Morphological Characterization of Female Rat Genitourinary Tissues Following Pelvic Radiation

**Results**

Vaginal epithelium exhibited significant atrophy at 4 and 9 weeks post-RT

**Methods**

Animals: Female Sprague-Dawley rats. RT rats were randomly assigned to 4 week and 9 week post-RT evaluation groups (n=8/group). Control group (n=6) did not undergo RT.

Radiation therapy: 0 or 25 Gy single-dose pelvic radiation was administered to anesthetized rats via MultiRad350 small animal irradiator.

Histological analysis: Vaginal, cervical, and clitoral tissues were fixed and embedded in paraffin. Tissue sectioned (6 µm) and stained with Masson’s Trichrome to assess fibrosis. Quantitative image analysis was used to determine epithelial changes.

Blood flow: Vaginal blood flow was measured in vitro using a laser Doppler probe following pelvic nerve stimulation.

**Conclusion**

Pelvic radiotherapy at a 25 Gy dose:
- Induces fibrosis and atrophy of vaginal tissue
- Causes increased contractility of vaginal tissue
- Produces pathological outcomes characteristic of clinical pelvic radiotherapy used for treatment of cancer
- Can be utilized to evaluate RT-induced changes in newly-characterized rat genitourinary tissues

**Future Directions**

1. Complete evaluation of effects of pelvic radiation on clitoral tissue
2. Determine bioadhesive properties and confirm in vivo application safety of intravaginal hydrogel developed at Mt. Sinai
3. Evaluate the efficacy of intravaginal hydrogel in preventing radiation-induced genitourinary pathologies