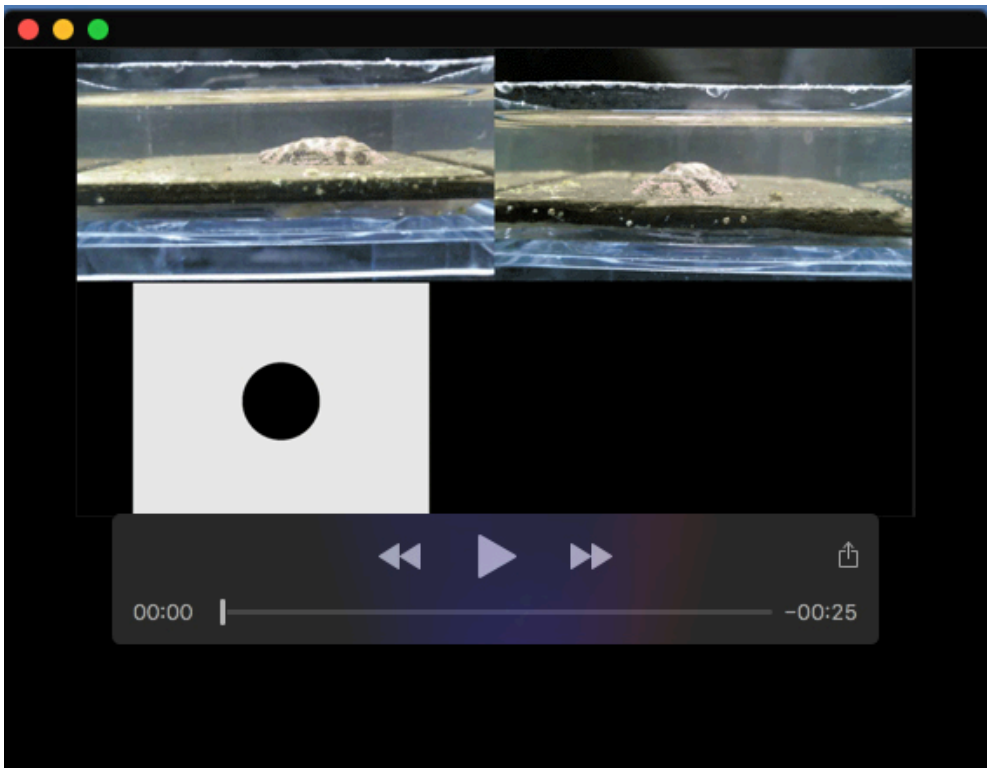
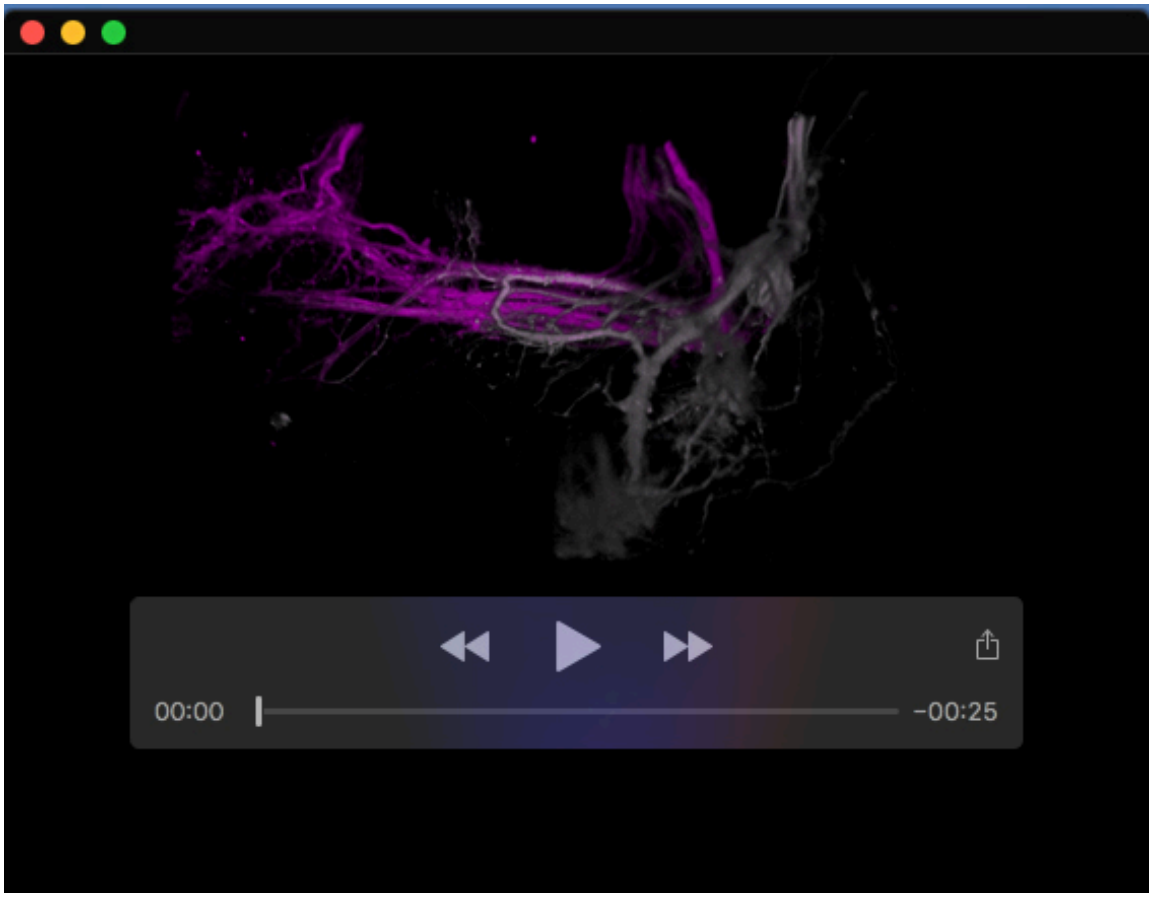
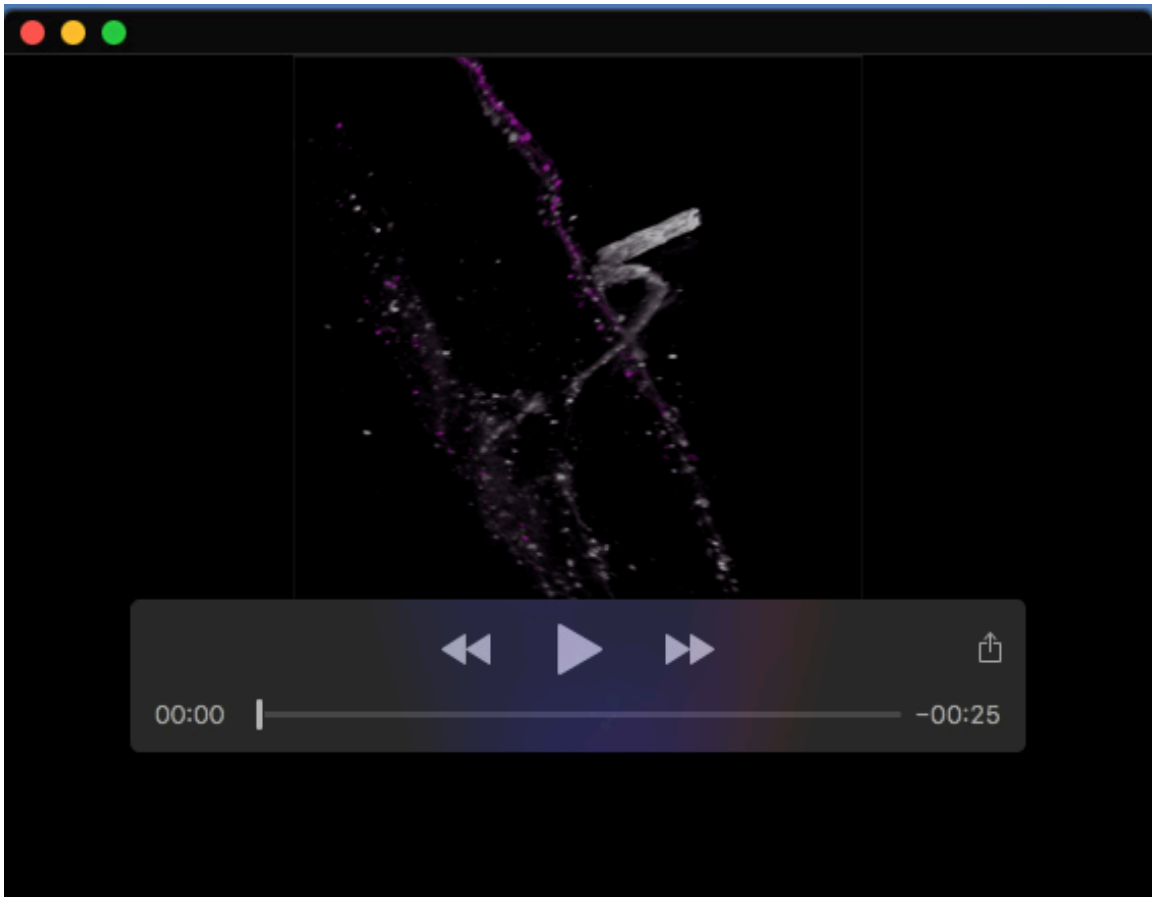


