Jan 15, 2024

Vagotomy and Tamoxifen treatment

DOI
dx.doi.org/10.17504/protocols.io.261gen9q7g47/v1

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OPEN ACCESS

DOI: https://dx.doi.org/10.17504/protocols.io.261gen9q7g47/v1

Protocol Citation: Arpine Sokratian, andrew.west west 2024. Vagotomy and Tamoxifen treatment. **protocols.io https://dx.doi.org/10.17504/protocols.io.261gen9q7g47/v1**

Manuscript citation:
Reference information: JCI Insight.
2023;8(23):e172192.
https://doi.org/10.1172/jci. insight.172192

Protocol status: Working
We use this protocol and it's working

Created: May 27, 2022

Last Modified: May 31, 2024

Protocol Integer ID: 63354

Keywords: Vagotomy, Tamoxifen treatment, Vil-CreERT2 mice, ASAPCRN, synuclein in cholecystokinin, subsequent tamoxifen injection, tamoxifen treatment this protocol, tamoxifen treatment, tamoxifen injection, tamoxifen, synuclein in the gi system, synuclein, cholecystokinin, cells within the gut, mouse model, pathological role of alpha, mice

Funders Acknowledgements:
Aligning Science Across Parkinson's
Grant ID: ASAP-020527

Abstract

This protocol provides the methodology of vagotomy procedure and tamoxifen injections in a murine model, investigating the pathological role of alpha-synuclein in the gastrointestinal (GI) system. The mouse model includes features of exclusive expression of alpha-synuclein in cholecystokinin (CCK) cells within the gut.
The protocol intricately details the surgical procedure, including a dissection of the vagus node to ensure the mice not only survive but thrive post-surgery. Subsequent tamoxifen injections, utilizing a tamoxifen-inducible promoter, aim to induce the expression of alpha-synuclein.
The significance of this protocol lies in presenting a unified and standardized procedure for both vagotomy and tamoxifen injections. This streamlined approach is crucial for investigating the role of alpha-synuclein in the GI system.

Attachments

DOCX

450-950.docx
19KB

Materials

Materials

- Syringe
- Needles
- Scalpels
- Ketamine
- Xylazine
- Bupivacaine
- Buprenorphine hydrochloride
- Tamoxifen
- Corn oil
- Stainless steel wound clips (MikRon Precision Inc)

Troubleshooting

Vagotomy and Tamoxifen treatment

35m

1 Perform surgical subdiaphragmatic vagotomy in 1-month-old male and female SNCAbow;Vil-CreERT2 mice.

2 Prior to surgery, sterilize all surgical instruments. Use syringe, needles, sutures, and scalpels from sterile packs, open it at the time of the operation.

3 Sterilize dissecting instruments before using on the next mouse.

4 Surgeon washed their hands thoroughly for 00:05:00 before donning sterile gloves. 5m

5 Surgeon maintained a sterile operating field during the operation.

6 Apply lubricant eye ointment to mouse eyes to prevent corneal drying.

7 Anesthetize mice with ketamine/xylazine at a dose of 87/13 mg/kg by intraperitoneal injection. Determine adequate anesthesia by lack of movement, lack of response to tail pinch, and lack of whisker twitching.

8 Administer buprenorphine 0.05 mg/kg subcutaneously before the surgery.

9 After initial anesthesia, place the mouse on top of a heating pad lined with a silicone pad within the stereotactic apparatus field.

Note

Note: Maintain heating pad at a temperature of 37 °C.

10 Make a mid-line incision with scissors to expose the abdominal contents.

11 Immediately below the diaphragm, identify the vagus nerve and isolate it from surrounding connective tissue and vessels.

12 Excise 2 mm section of the vagus nerve.

13 Monitor mice for intra-operatively signs of arousal. Continuously monitor mouse breathing throughout the surgery by observing chest wall movement.

14 Close the laparotomy in two layers with suturing and surgical clips. Suture the inner layer of skin with a continuous suture pattern using 5-0 monofilament absorbable suture and close the outer skin with 9 mm stainless steel wound clips (MikRon Precision Inc).

15 Apply analgesic bupivacaine (1-2 drops) to the incision site after suturing and allow the animals to awaken.

16 Following surgery, assess mice every 00:30:00 until they return to baseline level of activity with no signs of breathing complications or lasting motor deficits. 30m

17 Record the well-being of the mice in the post-surgery monitoring log. Postoperatively, give mice analgesics.

18 Administer mice analgesics (buprenorphine hydrochloride at a dose of 0.05 mg/kg) and observe daily for 5 days for any signs of infection, distress, or changes in behavior.

19 Give mice free access to food and water.

20 In sham-operated animals, perform abdominal laparotomy, and expose the vagus nerve but do not excise it.

21 Weight loss of ~15% was noted in mice undergoing vagotomy compared to sham surgery.

22 One week after surgery, treat mice with tamoxifen dissolved in corn oil (50 mg/kg) or vehicle administer by intraperitoneal injection daily for five days.