



| University Animal Care Committee Standard Operating Procedure |  |                      |
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| <b>Document No:</b><br>7.17                                   | <b>Subject:</b><br>Acute DSS Colitis (Mouse Model) |                      |
| <b>Date Issued:</b><br>February 16, 2012                      | <b>Revision:</b><br>2                              | <b>Page No:</b><br>1 |

**Location:** Queen's University

**Responsibility:** Principal Investigators (PI), Research Staff, Veterinary Staff

**Purpose:** The purpose of this Standard Operating Procedure (SOP) is to describe generating an acute colitis model of intestinal inflammation using Dextran Sodium Sulphate (DSS).

**1. Introduction and Definitions:** Dextran sodium sulfate (DSS) is a molecule that induces colitis like that seen in human patients. It is administered to the animal via their drinking water. This is a common model of Inflammatory Bowel Disease (IBD), the condition of chronic intestinal inflammation that is currently incurable.

Optimal DSS concentrations are determined by preliminary experiments, as disease severity often varies dependent on animal age, gender, and strain. Standard drinking water is given to controls.

## 2. Materials:

- Water bottles
- DSS solution
- Lactated Ringer's solution
- 1-3ml sterile syringes
- Sterile needles (26-27g)
- Alcohol swabs
- Weigh scale

## 3. Procedures:

- Prior to the initiation of a DSS cycle, all study mice must be weighed to obtain a baseline weight. Based on the baseline weight, the 5%, 10% and 15% weight loss value must be calculated.
- DSS is dissolved into standard drinking water to yield the desired concentration (2.5% - 5%) ("%" = g/100 mL).
- Regular water bottles are removed from the cages and replaced with the DSS-dosed bottles.
- DSS is administered in drinking water for 5 days, followed by a return to regular water.
- Standard husbandry practices are followed.

### Monitoring:

- Daily, cages are checked for DSS water consumption (volume drop in bottle, urine output) and bottles/cages replaced as necessary.
  - A logbook must be maintained and kept in the room to record daily weight, appearance, and behavioural changes. Mice must be weighed before fluid therapy administration.
  - All mice in a DSS-treated group must receive a daily subcutaneous injection of 1ml lactated Ringer's solution. Each and every animal requires a new sterile syringe and needle. Refer to SOP 7.9 "Injection Techniques in Mice".
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**Clinical Outcomes:**

- Treated mice may develop loose stool or diarrhea with detectable blood in the stool.
- Mice show ruffled fur and weight loss while the colitis is present.
- Weight loss should not reach a 15% drop from baseline value, unless approved in the Animal Use Protocol.
- All humane endpoints as approved in the Animal Use Protocol must be followed.

**Weight Loss Chart**

| <b>Starting weight (g)</b> | <b>Weight at 5% weight loss (g)</b> | <b>Weight at 10% weight loss (g)</b> | <b>Weight at 15% weight loss (g)</b> | <b>Weight at 20% weight loss (g)</b> |
|----------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 18g                        | 17.10g                              | 16.20g                               | 15.30g                               | 14.40g                               |
| 19                         | 18.05                               | 17.10                                | 16.15                                | 15.20                                |
| 20                         | 19.00                               | 18.00                                | 17.00                                | 16.00                                |
| 21                         | 19.95                               | 18.90                                | 17.85                                | 16.80                                |
| 22                         | 20.90                               | 19.80                                | 18.70                                | 17.60                                |
| 23                         | 21.85                               | 20.70                                | 19.55                                | 18.40                                |
| 24                         | 22.80                               | 21.60                                | 20.40                                | 19.20                                |
| 25                         | 23.75                               | 22.50                                | 21.25                                | 20.00                                |
| 26                         | 24.70                               | 23.40                                | 22.10                                | 20.80                                |
| 27                         | 25.65                               | 24.30                                | 22.95                                | 21.60                                |
| 28                         | 26.60                               | 25.20                                | 23.80                                | 22.40                                |
| 29                         | 27.55                               | 26.10                                | 24.65                                | 23.20                                |
| 30                         | 28.50                               | 27.00                                | 25.50                                | 24.00                                |
| 31                         | 29.45                               | 27.90                                | 26.35                                | 24.80                                |
| 32                         | 30.40                               | 28.80                                | 27.20                                | 25.60                                |
| 33                         | 31.35                               | 29.70                                | 28.05                                | 26.40                                |
| 34                         | 32.30                               | 30.60                                | 28.95                                | 27.20                                |
| 35                         | 33.25                               | 31.50                                | 29.75                                | 28.00                                |