

ANTI-INFLAMMATORY ACTIVITY



Muhammad Al Shorbagy, Ph.D
Pharmacology & Toxicology
muhammad.alsohrbagy@pharma.cu.edu.eg

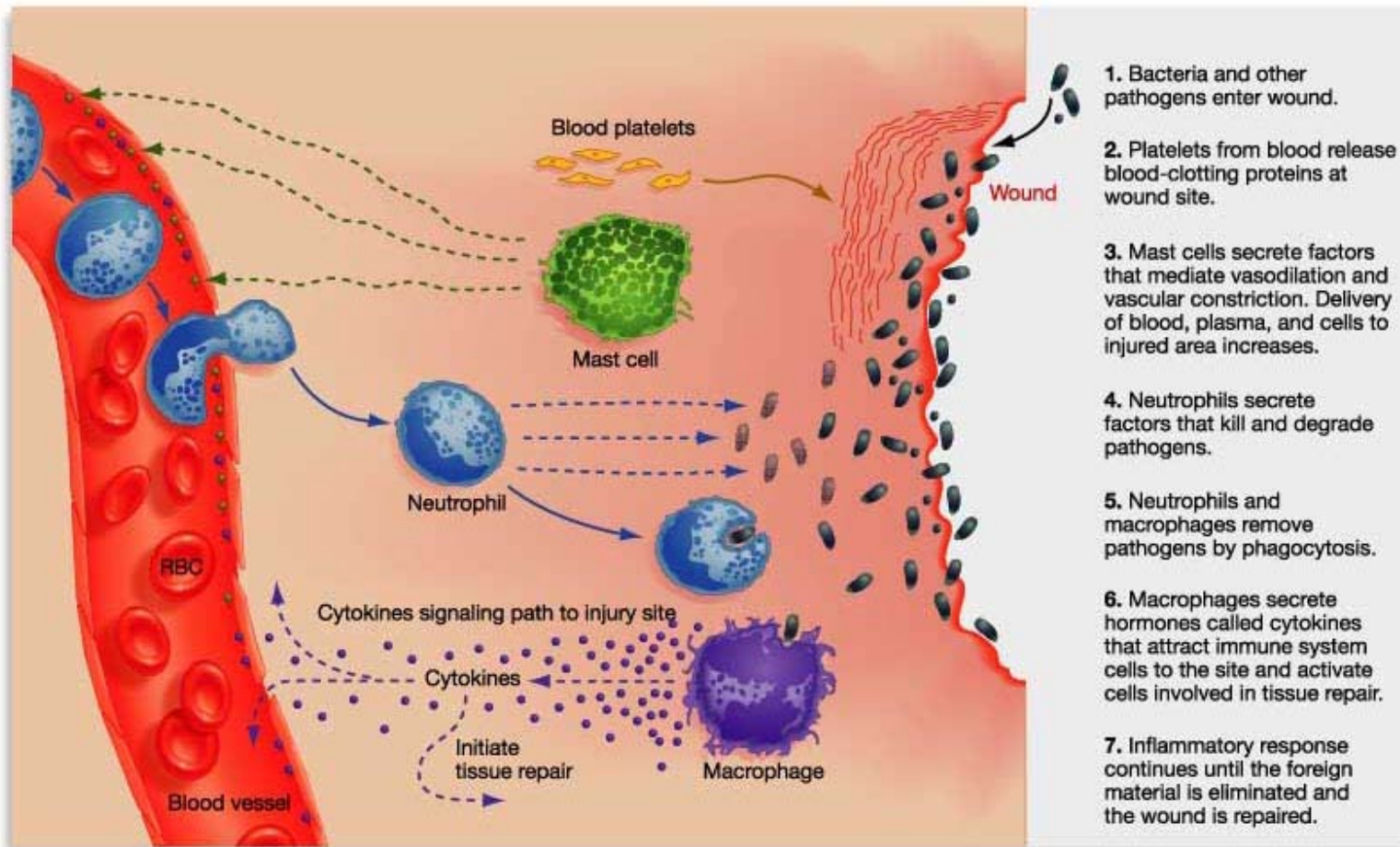


INFLAMMATION

INFLAMMATION

- Normal defense reaction to a tissue injury that ends with either complete healing or permanent destruction of the tissue.
- It may be **ACUTE** or **CHRONIC**

