Abstract View

OPTICAL RECORDING OF THE TRITONIA SWIMMING CENTRAL PATTERN GENERATOR.

G.D. Brown[1]; S. Yamada[2]; M. Nakashima[2*]; C.E. Moore-Kochlacs[1]; T.J. Sejnowski[1]; S. Shiono[2]

1. Computational Neurobiology Laboratory, Salk Institute for Biological Studies, La Jolla, CA, USA
2. Advanced Technology R&D Center, Mitsubishi Electric Corporation, Amagasaki, Japan

We recorded action potential activity from the isolated brain of the nudibranch seaslug Tritonia diomedea during fictive swimming. Candidate central pattern generator (CPG) interneurons were identified by their bursting patterns and positions in the brain. Previously identifed populations of interneurons were imaged, including the dorsal swim interneurons (DSI), C2, and ventral swim interneurons (VSI). A number of other neurons were also identified in the cerebral ganglion that burst in phase with identified swimming interneurons. All bursting neurons were classified roughly as either DSI-like or VSI-like. In general, more DSI-like activity was observed on the dorsal side of the ganglion, while VSI-like activity was found on the ventral side. However, in at least two preparations, a large number of DSI-like neurons were found along the midline of the ventral aspect. Based on our optical recordings and on previous results, we estimate that there are at least 10 DSI-like neurons and at least 5 VSI-like neurons. Considering only the recordings with the most bursting neurons, the total number of candidate swim interneurons was more than 20. Most of these neurons were located in the cerebral ganglion or near the (ambiguous) border between cerebral and pleural ganglia. A large number of weakly bursting neurons was also found, and these were not counted in our estimates. A variety of non-bursting neuron types were also observed.
Supported by: the National Science Foundation.

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