

# MICHAEL BONELLI, MD

Associate Professor & Rheumatologist

Medical University of Vienna



BonelliLab

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## RESEARCH INTERESTS

### Basic research

- Epigenetic
  - My research group investigates the influence of transcriptional and epigenetic modifications on development and stability of various immune cells under inflammatory conditions.
- Autoimmunity
  - We investigate factors that drive the development of pathogenic T cells, to identify and validate new treatment targets, and to study critical transcription factors, important for the balance of effector versus regulatory T cells.
  - Within the frame of international collaborations, we explore the association of infectious diseases, environmental and genetic factors with the manifestation of autoimmune diseases.
- Structural Immunity
  - We study structural immunity by focusing on the role of fibroblast-immune cell interactions as drivers of synovial tissue inflammation.
- Precision medicine
  - My research group aims to identify and validate biomarker for treatment response to enable a personalized treatment strategy.
  - We are further interested in the JAK-STAT signaling pathway and investigate the differences between pan and selective JAK-STAT inhibition.

### Clinical research

- Personalized Medicine
  - my research group investigates serological, cellular, and histological data from biobanked material in combination with epidemiological data derived from clinical cohorts for classification, diagnosis, prediction of disease progression and treatment response in patients with rheumatic diseases.
- Clinical Trails
  - we combine clinical and investigator-initiated trials with basic research tools to address translational research questions, including treatment response of novel therapeutic compounds and the cellular and humoral immune responses to COVID-19 vaccinations in patients under immunosuppressive therapy.

## WEBSITES

- Laboratory: [bonellilab.org](http://bonellilab.org)
- ORCID: <https://orcid.org/0000-0002-6122-7482>
- Web of Science: <https://www.webofscience.com/wos/author/record/JZC-7580-2024>
- Linked-In: <https://www.linkedin.com/in/michael-bonelli-38552829/>

## TEACHING

### Selected

- Lecturer for Master Programm "Molecular Precision Medicine" at Medical University of Vienna
  - 2021 - present
- Lecturer for the PhD Program in Immunology at Medical University of Vienna
  - 2020 - present
- Teaching of medical students (N094) at Medical University of Vienna
  - 2005 - present

## WORK EXPERIENCE

### Current Positions

<b>Director</b> Basic and translational science unit Division of Rheumatology	Medical University of Vienna Austria since 2024
<b>Deputy Head</b> Division of Rheumatology	Medical University of Vienna Austria since 2024
<b>Principal Investigator</b>	Ludwig Boltzmann Institute for Arthritis and Rehabilitation Austria since 2021
<b>Consultant</b> For Rheumatology	Medical University of Vienna Austria since 2018
<b>Guest Researcher</b> At National Institute of Arthritis and Musculoskeletal and Skin Disease and National Institute of Health	NIAMS & NIH Bethesda, MD, USA since 2015
<b>Principal Investigator</b> Division of Rheumatology	Medical University of Vienna since 2015
<b>Consultant</b> For Internal Medicine	Medical University of Vienna since 2015

### Previous Positions

<b>Postdoctoral Researcher</b> Research fellowship at John O'Shea's lab	NIAMS & NIH Bethesda, MD, USA 2011-2014
<b>Resident</b> Internal Medicine	Medical University of Vienna Austria 2005-2011

## SCIENTIFIC MANAGEMENT

### National & international conferences

over 40 invited presentations in the field of Rheumatology (ACR, EULAR, EWRR, CCR, ÖGR) and Immunology (ECI, ACI, IIG and Keystone symposia)

### Organizer of the 41st EWRR

including Co-Chair and Scientific member

### European funded project meetings

regular and active participations in

- Horizon Europe "Squeeze" - work package leader at coordinating center; period 2022-2027
- Horizon Europe "Dark Matter" - work package leader; period 2023-2029
- Autocure (FP6)
- Masterswitch (FP7)
- BTCure and RTCure (IMI)

## EDUCATION & CERTIFICATIONS

### "Ruf" for a full W3 professorship - 2024

at Christian-Albrecht-Universität, Kiel, Germany

### First-ranked candidate for full professorship - 2020

and Head of Department of Rheumatology & Immunology, Medical University of Graz, Austria

### Board certification - 2018

for Rheumatology, Medical University of Vienna, Austria

### Research Habilitation (*Venia docendi*) - 2016

in Internal Medicine, University of Vienna, Austria

### Board certification - 2015

for Internal Medicine, Medical University of Vienna, Austria

### Graduation from medical school - 2005

start in 1997, N201, Medical University of Vienna, Austria

### Doctoral thesis - 2004

"Regulatory T cells under steady state and autoimmune conditions"  
University of Vienna, Division of Rheumatology, Prof. C. Scheineker,  
MD, grade 1.0, Vienna Austria

