Compared with adaptive immunity found only in vertebrates, innate immunity is the ancient system to defend against microbial infection among all animals\cite{1}. Peptidoglycan (PGN) is N-acetylglucosamine and N-acetylmuramic acid polymer crosslinked with short peptides. PGN is especially a unique cell wall component in bacteria and not present in eukaryotic organisms, therefore it acts as an important recognition target by the innate immune system. Peptidoglycan Recognition Protein (PGRP) was first discovered and purified in the silkworm in 1996\cite{2} and some other PGRPs were found in *Drosophila, Anopheles* and mammalian cells. Insect PGRPs can be divided into short PGRGs (PGRP-S) and long PGRPs (PGRP-L) according to their predicted protein structure. Four PGRPs have been found in mammals: PGRP-S, PGRP-L, PGRP-I\(\alpha\) and PGRP-I\(\beta\). Their functions include activation of prophenoloxidase, activation of Toll-receptor, induction of phagocytosis, amidase activity and antibacterial effects in polymorphonuclear leukocytes (PMNs)\cite{3}. Insects and mammal PGRPs share the amidase activity while the antibacterial activity of PGRP-S is unique in mammalian cells. Although PGRP was traditionally considered as PGN-binding protein while recent studies have shown that it may recognize other molecules. The detailed functions of PGRP are still not well understood. Future research may be focused on the PGRP dependent pathway of innate immune systems.

References: