



University Animal Care Committee Standard Operating Procedure		
<b>Document No:</b> 10.18	<b>Subject:</b> Chronic DSS Colitis (Rat Model)	
<b>Date Issued:</b> May 7, 2012	<b>Revision:</b> 2	<b>Page No:</b> 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 a chronic 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), a 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 bottle
- DSS solution
- Lactated Ringer's solution
- 5-10ml sterile syringes
- Sterile needles (26-27g)
- Alcohol swabs
- Weigh scale

## **3. Procedures:**

- Prior to the initiation of a DSS cycle, the rat 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 (1% - 2%) ("%" = g/100 mL).
- Regular water bottles are removed from the cage and replaced with the DSS-dosed bottles.
- DSS is administered in drinking water for 5 days, followed by a return to regular water for 5 days. This cycle is repeated 3 times.
- 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. Rats must be weighed before fluid therapy administration.
  - In the first two (more severe) DSS cycles: All rats in a DSS-treated group must receive a daily subcutaneous injection of 5ml lactated Ringer's solution. Each and every animal requires a new sterile syringe and needle. Refer to SOP 10.9 "Injection Techniques in Rats".
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- In the third DSS cycle, when clinical symptoms are expected to be less severe, only rats failing to gain weight over a 24-hour period must receive the subcutaneous injections of 5ml lactated Ringer's solution.

**\*\* Rats may receive 2 daily injections of 5ml lactated Ringer's solution on the advice of Animal Care Services (ACS) or Veterinary staff.\*\***

**Clinical Outcomes:**

- Treated rats may develop loose stool or diarrhea with detectable blood in the stool.
- Rats show ruffled fur and weight loss while the colitis is present. This should begin to resolve by the third DSS cycle.
- 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.

*Revised: April 27, 2018 / February 25, 2021*

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