## LEADERSHIP EXPERIENCE

### Coordination of Biobank

PBMC and tissue bank encompassing over 100.000 samples

### Research Lab Head - since 2015

- Supervision of PostDocs, PhD-, Master-, Bachelor- and Diploma students
- Supervision of 5 research technicians and one computational biologist

### Senior physician - since 2015

with supervision of medical doctors in training

### Management of outpatient clinic - since 2015

includes also clinical ward at the Division of Rheumatology

### Project Management of research projects

includes projects funded by national (e.g. FWF stand-alone project or SFB) and international (IMI2, Horizon Europe) research projects

## MENTORING

### PostDocs

- Teresa Preglej
- Lisa Göschl
- Anela Tosevska

### PhD students

- Marie Brinkmann
- Mirjam Dellinger
- Bianca Luckerbauer
- Laura Hermann
- Lisabeth Emilius
- Daniel Mrak
- Kastriot Kastrati

### Master students

- Mar Corgos

### Alumni

- Lena Müller, PostDoc - 2020-2023
- Maximilian Kugler, PhD - 2019-2023
- Marie Brinkmann, MSc. - 2021-2022
- Mirjam Dellinger, MSc. - 2020-2021
- Lina Breit, B.Sc. - 2020-2021
- Lisa Göschl, Diploma student - 2010-2011

## AWARDS & FELLOWSHIPS

- **Lilly Innovation Awards (senior author)**
  - "Development of a High-Throughput Drug Screening Platform from T-cell-FLS interactions in RA" - 2021
  - "NFIL3 - A treatment target in Rheumatoid Arthritis" - 2019
  - "HDACS: new treatment targets for Rheumatoid Arthritis" - 2018
- **ÖGR Science Awards**
  - "T cells and synovial fibroblasts: partners in crime" (supervisor) - 2017
- **VFWF Habilitation Awards** - 2017
- **ÖGR Publication Award** - 2016
- **Inflammation Europe Aspire Research Award** - "Epigenetic reprogramming of rheumatoid fibroblast-like synoviocytes (RA-FLS) with JAKinibs" - 2016
- **ÖGR-Roche Young Scientist Awards** - 2014
- **MSD-sponsored Scientific Award for Young Scientists** - 2013
- **FWF Erwin-Schrödinger Postdoctoral Fellowship** - 2011
- **ÖGR Poster Award** - 2008

### Fellowships & Awards earned by lab members

- **ÖGR Lilly innovation awards** - 2024
- **Marietta Blau fellowship** - 2024
- **Career development Award (MUW)** - 2024
- **Travel Award (ÖGR)** - 2024
- **Publication Award** - 2023
- **Poster Award (ÖGR)** - 2023, 2022
- **Poster Award (EWRR)** - 2023
- **Master's Thesis Awards (ÖGR)** - 2023, 2022
- **ÖGR Lilly innovation award** - 2021, 2019, 2018
- **ÖGR Science award** - 2017
- **ÖGR Publication award** - 2016

## REVIEWER, EDITOR & INSTITUTIONAL RESPONSIBILITIES (SELECTED)

- **Reviewer for following journals** - since 2008
  - Arthritis and Rheumatology
  - Annals of Rheumatic Diseases
  - Rheumatology
  - Arthritis Research and Therapy
  - Lancet Rheumatology
  - Nature Medicine
  - Nature Communications
  - Clinical Experimental Rheumatology
  - Journal of Immunology
  - European Journal of Immunology
  - International Immunology
  - Frontiers in Immunology
- **Editor** - since 2021
  - at the journal "Wiener Klinische Wochenschrift"
- **Reviewer for following grants** - since 2014
  - UK Research Institute (UKRI)
  - Deutsche Forschungsgesellschaft (DFG)
  - French National Research Agency (ANR)
  - Austrian National Bank
  - Medical Scientific Fund of the Mayor of Vienna
- **Memberships for following organizations**
  - Working group member of gender & equality working group of ÖGAI - since 2023
  - Steering committee member of Austrian Society of Allergology and Immunology (ÖGAI) - since 2022
  - Austrian Society of Allergology and Immunology - since 2021
  - Scientific Advisory Board member of University of Chiba, Japan - since 2020
  - Austrian Society of Internal medicine - since 2014
  - Austrian Society of Rheumatology - 2005

