

MATERIALS

REAGENTS

- Female 2 months-old Sprague-Dawley (SD) rats (Charles River Wilmington, MA), weighing 200-250 g. **! CAUTION** All animal studies must be reviewed and approved by the Institutional Animal Care and Use Committees (IACUC) to ensure that they conform to relevant ethics regulations.
- Buprenorphine hydrochloride, 0.3 mg/vial (Webster Veterinary, cat. no. 07-001-9413, <http://webstervet.com>). **! CAUTION** Buprenorphine hydrochloride may cause prolonged respiratory depression. Wear protective clothing to avoid contact or inhalation. Buprenorphine is a controlled substance and should be handled according to relevant institutional rules.
- Euthasol (pentobarbital sodium and phenytoin sodium) solution 100 mL (Virbac, cat. no. 710101, <http://www.virbacvet.com>). **! CAUTION** Pentobarbital sodium produces rapid anesthetic action and unconsciousness. Phenytoin sodium produces cardiovascular collapse and central nervous system depression. Wear protective clothing to avoid contact or inhalation. Euthasol is a controlled substance and should be handled according to relevant institutional rules.
- Isoflurane, USP 100 mL (Piramal Healthcare, NDC: 66794-013-10, <http://www.piramalcriticalcare.com>). **! CAUTION** Isoflurane may cause prolonged respiratory depression and unconsciousness. Wear protective clothing to avoid contact or inhalation. Isoflurane is a controlled substance and should be handled according to relevant institutional rules. Use a vaporizer to minimize isoflurane exposition.

- Sodium chloride (0.9% (wt/vol)), 1 liter (Abbot Labs, cat. no. 04925-10, <http://www.abbotanimalhealth.com>).
- Compressed oxygen cylinder, USP grade (Airgas, cat. no. OX USP200, <http://www.airgas.com>).
- Ophthalmic ointment
- Heparin sodium injection, USP, 1000 U/mL (APP Pharmaceuticals, LLC, cat. no. 540-31 <http://www.apppharma.com>).
- Dextrose 50% solution (Vedco, cat. no. 18-801-50, <http://www.vedco.com>).
- Dulbecco's Phosphate Buffered Saline (DPBS) without calcium and magnesium (GIBCO, cat. no. 14190-144).
- 70% ethanol.
- Iodo-alcohol.

EQUIPMENT

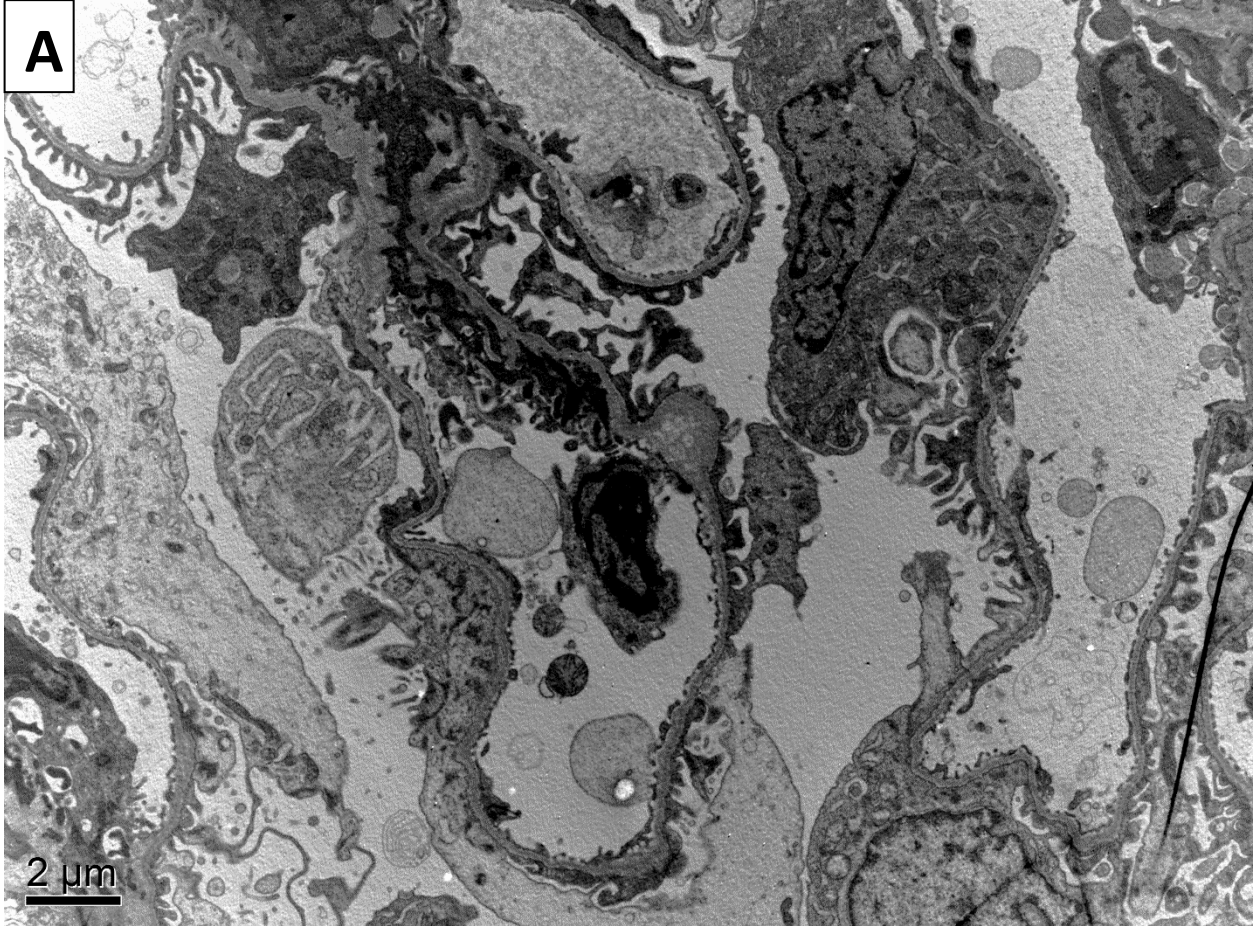
- Biosafety cabinet with vertical laminar flow and equipped with UV light for decontamination.
- Water bath with temperature control.
- Centrifuge with temperature control.
- Hemocytometer.
- 15 ml polypropylene tube.
- Pipette and pipette sterile tips.
- 5 ml round-bottom tube with cell strainer cap 35 μ m (BD Falcon TM, cat. 352235, <http://www.bdbiosciences.com>).