INFLAMMATION



Cellular Phase



Exudative Phase

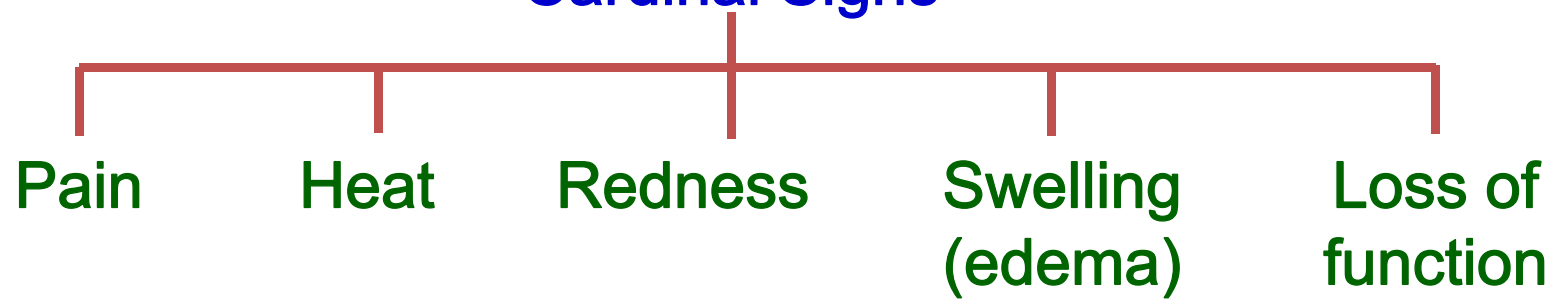


Proliferative Phase

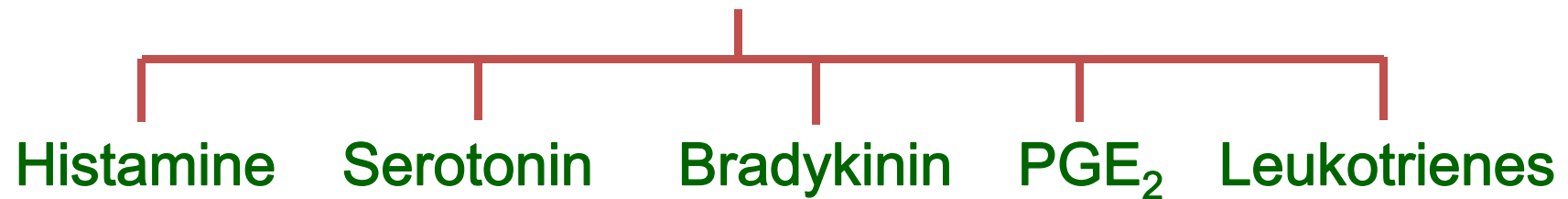
INFLAMMATION

ACUTE INFLAMMATION

Cardinal Signs



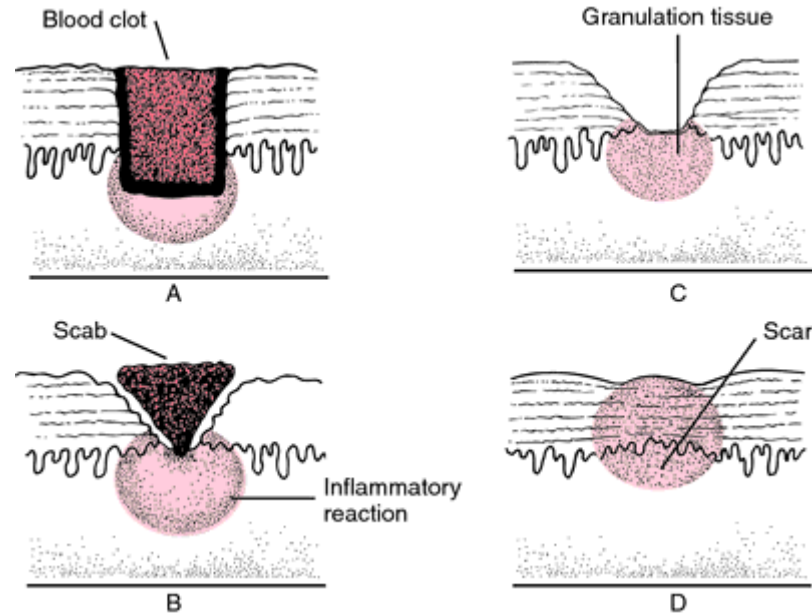
Mediators



INFLAMMATION

CHRONIC INFLAMMATION

- The **proliferative** phase is more pronounced
- New connective tissues (**granuloma**) and capillaries are formed to replace those destroyed.
- **Fibrosis** may occur and the affected area may lose its function.



INFLAMMATION

General Considerations

Inflammatory responses to stimuli

Erythema

Edema

Pain

Hyperalgesia

Anti-inflammatory Tests

Acute

Subacute

Chronic

ANTI-INFLAMMATORY ACTIVITY

A. Methods for testing acute and subacute phase

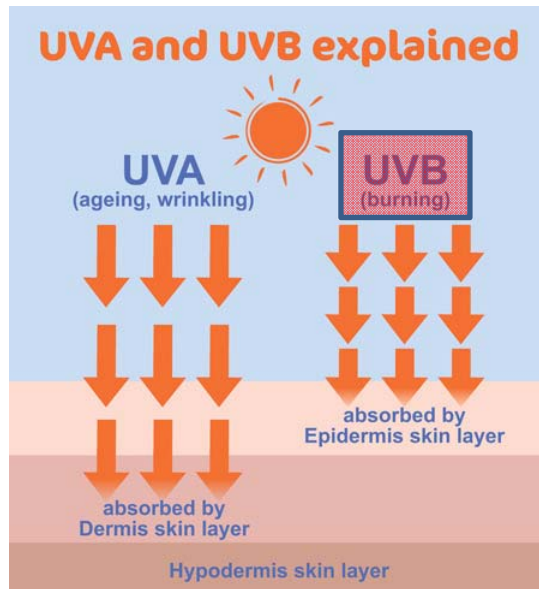
1. Ultraviolet-erythema in guinea pigs
2. Croton-oil ear edema in rats and mice
3. Paw edema in rats

B. Methods for proliferative phase

Cotton wool granuloma

1. UV-erythema in guinea pigs

Purpose and rationale



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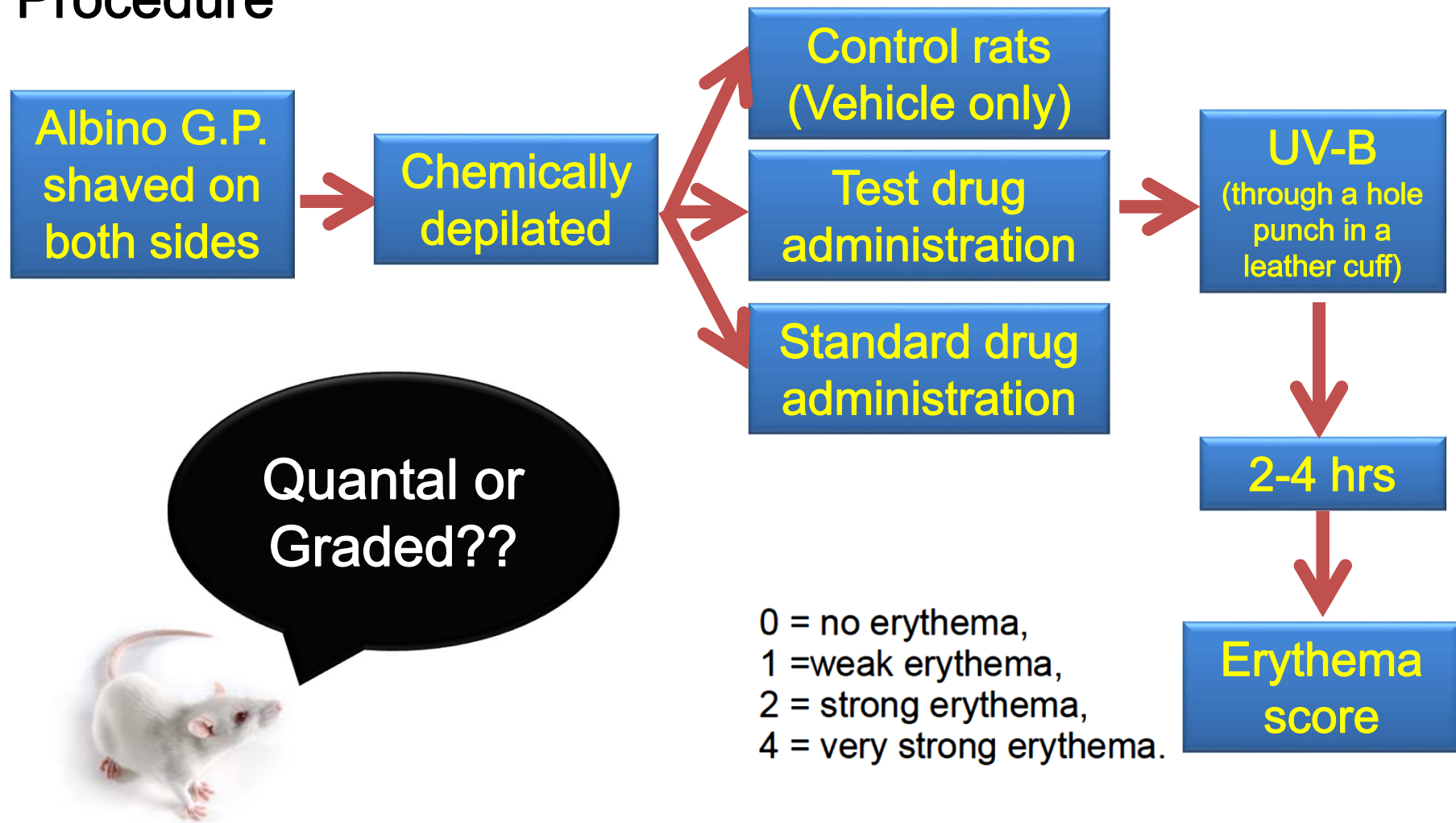
Anti-inflammatory