## SELECTED CLINICAL TRIALS WITH MAJOR CONTRIBUTION

Contribution in > 10 Phase II / III and investigator-initiated clinical trials as principle and sub investigator such as

- **PREDICTRA (2015-2018)**
- **RHBX (2016-2019)**
- **LUPIL-2 (2016-2019)**
- **PMR-Spare (2017-2020)**
- **TarIFNira (2018-2020)**
- **CC-10004-PSA-014 (2018-2020)**
- **CC-10004-PSA-013 (2018-2020)**

## RESEARCH FUNDING

> 2.5 million € of funding independently raised for my laboratory since 2017 was obtained in 12 internationally peer-reviewed research grants:

- **Horizon-Europe** project "MDA-RA", 2024.
- **FWF Doc.Fund PhD program**, (Coordinator: Maria Sibilia) "Securing Host Immunity – Elimination versus Destruction - SHIELD", principal investigator, approx. 300.000 €, 2024-2028
- **Horizon-Europe project "Dark matter"** (101136582), principal investigator, 550.000 €, 2023.
- **Horizon-Europe project "Squeeze"**, principal investigator, 2022
- **SFB (FWF): HDACs as regulators of T-cell-mediated immunity in Health and Disease** (subproject F7004), principal investigator, 407.526 €, 2023 - 2027
- **Boehringer Research Collaboration**, principal investigator, 15.000 €, 2022
- **Galapagos Research Foundation grant** "Time-resolved transcriptomic and epigenetic cell profiling of RA patients treated with Filgotinib", principal investigator, 250.000 €, 2023
- **GSK Innovate Medicine Initiative grant** "Automated high-content microscopy: a new tool to discover personalized treatment strategies for inflammatory diseases", principal investigator 180.000 €, 2022
- **FWF stand-alone grant** "Molecular control of regulatory T cells by the Transcription Factor NFIL3", principal investigator 402.000 €, 2021 - 2026
- **SFB (FWF): HDACs as regulators of T-cell-mediated immunity in Health and Disease** (subproject F7004), principal investigator, 378.000 €, 2018 - 2023
- **Jubiläumsfond der Österreichischen Nationalbank** (Development of new treatment strategies for patients with Rheumatoid Arthritis), principal investigator, 140.000 €, 2017 - 2021
- **Medical science fond of the city of Vienna** (Type 1 regulatory T cells in patients with Rheumatoid Arthritis), principal investigator, 15.000€, 2017

## SELECTED PAPERS

I have so far published over 67 scientific manuscripts with a cumulative citation index of 5527 and an H-index of 36 according to Google Scholar.

Selection of 10 recent peer-reviewed publications (2020-2024):

- Kugler M, Dellinger M, Kartnig F, Müller L, Preglej T, Heinz LX, Simader E, Göschl L, Puchner SE, Weiss S, Shaw LE, Farlik M, Weninger W, Superti-Furga G, Smolen JS, Steiner G, Aletaha D, Kiener HP, Lewis MJ, Pitzalis C, Tosevska A, Karonitsch T, **Bonelli M.** (2023); **Cytokine-directed cellular cross-talk imprints synovial pathotypes in rheumatoid arthritis.** Ann Rheum Dis. 2023 Sep;82(9):1142-1152. doi: 10.1136/ard-2022-223396. (IF: 27.4)
- Preglej T, Brinkmann M, Steiner G, Aletaha D, Göschl L, **Bonelli M.** (2023) **Advanced immunophenotyping: A powerful tool for immune profiling, drug screening, and a personalized treatment approach.** Front Immunol. 2023 Mar 24;14:1096096. doi: 10.3389/fimmu.2023.1096096. (IF: 7.3)
- Mrak D, Kartnig F, Sieghart D, Simader E, Radner H, Mandl P, Göschl L, Hofer P, Deimel T, Gessl I, Kain R, Winkler S, Smolen JS, Perkmann T, Haslacher H, Aletaha D, Heinz LX, **Bonelli M.** (2023). **Accelerated waning of immune responses to a third COVID-19 vaccination in patients with immune-mediated inflammatory diseases.** J Autoimmun. 2023 Feb;135:102981. doi: 10.1016/j.jaut.2022.102981. (IF: 12.8)
- Mrak, D., Sieghart, D., Simader, E., Tobudic, S., Radner, H., Mandl, P., Göschl, L., Koblichke, M., Hommer, N., Wagner, A., Mayer, M., Schubert, L., Hartl, L., Kozbial, K., Hofer, P., Kartnig, F., Hummel, T., Kerschbaumer, A., Deimel, T., Puchner, A., **Bonelli, M.** (2022). **Heterologous vector versus homologous mRNA COVID-19 booster vaccination in non-seroconverted immunosuppressed patients: a randomized controlled trial.** Nature communications, 13(1), 5362. <https://doi.org/10.1038/s41467-022-33036-y> (IF: 16.6)
- Kartnig, F., Mrak, D., Simader, E., Tobudic, S., Radner, H., Mandl, P., Göschl, L., Hommer, N., Mayer, M., Hofer, P., Hummel, T., Deimel, T., Geßl, I., Puchner, A., Kerschbaumer, A., Thalhammer, R., Handisurya, A., Kain, R., Winkler, S., Smolen, J. S., **Bonelli, M.** (2022). **Safety and immunogenicity of a third COVID-19 vaccination in patients with immune-mediated inflammatory diseases compared with healthy controls.** Ann Rheum Dis. [annrheumdis-2022-222682](https://doi.org/10.1136/ard-2022-222682). Advance online publication. <https://doi.org/10.1136/ard-2022-222682> (IF: 27.4)

