
Michael Niederweis, Ph.D.

Endowed Professor of Bacteriology, University Professor
University of Alabama at Birmingham

Date of birth: April 12, 1964
Place of birth: Saarbrücken, Germany
Citizenship: Germany, USA

Work Address: Department of Microbiology
Bevill Biomedical Research Bldg., Room 609
University of Alabama at Birmingham
Birmingham, AL 35294

Phone: (205) 975-4390
E-mail: mnieder@uab.edu

Education

1993: Ph.D. in Microbiology, University of Erlangen, Germany
Advisor: Prof. Dr. Wolfgang Hillen
Grade: excellent ("summa cum laude")
1989: Diploma in Chemistry, University of the Saarland, Germany
Grade: excellent (1.2) as the second best of 43 students in 1989
1983 – 88: Chemistry and Biology, University of the Saarland, Germany

Research and Professional Experience

2010 – present: Professor, Department of Microbiology, University of Alabama at Birmingham (USA)
2004 – 2010: Associate Professor, Department of Microbiology, University of Alabama at Birmingham (USA)
2002: Habilitation in Microbiology, University of Erlangen (Germany)
1996 – 2004: Research Assistant Professor, Microbiology, University of Erlangen (Germany)
1996: Postdoctoral Fellow, Prof. Dr. Lee W. Riley, Medical College, Cornell University (New York City, USA)
1994 – 1996: Postdoctoral Fellow, Prof. Dr. Roland Benz, Department of Biotechnology, University of Würzburg (Germany)
1994: Postdoctoral Fellow, Prof. Dr. Donald Crothers, Department of Chemistry, Yale University (New Haven, USA)
1993: Postdoctoral Fellow, Prof. Dr. Wolfgang Hillen, Microbiology, University of Erlangen (Germany)

Fellowships, Awards and Honors

2024: Appointed as [University Professor at UAB](#)
2023: Elected as [Senior Member of the National Academy of Inventors](#)
2022: [Triton Endowment by UAB](#)
2018: Elected as [Fellow of the American Academy of Microbiology](#)
2017: Endowed Professor of Bacteriology at UAB
2006: Tenure award at UAB
2003: Young Investigator Award of the German Society for Hygiene and Microbiology (DGHM)
2003: Poster Award of the Society of Biochemistry and Molecular Biology (GBM)
2001: Young Professor Award, Society for Chemical Engineering and Biotechnology (Dechema)
2001: Poster Award of the Society of Biochemistry and Molecular Biology (GBM)

1994: Fellowship of the Röntgen Foundation, University of Würzburg
1994: Human Frontiers Science Program Organization (HFSP) Fellowship
1993: Postdoctoral Fellowship, German Research Society (DFG)
1983: Award from the Society of the German Chemists (GdCh) for the best high school exam in Chemistry

Other Professional Activities

Consultant:

2013 – 2017: Consultant for Illumina (San Diego, USA)
2006 – 2014: Consultant for Schülke & Mayr (Hamburg, Germany)

Reviewer and Editorial Board Member:

Reviewer for journals:

Science, Nature Microbiology, Nature Communications, Nature Methods, Proceedings of the National Academy of Sciences, PLoS Pathogens, MBio, Scientific Reports, Molecular Microbiology, Journal of Bacteriology, Biochemistry, Biochemical Journal, European Journal of Biochemistry, Gene, BioTechniques, Biochimica et Biophysica Acta, Applied Microbiology and Biotechnology, FEBS Letters, BMC Microbiology, PLoS Genetics, PLoS One, Trends in Microbiology

Reviewer for grant agencies, universities and institutes:

Nominated as permanent member of the Bacterial-Host Interactions (BHI) study section (12/2022): declined

Ad hoc reviewer for the NIH:

- study section "Bacterial Pathogenesis" (BACP, NIAID): 06/2007, 06/2008, 06/2009, 01/2011, 02/2018
- study section "PSI: Biology network" (NIGMS): 11/2012
- study section "Tuberculosis Research Units (U19)" (NIAID): 01/2014
- study section "Special Topics in Bacterial Pathogenesis" (NIAID): 03/2015, 03/2016, 03/2017, 11/2018, 11/2020

Ad hoc reviewer for the: German Research Council (DFG), British Biotechnology and Biological Sciences Research Council (BBSRC), Institut Pasteur (Paris, France), National Medical Research Council Singapore

Editorial Advisory Board:

2009 – 2024: Tuberculosis

Publications

Pubmed: 126 of **132 publications** listed

ORCID: 0000-0003-4068-8092

Scopus: >**9,040 citations**; h-index 54 (54 papers are cited at least 54 times)

29 of my publications are in the top 25% journals and 31 of my publications are in the top 25% most cited documents worldwide.

Peer-reviewed articles: * corresponding author; # equal contributions

- 1992: 1. **Niederweis, M.**, Lederer, T. and Hillen, W.* (1992)
An accurate method for determining the helical repeat of DNA in solution reveals differences to the crystal structures of two B-DNA decamers
J. Mol. Biol. **228**, 322-326 (PMID:1453442)
- 1993: 2. **Niederweis, M.** and Hillen, W.* (1993)
Electrophoretic analysis of protein induced DNA bending and twist changes
Electrophoresis **14**, 693-698 (PMID:8404811)
3. Ettner, N., Haak, U., **Niederweis, M.** and Hillen, W.* (1993)
Synthesis of 8-Bromo- and 8-Azido-2'-deoxyadenosine-5'-O-(1-thiotriphosphate)
Nucleos. Nucleot. **12**, 757-771
- 1994: 4. **Niederweis, M.**, Lederer, T. and Hillen, W.* (1994)
Matrix effects suggest an important influence of DNA-polyacrylamide interactions on the electrophoretic mobility of DNA
J. Biol. Chem. **269**, 10156-10162 (PMID:8144517)
5. Biburger, M., **Niederweis, M.** and Hillen, W.* (1994)
Oligo d(C)•oligo d(G) runs exhibit a helical repeat of 11.1 bp and cause slightly DNA curvature when properly phased
Nucleic Acids Res. **22**, 1562-1566 (PMID:8202355; PMCID:PMC308030)
- 1995: 6. **Niederweis, M.**, Maier, E., Lichtinger, T. Benz, R. and Krämer, R.* (1995)
Identification of channel-forming activity in the cell wall of *Corynebacterium glutamicum*
J. Bacteriol. **177**, 5716-5718 (PMID:7559365; PMCID:PMC177387)
- 1998: 7. Lichtinger, T., Michels, J., **Niederweis, M.**, Przybylski, M., Krämer, R. and Benz, R.* (1998)
Biochemical and biophysical characterization of the cell wall porin of *Corynebacterium glutamicum*: the channel is formed by a low molecular mass polypeptide
Biochemistry **37**, 15024-15032 (PMID:9790664)
- 1999: 8. **Niederweis, M.**, Ehrt, S., Heinz, C., Klöcker, U., Swiderek, K. M., Riley, L. W. and Benz, R.* (1999)
Cloning of the *mshA* gene encoding the porin from *Mycobacterium smegmatis*
Mol. Microbiol. **33**, 933-945 (PMID:10476028)
9. Kartmann, B., S. Stenger and **M. Niederweis*** (1999)
Porins in the cell wall of *Mycobacterium tuberculosis*
J. Bacteriol. **181**, 6543-6546 (PMID:10515949; PMCID:PMC103794)
- 2000: 10. Sigler, A., Schubert, P., Hillen, W. and **Niederweis, M.*** (2000)
Permeation of tetracyclines through membranes of liposomes and *Escherichia coli*.
Eur. J. Biochem. **267**, 527-534. (PMID:10632722)
11. Scholz, O., Thiel, A., Hillen, W. and **Niederweis, M.*** (2000)
Quantitative analysis of gene expression with an improved green fluorescent protein
Eur. J. Biochem. **267**, 1565-1570 (PMID:10712585)
12. Wehrl, W., **Niederweis, M.** and Schumann, W.* (2000)
The FtsH protein accumulates at the septum of *Bacillus subtilis* during cell division
J. Bacteriol. **182**, 3870-3873 (PMID:10851010; PMCID:PMC94566)