Albino guinea pigs

1. UV-erythema in guinea pigs

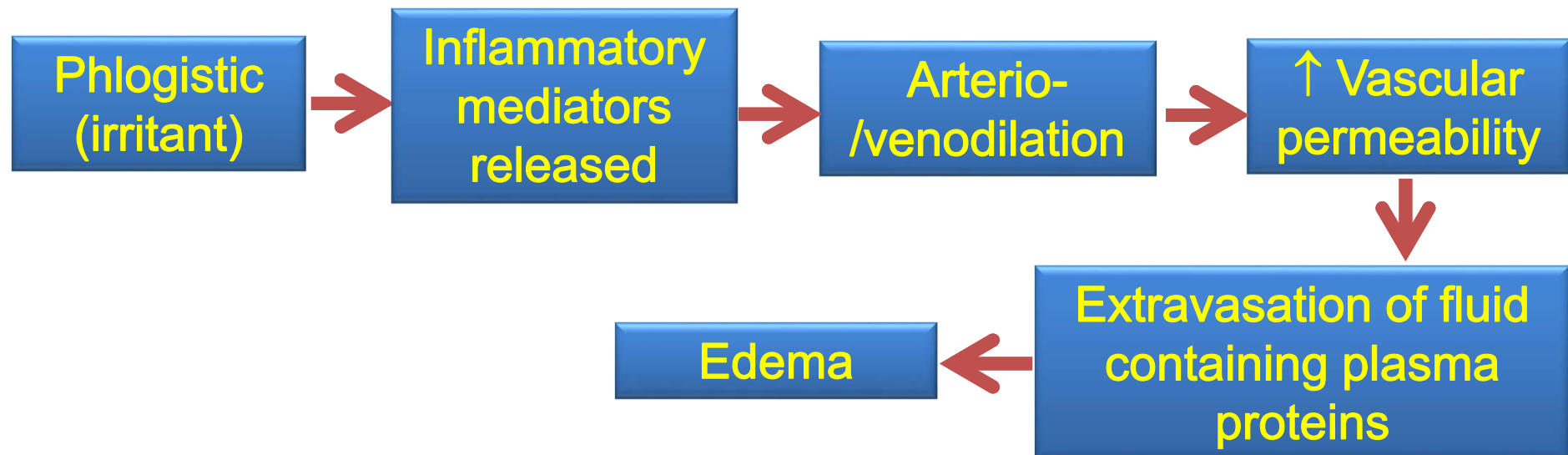
Procedure



2. Croton oil ear edema

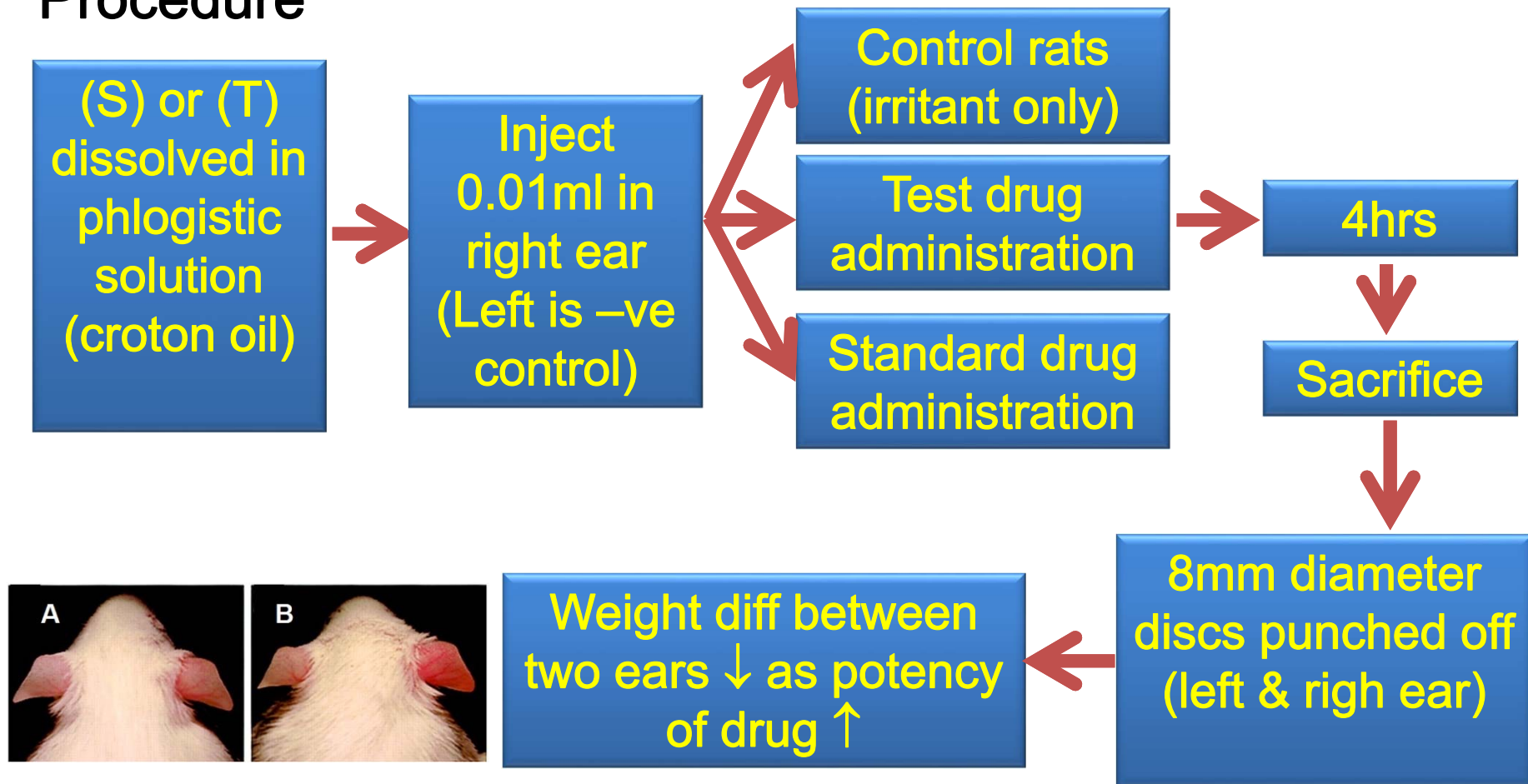
Purpose and rationale

Bioassay for the **antiphlogistic (irritant)** activity of topically applied steroids and NSAIDs.



