

Luna Innovations is developing a sprayable barrier to be used for the prevention of postoperative adhesions.

Post-Operative Adhesions

Postoperative adhesions are an “expected outcome” in abdominal surgeries. They are the leading cause of small-bowel obstruction in the western world, cause chronic debilitating pain, and lead to female infertility. Given the almost-universal occurrence of adhesions after abdominal surgery and the fact that >40% of adults require intra-abdominal surgery before age 60, there has been intensive research into strategies to prevent or reduce the incidence of adhesions.

LUNA is developing a sprayable gel, known as TissuCoat™, to be applied within the abdominal cavity and form a protective layer around internal tissues. Luna’s TissuCoat™ technology relies on the interaction of two polymeric solutions upon application to form a hydrogel capable of separating injured tissues during the adhesion-formation window following surgery. One of the components is colored blue to enable easy visualization in real-time during the application process. The two polymers are designed to interact and form a complex that loosely sets the gel and adheres it to the tissue surface over which it was applied. Additionally, ionic crosslinkers are included to further stabilize the hydrogel structure in order to withstand shear stresses imparted by surrounding tissues following closure.

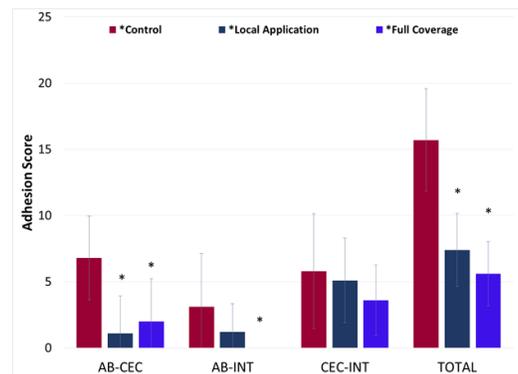


LUNA’s sprayable hydrogel applied using a two syringe air-assist applicator over a pig stomach

TissuCoat™ Sprayable Adhesion Barrier

- **Colored** for easy visibility of application area
- **Flowable** over irregular surfaces during application
- **Low cost**, basic materials and applicator system
- **Robust** to form a contiguous barrier over the susceptible tissue surface and maintain the barrier through strong adhesion to tissue
- **Biodegradable** and cleared quickly after healing
- **Adhesive to tissue** to maintain barrier for 4-7 days until the risk of adhesion formation has passed

A rat cecum abrasion model has demonstrated that Luna’s formulation, applied using a commercially available air-assist (CO₂) spray tip, almost completely eliminates the adhesion the model is designed to investigate (cecum to abdominal wall).



Preliminary analysis shows a decrease in the score and incidence of primary adhesions (Ab-Cec) and total adhesions formed in the rat model. There is no significant change detected in the cecum-intestine secondary adhesion (Cec-Int), primarily due to the low incidence in control animals due to their increased incidence of primary

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