13. Heinz, C. and **Niederweis, M.*** (2000)
Selective extraction and purification of a mycobacterial outer membrane protein
Anal. Biochem. **285**, 113-120 (PMID:10998270)
- 2001:** 14. **Niederweis, M.**, Heinz, C., Janik, K. and Bossmann S. H.* (2001)
Nanostructuring of carbon surfaces by deposition of a channel-forming protein and subsequent polymerization of methyl-methacrylate-prepolymers
Nano Lett. **1**, 169-174
15. Stahl, C., Kubetzko, S., Kaps, I., Seeber, S., Engelhardt, H. and **Niederweis, M.*** (2001)
MspA provides the main hydrophilic pathway through the cell wall of *Mycobacterium smegmatis*
Mol. Microbiol. **40**, 451-464 (PMID:11309127)
16. Peck, B., Ortkamp, M., Nau, U., **Niederweis, M.**, Hundt, E. and Knapp, B.* (2001)
Characterization of four members of a multigene family encoding outer membrane proteins of *Helicobacter pylori* and their potential for vaccination.
Microb. Infect. **3**, 171-179 (PMID:11358711)
17. Konieczny, M. P. J., Benz, I., Hollinderbäumer, B., Beinke, C., **Niederweis, M.** and Schmidt, M. A.* (2001)
Modular structure of the AIDA autotransporter translocator: The N-terminal β_1 -domain is surface-exposed and stabilizes the β_2 -domain.
Antonie Van Leeuwenhoek **80**, 19-34 (PMID:11761364)
18. Kaps, I., Ehrh, S., Seeber, S., Schnappinger, D., Martin, C., Riley, L. W. and **Niederweis, M.*** (2001)
Energy transfer between fluorescent proteins using a co-expression system in *Mycobacterium smegmatis*
Gene **278**, 115-24 (PMID:11707328)
- 2002:** 19. Engelhardt, H., Heinz, C. and **Niederweis, M.*** (2002)
A tetrameric porin limits the cell wall permeability of *Mycobacterium smegmatis*
J. Biol. Chem. **277**, 37567-37572 (PMID:12130659)
20. **Niederweis, M.**, Heinz, C., Janik, K. and Bossmann S. H.* (2002)
Nanostructuring by deposition of protein channels formed on carbon-surfaces
Nano Lett. **2**, 1263-1268
- 2003:** 21. Heinz, C., Engelhardt, H. and **Niederweis, M.*** (2003)
The core of the tetrameric mycobacterial porin MspA is an extremely stable β -sheet domain
J. Biol. Chem. **278**, 8678-8685 (PMID:12501242)
22. Heinz, C., Karosi, S. and **Niederweis, M.*** (2003)
High level expression of the mycobacterial porin MspA in *Escherichia coli* and purification of the recombinant protein
J. Chromatogr. B **790**, 337-348 (PMID:12767342)
23. **Niederweis, M.*** (2003)
Mycobacterial porins – new channel proteins in unique bacterial outer membranes
Mol. Microbiol. **49**, 1167-1177 (PMID:12940978)
24. Heinz, C., Roth, E. and **Niederweis, M.*** (2003)
Purification of porins from *Mycobacterium smegmatis*.
Methods Mol. Biol. **228**, 139-50.
25. Nothaft, H., Willimek, A., Dresel, D., **Niederweis, M.** and Titgemeyer, M.* (2003)
The phosphotransferase system of *Streptomyces coelicolor* is biased for *N*-acetylglucosamine metabolism.
J. Bacteriol. **185**, 7019-7023 (PMID:14617669; PMCID:PMC262694)
- 2004:** 26. Faller, M., **Niederweis, M.** and Schulz, G. E.* (2004)
The structure of a mycobacterial outer membrane channel
Science **303**, 1189-1192 (PMID:14976314)

27. Peipp, M., Saul, D., Barbin, K., Bruenke, J., Zunino, S. J., **Niederweis, M.** and Fey, G. H.* (2004)
Efficient secretion of fluorescent scFv-fusion proteins directed against CD antigens from insect and mammalian cells
J. Immunol. Meth. **285**, 265-280 (PMID:14980440)
28. Mailaender, C., Reiling, N., Engelhardt, H., Bossmann, S. H., Ehlers, S. and **Niederweis, M.*** (2004)
The MspA porin promotes growth and increases antibiotic susceptibility of both *Mycobacterium bovis* BCG and *Mycobacterium tuberculosis*.
Microbiology **150**, 853-864 (PMID:15073295)
29. Bruenke, J., Fischer, B., Barbin, K., Schreiter, K., Wachter, Y., Mahr, K., Titgemeyer, F., **Niederweis, M.**, Peipp, M., Zunino, S. J., Repp, R., Valerius, T. and Fey, G. H.* (2004)
A recombinant bispecific single-chain Fv antibody against HLA class II and FcγRIII(CD16) triggers effective antibody-mediated lysis of lymphoma cells
Br. J. Haematol. **125**, 167-179 (PMID:15059139)
30. Bossmann, S. H., Janik, K., Pokhrel, M. R., Heinz, C., and **Niederweis, M.** (2004)
Reconstitution of a porin from *Mycobacterium smegmatis* at HOPG covered with hydrophobic host layers
Surf. Interface Anal. 2004; **36**, 127–134
31. Stephan, J., Mailaender, C., Etienne, G., Daffé, M. and **Niederweis, M.*** (2004)
Multi-drug resistance of a porin-deletion mutant of *Mycobacterium smegmatis*
Antimicrob. Agents Chemother. **48**, 4163-4170 (PMID:15504836; PMCID:PMC525411)
32. Stephan, J., Stemmer, V. and **Niederweis, M.*** (2004)
Consecutive gene deletions in *Mycobacterium smegmatis* using the yeast FLP recombinase
Gene **343**, 181-190 (PMID:15563844)
33. Stephan, J., Bail, J. G., Titgemeyer, F. and **Niederweis, M.*** (2004)
DNA-free RNA preparation from mycobacteria
BMC Microbiology **4**, 45 (PMID:15571628; PMCID:PMC539233)
34. Roy, S., Mir, M. A., Anand, S. P., **Niederweis, M.** and Ajitkumar, P.* (2004)
Identification and semi-quantitative analysis of *Mycobacterium tuberculosis* H37Rv *ftsZ* gene-specific promoter activity-containing regions
Res. Microbiol. **155**, 817- 826 (PMID:15567275)
- 2005:** 35. Stephan, J., Wolschendorf, F., Bender, J., Hoffmann, C., Roth, E., Mailaender, C., Engelhardt, H. and **Niederweis, M.*** (2005)
The growth rate of *Mycobacterium smegmatis* depends on sufficient porin-mediated influx of nutrients
Mol. Microbiol. **58**, 714–730 (PMID:16238622)
36. Sharbati-Tehrani, S., Stephan, J., Holland, G., Appel, B., **Niederweis, M.** and Lewin, A.* (2005)
Porins limit the intracellular persistence of *Mycobacterium smegmatis*
Microbiology **151**, 2403-2410 (PMID:16000730)
- 2006:** 37. Mahfoud, M., Sukumaran, S., Hülsmann, P., Grieger, K. and **Niederweis, M.*** (2006)
Topology of the porin MspA in the outer membrane of *Mycobacterium smegmatis*
J. Biol. Chem. **281**, 5908-5915 (PMID:16352610)
38. Niebler, S., Gogritchiani, E., Egner, N., Braun, A. M., Wörner, M., **Niederweis, M.** and Bossmann, S. H.* (2006)
Nanoarray-surfaces by reconstitution of the porin MspA into stabilized long-chain-lipid-monolayers at a gold-surface
Electroanalysis **18**, 1859-1870
- 2007:** 39. Hillmann, D., Eschenbacher, I., Thiel, A. and **Niederweis, M.*** (2007)
Expression of the major porin gene *mspA* is regulated in *Mycobacterium smegmatis*
J. Bacteriol. **189**, 958-967 (PMID:17142388; PMCID:PMC1797333)
40. Wolschendorf, F., Mahfoud, M., and **Niederweis, M.*** (2007)
Porins are required for uptake of phosphates by *Mycobacterium smegmatis*
J. Bacteriol. **189**, 2435-2442 (PMID:17209034; PMCID:PMC1899398)