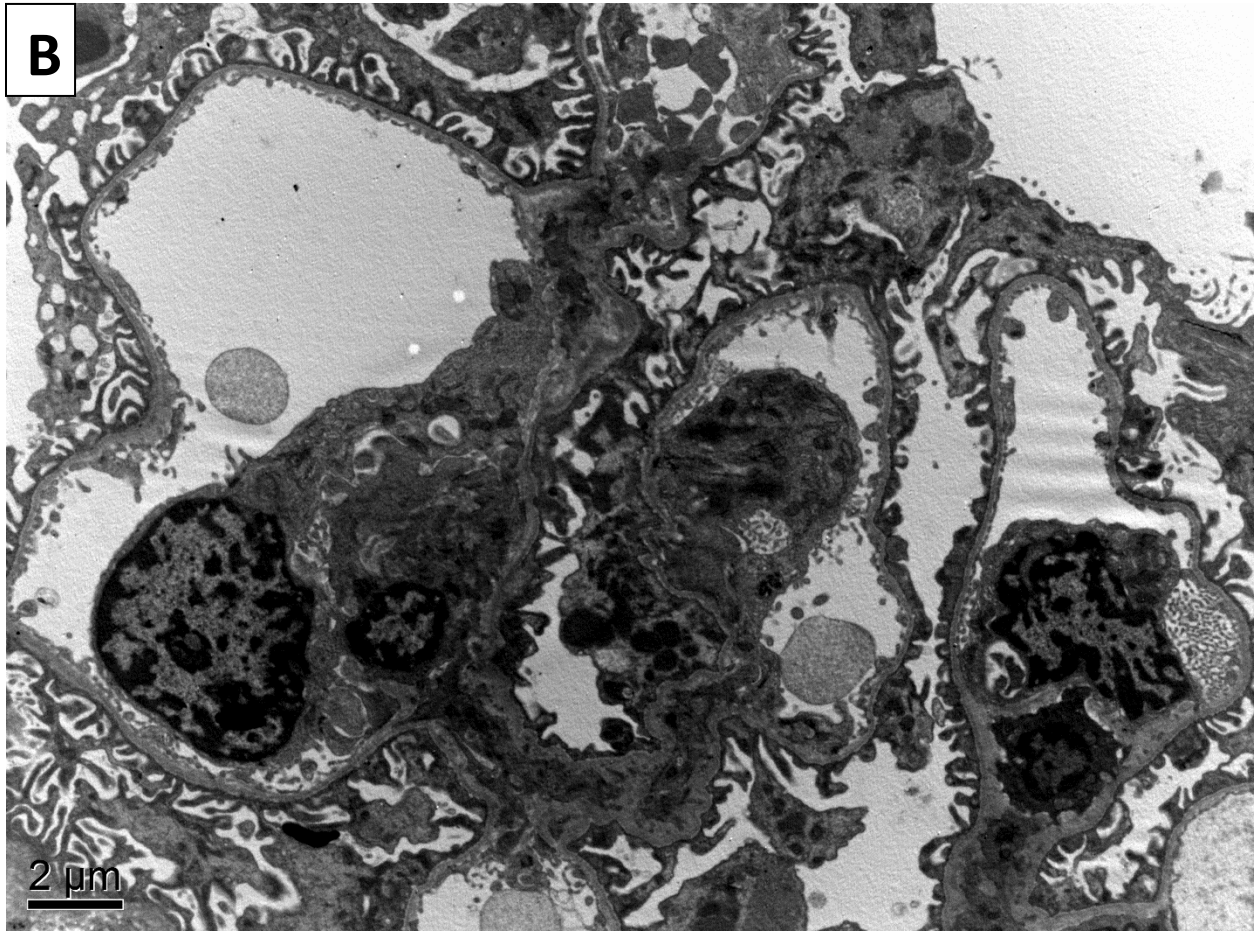
- 5 ml round-bottom tube with a snap cap (BD Falcon TM, cat. 352063, <http://www.bdbiosciences.com>).
- DMSO (Dimethyl Sulfoxide) (Sigma-Aldrich, cat. no. D2650, <http://www.sigmaaldrich.com>).
- BD angiocath TM brand BD autoguard TM shielded IV catheters 14-gauge x 1.75 "" (2.1 c 45 mm), orange (BD Becton, Dickinson and Company, cat no. 381709, <http://www.bd.com>).
- Needles: 25-gauge x 5/8 in. BDTM (BD Becton, Dickinson and Company, cat. no. 305122, <http://www.bd.com>) and 18-gauge x 1 1/2 in. BDTM (BD Becton, Dickinson and Company, cat. no. 305196, <http://www.bd.com>).
- Model 683 small animal ventilator (Harvard apparatus, cat no. PY2 55-0000, <http://www.harvardapparatus.com>).
- T3 isoflurane funnel-fill vaporizer (Harvard apparatus, cat no. PY2 72-8132, <http://www.harvardapparatus.com>).
- 4 Port Anesthetic Manifold –connect to 2 anesthetic devices (Harvard apparatus, cat no. PY2 60-5242, <http://www.harvardapparatus.com>).
- Oxygen regulator
- GerminatorTM 500 Dry Sterilizer (Roboz, cat. no. DS-401, <http://www.roboz.com>).
- Vannas Micro-dissecting (eye) Scissors 8.5 cm straight, spring action (Harvard apparatus, cat. no. PY2 72-8503, <http://www.harvardapparatus.com>).
- Micro Dissecting Scissors, sure cut blades, straight, sharp points, 24 mm blade length, 4 1/2" overall length (Roboz, cat. no. RS-5912SC, <http://www.roboz.com>).
- Metzenbaum Scissors 5.75" overall length, curved extra delicate, 32 mm blades (Roboz, cat. no. RS-6959, <http://www.roboz.com>).

