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Intraganglionic injection of AAV into thoracic dorsal root ganglia in mice

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ABSTRACT

We have developed a novel method of injecting AAV vectors directly into the sensory ganglia, vagal and dorsal root ganglia, of mice. This technique provides for the first time a tool for expression of specific markers in sensory neurons that aid in the tracing of peripheral sensory innervation of organs like the airways and the esophagus.

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1 Mice were anesthetized with a mixture of ketamine (50 mg/kg) and dexmedetomide (0.5 mg/kg) via intraperitoneal injection.

2 Approximately 4 cm of incision was made over a shaved portion of the mouse back region, just around the neck area.

3 The skin flaps were opened, and the neck muscles were identified. The C7 and T1 vertebra were used as visual guides.

4 Muscle fibers were separated to get to the T1 and T2 intervertebral space. The nerve bundle that connects to the ganglia sits outside the vertebrae was identified. The corresponding DRGs are tucked inside the vertebrae.

5 We followed the spinal nerves and identified the beginning of the ganglia.

6 A pulled glass micropipette (~10-15 µm tip diameter) was prefilled with 0.75 mL of AAV9 then injected unilaterally into the T1-T3 DRGs.

7 After AAV injection, the mice received atipamezole (5 mg/kg) via subcutaneous injection for rapid recovery. The mice were injected with meloxicam (500 mg/kg via subcutaneous injection) as a post-analgesic on the day and 24 h later.

8 4 weeks later, mice were euthanized by CO_2 asphyxiation for tissue collection.

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