41. Titgemeyer, F., Parche, S., Mahfoud, M., Amon, J., Bail, J., Schlicht, M., Rehm, N., Hillmann, D., Stephan, J., Walter, B., Burkovski, A. and **Niederweis, M.*** (2007)
A genomic view of sugar transport in *Mycobacterium smegmatis* and *Mycobacterium tuberculosis*
J. Bacteriol. **189**, 5903-5915 (PMID:17557815; PMCID:PMC1952047)
42. Song, H. and **Niederweis, M.*** (2007)
Functional expression of the Flp recombinase in *Mycobacterium bovis* BCG
Gene **399**, 112-119 (PMID:17590537; PMCID:PMC1987385)
43. Gibbons, H. S., Wolschendorf, F., Abshire, M., **Niederweis, M.** and Braunstein, M.* (2007)
Identification of two *Mycobacterium smegmatis* lipoproteins exported by a SecA2-dependent pathway
J. Bacteriol. **189**, 5090-5100 (PMID:17496088; PMCID:PMC1951849)
44. Wörner, M., Lioubashevski, O., Basel, M.T., Niebler, S., Gogritchiani, E., Egner, N., Heinz, C., Hoferer, J., Cipolloni, M., Janik, K., Katz, E., Braun, A.M., Willner, I., **Niederweis, M.**, and Bossmann, S.H.* (2007)
Characterization of nanostructured surfaces generated by reconstitution of the porin MspA from *Mycobacterium smegmatis*.
Small **3**, 1084-1097 (PMID:17514767)
45. Hoffmann, C., Leis, L., **Niederweis, M.**, Plitzko, J. M. and Engelhardt, H.* (2007)
Cryo-electron tomography and vitreous sections reveal the outer membrane of mycobacteria.
Int. J. Med. Microbiol. **297**, 138-139
- 2008:** 46. **Niederweis, M.*** (2008)
Nutrient acquisition by mycobacteria
Microbiology **154**, 679-692 (PMID:18310015)
47. Hoffmann, C., Leis, L., **Niederweis, M.**, Plitzko, J. M. and Engelhardt, H.* (2008)
Disclosure of the mycobacterial outer membrane: Cryo-electron tomography and vitreous sections reveal the lipid bilayer structure
Proc. Natl. Acad. Sci. USA **105**, 3963-3967 (PMID:18316738; PMCID:PMC2268800)
48. Song, H., Sandie, R., Wang, Y., Andrade-Navarro, M., and **Niederweis, M.*** (2008)
Identification of outer membrane proteins of *Mycobacterium tuberculosis*.
Tuberculosis **88**, 526-544 (PMID:18439872; PMCID:PMC2615007)
49. Siroy, A., Mailaender, C., Harder, D., S., K., Wolschendorf, F., Danilchanka, O., Wang, Y., Heinz, C., and **Niederweis, M.*** (2008)
Rv1698 of *Mycobacterium tuberculosis* represents a new class of channel-forming outer membrane proteins.
J. Biol. Chem. **283**, 17827-17837 (PMID:18434314; PMCID:PMC2440620)
50. Song, H., Wolschendorf, F. and **Niederweis, M.*** (2008)
Construction of unmarked deletion mutants in mycobacteria.
Methods Mol. Biol. **465**, 279-295
51. Danilchanka, O., Pavlenok, M. and **Niederweis, M.*** (2008)
Role of porins for uptake of antibiotics by *Mycobacterium smegmatis*
Antimicrob. Agents Chemother. **52**, 3127-3134 (PMID:18559650; PMCID:PMC2533485)
52. Danilchanka, O., Mailaender, C. and **Niederweis, M.*** (2008)
Identification of a novel multidrug efflux pump of *Mycobacterium tuberculosis*
Antimicrob. Agents Chemother. **52**, 2503-2511 (PMID:18458127; PMCID:PMC2443884)
53. Butler, T. Z., M. Pavlenok, I. M. Derrington, **M. Niederweis*** and J. H. Gundlach* (2008)
Single-Molecule DNA detection with an engineered MspA protein nanopore
Proc. Natl. Acad. Sci. USA **105**, 20647-20652 (PMID:19098105; PMCID:PMC2634888)
- 2009:** 54. Basel, M. T., Dani, R. K., Kang, M., Smith, P. E., Pavlenok, M., **Niederweis, M.**, Bossmann, S. H.* (2009)
Direct observation of gold nanoparticle assemblies with the porin MspA on mica
ACS Nano **3**, 462-466 (PMID:19236086; PMCID:PMC2657223)

55. Huff, J., Pavlenok, M., Sukumaran, S. and **Niederweis, M.*** (2009)
Functions of the periplasmic loop of the porin MspA from *Mycobacterium smegmatis*
J. Biol. Chem **284**, 10223-10231 (PMID:19208627; PMCID:PMC2665076)
56. Cook, G. M., Berney, M., Gebhard, S., Heinemann, M., Cox, R. A., Danilchanka, O., and **Niederweis, M.*** (2009)
Physiology of mycobacteria
Adv. Microb. Physiol. **55**, 81-182 (PMID:19573696)
57. Fabrino, D. L., Bleck, C. K. E., Anes, E., Hasilik, A., Melo, R. C. N., **Niederweis, M.**, Griffiths, G. and Gutierrez, M. G.* (2009)
Porins facilitate nitric oxide-mediated killing of mycobacteria
Microbes and Infection **11**, 868-75 (PMID:19460455; PMCID:PMC2737867)
58. Svetlikova, Z., Skovierova, H., **Niederweis, M.**, Gaillard, J.L., McDonnell, G., and Jackson, M.* (2009)
The role of porins in the susceptibility of *Mycobacterium smegmatis* and *Mycobacterium chelonae* to aldehyde-based disinfectants and drugs.
Antimicrob Agents Chemother. **53**, 4015-4018 (PMID:19581465; PMCID:PMC2737867)
59. Purdy, G. E., **Niederweis, M.** and Russell, D. G.* (2009)
Decreased outer membrane permeability protects mycobacteria from killing by ubiquitin-derived peptides
Mol. Microbiol. **73**, 844-857 (PMID:19682257; PMCID:PMC2747030)
60. Gamage, P., Basel, M.T., Lovell, K., Pokhrel, M.R., Battle, D., Ito, T., Pavlenok, M., **Niederweis, M.**, and Bossmann, S.H.* (2009)
Poly-N-isopropylacrylamide/acrylic acid copolymers for the generation of nanostructures at mica surfaces and as hydrophobic host systems for the porin MspA from *Mycobacterium smegmatis*.
J Phys Chem C **113**: 16485-16494. (PMID:20161351; PMCID:PMC2776743)
- 2010:** 61. Steinhauer, K.*, Eschenbacher, I., Radischat, N., Detsch, C., **Niederweis, M.**, Goroncy-Bermes, P. (2010)
Rapid evaluation of the mycobactericidal efficacy of disinfectants in the quantitative carrier test EN 14563 using fluorescent *Mycobacterium terrae*
Appl. Environ. Microbiol. **76**, 546-554 (PMID:19948860; PMCID:PMC2805218)
62. **Niederweis, M.***, Danilchanka, O., Hoffmann, C., Huff, J. and Engelhardt, H. (2010)
Mycobacterial outer membranes: in search of proteins
Trends Microbiol. **18**, 109-116 (PMID:20060722; PMCID:PMC2931330)
63. Teriete, P., Yao, Y., Kolodzik, A., Yu, J., Song, H., **Niederweis, M.**, and Marassi, F.M.* (2010)
Mycobacterium tuberculosis Rv0899 adopts a mixed alpha/beta-structure and does not form a transmembrane beta-barrel.
Biochemistry **49**, 2768-2777 (PMID:20199110; PMCID:PMC2847638)
64. Mojib, N., Philpott, R., Huang, J.P., **Niederweis, M.**, and Bej, A.K.* (2010)
Antimycobacterial activity in vitro of pigments isolated from Antarctic bacteria.
Antonie Van Leeuwenhoek **98**, 531-40 (PMID:20556653)
65. Wolschendorf, F., A. Duverger, J. Jones, F. H. Wagner, J. Huff, W. H. Benjamin, M. S. Saag, **M. Niederweis** and O. Kutsch* (2010)
Hit-and-Run Stimulation: A Novel Concept to Reactivate Latent HIV-1 Infection Without Cytokine Gene Induction.
J. Virol. **84**, 8712-8720 (PMID:20538859; PMCID:PMC2919022)
66. Huff, J., Czyz, A., Landick, R. and **Niederweis, M.*** (2010)
Taking phage integration to the next level as a genetic tool for mycobacteria
Gene **468**, 8-19 (PMID:20692326; PMCID:PMC2952446)

