



COMPARATIVE BIOSCIENCES, INC.  
A TRANSLATIONAL APPROACH TO PRECLINICAL RESEARCH



## Technical Bulletin: Subcutaneous Implant Procedure + Video



### WHAT IS: The Implant Surgery

A chip or test implant is inserted in a pocket of the skin made by the surgeon. Once this medical device is placed, the wound is then closed with wound clips, surgical glue or interrupted sutures. In preclinical research, a subcutaneous implant, or subcutaneous pellet, is an implant that is delivered under the skin into the subcutaneous tissue by surgery or injection and is used to deliver a drug for a long period of time.

Examples of drugs that can be administered in this way include proprietary test articles, insulin, hormones, leuprorelin and other long acting drugs. Various species such as mice, rats, rabbits, and larger animals maybe easily implanted.

One of the unique and customized surgical services offered by **Comparative Biosciences, Inc.**

Comparative Biosciences, Inc and GD3 have joined together to providing expert scientific resources and high quality contract research services to all sectors within the biomedical and pharmaceutical community.

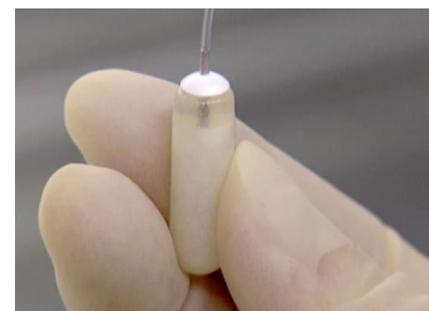


WATCH VIDEO

## Subcutaneous Implant Procedure at CBI

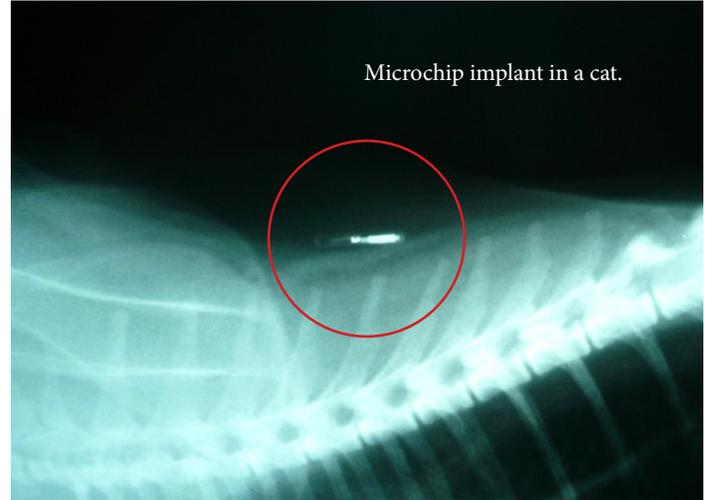
### INTRODUCTION:

In medicine, a subcutaneous implant, or subcutaneous pellet, is an implant that is delivered under the skin into the subcutaneous tissue by surgery or injection and is used to deliver a drug for a long period of time. Examples of drugs that can be administered in this way include leuporelin and the sex steroids estradiol and testosterone. Such implants fall under the broad category of body modification. Many subdermal implants are made out of silicone, either carved or mold injected. Many people who have subdermal implants use them in conjunction with other types of body modification to create a desired, dramatic effect. This process is also known as a 3-D implant, or pocketing.



**Comparative Biosciences, Inc.** provides a range of sophisticated and customized implant models. Rat subcutaneous implantation with the frame method is performed with success and ease. The surgical approach used for the frame technique was found to be the best methodology for *in vivo* evaluation of tissue engineered acellular scaffolds, where the frame method did not compromise mechanical strength, but it reduced inflammation significantly.

**Objectives:** **Subcutaneous implantations** in small animal models are currently required for preclinical studies of acellular tissue to evaluate biocompatibility, including host recellularization and immunogenic reactivity.



