The ABC transport PGP-5 activates an immune response in *C. elegans* against *S. gordonii*

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Objectives: The damage caused by virulence factors produced by the pathogens has been shown to initiate an immune response known as the effector-triggered immunity (ETI). We have shown an ETI response in the nematode *Caenorhabditis elegans* is mediated by the bZIP transcription factor, ZIP-2. This immune response was shown to be activated by hydrogen peroxide (H_2O_2) produced by the mitis group streptococci. Previous studies have shown the P-glycoproteins are an evolutionary conserved sub-group of ABC transporters that protect cells by actively exporting drugs and toxins. More recently PGP-5, a member of this group of proteins, was shown to be involved in the resistance to bacterial infection in the worm. Using protein interaction data from Wormbase, we identified a putative interaction between PGP-5 and ZIP-2. The goal of this study was to determine how *pgp-5* influenced the activation and expression of ZIP-2 and the survival of the worms in response *Streptococcus gordonii* a representative of the mitis group.

Experimental methods: We knockdown *pgp-5* and vector control in worms expressing ZIP-2 and *zip-2*-dependent gene *irg-1* fused to Green Fluorescent Protein (GFP) and observed the localization of ZIP-2 in the nuclei of the intestinal cells and expression of *irg-1* on *S. gordonii*. Killing assays were performed to determine the survival between the *pgp-5* knockdown and vector control worms on *S. gordonii*.

Results: We observed a significant increase in the localization of ZIP-2::GFP and the expression of *irg-1*::GFP in the intestinal cells of *pgp-5* knockdown worms relative to the vector control treated worms. Furthermore, *pgp-5* knockdown worms survived less compared to the vector control treated worms on *S. gordonii*.

Conclusion: Taken together, *pgp-5* is required for the survival of the worms on *S. gordonii*. Furthermore, loss of *pgp-5* in the presence of *S. gordonii* further enhanced the ETI response mediated by ZIP-2.

This study was supported by the National Institutes of Allergy and Infectious Diseases of the National Institutes of Health under award number R01AI158429.