67. Derrington, I. M., T. Z. Butler, M. D. Collins, E. Manrao, M. Pavlenok, **M. Niederweis** and J. H. Gundlach* (2010)
Nanopore DNA sequencing with MspA
Proc. Natl. Acad. Sci. USA **107**, 16060-16065 (PMID:20798343; PMCID:PMC2941267)
68. Jones, C. and **M. Niederweis*** (2010)
Role of porins in iron uptake by *Mycobacterium smegmatis*
J. Bacteriol. **192**, 6411-6417 (PMID:20952578; PMCID:PMC3008526)
- 2011:** 69. Wolschendorf, F., D. Ackart, T. B. Shrestha, L. Hascall-Dove, S. Nolan, G. Lamichhane, Y. Wang, S. H. Bossmann, R. J. Basaraba and **M. Niederweis*** (2011)
Copper resistance is essential for virulence of *Mycobacterium tuberculosis*
Proc. Natl. Acad. Sci. USA **108**, 1621-1626 (PMID:21205886; PMCID:PMC3029754)
70. Jones, C. and **Niederweis, M.*** (2011)
Mycobacterium tuberculosis can utilize heme as an iron source
J. Bacteriol. **193**, 1767-70 (PMID:21296960; PMCID:PMC3067660)
71. Frenzel, E., Schmidt, S., **Niederweis, M.**, Steinhauer, K.* (2011)
Porins are important for the efficacy of biocides against *Mycobacterium smegmatis*
Appl Environ Microbiol. 2011 Mar 11. (PMID: 21398489; PMCID:PMC3126410)
72. Song, H., Huff, J., Janik, K., Walter, K., Keller, C., Ehlers, S., Bossmann, S. H., **Niederweis, M.*** (2011)
Expression of the *ompATb* operon accelerates ammonia secretion and adaptation of *Mycobacterium tuberculosis* to acidic environments.
Mol Microbiol. **80**, 900-918 (PMID: 21410778; PMCID:PMC3091969)
73. Manrao, E. A., Derrington, I. M., Pavlenok, M., **Niederweis, M.**, Gundlach, J. H.* (2011)
Nucleotide Discrimination with DNA Immobilized in the MspA Nanopore
PLoS One **6**, e25723 (PMID:21991340; PMCID:PMC3186796)
- 2012:** 74. Song, H. and **Niederweis, M.*** (2012)
Uptake of sulfate but not phosphate by *Mycobacterium tuberculosis* is slower compared to *Mycobacterium smegmatis*
J. Bacteriol. **194**, 956-64 (PMID:22194452; PMCID:PMC3294763)
75. Yao, Y., Barghava, N., Kim, J., **Niederweis, M.**, Marassi, F. M.* (2012)
Peptidoglycan recognition by *Mycobacterium tuberculosis* ArfA (Rv0899) reveals a link between acid adaptation and cell wall structure
J. Mol. Biol. **416**, 208-20 (PMID:22206986; PMCID:PMC3269530)
76. Seeliger, J. C., Holsclaw, C. M., Schelle, M. W., Botyanszki, Z., Gilmore, S. A., Tully, S. E., **Niederweis, M.**, Cravatt, B. F., Leary, J. A., Bertozzi, C. R.* (2012)
Elucidation and chemical modulation of sulfolipid-1 biosynthesis in *Mycobacterium tuberculosis*
J. Biol. Chem. **287**, 7990-8000 (PMID:22194604; PMCID:PMC3318749)
77. Rowland, J. and **Niederweis, M.*** (2012)
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Biophys. J. **120**, 1-5 (PMID: 33617833)
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The C-terminus is essential for the stability of the mycobacterial channel protein MspA
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Book chapters:

- 2003:** 1. **Niederweis, M.** and Bossmann, S. (2003)
Surface nanostructuring using proteins
in Nalwa, H. S. (Ed.) Encyclopedia of Nanoscience and Nanotechnology
2. **Niederweis, M.** (2003)
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ChemBioChem **3**, 1-4
- 2005:** 3. Bossmann, S. H., Janik, K. and **Niederweis, M.** (2004)
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in O. Shoseyov and I. Levy (Eds.) NanoBioTechnology: BioInspired devices and materials of the future
- 2008:** 4. **Niederweis, M.** (2008)
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TB Handbook, Volume 1: Molecular Genetics and Biochemistry
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5. **Niederweis, M.** (2008)
Mycobacterial Porins
The Mycobacterial Cell Envelope
Eds.: Daffé, M. and Reyrat, J.-M.

Patents:

1. **Process for the production of a channel-forming protein**
M. Niederweis, S. Bossmann
Priority 1999-08-31 • Filed 1999-09-11 • Published 2001-03-01
2. **Method for the production of regular nanostructures**
M. Niederweis, S. Bossmann
Priority 1999-08-31 • Filed 2000-08-28 • Published 2001-03-08
3. **Msp Nanopores and Related Methods**
Jens H. Gundlach, Michael Niederweis, Thomas Z. Butler, Mikhail Pavlenok, Mark A. Troll, Suja Sukumaran, Bertil Hille
US Patent: 8,673,550, 03/18/2014; US20210189480A1
US patent 9,170,230 issued 10/27/2015 (filed 3/17/2014)
US divisional application 14/216,349 filed 3/17/2014
US continuation application 14/318,072 filed 6/27/2014
Canadian patent application 2,774,710 filed 3/22/2011
European patent application 09815404.0 filed 3/22/2011
Chinese patent ZL200980142855.5 issued 4/1/2015 (filed 4/28/2011)
(All applications in this family of applications claim priority to same original application and have the same title.)
Illumina Inc. has acquired the exclusive licence to this patent in October 2013.
<https://www.uab.edu/news/latest/item/3847-licensing-deal-marks-coming-of-age-for-uab-uw-nanopore-sequencing-technology>
4. **Mycobacterium tuberculosis porins and toxins and related methods**
Michael Niederweis and Olga Danilchanka
US patent application 14/342,057 filed 3/3/2014
Canadian patent application 2,847,442 filed 4/4/2014
European patent application 12827230.9 filed 1/10/2014
Japanese patent application 2014-528593 filed 2/28/2014
5. **Msp Nanopores and Uses Thereof**
Michael Niederweis and Mikhail Pavlenok
US Patent: US 2022/0169683, US20220169683A1
Published 2022-06-02
6. Priority 2014-04-16 • Filed 2020-08-19 • Published 2021-02-11
Latent human immunodeficiency virus reactivation
Olaf Kutsch, Michael Niederweis, Frank Wolschendorf, Alexandra Duverger, Frederic Wagner
Priority 2010-05-18 • Filed 2011-05-18 • Published 2011-11-24
7. **Targeting the efflux systems of *Mycobacterium tuberculosis***
Michael Niederweis
Priority 2008-05-20 • Filed 2009-05-20 • Published 2009-11-26

Research Support

Current Research Support:

	Total Costs
NIH/NIAID: 1 R01 AI137338	01/01/2019 - 12/31/2024
“Heme and hemoglobin utilization by <i>Mycobacterium tuberculosis</i>”	\$3,268,866
Role: PI	
Major Goal: The aim of this proposal is to reveal the molecular mechanisms of iron acquisition by <i>M. tuberculosis</i> from heme and hemoglobin, the most prevalent iron sources in the human body.	
NIH: R01 5HL126066	09/01/2021 – 08/31/2026
“Necrosis in pulmonary TB granulomas: dynamics, mechanisms, therapies”	\$743,915
Role: co-PI (PI Kramnik, Boston University)	
Major Goals: This proposal aims to understand the mechanisms underlying necrotic death in cells infected with <i>M. tuberculosis</i> , their relevance during infection and exploit their potential for host-directed therapies.	
NIH/NHGRI: R01 HG012553	06/01/2023-05/31/2026
“Asymmetric single-chain MspA nanopores for electroosmotic stretching and sequencing proteins”	\$556,878
Role: co-PI (PI Wanunu, Northeastern University)	
Major Goal: In this project we will engineer single-chain MspA to develop a novel platform for protein sequencing.	
NIH/NIAID: R01 AI175106	07/01/2023 – 06/30/2027
“Toxin Secretion and Trafficking by <i>Mycobacterium tuberculosis</i>”	\$2,965,989
Role: PI	
Major Goal: In this project we will examine the novel protein secretion mechanisms utilized by <i>M. tuberculosis</i> to secrete the toxin TNT and to enable its trafficking across the phagosomal membrane.	
UAB Bridge Fund	07/01/2024 – 06/30/2025
Structural and biochemical investigation of siderophore secretion by <i>Mycobacterium tuberculosis</i>	\$75,000
<u>Pending grant applications:</u>	
NIAID (NIH): 1 R01 AI184596	04/01/2025 – 03/31/2030
Structural and biochemical investigation of siderophore secretion by <i>Mycobacterium tuberculosis</i>	\$3,319,620
Role: PI	
Major Goal: We will identify missing components of the unique siderophore secretion system of <i>M. tuberculosis</i> , solve their structures and characterize their functions to shed light on the molecular organization and transport mechanism of (carboxy)mycobactins.	
A1 submission 07/2024: Score: 23, 9 th percentile; pending	
NIAID (NIH): 1 R01 AI184596	04/01/2025 – 03/31/2030
Role of ESX-5 substrates in protein secretion and virulence of <i>Mycobacterium tuberculosis</i>	\$3,651,095
Role: PI	
The goal of this project is to gain fundamental knowledge on the molecular mechanisms of ESX-5 protein export and secretion and the function of Esx effector proteins secreted by the ESX-5 system in <i>M. tuberculosis</i> .	
A1 submission 07/2024: pending	
Open Lab Foundation (Tres Cantos, Spain):	06/01/2025 – 05/31/2027
Synergistic siderophore secretion inhibitors against <i>Mycobacterium tuberculosis</i>	\$325,508
Role: PI	
The goal of this project is to comprehensively characterize a siderophore-dependent inhibitor to provide a solid foundation for mouse infection experiments and potentially develop a drug, which not only kills Mtb by itself but also rescues bedaquiline as a key drug for treating drug-resistant tuberculosis.	
02/2025: pending	

Total Research Support:

Grants highlighted in green are active.

Grant Title	Awardee(s)	Funding Agency	Dates	Direct costs / year (MN)	Total direct costs (MN)	Total indirect costs (UAB)	Total Research Funds
Structural and biochemical investigation of siderophore secretion by <i>Mycobacterium tuberculosis</i>	Niederweis	UAB Bridge Fund	07/01/2024-06/30/2025	\$75,000	\$75,000		\$75,000
Toxin Secretion and Trafficking by <i>Mycobacterium tuberculosis</i>	Niederweis	NIH/NIAID: R01 AI175106	07/01/2023-06/30/2027	\$493,014	\$2,186,647	\$779,342	\$2,965,989
Designed Protein Nanopores	Niederweis	Blazer Bridge Fund: U23-005	07/01/2023-06/30/2025	\$50,000	\$50,000		\$50,000
Asymmetric single-chain MspA nanopores for electroosmotic stretching and sequencing proteins	Wanunu	NIH/NHGRI: R01 HG012553	02/01/2023-01/31/2026	\$125,000	\$375,000	\$181,876	\$556,876
Necrosis in pulmonary TB granulomas: dynamics, mechanisms, therapies	Kramnik (PI), Niederweis	NIH: R01 HL126066	04/01/2021 - 03/31/2026	\$102,425	\$512,126	\$248,386	\$760,512
Siderophore secretion by <i>Mycobacterium tuberculosis</i>	Niederweis	NIAID/NIH: R21 AI151239	09/01/2021 - 08/31/2023	\$150,000	\$275,000	\$133,377	\$408,377
Siderophore-dependent inhibitors of <i>Mycobacterium tuberculosis</i>	Niederweis	NIAID/NIH: R21 AI153981	06/22/2020 - 05/31/2022	\$150,000	\$275,000	\$133,377	\$408,377
Single-chain MspA for nanopore sequencing of MspA	Niederweis	NHGRI (NIH): R21 HG010543	04/01/2019 - 03/31/2021	\$150,000	\$275,000	\$133,377	\$408,377
Heme and hemoglobin utilization by <i>Mycobacterium tuberculosis</i>	Niederweis	NIAID (NIH): R01 AI137338	01/01/2019 - 12/31/2024	\$218,295	\$1,091,475	\$577,865	\$3,268,866
Impact Award		UAB	05/01/2017 - 04/30/2021	\$100,000	\$300,000		\$300,000
Self-poisoning of <i>Mycobacterium tuberculosis</i> by inhibiting siderophore secretion	Niederweis	Open Lab Foundation (Spain): TC193	07/01/2016 - 12/31/2020	\$150,000	\$300,000		\$300,000
The necrosis-inducing toxin of <i>Mycobacterium tuberculosis</i>	Niederweis	NIH/NIAID: R01 AI121354	12/01/2015 - 11/30/2021	\$284,044	\$1,420,220	\$667,503	\$2,514,315
Iron acquisition by <i>Mycobacterium tuberculosis</i>	Niederweis	UAB, AMC21	04/2016-03/2018	\$50,000	\$150,000		\$150,000
Killing and sensitizing bacterial pathogens to conventional antibiotics using a protein complex from human milk	Hakansson (PI), Niederweis	Swedish Research Council	12/2014 - 11/2018	\$164,265	\$657,058	\$308,817	\$965,875
Targeting siderophore secretion, an achilles heel of <i>Mycobacterium tuberculosis</i>	Niederweis	Alabama Drug Discovery Alliance	05/2013-04/2018	\$50,000	\$250,000		\$250,000
Nanopore sequencing of DNA with MspA	Gundlach (PI), Niederweis	NIH (NHGRI): R01 HG005115	09/23/2009 - 06/30/2013	\$227,760	\$911,040	\$428,189	\$1,339,229
M. tuberculosis Membrane Protein Pharmaceutical Targets	Cross (PD), Niederweis	NIH/NIAID: P01 AI074805	08/2009-07/2014	\$233,000	\$1,165,000	\$547,550	\$1,712,550
Copper transport in <i>Mycobacterium tuberculosis</i>	Niederweis	NIH/NIAID, R01 AI083632	05/2009-04/2014	\$250,000	\$1,250,000	\$587,500	\$1,837,500
Mechanisms of multidrug resistance of <i>Mycobacterium tuberculosis</i>	Niederweis	Center for AIDS Research, UAB	02/2008-01/2009		\$20,000		\$20,000
Engineering MspA for Nanopore Sequencing	Gundlach (PI), Niederweis	NIH/NHGRI: R21 HG004145	09/2006-08/2009		\$401,126	\$183,374	\$584,500
Role of OmpATb in adaptation of <i>Mycobacterium tuberculosis</i> to acidic environments	Niederweis	The Potts Memorial Foundation	09/2006-08/2007		\$23,000		\$23,000
Role of OmpATb in adaptation of <i>Mycobacterium tuberculosis</i> to acidic environments	Niederweis	Center for AIDS Research, UAB	07/2006-06/2007		\$30,000		\$30,000
Porins of <i>Mycobacterium tuberculosis</i>	Niederweis	NIH/NIAID: R01 AI63432	02/2005-01/2010	\$250,000	\$1,250,000	\$587,500	\$1,837,500
Total of five grants obtained in Germany	Niederweis		1997 - 2004		\$919,655		\$919,655
					\$14,162,347	\$5,498,031	\$21,686,496

Leadership responsibilities and service at UAB

Microbiology Department

- 2022-current: Co-Chair of the equipment committee of the Microbiology Department
- 2022-2024: Co-Chair of the faculty appointments, promotions, and tenure (APT) committee
- 2022: Member of the faculty appointments, promotions, and tenure (APT) committee of the Microbiology Department
- 2019-2022: Member of the equipment committee of the Microbiology Department
- 2017-2019: Co-chair of a faculty search committee for Bacteriology, Microbiology Department
- 2013-2015: Co-Director of the "Microbiology" theme at UAB
- 2013-2014: Chair of two faculty search committees for Bacteriology, Microbiology Department
- 2009-2015: Director of the International student exchange program between UAB and the University of Erlangen-Nürnberg, Germany
- 2009-2013: Representative of the "Microbiology" theme in the [GBS \(Graduate Biomedical Sciences\)](#) curriculum committee
- 2010: Development of the new curriculum for the "Microbiology" theme in the GBS program

Teaching Activities

University of Würzburg, Germany:

- 1995: "Physical Chemistry in Biotechnology – Enzyme kinetics and membrane transport", 10 lectures

University of Erlangen, Germany:

- 1996 – 2004: "Microbiological exercises for advanced students", 20-30 students, 80 hours, course director
- 1998 – 2004: "Molecular mechanisms of microbial pathogenesis", Advanced Microbiology, 10 lectures
- 2001 – 2004: "Experimental Methods in Biology", 3 lectures
- 2003: "Genomics and Proteomics", 1 lecture
- 2004: "General Microbiology", 8 lectures

University of Alabama at Birmingham, USA: (not updated)

- 2005: "Cellular and Molecular Biology II - Genes", graduate program (2 hrs)
- 2006: "Cellular and Molecular Biology IV - Bacterial Genetics and Physiology", graduate program (2 hrs)
- 2006: "Cellular and Molecular Biology VII - Bacterial Pathogenesis", graduate program, (2 hrs)
- 2006 - 2008: "Cellular and Molecular Biology II - Genes", graduate program, 3 lectures (6 hrs)
- 2007 - 2012: "Cellular and Molecular Biology IV - Bacterial Genetics and Physiology", graduate program, 2 lectures (4 hrs)
- 2007 - 2012: "Cellular and Molecular Biology VII - Bacterial Pathogenesis", graduate program, 2 lectures (4 hrs)
- 2008 - 2013: "Cellular and Molecular Biology II - Genes", graduate program, course director, 3 lectures (6 hrs)
- 2008 - 2017: "Physiology and Pathogenicity of Mycobacteria", graduate program, Journal Club, each semester (20 hrs)
- 2013 - 2019: "Prokaryotic Genetics and Molecular Biology", GBS760, course director, 6 lectures (12 hrs)
- 2011 - current: GBS 763 – Microbial Pathogenesis, 1 lecture (2 hrs)
- 2017 - current: GBS 740V – Advanced Topics in Bacterial Pathogenesis, 1 lecture, 1 group presentation (4 hrs contact time)
- 2021 - current: DENT 1150/1155 & OBHS 111/112, Fundamentals I & II, 1 lecture (2 hrs)
- 2022 - current: GBS 707 Small Group Discussions, 1 lecture, 1 group presentation (4 hrs)

Activities as a course director of CMB II: organize a course for 50-70 students from different UAB graduate programs, attend 15 lectures (2 hours each), prepare and grade two exams (together with the lecturers)

Trainees

Current trainees:

- since 05/12: Dr. Maria Virginia Meikle, scientist I, lab manager
 since 12/15: Dr. Mikhail Pavlenok, scientist I
 since 09/21: Dr. Rashmi Ravindran Nair, postdoctoral researcher
 since 03/22: Dr. Avraneel Paul, postdoctoral researcher
 since 09/22: Dr. Swati Dubey, postdoctoral researcher
 since 02/24: Dr. John Mark Miller, postdoctoral researcher
 since 04/24: Logan Mavar, graduate student

