steinparzer, B. Strobl, and **P. Kovarik**. 2015. Promoter Occupancy of STAT1 in Interferon Responses Is Regulated by Processive Transcription. *Mol Cell Biol* 35: 716-727.(doi: 10.1128/MCB.01097-14) [featured as spotlight article](#)
- Kratochvill, F., N. Gratz, J. E. Qualls, L. A. Van De Velde, H. Chi, **P. Kovarik**, and P. J. Murray. 2015. Tristetraprolin Limits Inflammatory Cytokine Production in Tumor-Associated Macrophages in an mRNA Decay-Independent Manner. *Cancer research* 75: 3054-3064.(doi: 10.1158/0008-5472.CAN-15-0205)
- Kovarik, P.**, F. Ebner, and V. Sedlyarov. 2015. Posttranscriptional regulation of cytokine expression. *Cytokine*.(doi: 10.1016/j.cyto.2015.11.007)
- Fieber, C., M. Janos, T. Koestler, N. Gratz, X. D. Li, V. Castiglia, M. Aberle, M. Sauert, M. Wegner, L. Alexopoulou, C. J. Kirschning, Z. J. Chen, A. von Haeseler, and **P. Kovarik**. 2015. Innate immune response to *Streptococcus pyogenes* depends on the combined activation of TLR13 and TLR2. *PLoS ONE* 10: e0119727.(doi: 10.1371/journal.pone.0119727)
- Fieber, C., and **P. Kovarik**. 2014. Responses of innate immune cells to group A *Streptococcus*. *Frontiers in cellular and infection microbiology* 4: 140.(doi: 10.3389/fcimb.2014.00140)
- Dinis, M., C. Plainvert, **P. Kovarik**, M. Longo, A. Fouet, and C. Poyart. 2014. The innate immune response elicited by Group A *Streptococcus* is highly variable among clinical isolates and correlates with the emm type. *PLoS ONE* 9: e101464.(doi: 10.1371/journal.pone.0101464)
- Bancerek, J., Z. C. Poss, I. Steinparzer, V. Sedlyarov, T. Pfaffenwimmer, I. Mikulic, L. Dolken, B. Strobl, M. Muller, D. J. Taatjes, and **P. Kovarik**. 2013. CDK8 Kinase Phosphorylates Transcription Factor STAT1 to Selectively Regulate the Interferon Response. *Immunity* 38: 250-262.(doi: 10.1016/j.immuni.2012.10.017)
- Roetzer, A., E. Klopff, N. Gratz, M. Marcet-Houben, E. Hiller, S. Rupp, T. Gabaldon, **P. Kovarik**, and C. Schuller. 2011. Regulation of *Candida glabrata* oxidative stress resistance is adapted to host environment. *FEBS letters* 585: 319-327.(doi: 10.1016/j.febslet.2010.12.006)

- Gratz, N., H. Hartweger, U. Matt, F. Kratochvill, M. Janos, S. Sigel, B. Drobits, X. D. Li, S. Knapp, and **P. Kovarik**. 2011. Type I interferon production induced by *Streptococcus pyogenes*-derived nucleic acids is required for host protection. *PLoS Pathog* 7: e1001345.(doi: 10.1371/journal.ppat.1001345)
- Kratochvill, F., C. Machacek, C. Vogl, F. Ebner, V. Sedlyarov, A. R. Gruber, H. Hartweger, R. Vielnascher, M. Karaghiosoff, T. Rulicke, M. Muller, I. Hofacker, R. Lang, and **P. Kovarik**. 2011. Tristetraprolin-driven regulatory circuit controls quality and timing of mRNA decay in inflammation. *Mol Syst Biol* 7: 560.(doi: 10.1038/msb.2011.93)
- Gruber, A. R., J. Fallmann, F. Kratochvill, **P. Kovarik**, and I. L. Hofacker. 2011. AREsite: a database for the comprehensive investigation of AU-rich elements. *Nucleic Acids Res* 39: D66-69.(doi: 10.1093/nar/gkq990)

