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**L Courtney Smith\*** ([csmith@gwu.edu](mailto:csmith@gwu.edu)), Department of Biological Sciences, George Washington University, 800 22nd St NW, Suite 6000, Washington, DC 20052. *Innate immunity in the purple sea urchin and diversity of the Sp185/333 system.*

Innate immunity in the purple sea urchin is complex and sophisticated. One example of the immune response genes is the Sp185/333 family, which is composed of about 50 small genes that are tightly clusters. The genes have repeats, mosaic patterns of shared blocks of sequence, and are surrounded by microsatellites. Sp185/333 gene expression is induced by pathogens and single immune cells express a single Sp185/333 gene. This suggests that each cell produces and secretes a single version of the Sp185/333 proteins that may function synergistically with other isoforms in response to pathogen challenge.

The Sp185/333 proteins show significant sequence diversity, yet are structurally similar with a leader, a glycine rich region, RGD motif, and a histidine rich region. The proteins opsonize bacteria, induce phagocytosis, and retard bacterial growth. A recombinant, rSp0032, binds Vibrio, lipopolysaccharide (LPS), flagellin, yeast and beta,1-3,glucan but not Bacillus or peptidoglycan. It binds phosphatidic acid (PA) and deforms liposomes with PA. rSp0032 is intrinsically disordered but switches to alpha helical upon binding LPS or PA. Each of the Sp185/333 isoforms may have overlapping binding capabilities resulting in highly effective host protection against a wide range of pathogens. (Received December 18, 2014)