Awards for trainees in my laboratory:

1. Rashmi Ravindran Nair (2024) 1st place, oral presentation, postdocs, UAB Microbiology Research Retreat
2. Uday Tak (2019): 1st place, poster presentation, graduate students, UAB Microbiology Research Retreat
3. Uday Tak (2019): David E. Wells Award for the best graduate student in Microbiology at UAB
4. Uday Tak (2019): Best poster award, Gordon Research Seminar and Conference: Proteins – Molecular Form and Function of Proteins, in Nature and by Design
5. David Pajuelo Gamez (2018): Cell Reports paper selected as a UAB Featured Discovery of the month in December 2018
6. Avishek Mitra (2018): 1st place, oral presentation, postdocs, UAB Microbiology Research Retreat
7. David Pajuelo Gamez (2018): 2nd place, poster presentation, postdocs, UAB Microbiology Research Retreat
8. Lei Zhang (2017): 1st place, poster presentation, postdocs, UAB Microbiology Research Retreat
9. Uday Tak (2017): 2nd place, oral presentation, graduate students, UAB Microbiology Research Retreat
10. Kathryn Dornboos (2017): 2nd place, oral presentation, graduate students, 6th Southeastern Mycobacteria Meeting (Athens, Georgia)
11. Avishek Mitra (2017): 2nd place, oral presentation, postdocs, 6th Southeastern Mycobacteria Meeting (Athens, Georgia)
12. David Pajuelo Gamez (2017): 1st place, oral presentation, postdocs, UAB Microbiology Research Retreat
13. Uday Tak (2016): Hiramoto Travel Award, UAB Microbiology Department
14. Avishek Mitra (2016): 1st place, oral presentation, postdocs, UAB Microbiology Research Retreat
15. David Pajuelo Gamez (2016): 1st place, poster presentation, postdocs, UAB Microbiology Research Retreat
16. Kathryn Dornboos (2016): Hiramoto Travel Award, UAB Microbiology Department
17. Mikhail Pavlenok (2015): 1st place, oral presentation, graduate students, UAB Microbiology Research Retreat
18. Kathryn Dornboos (2015): 1st place, poster presentation, graduate students, UAB Microbiology Research Retreat
19. Uday Tak (2015): 1st place, poster presentation, graduate students, UAB Microbiology Research Retreat
20. Avishek Mitra (2015): 1st place, poster presentation, postdocs, UAB Microbiology Research Retreat
21. Kathryn Dornboos (2014): 1st place, oral presentation, graduate students, UAB Microbiology Research Retreat
22. Avishek Mitra (2014): 1st place, poster presentation, postdocs, UAB Microbiology Research Retreat
23. Bradford Buck (2014): Basic Mechanisms in AIDS Pathogenesis Training Grant (T32 AI 7493-17)
24. Jim Sun (2014): 1st place, Postdoctoral Research Day, UAB
25. Alexander Speer (2014): 2nd place, Postdoctoral Research Day, UAB
26. Jim Sun (2014): 1st place, oral presentation, postdocs, 5th Southeastern Mycobacteria Meeting (Birmingham, Alabama)
27. Bradford Buck (2014): 3rd place, poster presentation, graduate students, 5th Southeastern Mycobacteria Meeting (Birmingham, Alabama)
28. Kathryn Doornbos (2013): Sinkala Travel Fellowship, 2013. Travel grant awarded by the Sparkman Center for Global Health at UAB.

29. Kathryn Doornbos (2013): Hiramoto Travel Award, UAB Microbiology Department
30. Kathryn Doornbos (2013): Ireland Travel Award granted by the UAB Graduate School
31. Jennifer Rowland (2013): Infectious Diseases, Global Health and Vaccines Travel Scholarship
32. Jennifer Rowland (2013): UAB Ireland Research Travel Award
33. Kathryn Doornbos (2012): 1st place, oral presentation, graduate students, UAB Microbiology Research Retreat
34. Jennifer Rowland (2012): UAB Graduate Student Association Travel Award (August 2012)
35. Jennifer Rowland (2012): Hiramoto Travel Award, UAB Microbiology Department
36. Jennifer Rowland (2012): UAB Graduate Student Association Travel Award (January 2012)
37. Jennifer Rowland (2012-2014): Basic Mechanisms in AIDS Pathogenesis Training Grant (T32 AI 7493-17)
38. Mikhail Pavlenok (2012-2014): Carmichael fellowship, best student in the UAB GBS graduate program
39. Axel Siroy (2009-2011): Postdoctoral fellowship, Heiser Program for Research in Leprosy and Tuberculosis
40. Mikhail Pavlenok (2010): 1st place, poster presentation, graduate students, UAB Microbiology Research Retreat
41. Jason Huff (2010): Award for poster, American Society for Microbiology
42. Chris Jones (2010): Hiramoto Travel Award, UAB Microbiology Department
43. Olga Danilchanka (2010): Best Doctoral Graduate Student in the Dept. of Microbiology, UAB
44. Olga Danilchanka (2010): Travel award, American Society for Microbiology
45. Jennifer Rowland (2010): Graduate Student Travel award, UAB
46. Jennifer Rowland (2010): Hiramoto Travel Award, UAB Microbiology Department
47. Jennifer Rowland (2009-2011): Cellular and Molecular Biology Training Grant (T32 GM 8111-23)
48. Jason Huff (2009): 1st place, UAB Graduate Student Research Day
49. Jason Huff (2009): 1st place, oral presentation, graduate students, UAB Microbiology Research Retreat
50. Jason Huff (2009): Fellowship, NIH training grant, UAB
51. Chris Jones (2008): Fellowship, NIH training grant, UAB
52. Frank Wolschendorf (2008): Travel award, American Society for Microbiology
53. Olga Danilchanka (2008): Travel award, American Society for Microbiology
54. Olga Danilchanka (2008): Hiramoto Travel Award, UAB Microbiology Department
55. Olga Danilchanka (2008): 1st place, UAB Graduate Student Research Day
56. Olga Danilchanka (2007): 1st place, poster presentation, graduate students, UAB Microbiology Research Retreat
57. Ryan Wells (2007-2010): Fellowship, NIH training grant, UAB
58. Ryan Wells (2005-2011): MD/PhD training grant, UAB

Past trainees:

Postdoctoral trainees	Current position
1. Dr. Xiyuan Bai , Department of Microbiology, University of Erlangen, Germany (1999-2000)	Associate Professor, University of Colorado, Denver
2. Dr. Suja Sukumaran , Department of Microbiology, University of Alabama at Birmingham, USA (2005-2006)	Spectroscopy Scientist at Thermo Fisher Scientific, San Francisco
3. Dr. Houhui Song , Department of Microbiology, University of Alabama at Birmingham, USA (2005-2008, 2010-2011)	Professor, Zhejiang A&F University, China
4. Dr. Frank Wolschendorf , Department of Microbiology, University of Erlangen, Germany (2009)	Adjunct Associate Professor, UAB; Scientific director of the HTK Hygiene Technology Center, Nuernberg, Germany
5. Dr. Olga Danilchanka , Department of Microbiology, University of Alabama at Birmingham, USA (2010-2012)	Senior Associate, MRL Ventures at Merck
6. Dr. Christopher Jones , Department of Microbiology, University of Alabama at Birmingham, USA (2012-2013)	Postdoctoral Researcher, University of Arizona
7. Dr. Axel Siroy , Department of Microbiology, University of Alabama at Birmingham, USA (2007-2014)	Postdoctoral Researcher, CNRS, France

8. Dr. Alexander Speer , Department of Microbiology, University of Alabama at Birmingham, USA (2013-2015)	Assistant Professor, VU University Medical Center Amsterdam, Netherlands
9. Dr. Jim Sun , Department of Microbiology, University of Alabama at Birmingham, USA (2012-2015)	Assistant Professor, University of Ottawa, Canada
10. Dr. Robert van de Weerd , Department of Microbiology, University of Alabama at Birmingham, USA (2016-2018)	Postdoctoral Researcher, Carnegie Mellon University
11. Dr. Mukta Khasnis , Department of Microbiology, University of Alabama at Birmingham, USA (2017-2018)	maternity leave
12. Dr. Avishek Mitra , Department of Microbiology, University of Alabama at Birmingham, USA (2014-2020)	Assistant Professor, Oklahoma State University, Stillwater
13. Dr. David Pajuelo Gamez , Department of Microbiology, University of Alabama at Birmingham, USA (2015-2021)	Director, R&D Division, Bionos Biotech, Spain
14. Dr. Lei Zhang , Department of Microbiology, University of Alabama at Birmingham, USA (2014-2022)	Assistant Professor, Huazhong University, China

