

P003 cGMP modulation of innate immunity in *Drosophila*
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cGMP is recognised as a key signalling molecule responsible for mediating a wide range of physiological responses. In this study, a novel role for cGMP in the regulation of the *Drosophila melanogaster* innate immune response is demonstrated. *Drosophila* innate immunity is controlled by two distinct pathways: Toll and Imd. Activation of these pathways induces the production of anti-microbial peptides (AMPs) either in fat body or barrier epithelia. Recent published work has shown that the *Drosophila* Malpighian (renal) tubule - whose function is modulated by cGMP- is a key tissue in the immune response, which is important in survival of the fly. Using both quantitative PCR and transgenic GFP reporter flies, it has been demonstrated cGMP inhibits expression of specific Imd-associated AMPs. This effect appears to be cGMP-specific, as cAMP does not modulate expression of these AMPs. Targeted over-expression of cGMP-dependant protein kinase DG2 to principal cells of the tubule also results in decreased AMP expression, and significantly lowers survival rates of flies subject to bacterial challenge. This indicates that the effect of cGMP on the Imd pathway is mediated via DG2.