

## *Regulatory RNAs in the pathogenic Epsilonproteobacteria Helicobacter pylori and Campylobacter jejuni.*



**Cynthia M. SHARMA**

Research Center for Infectious Diseases, University of  
Würzburg, GERMANY

Genome sequencing revealed the potential proteins and a high genetic diversity of *Helicobacter pylori* and *Campylobacter jejuni*, yet little is known about transcriptome organization and post-transcriptional regulation in these major human pathogens. *Helicobacter* was even regarded as an organism without riboregulation since it lacks, like 50% of all bacteria, the RNA chaperone Hfq, a key player in small RNA (sRNA)-mediated regulation in many bacteria. However, based on a novel differential RNA-sequencing approach (dRNA-seq), we have recently defined a genome-wide map of transcriptional start sites (TSS) and identified more than 60 sRNAs in *H. pylori* strain 26695. We have now applied a comparative dRNA-seq approach to multiple *Campylobacter jejuni* isolates, to understand how transcriptome differences could contribute to phenotypic differences among closely related strains. Our study revealed that the majority of TSS is conserved among strains, but we also observed several strain-specific TSS, indicating divergent transcription and promoter usage among strains. Moreover, we identified differences in sRNA repertoires among strains which could contribute to strain-specific gene regulation.

Based on our transcriptome datasets, we are now using *Helicobacter* and *Campylobacter* as new model organisms for riboregulation in virulent bacteria and bacteria that lack Hfq. We have started with the functional characterization of abundant sRNAs as well as identification and analysis of associated RNA-binding proteins. Overall, the identification and characterization of diverse sRNA candidates in *Helicobacter* and *Campylobacter* indicates that riboregulation constitutes an important layer of gene-expression control in these major human pathogens and will provide insights into novel regulatory mechanisms.