### **Publications (peer reviewed, 10 most important)**

- Sedlyarov, V., J. Fallmann, F. Ebner, J. Huemer, L. Sneezum, M. Ivin, K. Kreiner, A. Tanzer, C. Vogl, I. Hofacker, and **P. Kovarik**. 2016. Tristetraprolin binding site atlas in the macrophage transcriptome reveals a switch for inflammation resolution. *Mol Syst Biol* 13;12(5):868. (doi: 10.15252/msb.20156628)
- Castiglia, V., A. Piersigilli, F. Ebner, M. Janos, O. Goldmann, U. Dambock, A. Kroger, S. Weiss, S. Knapp, A. M. Jamieson, C. Kirschning, U. Kalinke, B. Strobl, M. Muller, D. Stoiber, S. Lienenklaus, and **P. Kovarik**. 2016. Type I Interferon Signaling Prevents IL-1beta-Driven Lethal Systemic Hyperinflammation during Invasive Bacterial Infection of Soft Tissue. *Cell Host Microbe* 19: 375-387.(doi: 10.1016/j.chom.2016.02.003) [featured by editorial preview](#)
- Wiesauer, I., C. Gaumannmuller, I. Steinparzer, B. Strobl, and **P. Kovarik**. 2015. Promoter Occupancy of STAT1 in Interferon Responses Is Regulated by Processive Transcription. *Mol Cell Biol* 35: 716-727.(doi: 10.1128/MCB.01097-14) [featured as spotlight article](#)
- Bancerek, J., Z. C. Poss, I. Steinparzer, V. Sedlyarov, T. Pfaffenwimmer, I. Mikulic, L. Dolken, B. Strobl, M. Muller, D. J. Taatjes, and **P. Kovarik**. 2013. CDK8 Kinase Phosphorylates Transcription Factor STAT1 to Selectively Regulate the Interferon Response. *Immunity* 38: 250-262.(doi: 10.1016/j.immuni.2012.10.017)
- Gratz, N., H. Hartweger, U. Matt, F. Kratochvill, M. Janos, S. Sigel, B. Drobits, X. D. Li, S. Knapp, and **P. Kovarik**. 2011. Type I interferon production induced by *Streptococcus pyogenes*-derived nucleic acids is required for host protection. *PLoS Pathog* 7: e1001345.(doi: 10.1371/journal.ppat.1001345)
- Kratochvill, F., C. Machacek, C. Vogl, F. Ebner, V. Sedlyarov, A. R. Gruber, H. Hartweger, R. Vielnascher, M. Karaghiosoff, T. Rulicke, M. Muller, I. Hofacker, R. Lang, and **P. Kovarik**. 2011. Tristetraprolin-driven regulatory circuit controls quality and timing of mRNA decay in inflammation. *Mol Syst Biol* 7: 560.(doi: 10.1038/msb.2011.93)
- Schaljo, B., F. Kratochvill, N. Gratz, I. Sadzak, I. Sauer, M. Hammer, C. Vogl, B. Strobl, M. Muller, P. J. Blackshear, V. Poli, R. Lang, P. J. Murray, and **P. Kovarik**. 2009. Tristetraprolin is required for full anti-inflammatory response of murine macrophages to IL-10. *J Immunol* 183: 1197-1206.(doi: 10.4049/jimmunol.0803883) [featured article](#)
- Sadzak, I., M. Schiff, I. Gattermeier, R. Glinitzer, I. Sauer, A. Saalmuller, E. Yang, B. Schaljo, and **P. Kovarik**. 2008. Recruitment of Stat1 to chromatin is required for interferon-induced serine phosphorylation of Stat1 transactivation domain. *Proc Natl Acad Sci USA* 105: 8944-8949.(doi: 10.1073/pnas.0801794105) [Faculty of 1000 prime recommended](#)
- Ramsauer, K., I. Sadzak, A. Porras, A. Pilz, A. R. Nebreda, T. Decker, and **P. Kovarik**. 2002. p38 MAPK enhances STAT1-dependent transcription independently of Ser-727

phosphorylation. *Proc Natl Acad Sci U S A* 99: 12859-12864.(doi: 10.1073/pnas.192264999)

Decker, T., and **P. Kovarik**. 2000. Serine phosphorylation of STATs. *Oncogene* 19: 2628-2637.(doi: 10.1038/sj.onc.1203481) [> 700 citations](#)