

**P009** Innate immunity is required for defence against bacterial infections in Zebrafish

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Although all vertebrates developed acquired immunity, early vertebrates' eggs and embryos must solely rely on innate immunity in defence against infections until their acquired immune system develops, which has been assumed, but lacks experimental evidence. We identified and cloned three zebrafish Peptidoglycan Recognition Proteins (PGRPs), which are pattern recognition molecules that are conserved through evolution. Zebrafish PGRPs are highly expressed in eggs, developing embryos, and in adult tissues that contact external environment. We demonstrated that all three zebrafish PGRPs have both peptidoglycan-lytic amidase activity and broad-spectrum bactericidal activity, which is unique for vertebrate PGRPs. We further demonstrated that in the developing zebrafish embryo one of these PGRPs is essential for defence and survival during bacterial infections. This is the first demonstration of an absolute requirement for innate immunity, and specifically PGRP, in defence against infections in fish embryos.