**The neural basis of sound detection and auditory driven social behavior in the plainfin midshipman fish (*Porichthys notatus*)**

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The plainfin midshipman fish (*Porichthys notatus*) is an established neuroethological model for investigating mechanisms of acoustic communication because the reproductive success of this species is dependent on the production and reception of social acoustic signals. At the periphery, midshipman detect sound using three otolithic end organs: the saccule, utricle, and lagena. While the tuning properties of the saccule have been well characterized, the contribution of the lagena to hearing is not well understood. Furthermore, the presence of the swim bladder extensions in females is thought to enhance sound detection at the level of the saccule. By examining evoked lagenar potentials in fish with intact (control condition) and removed (treated condition) swim bladders, we have found evidence that the midshipman lagena is sensitive to sound pressure indirectly and maybe important for the detection of social acoustic signals. The inner ear also receives direct input from diencephalic dopamine neurons that project widely throughout the brain, including multiple levels of the auditory system. Dopamine fiber innervation in certain auditory brain regions changes seasonally with reproductive state and playbacks of male advertisement calls activate dopaminergic neurons in the diencephalon of males and behaviorally attentive females. In reproductive female plainfin midshipman fish, exposure to playbacks of the male advertisement call alters dopamine synthesis in the hindbrain auditory efferent nucleus. Modulation of the peripheral auditory system to enhance the detection and evaluation of social-acoustic signals may be a conserved feature of the dopaminergic system in other vocal vertebrates.