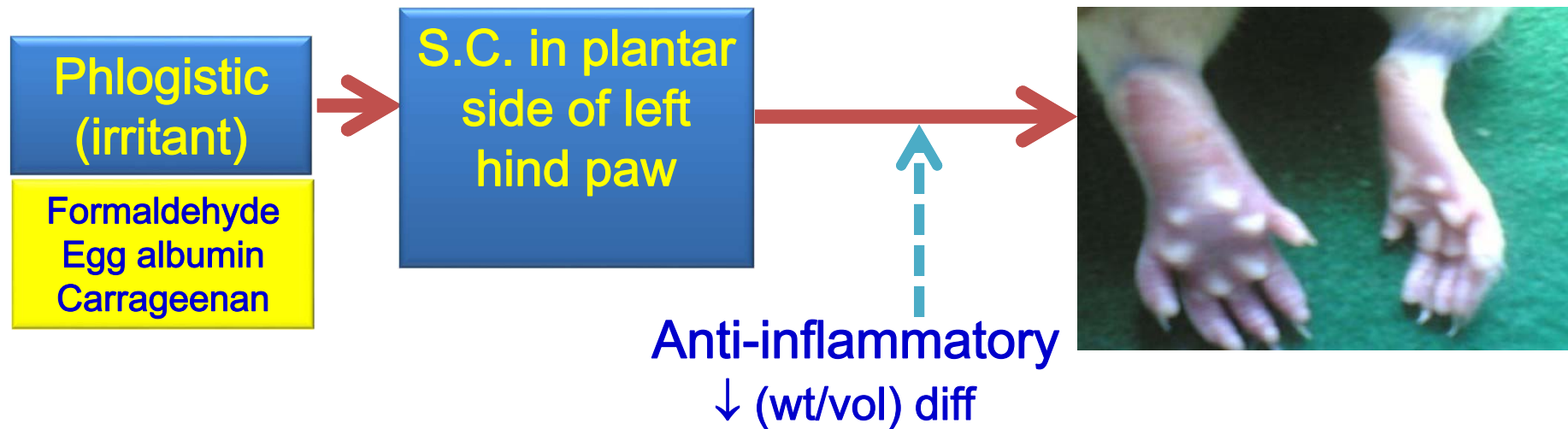
2. Croton oil ear edema

Procedure



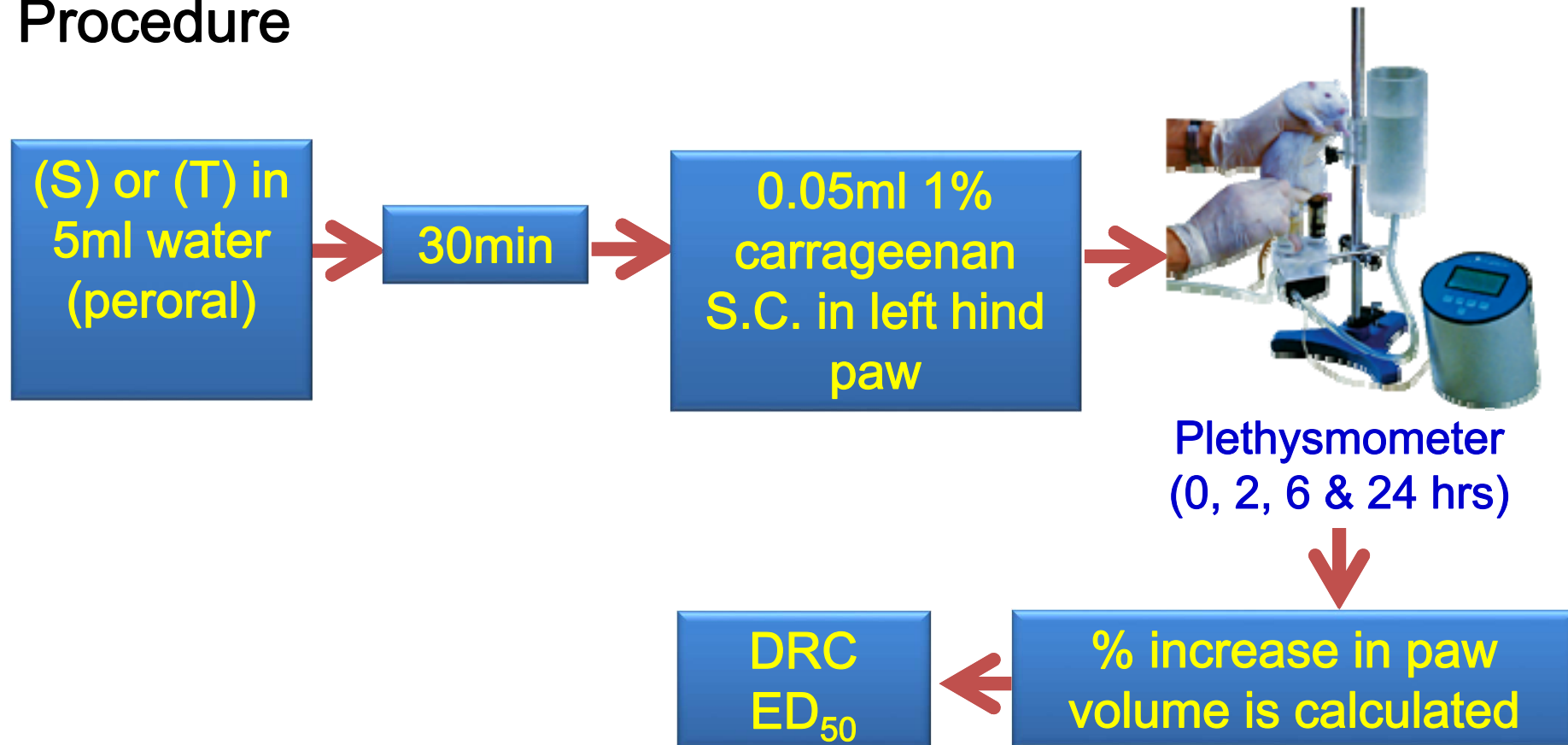
3. Paw edema in rats

Purpose and rationale



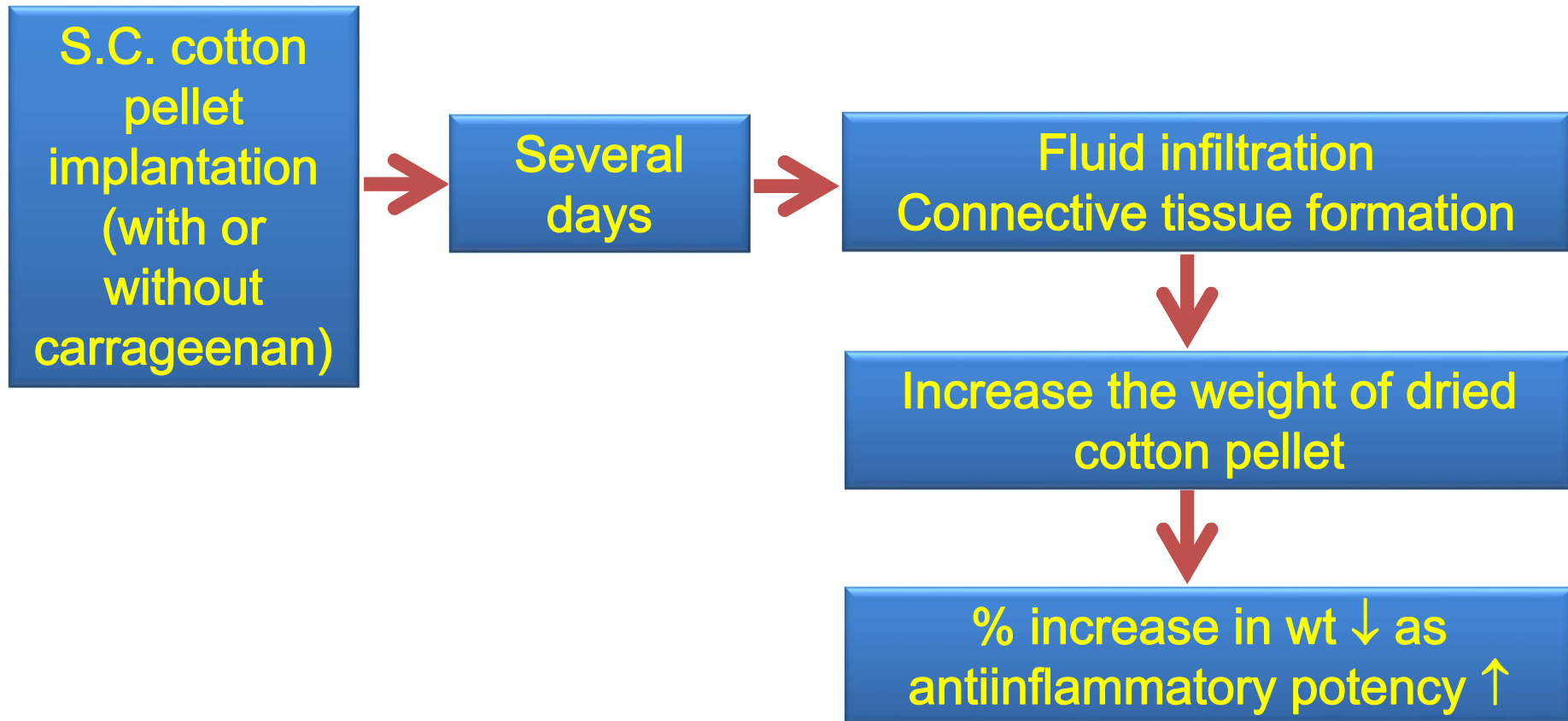
3. Paw edema in rats

Procedure



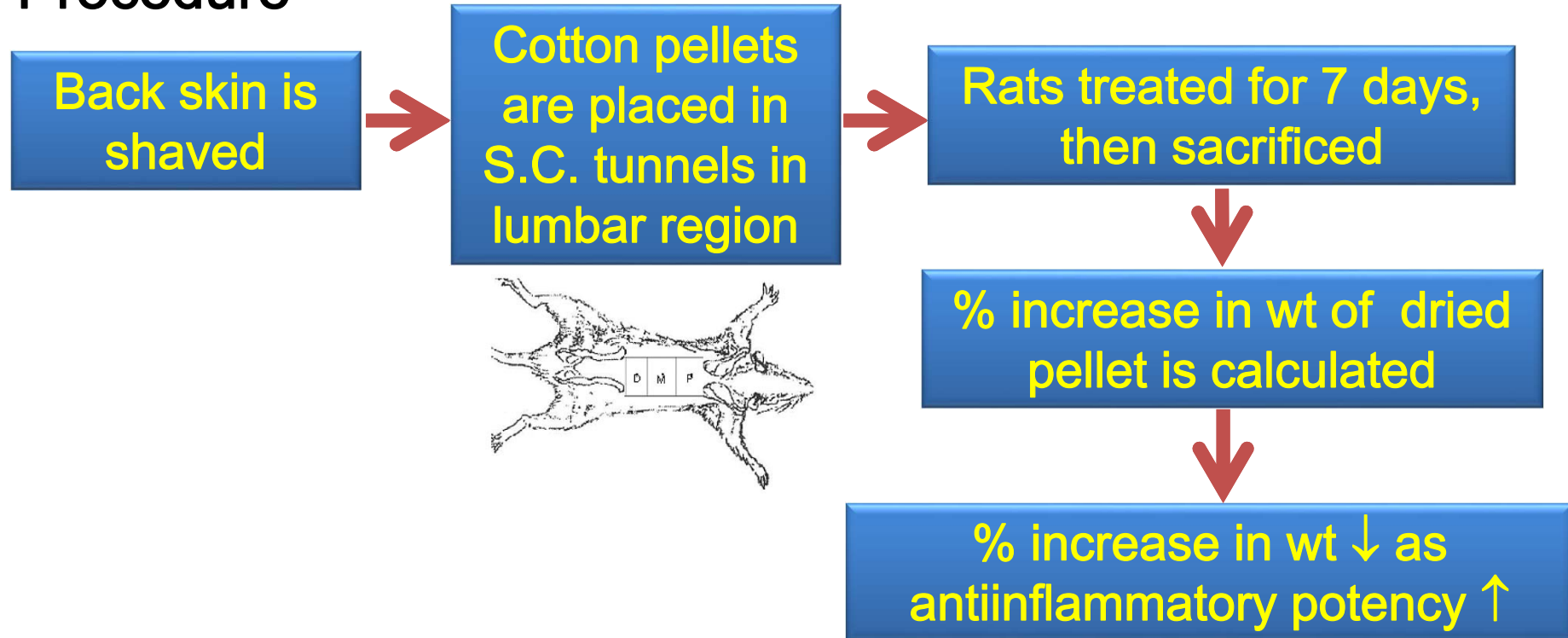
Proliferative phase (Granuloma formation)

Purpose and rationale



Proliferative phase (Granuloma formation)

Procedure



A white mouse is shown in profile, facing right. It has a long, thin tail that curves upwards and then back down. The mouse is standing on its hind legs, with its front paws slightly raised. The background is a soft, light blue gradient.

