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Molecular and immunological characterization of a Gq protein from ventral and lateral eye of the horseshoe crab *Limulus polyphemus*

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Abstract

GTP binding proteins of the Gq family have been implicated in phototransduction in rhabdomeral photoreceptors. In this study we used molecular and immunochemical techniques to characterize a GTP-binding protein alpha subunit of the Gq family in ventral and lateral photoreceptors of the horseshoe crab, *Limulus polyphemus*. Both ventral photoreceptors and lateral eye reticular cells became strongly labeled with an antibody directed against the common carboxyl tail of two Gq family proteins, G alpha q and G alpha 11. This antibody also labeled a 42 kDa band on Western blots of proteins from ventral photoreceptor cell bodies, ventral photoreceptor axons, lateral eyes and lateral optic nerves. The reverse transcription-polymerase chain reaction (RT-PCR), along with degenerate oligonucleotide primers designed against conserved regions of known G alpha q and G alpha 11 proteins, was used to isolate a cDNA from ventral eye RNA which encodes a protein with high identity to known Gq proteins. Ribonuclease protection assays showed that the corresponding message was expressed in ventral eye, but these assays, as well as Northern blots, failed to detect expression in lateral eye. Therefore, while photoreceptors of both ventral and lateral eyes contain a Gq-like protein, the mRNA encoding the Gq protein in the ventral eye may differ in nucleotide sequence from its lateral eye counterpart.

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