

Prof. Dr. Pia Abel-zur Wiesch genannt Hülshoff
Assoziierter Professor, Universität Siegen
Forschungsprofessor/ Research Professor, Norwegian Institute of Public Health, Oslo
Email: Pia.AHuelshoff@uni-siegen.de

CURRENT POSITIONS

since 01/2023 Assoziierter Professor, University Siegen (20 %)
since 08/2021 Research Professor
(Forsker 1183, equivalent to Professor without teaching obligations)
Division of Infection Control and Environmental Health
Norwegian Institute of Public Health (NIPH), Norway
since 03/2022 Affiliate Associate Professor
Department of Biology & Huck Institute of the Life Sciences
The Pennsylvania State University, PA, USA
since 09/2015 Research group leader, Department of Pharmacy,
University of Tromsø, Norway

PREVIOUS POSITIONS

02/2020-07/2021 Associate Professor & Huck Early Career Chair of Systems Pharmacology at the
Department of Biology & Huck Institute of the Life Sciences
The Pennsylvania State University, PA, USA
10/2015-01/2020 NCMM young associate investigator at the Department of Pharmacy & Nordic
EMBL partnership
University of Tromsø, Norway
09/2015-08/2017 Visiting Assistant Professor at the School of Public Health
Yale University, CT, USA
09/2014-08/2015 Research Fellow mentored by Ted Cohen
Yale University, CT, USA
04/2012-08/2014 Research Fellow mentored by Ted Cohen
Harvard Medical School, MA, USA &
Postdoctoral Research Fellow
Brigham and Women's Hospital, MA, USA
05/2011-03/2012 Postdoctoral Researcher mentored by Sebastian Bonhoeffer
ETH Zürich, Switzerland

EDUCATION

05/2011 PhD in Theoretical Biology
ETH Zürich, Switzerland
Mark: with distinction, awarded ETH medal

RESEARCH INTERESTS

I use theoretical models in close collaboration with experimentalists and clinicians how within-host and population-wide treatment strategies can minimize human morbidity and mortality. The aim of my group is rationalizing anti-infective treatment by bridging the gap between mathematical models of intracellular reaction kinetics and pathogen population dynamics. We are employing these newly developed mathematical models to improve dosing regimens for existing and new anti-infectives in several consortia with academics, clinicians and industry. Our focus is on bacterial diseases and we recently branched out to COVID-19 and anti-cancer therapy.

PUBLICATION HIGHLIGHTS

(full publication list at <https://scholar.google.com/citations?user=YhVKwHgAAAAJ&hl=en>)

Citations: 1954; h-index 21; i10-index: 25

Martinez A, Boeree MJ, Diacon AH, Dawson R, Hemez C, Aarnoutse RE, *Abel zur Wiesch P*
High rifampicin peak plasma concentrations accelerate the slow phase of bacterial decline in
tuberculosis patients: evidence for heteroresistance
PLOS Computational Biology 19 (4), e1011000.
<https://doi.org/10.1371/journal.pcbi.1011000>

Ngoc-Nha Tran V, Shams A, Ascioğlu S, Martinez A, Liang J, Clarelli F, Mostowy R, Cohen T, *Abel zur
Wiesch P*
vCOMBAT: a novel tool to create and visualize a computational model of bacterial antibiotic target-
binding
BMC bioinformatics 23 (1), 22.
<https://doi.org/10.1186/s12859-021-04536-3>

Hemez C, Clarelli F, Palmer AC, Bleis C, Abel S, Chindelevitch L, Cohen T, *Abel Zur Wiesch P*
Mechanisms of antibiotic action shape the fitness landscapes of resistance mutations
Computational and Structural Biotechnology Journal 20, 4688-4703.
<https://doi.org/10.1016/j.csbj.2022.08.030>

Mahmutovic A, Gillman AN, Lauksund S, Robson Moe N-A, Manzi A, Storflor M, Abel Zur Wiesch P*,
*Abel S**
RESTAMP—Rate estimates by sequence-tag analysis of microbial populations
COMPUT STRUCT BIOTEC (2021) 19:1035-51.
<https://doi.org/10.1016/j.csbj.2021.01.017>

Clarelli F, Palmer A, Singh B, Storflor M, Lauksund S, Cohen T, *Abel S**, *Abel zur Wiesch P**
Drug-target binding quantitatively predicts optimal antibiotic dose levels in quinolones.
PLOS COMP BIO (2020) 16(8):e1008106
<https://doi.org/10.1371/journal.pcbi.1008106>

Mahmutovic A, *Abel zur Wiesch P**, *Abel S**
Selection or drift: The population biology underlying transposon insertion sequencing experiments
COMPUT STRUCT BIOTEC (2020) 18: 91-804.
<https://doi.org/10.1016/j.csbj.2020.03.021>