Doctoral trainees (Year of degree in parentheses)	Current position
1. Iris Eschenbacher (Kaps), Department of Microbiology, University of Erlangen, Germany (2002)	Expert for Food Chemistry, Cosmetics and Hygiene, CEO of IrisResearch
2. Christian Heinz , Department of Microbiology, University of Erlangen, Germany (2003)	Postdoc, University of Vienna, Austria
3. Claudia Mailaender , Department of Microbiology, University of Erlangen, Germany (2004)	Sales representative, Sanofi Aventis, Germany
4. Joachim Stephan , Department of Microbiology, University of Erlangen, Germany (2004)	Sales representative, Sanofi Aventis, Germany
5. Maysa Mahfoud , Department of Microbiology, University of Erlangen, Germany (2004)	Senior Scientist, Prince Sultan Military Medical City, Saudi Arabia; Previously: Assistant Professor, Aleppo University, Syria
6. Dietmar Hillmann , Department of Microbiology, University of Erlangen, Germany (2006)	Sales representative, Biorad
7. Frank Wolschendorf , Department of Microbiology, University of Erlangen, Germany (2008)	Associate Professor, UAB
8. Olga Danilchanka , Department of Microbiology, University of Alabama at Birmingham, USA (2010)	Principal Scientist, Merck
9. Jason Huff , Department of Microbiology, University of Alabama at Birmingham, USA (2010)	Patent Attorney at Kilpatrick Townsend & Stockton LLP
10. Ryan Wells , Department of Microbiology, University of Alabama at Birmingham, USA (2012)	MD/PhD, resident
11. Christopher Jones , Department of Microbiology, University of Alabama at Birmingham, USA (2012)	Postdoc, University of Arizona
12. Alexander Speer , Department of Microbiology, University of Erlangen, Germany (2013)	Assistant Professor, University of Amsterdam, Netherlands
13. Jennifer Rowland , Department of Microbiology, University of Alabama at Birmingham, USA (2014)	Postdoc, University of Columbia, Vancouver, Canada

14. Mikhail Pavlenok , Department of Microbiology, University of Alabama at Birmingham, USA (2015)	Postdoc, UAB
15. Kathryn Doornbos , Department of Microbiology, University of Alabama at Birmingham, USA (2017)	CEO, Redemptive Cycles
16. Uday Tak , Department of Microbiology, University of Alabama at Birmingham, USA (2020)	Postdoc, University of Colorado

Rachel Philpot, MSc, Department of Biology, University of Alabama at Birmingham, USA (2009)

Mentor of **35 Diploma students in Germany** (similar to MSc)

Member of PhD committees of graduate students of other labs:

(Year of degree in parentheses)

- Cecile Rousseau, Mentor: Dr. Brigitte Gicquel, Unit of the Genetics of Mycobacteria, Institut Pasteur, Paris, France (2003)
- Bobbi Xayarath, Mentor: Dr. Janet Yother, Department of Microbiology, UAB (2007)
- Greer Kaufman, Mentor: Dr. Janet Yother, Department of Microbiology, UAB (2007)
- Deborah Mai, Mentor: Dr. Adrie Steyn, Department of Microbiology, UAB (2011)
- Loni A. Guidry, Mentor: Dr. Adrie Steyn, Department of Microbiology, UAB (2012)
- Kajal Buckoreelall, Mentor: Dr. Palmer, Southern Research Institute, Department of Pharmacology, UAB (2012)
- Melissa Ellis, Mentor: Dr. Janet Yother, Department of Microbiology, UAB (2012)
- David James, Mentor: Dr. Janet Yother, Department of Microbiology, UAB (2013)
- Branton Hatcher, Mentor: Dr. David Briles, Department of Microbiology, UAB (2013)
- Haley Echlin, Mentor: Dr. Hui Wu, Department of Microbiology, UAB (2014)
- Jeffery M. Vahrenkamp, Mentor: Dr. Chuck Turnbough, Department of Microbiology, UAB (2014)
- Gregory Bedwell, Mentor: Dr. Peter Prevelige, Department of Microbiology, UAB (2016)

Seminars

1993: University of Würzburg, Germany

1994: Lederle, NY, USA

Elektrophoresis Forum, Munich, Germany

1995: University of Würzburg, Germany

European Science Foundation Meeting, Seeheim, Germany

1996: Cornell University, New York City, USA

1998: University of California, Berkeley, USA

Biofuture Concours, Berlin, Germany

Chiron-Behring, Marburg, Germany

1999: University of Freiburg, Germany

2000: MPI for Biochemistry, Martinsried, Germany

University of Dresden, Germany

VAAM Meeting (German Society for Microbiology), München, Germany

University of Hannover, Germany

Research Center Jülich, Germany

University of Freiburg, Germany

2001: „Nanotechnologische Synthese von Proteinfiltren zur Transportanalyse von Antibiotika“, Dechema, Frankfurt, Germany; 4/9/2001

„Channel proteins in the cell wall of mycobacteria“, Research Center Borstel, Reference Center for Tuberculosis, Germany; 15/10/2001

„Channel proteins in the cell wall of mycobacteria“, University of Erlangen, Biology, Germany; 5/12/2001

- 2002:** "Extremely long and stable channel proteins in the cell wall of mycobacteria", VAAM Meeting (German Society for Microbiology), Göttingen, Germany (Chair and speaker) ; 5/4/2002
„Mycobacterial porins - A way to overcome antibiotic resistance?“, University of Geneva, Switzerland; 25/4/2002
„Mycobacterial porins - A way to overcome antibiotic resistance?“, ASM Meeting (American Society of Microbiology), Salt Lake City, USA (Chair and invited speaker); 22/5/2002
„Mycobakterielle Porine - Neue Wege in der Mikrobiologie und Biotechnologie“, University of Münster, Germany; 24/7/2002
„Mycobacterial porins - A way to overcome antibiotic resistance?“, University of Alabama, Department of Microbiology, Birmingham, Alabama, USA; 11/9/2002
„Drug transport and antigen presentation by mycobacterial porins“, Max-Planck Institute for Infection Biology, Berlin; 21/10/2002
- 2003:** "Mycobakterielle Porine - Neue Wege in der Mikrobiologie und Biotechnologie“, University of Bochum, Biology, Germany; 20/2/2003
„The porin pathway limits the efficiency of tuberculosis therapy“, VAAM Meeting (German Society for Microbiology), Berlin, Germany; 24/3/2003
„Mycobacterial porins - New ways in microbiology and biotechnology“, University of Marburg, Microbiology, Germany; 28/5/2003
„Porins limit the efficiency of tuberculosis chemotherapy“, DGHM Meeting (German Society for Hygiene and Microbiology), Dresden, Germany; 29/9/2003
„Mycobacterial porins - New channel proteins in unique membranes“, Robert-Koch-Institut, Berlin, Germany; 31/10/2003
„Mycobacterial porins - New channel proteins in unique membranes“, Institut Pasteur, Paris, France; 28/11/2003
- 2004:** "Mycobacterial porins - New channel proteins in unique membranes“, University of Texas, Southwestern Medical Center at Dallas, Howard Hughes Medical Institute, Dallas, USA; 15/3/2004
„Porins limit the efficiency of tuberculosis chemotherapy“, VAAM Meeting (German Society for Microbiology), Braunschweig, Germany; 29/3/2004
„The role of porins in outer membrane permeability and drug resistance of mycobacteria“, Southern Research Institute, Birmingham, Alabama, USA; 19/5/2004
„Mycobacterial porins - New ways in microbiology and biotechnology“, University of Alabama at Birmingham, Department of Physics, USA; 20/5/2004
„The role of porins in outer membrane permeability and drug resistance of mycobacteria“, 25th Annual Congress of the European Society of Mycobacteriology, Alghero, Sardinia, Italy; 29/6/2004 (invited speaker)
- 2005:** "The role of outer membrane permeability for drug resistance of mycobacteria“, UAB TB Mini-Symposium, Birmingham, Alabama, USA; 14/4/2005
„Mycobacterial porins - New channel proteins in unique membranes“, 5th Transport Colloquium, Rauischholzhausen/Marburg, Germany; 20/5/2005 (invited speaker)
- 2006:** "Mycobacterial channel proteins - Nutrient uptake, tuberculosis chemotherapy and nanotechnology“, Kansas State University, Manhattan, Kansas, USA; 16/2/2006
„Importance of mycobacterial porins for uptake of nutrients and drugs“, Schülke&Mayr, Hamburg, Germany; 24/3/2006
„Porins play a central role for uptake of nutrients and drug sensitivity of mycobacteria“, Center of Disease Control, Atlanta, USA; 24/7/2006
- 2007:** "Transport of nutrients and drugs by mycobacteria“, Schülke&Mayr, Hamburg, Germany; 12/7/2007
„Balancing nutrient uptake and drug resistance is a key virulence factor of *Mycobacterium tuberculosis*“, University of Ulm, Germany; 16/7/2007
Transport of nutrients and drugs by mycobacteria“, University of Erlangen, Germany; 18/7/2007
- 2008:** "Novel proteins in unique mycobacterial outer membranes“, San Diego, Burnham Institute, USA; 17/3/2008
„Novel proteins in unique mycobacterial outer membranes“, Birmingham, UAB (Microbiology), USA; 20/5/2008