- Mayo Scissors, straight, 43mm blade length, 4.5" overall length (Roboz, cat. no. RS-6870, <http://www.roboz.com>).
- Halsted–mosquito, hemostatic forceps 12.5 cm, straight (Harvard apparatus, cat. no. PY2 72-8973, <http://www.harvardapparatus.com>).
- Graefe Tissue Forceps 4" (10 cm) long full curve 1x2 teeth 0.8 mm tip (Roboz, cat. no. RS-5157, <http://www.roboz.com>).
- Graefe Tissue Forceps 4" (10 cm) long, serrated slight curve extra delicate 0.5 mm tip (Roboz, cat. no. RS-5136, <http://www.roboz.com>).
- Semken Forceps, 2x3 teeth, 1.4 mm tip width, 5" length (Roboz, cat. no. RS-5244, <http://www.roboz.com>).
- Alm Retractor, blunt 4x4 prongs, 5mm depth, 3" spread, 4" length (Roboz, cat. no. RS-6514, <http://www.roboz.com>).
- Vessel clips, jaw length 4 mm, width of jaw 0.75 mm, locking pressure 125 g (Harvard apparatus, cat. no. PY2 72-8816, <http://www.harvardapparatus.com>).
- Schwartz temporary clip, straight, smooth; 795 grams pressure, 1.7 mm jaw width, 8 mm jaw length, 1" clip length (Roboz, cat. no. RS-5452, <http://www.roboz.com>).
- Polypropylene suture (Prolene), 18" (45 cm) 4.0 (1.5 metric) (FS-1, 24 mm, 3/8 c reverse cutting) (Ethicon, cat. no. 8629H, <http://www.ethicon.com>).
- Silk suture (Ligapak dispensing reel, black braided) 144" (365 cm) 3.0 (2.0 metric) (Ethicon, cat. no. LA54G, <http://www.ethicon.com>).
- Cotton tipped cleaning sticks 6-inches (15 cm) (Puritan Medical Products, cat. no. 861-WC DBL, <http://www.puritanmedproducts.com>).

- Stainless steel disposable scalpels number 11 (Miltex, cat. no. 4-411, <http://www.miltex.com>).
- Insulin syringes with the BD ultra-fine needle, capacity ½ mL cc, length 8 mm (5/16”), 31-gauge (BD, cat. no. 328468, <http://www.bd.com>).
- Tygon flexible plastic tubing S-54-HL (Harvard apparatus, cat no. PY2 72-0993, <http://www.harvardapparatus.com>).
- Surgicel Nu-Knit absorbable hemostat (oxidized regenerated cellulose) 6in x 9in (15.2 cm x 22.9 cm) (Ethicon, cat no. JJ1946, <http://www.ethicon.com>).
- Intravenous set
- *Surgical instruments*: We have listed the instruments that we currently use, but one should feel free to substitute alternative and comparable instruments at one’s discretion.

Figure 1S. Transmission electron microscopy (TEM) analyses of saline-treated group (A), MSC-treated group (B), and c-Kit treated group (C).





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