GROUP MEMBERS/STUDENTS

| | | | |
|-------------------|---------------------|-------------------------------|----------------------------|
| <i>Since 2022</i> | <i>Adviser</i> | <i>PhD student Penn State</i> | <i>Leah Marie Childers</i> |
| <i>since 2016</i> | <i>Co-adviser</i> | <i>PhD student at UiT</i> | <i>Christina Bleis</i> |
| <i>since 2018</i> | <i>Main adviser</i> | <i>postdoc at UiT</i> | <i>Jingyi Liang</i> |

FORMER GROUP MEMBERS

| | | | |
|------------------|---------------------|---|-------------------------------|
| <i>2021-2023</i> | <i>Adviser</i> | <i>PhD student University of Edinburgh</i> | <i>Nicola Cave</i> |
| <i>2020-2021</i> | <i>Co-Adviser</i> | <i>PhD student paid from my funds Ahmed Aliyu Abulfathi</i> | <i>Aliyu Abulfathi</i> |
| <i>2018-2019</i> | <i>Main adviser</i> | <i>MSc student, Pharmacy</i> | <i>Natasha-Ann Robson Moe</i> |
| <i>2018-2020</i> | <i>Host/partner</i> | <i>Marie Curie Fellow</i> | <i>Santiago Ramon Garcia</i> |
| <i>2018-2020</i> | <i>Main adviser</i> | <i>MPH student/intern at Yale</i> | <i>Colin Hemez</i> |
| <i>2018-2021</i> | <i>Main adviser</i> | <i>postdoc at UiT</i> | <i>Vi Tran</i> |
| <i>2017-2019</i> | <i>Main adviser</i> | <i>project manager</i> | <i>Marie Hella Lindberg</i> |
| <i>2017-2021</i> | <i>Co-adviser</i> | <i>postdoc at UiT</i> | <i>Anel Mahmutovic</i> |
| <i>2017</i> | <i>Main adviser</i> | <i>MPH student/intern at Yale</i> | <i>Yu Li Hsieh</i> |
| <i>2016-2022</i> | <i>Main adviser</i> | <i>postdoc at UiT</i> | <i>Fabrizio Clarelli</i> |
| <i>2016-2020</i> | <i>Main adviser</i> | <i>PhD student at UiT</i> | <i>Antal Martinez</i> |
| <i>2015-2016</i> | <i>Main adviser</i> | <i>postdoc at Yale</i> | <i>Alireza Shams</i> |
| <i>2013</i> | <i>Supervision</i> | <i>grad. stud. at Harvard Medical School</i> | <i>Joanna Wolny</i> |

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|-----------|-------------|-------------------------------|-------------------|
| 2011 | Supervision | research intern at ETH Zürich | Laurence Laser |
| 2010-2011 | Supervision | master student | Dominique Cadosch |
| 2008 | Supervision | research intern at ETH Zürich | Pascal Schlapfer |

PROFESSIONAL ACTIVITIES/MEMBERSHIPS

Participation in policy work (Norwegian equivalent of CDC guidance documents)

| | |
|---------|---|
| 01/2022 | Oppdrag om vurdering av mulighet for norsk deltagelse i en internasjonal studie av orale antiviralia mot COVID-19 hos vaksinerte pasienter tidlig i behandlingsforløpet (Assess the possibility of Norwegian participation in an international study of early treatment with oral antivirals against COVID-19 in vaccinated patients) |
| 08/2021 | Oppdrag 45 – Om vurdering av koronavaksinasjon av barn 12-15 år (Assessment of SARS-CoV-2 vaccination of children ages 12-15) |
| 05/2021 | Revidert oppdrag 16: Nye vurderinger av vaksinasjonsstrategien (New assessment of vaccination strategy) |

Professional contribution to public health agencies

- I was part of a team that derived new estimates for TB disease burden for the WHO: https://www.who.int/tb/advisory_bodies/impact_measurement_taskforce/meetings/global_consultation_doc08c_statistical_model_children.pdf
- I represent the Norwegian Institute of Public Health at the Transatlantic Taskforce on Antimicrobial Resistance (TATFAR) <https://www.cdc.gov/drugresistance/tatfar/index.html>
- I have observer status at a European board coordinating clinical COVID trials <https://www.recover-europe.eu>

TEACHING INTERESTS

I am very interested in recruiting Master and PhD students to Oslo. Due to the high living costs, I would recommend applying for fellowships together. Please contact me!

Ich bin sehr daran interessiert, Masterstudenten und Diplomanden nach Oslo zu rekrutieren. Wegen der hohen Lebenskosten, wäre es das Beste, sich gemeinsam auf Stipendien zu bewerben. Bitte Kontakt aufnehmen!

