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Phenotypic and Genotypic Comparisons of *Campylobacter jejuni* strains with different clinical outcomes

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*Campylobacter jejuni* is the leading bacterial cause of gastroenteritis in the world, which is estimated to result in close to 500 million cases per year. Infection with *Campylobacter jejuni* produces two different diarrheal manifestations: a bloody, inflammatory diarrhea or a watery diarrhea. However, little is known about the underlying genetics, pathogenesis, or host factors involved in the production of either clinical manifestation. The neonate piglet model differentiates between these two diarrheal clinical manifestations. In this study, we compared the genotypes and phenotypes of *C. jejuni* strains with defined and consistent diarrheal clinical manifestations in the neonatal piglet model to better understand the genomics, phenotypes and to potentially identify virulence factors associated with different diarrheal manifestations. Core and accessory gene presence were explored in five strains associated with watery diarrhea, and five with bloody, inflammatory diarrhea. SNP analysis identified 18 SNPs, in 12 genes, unique to a particular diarrheal outcome, of which seven SNPs were non-synonymous (from four genes). SNPs in the RacRS system were associated with bloody diarrhea including ten additional human clinical isolates that were associated with bloody diarrhea. Phenotypic assays were performed with five strains associated with bloody diarrhea and with five strains associated with watery diarrhea. Statistically significant differences between the two different diarrheal manifestation groups were found for invasion and growth rate. Differences in *C. jejuni* diarrheal outcome cannot be fully explained by differences in gene presence but appear to be a complicated system that could involve epistasis between linked SNPs, gene expression and the host immune system. This study lays the foundation for further investigations to solve the differential pathogenesis of *C. jejuni* strains associated with the two diarrheal manifestations.