- Mrak, D., Simader, E., Sieghart, D., Mandl, P., Radner, H., Perkmann, T., Haslacher, H., Mayer, M., Koblichke, M., Hofer, P., Göschl, L., Kartnig, F., Deimel, T., Kerschbaumer, A., Hummel, T., Kornek, B., Thalhammer, R., Stiasny, K., Winkler, S., Smolen, J. S., **Bonelli, M.** (2022). Immunogenicity and safety of a fourth COVID-19 vaccination in rituximab-treated patients: an open-label extension study. *Ann Rheum Dis.* 81(12), 1750–1756. <https://doi.org/10.1136/ard-2022-222579> (IF: 27.4)
- Mrak, D., Tobudic, S., Koblichke, M., Graninger, M., Radner, H., Sieghart, D., Hofer, P., Perkmann, T., Haslacher, H., Thalhammer, R., Winkler, S., Blüml, S., Stiasny, K., Aberle, J. H., Smolen, J. S., Heinz, L. X., Aletaha, D., & **Bonelli, M.** (2021). SARS-CoV-2 vaccination in rituximab-treated patients: B cells promote humoral immune responses in the presence of T-cell-mediated immunity. *Ann Rheum Dis.* 80(10), 1345–1350. <https://doi.org/10.1136/annrheumdis-2021-220781> (IF: 27.4)
- **Bonelli M.**, Radner H, Kerschbaumer A, Mrak D, Durechova M, Stieger J, Husic R, Mandl P, Smolen JS, Dejaco C, Aletaha D. (2022) Tocilizumab in patients with new onset polymyalgia rheumatica (PMR-SPARE): a phase 2/3 randomised controlled trial. *Ann Rheum Dis.* doi: 10.1136/annrheumdis-2021-221126 (IF: 27.4)
- Roychoudhuri R.; Hirahara K.; Mousavi K.; Clever D.; Klebanoff C.A.; Bonelli M.; Sciumè G.; Zare H.; Vahedi G.; Dema B.; Yu Z.; Liu H.; Takahashi H.; Rao M.; Muranski P.; Crompton J.G.; Punkosdy G.; Bedognetti D.; Wang E.; Hoffmann V.; Rivera J.; Marincola F.M.; Nakamura A.; Sartorelli V.; Kanno Y.; Gattinoni L.; Muto A.; Igarashi K.; O'Shea J.J.; Restifo N.P. (2013) **BACH2 represses effector programs to stabilize T reg-mediated immune homeostasis**, *Nature*. doi: 10.1038/nature12199 (IF: 50.5)
- Göschl, L., Preglej, T., Boucheron, N., Saferding, V., Müller, L., Platzer, A., Hirahara, K., Shih, H. Y., Backlund, J., Matthias, P., Niederreiter, B., Hladik, A., Kugler, M., Gualdoni, G. A., Scheinecker, C., Knapp, S., Seiser, C., Holmdahl, R., Tillmann, K., Plasenzotti, R., Podesser, B., Aletaha, D., Smolen, J. S., Karonitsch, T., Steiner, G., Ellmeier, W., **Bonelli, M.** (2020) **Histone deacetylase 1 (HDAC1): A key player of T cell-mediated arthritis**. *J Autoimmun.* Mar;108:102379. doi: 10.1016/j.jaut.2019.102379 (IF: 12.8)