GRANTS/ACTIVITIES

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|------------------|--|
| 09/2022- 08/2026 | Management Committee (National Representative, Norway) COST Network ADVANCE- TB, CA21164 (European Commission) |
| 10/2022- 09/2024 | Co-PI JPI-AMR consortium, Bench to Business to Bedside and Beyond Main PI: Leonid Chindelevitch Imperial College, UK |
| 05/2018- 12/2022 | Co-PI (shared student) Career development award, Medical Research Council UK (main PI: Helen Stagg) Collaborator: Helen Stagg Imperial College, UK |
| 06/2017-06/2023 | PI Young Research Talents, Norwegian Research Council 8Mio NOK/\$930k <i>The aim of this grant is to build a solid mechanistic understanding of how the molecular mechanisms of drug-target binding determine optimal treatment regimens with antibiotics.</i> |
| 01/2017-06/2023 | Work package leader Consortium “anTBiotic”, Horizon 2020 5.82 Mio EUR/~\$6.5 Mio (644k EUR/\$723k to PzW) <i>In this consortium with industry, clinicians and public health agencies, we aim at advancing two novel therapeutic regimens to phase III trials. We re-purpose beta-lactams for tuberculosis based on Diacon & al., NEJM 2016 as well as work with a</i> |

completely novel antibiotic compound developed by GlaxoSmithKline. Our role in this consortium is to predict optimal antibiotic dosing in the clinical trials.

Collaborators

David Barros **GlaxoSmithKline**, Spain
Clif Barry **NIH, USA/ University Cape Town**, South Africa
Andreas Diacon **TASK foundation**, South Africa
Christoph Lange **Leibniz Research Center Borstel**, Germany

09/2018

PI

Tromsø Research Foundation

15 Mio NOK /\$1.7 Mio external + 7 Mio NOK/\$800k internal

(declined to start faculty position at PSU)

The aim of this grant is to extend our previous work to a) investigate the impact of patient adherence and b) to help develop new antibiotics from the Arctic sea.

01/2018- 12/2020

Co-PI

iResist by the Helse-EU program of the Research Council of Norway

2Mio NOK/\$230k

01/2017-12/2021

Work package leader

Consortium “collateral damage”, JPI-AMR

1.8 Mio EUR/~\$2 Mio (357k Euro/\$400k to PzW)

The aim of this consortium is to create treatment strategies that make use of a phenomenon called “collateral sensitivity”, i.e. that resistance to one antibiotic makes bacteria more susceptible to another drug. Our role is to use data on the mechanisms of collateral sensitivity to make prediction regarding optimal treatment that can then be tested in mouse models.

Collaborators

Pål Johnsen **UiT, Norway**
Dan Andersson **University Uppsala**, Sweden
Niels Frimodt-Møller **Rigshospital Copenhagen**, Denmark
Daniel Rozen **University Leiden**, Netherlands

12/2015- 12/2020

Co-PI (shared postdoc)

Helse Nord, Norway (main PI: Sören Abel)

3.14Mio NOK/\$358k

In this grant, we investigate the interactions of co-infecting V. cholerae strains

Collaborators

Sören Abel **UiT & NCMM**, Norway
Virginia Pitzer **Yale School of Public Health**, CT, USA
Ulf Dahle **Norwegian Institute of Public Health**, Norway

09/2014- 08/2018

Co-PI (shared postdoc)

Bill & Melinda Gates foundation (main PI: Ted Cohen) **\$412,262**

The aim of this grant is to develop dosing regimens that shorten tuberculosis treatment.

Collaborators

Ted Cohen **Yale School of Public Health**, CT, USA

04/2018

Partner (co-supervision of postdoc)

Marie Curie Fellowship, Horizon 2020/EU (main host: GlaxoSmithKline)

Collaborator:

David Barros **GlaxoSmithKline**, Spain
Santiago Garcia **University Zaragoza**, Spain

06/2017

Collaborator (hosting of student)

Medical Research Council (main PI: Laura Piddock)

Collaborator:

Laura Piddock **University Birmingham**, UK

12/2015

Collaborator internal postdoc **Astra Zeneca**

<https://www.linkedin.com/jobs/view/153015436>

2014 **Partner**
 Miljøstøtte Grant by Helse Nord, Norway (main PI: Pål Johnsen)
Collaborator:
 Pål Johnsen **University of Tromsø**, Norway

ACQUIRED FUNDS (scholarships, internal university funding)

| | | |
|-----------------|--|---------------------------|
| 04/2020-08/2020 | PI Huck Institutes of the Life Sciences, Seed Grant \$33k <i>The aim of this work is to establish a multi-scale model that allows predicting optimal dose levels for remdesivir, an anti-COVID drug candidate</i> | |
| 09/2014-08/2015 | 3 year postdoctoral fellowship, partially declined to start faculty position Swiss National Science Foundation (SNF), Switzerland (2x \$49,400 + 100510CHF ~\$200,000) | |
| 04/2013-03/2014 | 1 year postdoctoral fellowship Swiss National Science Foundation (SNF), Switzerland | 57200CHF/\$56,078 |
| 04/2012-03/2013 | 1 year postdoctoral fellowship Fellowship by German Academic Exchange Service | 60,564EUR/\$67,600 |