ANTI-ARTHROTIC ACTIVITY



General considerations

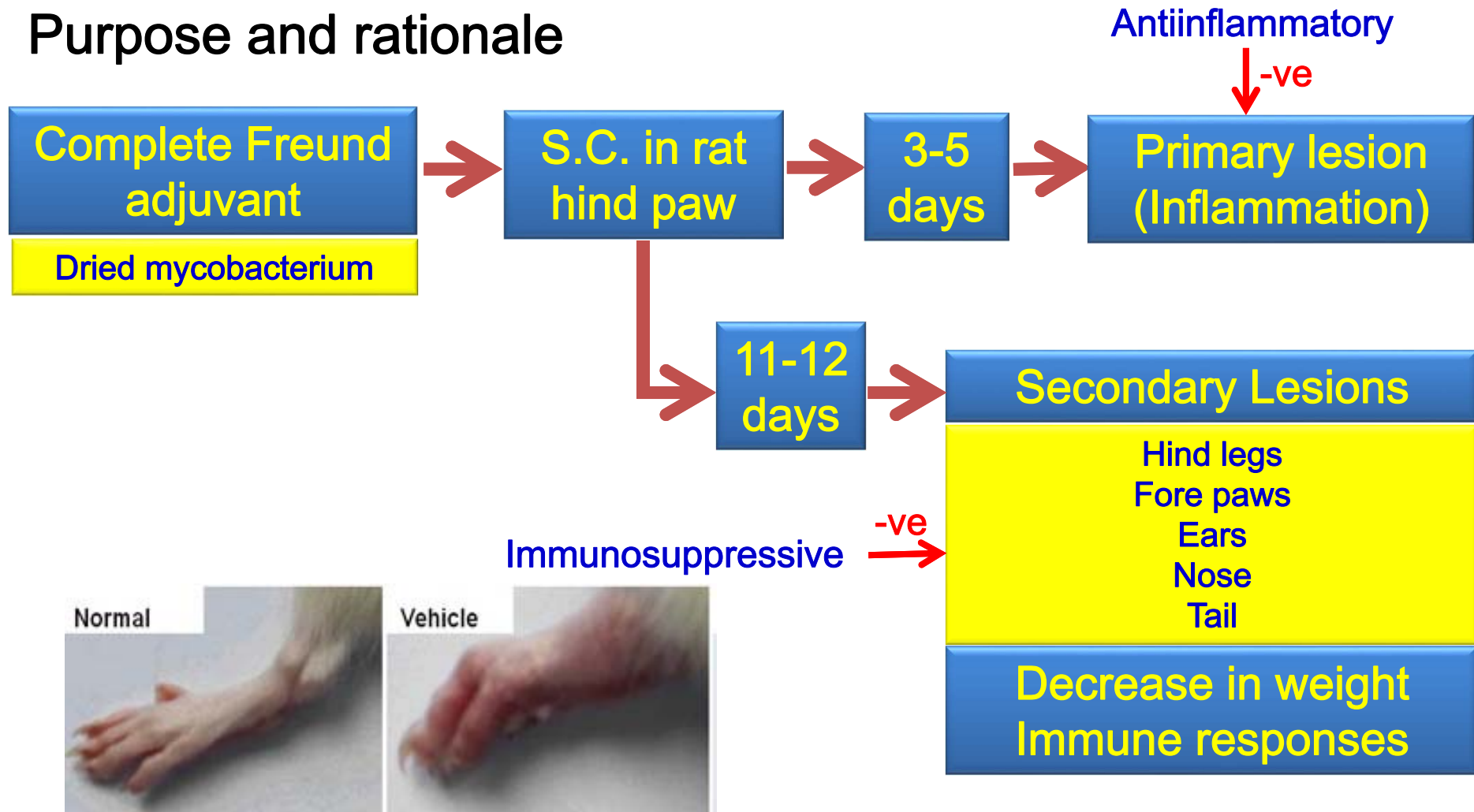
Rheumatoid arthritis

Rheumatoid arthritis (RA) is a **chronic, systematic inflammatory** disorder of the joints and surrounding tissues.



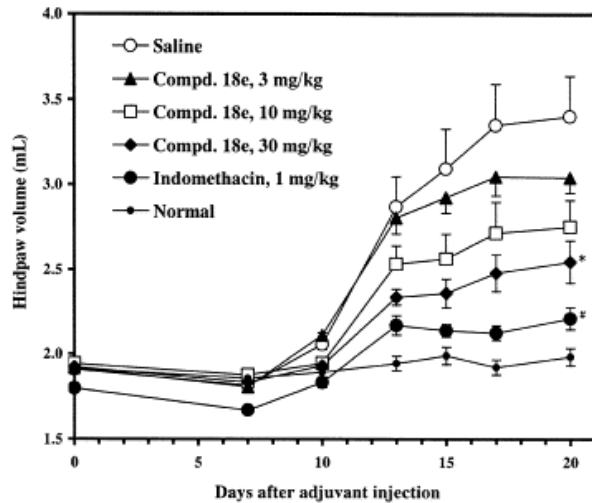
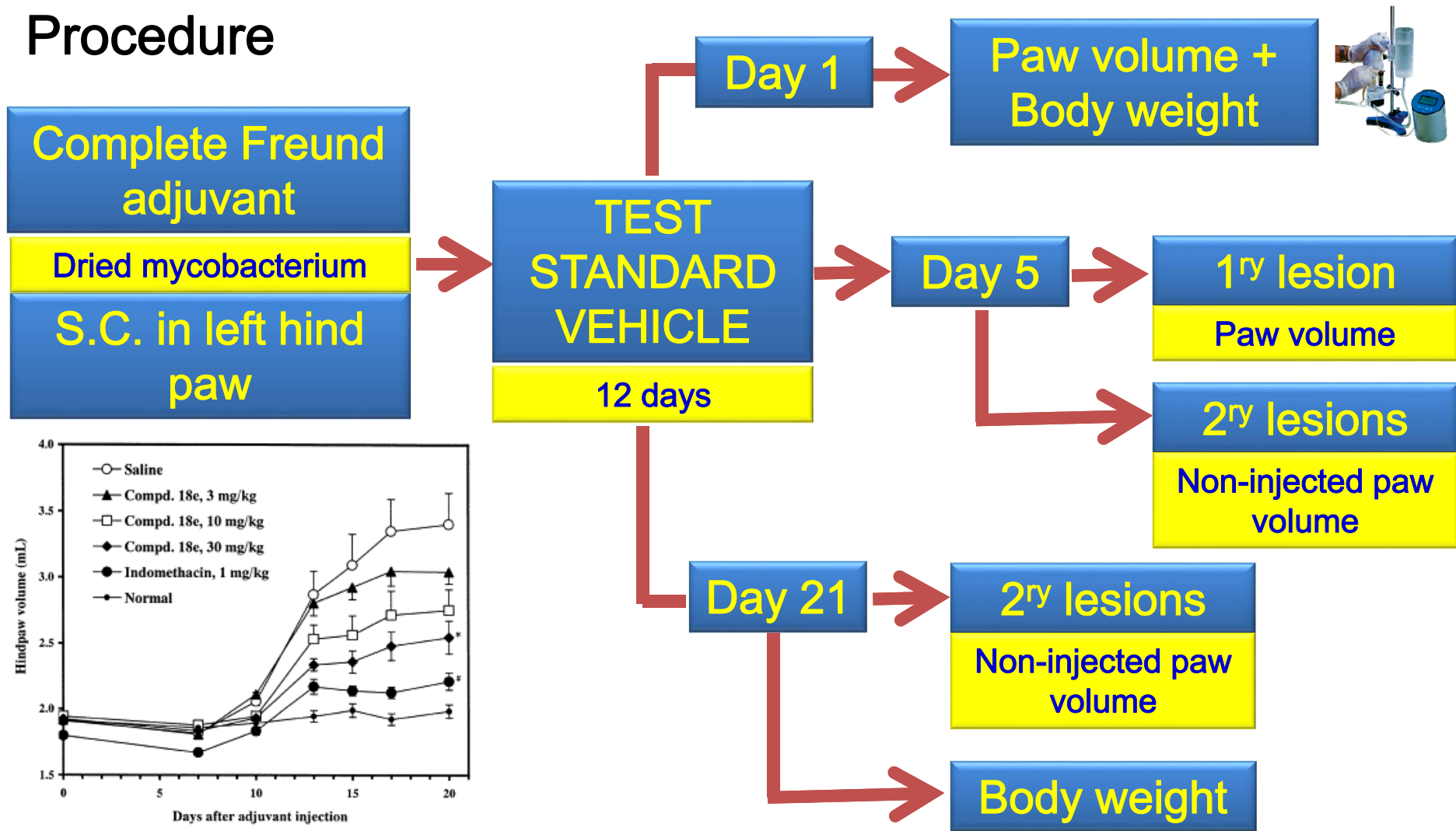
Adjuvant-induced Arthritis in Rats

