**Bio**

My background is in general microbiology and microbial physiology. I am interested in bacterial degradation of complex molecules, focusing on the degradation of steroid. I use a mix of culture dependent analyses (including chemical, genetic and biochemical analyses) and culture independent bioinformatic analysis of bacterial genomes and environmental metagenomes to learn more about the processes and the communities involved in bacterial steroid degradation.

**Postdoc**, UBC, 2015-present

Bacterial steroid degradation – the ‘omics approach and more

**Ph.D.** **in Microbiology,** University of Münster, Germany, 2014

Thesis: Bacterial degradation of steroid compounds: elucidation of metabolic pathways and cell-cell interactions

**M.Sc. in Microbiology,** University of Oldenburg, Germany, 2009

Thesis**:** Light and respiration dependent ATP conservation in *Dinoroseobacter shibae*

**B.Sc. in Life Sciences,** University of Konstanz, Germany, 2006

Thesis**:** Characterisation of a mutant of *P.* *stutzeri* strain Chol1 with a defect in the degradation of the bile salt cholate

Researchgate profile: https://www.researchgate.net/profile/Johannes\_Holert

Google scholar profile: https://scholar.google.com/citations?user=JzgMGa8AAAAJ&hl=de

**Research interests**

Steroids are ubiquitous in the environment and are significant growth substrates for microorganisms. Metabolism of steroids is also important for some pathogens like *Mycobacterium tuberculosis*, the causative agent of tuberculosis, as well as for biotechnical applications. We are studying bacterial steroid degradation using a combination of (i) culture dependent genetic and biochemical studies and (ii) culture independent analyses of bacterial genomes and environmental metagenomes.

Our lab work focuses on the question how steroid degrading bacteria like *Rhodococcus jostii* RHA1 access water insoluble steroid substrates like cholesterol, which are usually embedded in biological membrane systems. We use a liposome based model system together with RHA1 and mutant strains of it, which are unable to degrade steroids. In addition, we develop tools to mine bacterial genomes and environmental metagenomes for the presence of steroid-degradation genes to analyze the potential of steroid degradation in sequenced bacterial strains as well as in diverse bacterial habitats.

**Major publications**

(1) BergstrandHL, CardenasE, HolertJ, Van HammeJD, MohnWW (2016) Delineation of steroid-degrading microorganisms through comparative genomic analysis. mBio doi:10.1128/mBio.00166-16

(2) Holert J, Yücel O, Jagmann N, Prestel A, Möller HM, Philipp B. (2015) Identification of bypass reactions leading to the formation of one central steroid degradation intermediate in metabolism of different bile salts in *Pseudomonas* sp. strain Chol1. Environmental Microbiology doi:10.1111/1462-2920.13192

(3) Holert J, Yücel O, Suvekbala V, Kulić Ž, Möller HM, Philipp B. (2014) Evidence of distinct pathways for bacterial degradation of the steroid compound cholate suggests the potential for metabolic interactions by interspecies cross-feeding. Environmental Microbiology doi: 10.1111/1462-2920.12407

(4) Barrientos Á, Merino E, Casabon I, Rodríguez J, Crowe AM, Holert J, Philipp B, Eltis LD, Olivera ER, Luengo JM. (2014) Functional analyses of three acyl-CoA synthetases involved in bile acid degradation in *Pseudomonas putida* DOC21. Environmental Microbiology doi:10.1111/1462-2920.12395

## (5) Holert J, Jagmann N, Philipp B. (2013) The essential function of genes for a hydratase and an aldehyde dehydrogenase for growth of *Pseudomonas* sp. strain Chol1 with the steroid compound cholate indicates an aldolytic reaction step for deacetylation of the side chain. Journal of Bacteriology doi: 10.1128/JB.00410-13.

## (6) Holert J, Alam I, Larsen M, Antunes A, Bajic VB, Stingl U, Philipp B. (2013) Genome sequence of *Pseudomonas* sp. strain Chol1, a model organism for the degradation of bile salts and other steroid compounds. Genome Announcement doi: 10.1128/genomeA.00014-12

(7) Holert J, Kulić Ž, Yücel O, Suvekbala V, Suter MJ, Möller HM, Philipp B. (2013) Degradation of the acyl side chain of the steroid compound cholate in *Pseudomonas* sp. strain Chol1 proceeds via an aldehyde intermediate. Journal of Bacteriology doi: 10.1128/JB.01961-12.