- "*Mycobacterium tuberculosis* and the art of selective protection", UAB (Biology), USA; 4/11/2008
- "*Mycobacterium tuberculosis* and the art of selective protection", University of Erlangen, Germany; 13/12/2008
- 2009:** "Mycobacterial outer membrane proteins - The art of selective protection", Lisbon, Portugal; 8/4/2009
- "Iron uptake by mycobacteria", Institute of Biotechnology, Research Center in Veterinary and Agronomic Sciences, National Institute of Agricultural Technology, Buenos Aires, Argentina; 9/30/2009
- "Iron uptake by mycobacteria", University of Rosario, Argentina; 10/2/2009
- "Novel transport mechanisms across mycobacterial outer membranes", Meeting of the Latin American Society for Mycobacteria and Tuberculosis (SLAMTB), Rosario, Argentina; 10/8/2009 (keynote speaker)
- 2010:** "Discovery of a novel toxin of *Mycobacterium tuberculosis*", Institute of Biotechnology, Research Center in Veterinary and Agronomic Sciences, National Institute of Agricultural Technology, Buenos Aires, Argentina; 3/31/2010
- "Discovery of a novel toxin of *Mycobacterium tuberculosis*", University of Erlangen, Germany; 4/15/2010
- 2011:** "Structure and function of the *Mycobacterium tuberculosis* protein Rv0899", Biophysical Society 56th Annual Meeting, Baltimore, MD; 3/6/2011
- "Toxin secretion and nutrient uptake - an unexpected link in *M. tuberculosis*", Cornell University, Weill Medical College; 9/17/2011
- "A novel toxin of *M. tuberculosis*", University of Texas, San Antonio Medical Center, 11/10/2011
- 2012:** "Outer membrane proteins in mycobacteria" Scientific Spring Meeting by the Royal Dutch Society for Microbiology (KNVM) and the Dutch Society of Medical Microbiology (NVMM), Arnhem, invited speaker, 4/17/12
- "Cell death by *Mycobacterium tuberculosis*", Braunschweig, Germany; 3/27/2012
- "Death by *Mycobacterium tuberculosis*", Oregon State University, Corvallis; 5/16/2012
- "Death by *Mycobacterium tuberculosis*", Tuberculosis 2012, Biology, pathogenesis, intervention strategies, Paris, France; invited speaker; 9/11-15/2012
- 2013:** "Iron utilization by *Mycobacterium tuberculosis*", Keystone Symposium „Tuberculosis: Understanding the Enemy", Whistler Conference Centre, Canada; invited speaker; 3/13-18/2013
- "Iron utilization by *Mycobacterium tuberculosis*", University of Erlangen, Germany; 5/19/2013
- "Self-Poisoning of *Mycobacterium tuberculosis* by Interrupting Siderophore Recycling", University of Pittsburgh; 11/10/2013
- 2014:** "Single-molecule detection with the MspA nanopore", BioAlabama Annual Meeting; Birmingham, invited speaker; May 29, 2014
- 2015:** "The necrosis-inducing toxin of *Mycobacterium tuberculosis*", Montevideo, Uruguay; June, 22, 2015
- "The necrosis-inducing toxin of *Mycobacterium tuberculosis*", Gordon Research Conference „Tuberculosis Drug Discovery & Development", Girona, Spain; invited speaker; July 12-17, 2015
- "Self-Poisoning of *Mycobacterium tuberculosis* by Inhibiting Siderophore Secretion", Alabama Drug Discovery Alliance; October 22, 2015
- "The necrosis-inducing toxin of *Mycobacterium tuberculosis*", Joint Seminar of the Rockefeller University, the Memorial Sloan Kettering Cancer Center and the Cornell University Medical College, New York City; November 30, 2015
- "Self-Poisoning of *Mycobacterium tuberculosis* by Inhibiting Siderophore Secretion", Global Alliance for TB Drug Development, New York City; December 1, 2015
- "The necrosis-inducing toxin of *Mycobacterium tuberculosis*", Albert Einstein College of Medicine, New York City; December 2, 2015
- 2016:** "Iron acquisition by *Mycobacterium tuberculosis*", Georgia State University, Atlanta; March 11, 2016
- "The necrosis-inducing toxin of *Mycobacterium tuberculosis*", Maastricht University, Netherlands; April 4; 2016
- "The necrosis-inducing toxin of *Mycobacterium tuberculosis*", Wadsworth Center, Albany, NY; April 28, 2016
- "The necrosis-inducing toxin of *Mycobacterium tuberculosis*", Thomas Jefferson University, Philadelphia, May 16, 2016
- "The Tuberculosis Necrotizing Toxin", Georgia State University, Atlanta; June 2, 2016

- "Toxin secretion and nutrient uptake in *Mycobacterium tuberculosis*", 116th ASM Meeting, Boston, June 18, 2016; invited speaker
- "The Tuberculosis Necrotizing Toxin", EMBO Conference Tuberculosis 2016, September 20, 2016, Paris; invited speaker
- "Iron acquisition by *Mycobacterium tuberculosis*", Redox Biology Symposium, Nebraska University, Nov. 8, 2016; invited speaker
- "The necrosis-inducing toxin of *Mycobacterium tuberculosis*", UAB; December 1, 2016
- 2017:** "Iron acquisition by *Mycobacterium tuberculosis*", Open Lab, Tres Cantos, Spain; March 29, 2017
- "Iron acquisition by *Mycobacterium tuberculosis*", EMBL, Hamburg, Germany; 8, March 31, 2017
- "Iron acquisition by *Mycobacterium tuberculosis*", Annual Conference, UK Microbiology Society, Edinburgh, UK; April 5, 2017; invited speaker
- "Iron acquisition by *Mycobacterium tuberculosis*", University of Chicago, May 31, 2017
- "Iron acquisition by *Mycobacterium tuberculosis*", Indiana University, Bloomington, November 10, 2017
- "The Tuberculosis Necrotizing Toxin", Boston University, November 29, 2017
- 2018:** "The Tuberculosis Necrotizing Toxin", Oklahoma State University, May 15, 2018
- "The Tuberculosis Necrotizing Toxin", Cape Town University, South Africa, September 21, 2018
- "Iron acquisition by *Mycobacterium tuberculosis*", Georgia Institute of Technology, October 18, 2018
- "Self-poisoning of *Mycobacterium tuberculosis* by inhibiting siderophore secretion", Open Lab, Tres Cantos, Spain, October 18, 2018
- 2019:** "Single-chain MspA for nanopore sequencing", NHGRI Grantee Meeting, Boston, May 29-31, 2019
- "Self-poisoning of *Mycobacterium tuberculosis* by inhibiting siderophore secretion", Gordon Research Conference "Tuberculosis Drug Discovery and Development", Castelldefels, Spain, July 7-12, 2019; invited speaker
- 2020:** "Heme and hemoglobin utilization by *Mycobacterium tuberculosis*", Gordon Research Conference "Chemistry and Biology of Tetrapyrroles", Salve Regina University in Newport, RI, US; invited speaker; postponed due to Covid-19
- Lakeside Conference on Protein Toxins and Effectors, invited speaker; October 5-7, 2020; declined
- "The Tuberculosis Toxin", UAB, Department of Microbiology, August 11, 2020
- "The Tuberculosis Necrotizing Toxin", Ohio State University, November 18, 2020
- "Single-chain MspA for nanopore sequencing", NHGRI Grantee Meeting, December 2020
- 2021:** "The Tuberculosis Toxin", UAB, Department of Biochemistry, April 21, 2021
- NIH Workshop "The Role of Cell Death in TB and the Potential as a Therapeutic Target", invited speaker, May 19-20, 2021
- "Single-chain MspA for nanopore sequencing", NHGRI Grantee Meeting, May 25, 2021
- "2nd Annual Symposium New approaches to TB Drug discovery", invited speaker, May 25-27, 2021
- 2022:** "The Tuberculosis Toxin – Novel mechanisms of secretion and function", Albert Einstein College of Medicine, New York City, March 15, 2022
- "MspA Nanopores", Meeting "Nanopore Sequencing: From Genomes to Proteomics", invited speaker, Northeastern University, Boston, May 9-11, 2022
- 2024:** "**Siderophore-dependent inhibitors of *Mycobacterium tuberculosis***", Bill Gates Foundation, June 11, 2024
- "***Mycobacterium tuberculosis* MmpL5 Inhibitors**", Calibr, San Diego, July, 19, 2024
- "**Siderophore-dependent inhibitors of *Mycobacterium tuberculosis***", Open Lab Foundation, December 11, 2024
- 2025:** "**Translocation of trehalose dimycolate to the outer membrane of *Mycobacterium tuberculosis***", Invited Speaker, Spring Meeting of the American Chemical Society, March 23, 2025