## How is Subcutaneous Implant Procedure used in preclinical research?

### STATE-OF-THE-ART PRE AND POST-SURGICAL CARE:

The use of biodegradable materials is gaining popularity in medicine, especially in orthopedic applications. However, preclinical evaluation of biodegradable materials can be challenging, since they are located in close contact with host tissues and might be implanted for a long period of time. Evaluation of these compounds requires biodegradability and biocompatibility studies and meticulous pathology examination. Intra-articular film implantation and subcutaneous implantation of the downsized device showed favorable local and systemic tolerability.

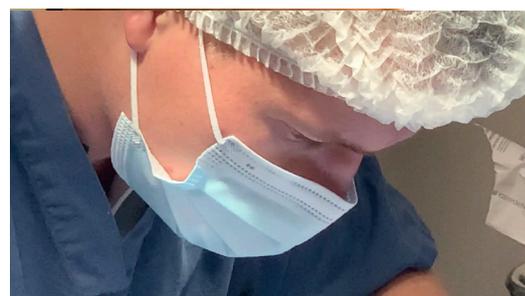
Here at **Comparative Biosciences, Inc.** a rat subcutaneous implant model is our most frequently requested (and most frequently recommended) animal model for screening antimicrobial and anti-biofilm actives and coatings. The model is fast, relatively inexpensive and, in our experience, 75-80% predictive of more complicated animal models. Using this model, it is possible to screen a wide array of microbial species with high reproducibility.

- . Device is implanted subcutaneously (hernia mesh)
- . Implanted device is collected for microbial counts & surrounding tissue is evaluated histologically
- . Study duration can be hours to at least 6 months

**Surgery is successful. Surgery is complete.  
Excellent recovery. No impariments.**

The animal regains mobility and generally make a complete recovery with little mortality or post surgical complications.

In many studies, following the duration of the implant, there are frequent blood collections to assess blood levels of the test material, followed by collection of the device and is histopathologic evaluation of the implant site and target organs; a full report may be prepared.



## BEFORE STARTING: SUBCUTANEOUS IMPLANT PROCEDURE

### WHAT WE DO TO PREPARE

- . Set up prepping/recovery station
- . Line the prepping/recovery station with green pads.
- . Set up prepping field with shaver, scale, and surgery log.
- . Set up recovery field with vetbond, cefazolin (160 mg/kg, antibiotic), flunixin (2.5 mg/kg, analgesic), 25 gauge needles (blue), 1 ml syringes (1 for cefazolin and 1 for flunixin), 10 ml syringe, and a recovery cage (lined with blue pad) placed on top of a water-circulating heating pad.
- . Prepare 160 mg/kg cefazolin: add 6.25 ml saline. Prepare 2.5 mg/kg flunixin: add 1.5 ml flunixin to 30 ml bottle of saline

### SET UP ANESTHESIA MACHINE:

Place the mobile rodent anesthesia machine next to surgery station. Place nose cone on surgery table and secure it with tape.

### SET UP SURGERY STATION:

Line the surgery station with green pads. Set up surgery field with lamp, alcohol prep wipes, surgery tools, gauze, suture thread, suture needle, 1 dish with beta-dine-alcohol solution, and 1 dish with sterile water.

### THE CHIP OR TEST IMPLANT:

Pick up the filled implant by the top and insert it with the end going in first.

Close the incision site with sutures and vetbond.

Write down how surgery went in surgery sheet.

Place the rat in recovery box. Wait for the rat to wake up and show some active behavior before returning to home cage. Write down recovery notes in surgery sheet.

Put POST-OP sticker on cage card with date and type of surgery.



In summary CBI provides research procedure in rats and other species. We have highly trained surgeons and specialized skilled researchers. We have state of the art equipment and high quality detailed reports to support your research activities and FDA regulatory submissions.

CHECK OUT OUR SUBCUTANEOUS IMPLANT PROCEDURE VIDEO:  
<https://www.youtube.com/watch?v=l4pamRdMw2w>