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Global reprogramming of the *Yersinia pseudotuberculosis* transcriptional landscape in response to host signals

Yersinia pseudotuberculosis evolved numerous strategies to survive in environmental reservoirs and mammalian hosts. A hallmark is the ability to rapidly adjust the lifestyle upon host entry to prevent attacks by the host immune systems. The pathogen employs a plethora of control elements to fine-tune regulatory networks. To capture the range, magnitude and complexity of the underlying control mechanisms, we used comparative RNA-seq-based transcriptomic profiling under infection-relevant conditions *in vitro* and during the infection process in mice. We identified riboswitch-like RNA elements, a set of antisense RNAs, and previously unrecognized *trans*-acting RNAs, which are differentially regulated under infection conditions. We revealed a temperature- and host-induced reprogramming of important metabolic pathways, virulence traits, and discovered CRP as master regulator of non-coding RNAs. Individual regulatory RNAs, which are differentially regulated during infection, were characterized and their role in infection was elucidated using mouse infection models. Among the regulatory RNAs, which are most important for *Yersinia* virulence, are the Crp-dependent Csr-type regulatory RNAs found to control multiple virulence-relevant metabolic processes. Our finding highlights a novel level of complexity in which the concerted action of transcriptional regulators and non-coding RNAs adjusts the control of *Yersinia* fitness and virulence to the requirements of their virulent lifestyle.

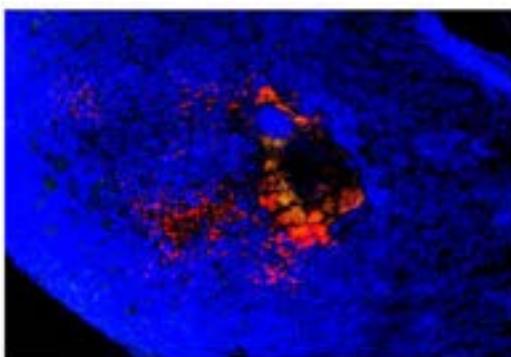


Figure 1: *Y. pseudotuberculosis* colonizing in the Peyer's patches of infected mice (red: Yersiniac in necrotic lesions).

Biography

Petra Dersch graduated in Microbiology at the University of Konstanz and at the Max-Planck-Institute for Terrestrial Microbiology Marburg. She worked as a Postdoc at the Tufts Medical School, Boston/USA, started her own group at the Freie Universität Berlin, and was Junior Research Group Leader at the Robert Koch Institute Berlin. In 2005, she was appointed at the Technische Universität Braunschweig as Associate Professor in Microbiology, and since 2008, she is Head of the Department of Molecular Infection Biology at the Helmholtz Centre for Infection Research in Braunschweig. She is member of various boards, and a current member of the study section, "Microbiology, Virology and Immunology" of the DFG. Since 2016, she is one of the Vice Presidents of the German Society for Hygiene and Microbiology. Her main research field is Molecular Pathogenesis of Enteric Pathogens. She published more than 90 original papers in peer-reviewed international journals, reviews and book chapters.

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