

Prof. Dr. Tanja Schneider

Institute for Pharmaceutical Microbiology



Institute

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Research Expertise

Tanja Schneider's research area is the bacterial cell envelope as a target for (new) antibiotics. Main focus is the elucidation of molecular mechanisms of action and resistance and the identification & characterization of novel antibacterial targets. Pivotal to these efforts is the discovery of novel antibiotics and to understand the biology beyond an antibiotic target as well as its integration into the cellular network of bacteria in support of drug discovery.

Education / Training/ Positions Held

Tanja Schneider studied biology in Bonn, Germany, specialized in microbiology and obtained her PhD in 2004. Following a postdoctoral training at the Institute of Medical Microbiology, Immunology and Parasitology, University Hospital Bonn, she joined industry from 2011 until 2012. During that time she worked at the Peptide and Cell Discovery Department at Novozymes A/S, Denmark in the course of a Marie Curie Actions fellowship. Returning to Germany, she became a junior research group leader within the German Center for Infection Research (DZIF). In 2014 she completed her habilitation in Medical-Pharmaceutical Microbiology and was appointed Professor of Pharmaceutical Microbiology at the University of Bonn in 2015.

Honors / Awards

She was awarded with the Robert-Koch Post-doctoral Award for Microbiology in 2010 and the Wolfgang-Stille-Prize in 2016 for her contributions in anti-infective research.

10 Most Relevant Publications for Prof. Tanja Schneider

1. **Schneider, T.**; Kruse, T., Wimmer, R.; Wiedemann, I.; Sass, V., Pag, U.; Jansen, A.; Nielsen, A.K.; Mygind, P.H.; Raventós, D.S.; Neve, S.; Ravn, B.; Bonvin, A.M.J.J.; De Maria, L.; Andersen, A.S.; Gammelgaard, L.K.; Sahl, H.-G.; Kristensen, H.-H. Plectasin, a fungal defensin, targets the bacterial cell wall precursor lipid II. *Science*. **2010**, 328,1168-1172. DOI: 10.1126/science.1185723
2. Ling, L. L.*; **Schneider, T.***; Peoples, A. J.; Spoering, A. L.; Engels, I.; Conlon, B. P.; Mueller, A.; Schäberle, T. F.; Hughes, D. E.; Epstein, S.; Jones, M.; Lazarides, L.; Steadman, V. A.; Cohen, D. R.; Felix, C. R.; Fetterman, K. A.; Millett, W. P.; Nitti, A. G.; Zullo, A. M.; Chen, C.; Lewis, K. A new antibiotic kills pathogens without detectable resistance. *Nature* **2015**, 517, 455–459. DOI: 10.1038/nature14303. * contributed equally
3. Wirtz, D. A.; Ludwig, K. C.; Arts, M.; Marx, C. E.; Krannich, S.; Barac, P.; Kehraus, S.; Josten, M.; Henrichfreise, B.; Müller, A.; König, G. M.; Peoples, A. J.; Nitti, A.; Spoering, A. L.; Ling, L. L.; Lewis, K.; Crüsemann, M.; **Schneider, T.** Biosynthesis and Mechanism of Action of the Cell Wall Targeting Antibiotic Hypeptin. *Angewandte Chemie Int Ed Engl.* **2021**, 60(24), 13579–13586. DOI: 10.1002/anie.202102224
4. Reithuber, E.; Wixe, T.; Ludwig, K. C.; Müller, A.; Uvell, H.; Grein, F.; Lindgren, A.; Muschiol, S.; Nannapaneni, P.; Eriksson, A.; **Schneider, T.***; Normark, S.; Henriques-Normark, B.*; Almqvist, F.*; Mellroth, P. THCz: Small molecules with antimicrobial activity that block cell wall lipid intermediates. *Proc. Natl. Acad. Sci. U. S. A.* **2021**, 118(47), e2108244118. DOI: 10.1073/pnas.2108244118 *corresponding author
5. **Müller, A.**; Wenzel, M.; Strahl, H.; Grein, F.; Saaki, T. N. V.; Kohl, B.; Siersma, T.; Bandow, J. E.; Sahl, H.-G.; **Schneider, T.***; Hamoen, L. W.* Daptomycin inhibits cell envelope synthesis by interfering with fluid membrane microdomains. *Proc. Natl. Acad. Sci. U. S. A.* **2016**, 113, E7077-E7086. * DOI: 10.1073/pnas.1611173113. contributed equally, corresponding author
6. Hardt, P.; Engels, I.; Rausch, M.; Gajdiss, M.; Ulm, H.; Sass, P.; Ohlsen, K.; Sahl, H.-G.; Bierbaum, G.; **Schneider, T.***; Grein, F*. The cell wall precursor lipid II acts as a molecular signal for the Ser/Thr kinase PknB of *Staphylococcus aureus*. *Int J Med Microbiol.* **2017**, 307(1),1-10. DOI: 10.1016/j.ijmm.2016.12.001 *contributed equally, corresponding author
7. Kaur, P.; Rausch, M.; Malakar, B.; Watson, U.; Damle, N.P.; Chawla, Y.; Srinivasan, S.; Sharma, K.; **Schneider, T.**; Jhingan, G.D.; Saini, D.; Mohanty, D.; Grein, F.; Nandicoori, V.K. LipidII interaction with specific residues of Mycobacterium tuberculosis PknB extracytoplasmic domain governs its optimal activation. *Nat Commun.* **2019**, 15,10(1):1231. DOI: 10.1038/s41467-019-09223-9.
8. Rausch, M.; Deisinger, J.; Ulm, H.; Mueller, A.; Li, W.; Hardt, P.; Sylvester, M.; Li, X.; Sahl, H.-G.; Vollmer, W.; Mueller, C.; Lee, J.C.; **Schneider, T.** Integration of Capsule Assembly Modules into Cell Wall Biosynthetic and Regulatory Networks. *Nat Commun.* **2019**, 10,1404. DOI: 10.1038/s41467-019-09356-x.
9. Ortiz-López, F.J.; Carretero-Molina, D.; Sánchez-Hidalgo, M.; Martín, J.; González, I.; Román-Hurtado, F.; de la Cruz, M.; García-Fernández, S.; Reyes, F.; Deisinger, J.P.; Müller, A.; **Schneider, T.**; Genilloud, O. Cacaoidin, First Member of the New Lanthidin RiPP Family. *Angew Chem Int Ed Engl.* **2020**, 59, 12654-12658. DOI: 10.1002/anie.202005187.
10. Grein, F.; Müller, A.; Scherer, K.M.; Liu, X.; Ludwig, K.C.; Klöckner, A.; Strach, M.; Sahl, H.-G.; Kubitscheck, U.*; **Schneider, T.*** Ca²⁺-Daptomycin targets cell wall biosynthesis by forming a tripartite complex with undecaprenyl-coupled intermediates and membrane lipids. *Nat Commun.* **2020**, 19,11,1455. DOI: 10.1038/s41467-020-15257-1. *contributed equally, corresponding author