Purpose and rationale



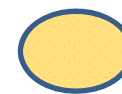
Adjuvant-induced Arthritis in Rats

Procedure



A white mouse is shown in profile, facing right. It has a long, thin tail that curves upwards and then back down. The mouse is standing on its hind legs, with its front paws slightly raised. The background is a soft, light blue gradient.

ANALGESIC ACTIVITY



General considerations

Analgesic drugs

They may be classified according to their site of action into:

1. **Peripheral analgesics** (e.g.: NSAIDS – COX-2 inhibitors...etc)
2. **Centrally acting analgesics** (e.g.: opioids)

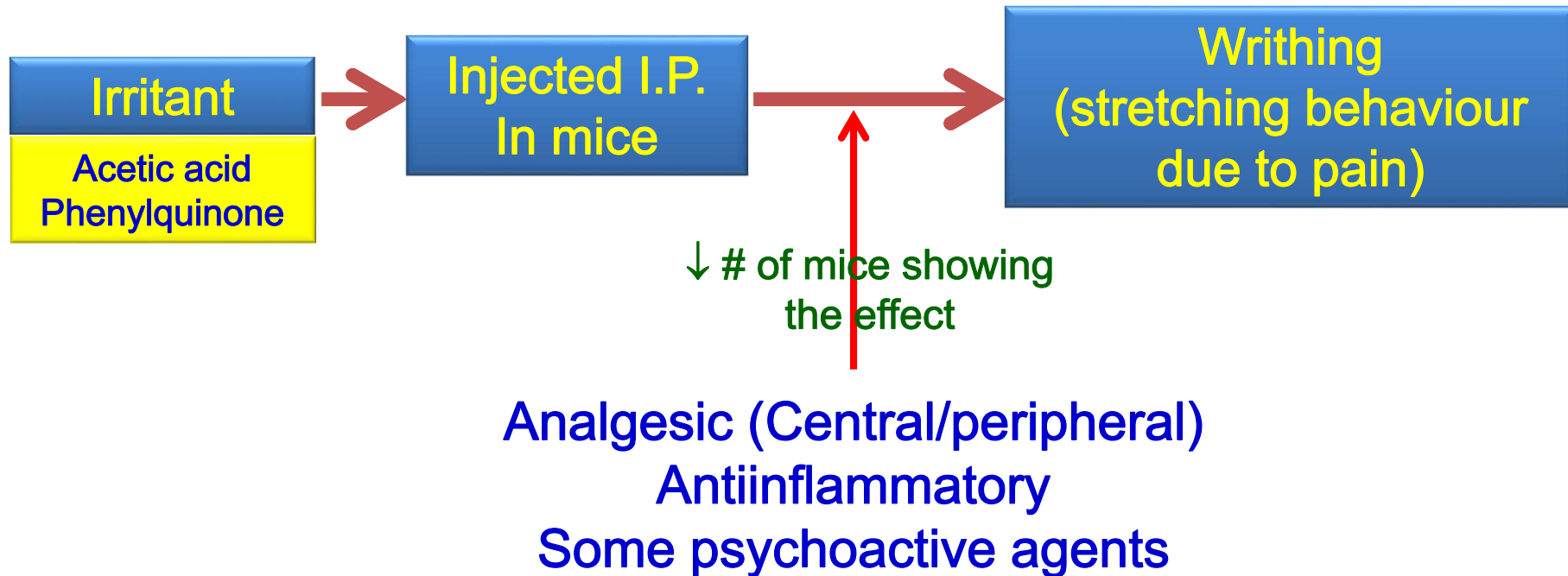
Most of the peripheral analgesics possess anti-inflammatory properties and in some cases also antipyretic activity besides analgesia.

The most commonly used *in vivo* methods for measuring peripheral analgesic activity are:

1. **Chemical-induced hyperalgesia**
2. **Mechanical hyperalgesia**

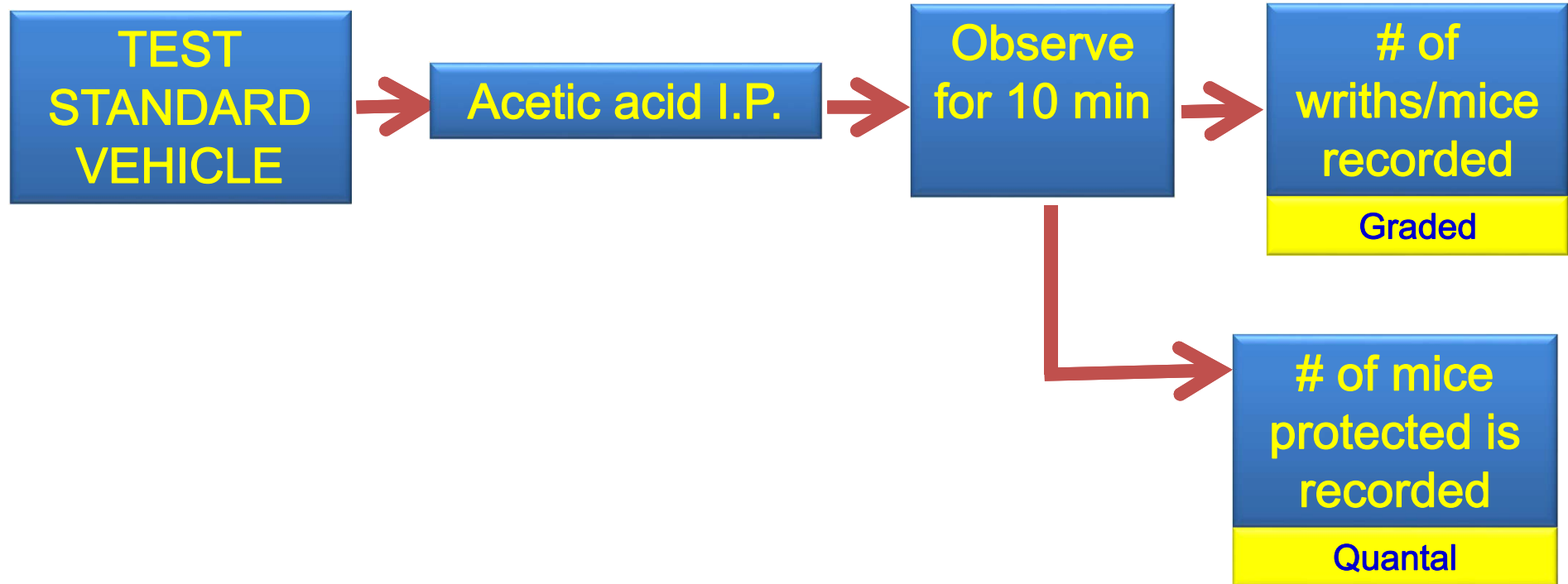
1. Chemical-induced hyperalgesia (writhing)