Movie 1. An example video recording of *A. granulata* behaviorally responding to the black-on-white loom. The video shows simultaneous orthogonal lateral views of the same chiton as well as a simultaneous screen recording of the overhead computer screen. In the beginning of the video, the chiton is slowly crawling towards the edge of the arena with sections of its girdle raised. When the looming black circle reaches a certain size, the chiton stops moving and lowers its girdle while simultaneously clamping to the substrate - which can be recognized by the lowering of the dorsal shell plates. This behavior is likely a defensive response, as the chiton is preparing itself for an impending attack by a looming predator.



Movie 2. An animated 3-d reconstruction of the neural plexus of optic nerves along the lateral edge of a shell plate from *Acanthopleura granulata*. This video is a 3-d reconstruction of Fig. 4B, which is a composite maximum projection image. The relatively large white- and magenta-labeled nerves that converge on the underside of the neural plexus in the video correspond to the white and magenta arrows in Fig. 4B. The fluorescently labeled optic nerves traverse to the edge of the shell plate, where they exit the canal system and defasciculate to form a plexus. They then traverse this plexus to fasciculate and converge with other optic nerves at the site of an insertion slit before passing through the slit and reaching the underlying mantle tissue.



Movie 3. An animated 3-d reconstruction of the optic nerve arborization along the lateral neuropil of *Acanthopleura granulata.* This video is a 3-d reconstruction of the left section of Fig. 5C, which is a composite maximum projection image. The large white nerve in the video is the optic nerve labeled with a white arrow in Fig. 5C, and magenta neurites in the video are the traversing neurites of the optic nerve labeled with a magenta arrow in Fig 5C. The white fasciculated optic nerve splits into two separate neurite bundles which travel to separate tracts of the neuropil. The white- and magenta-labeled optic nerves are seen to travel in close proximity to one another and both have periodic varicosities that are likely *en passant* synapses.