Purpose and rationale



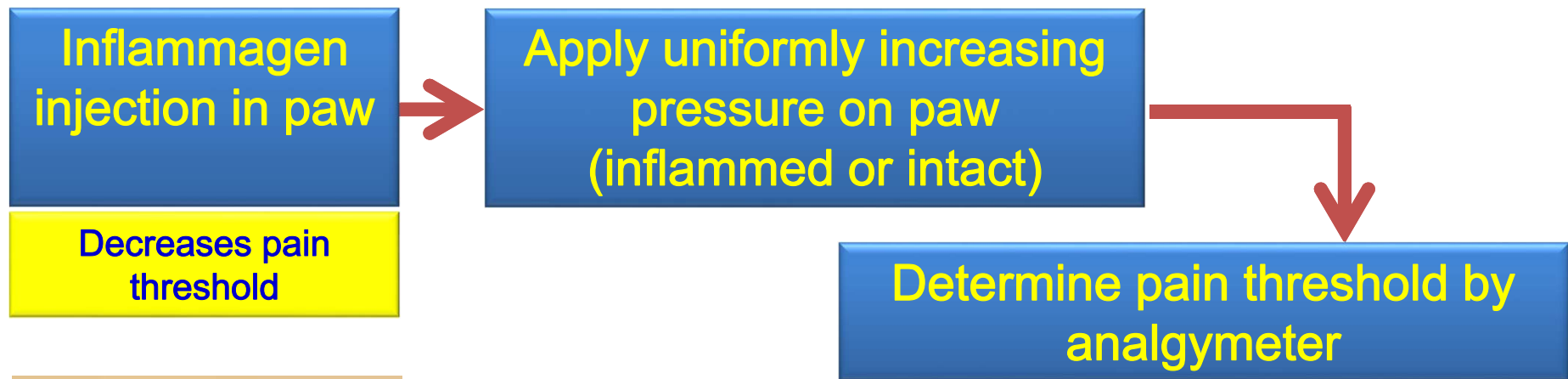
1. Chemical-induced hyperalgesia (writhing)

Procedure



2. Mechanical hyperalgesia (Randall-Selitto test)

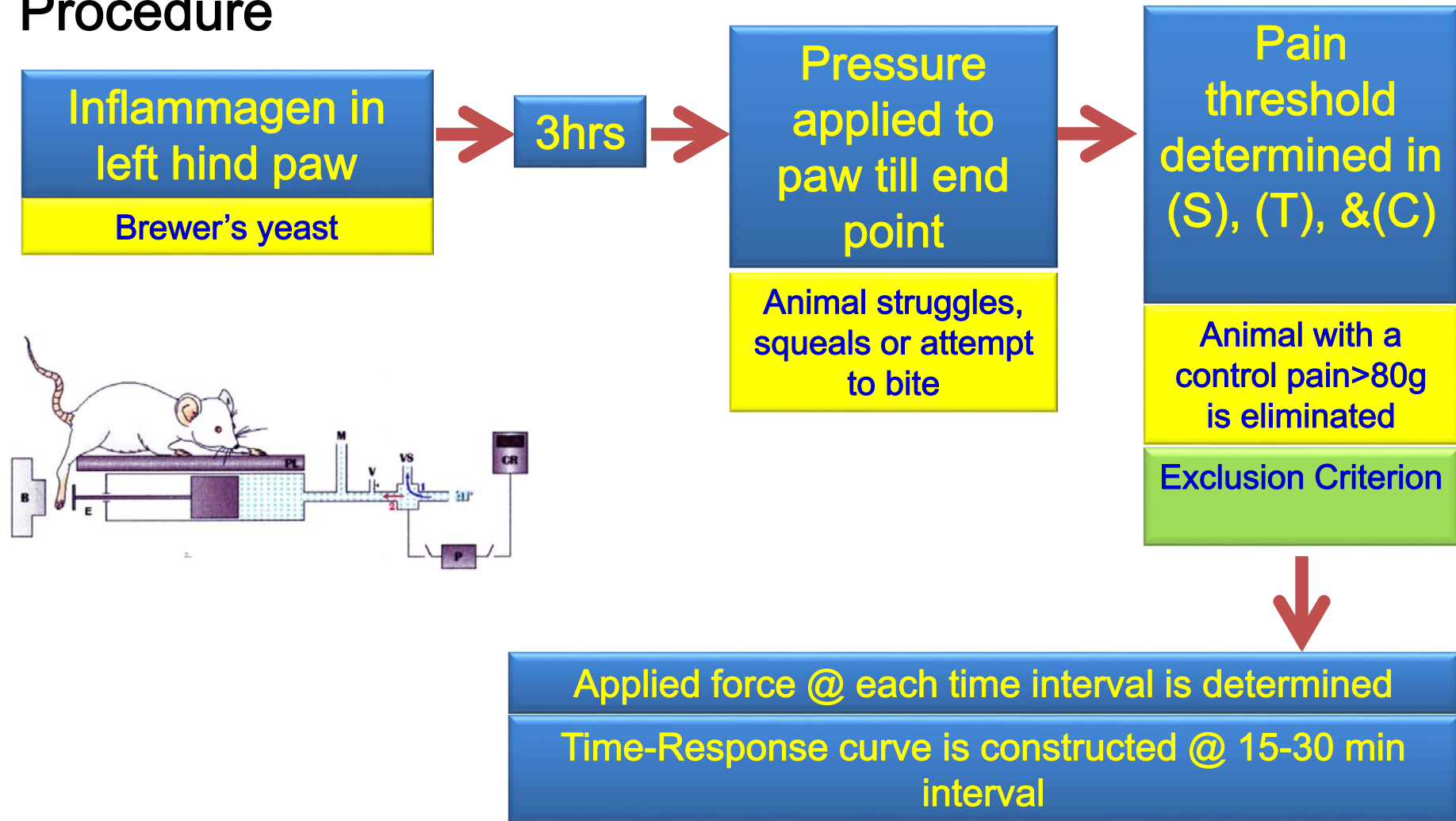
Purpose and rationale



- **Peripherally** acting analgesics ↑ pain threshold of the **inflamed paw only**.
- **Opiates** analgesics ↑ **also** the threshold of the **intact paw**.

2. Mechanical hyperalgesia (Randall-Selitto test)

Procedure

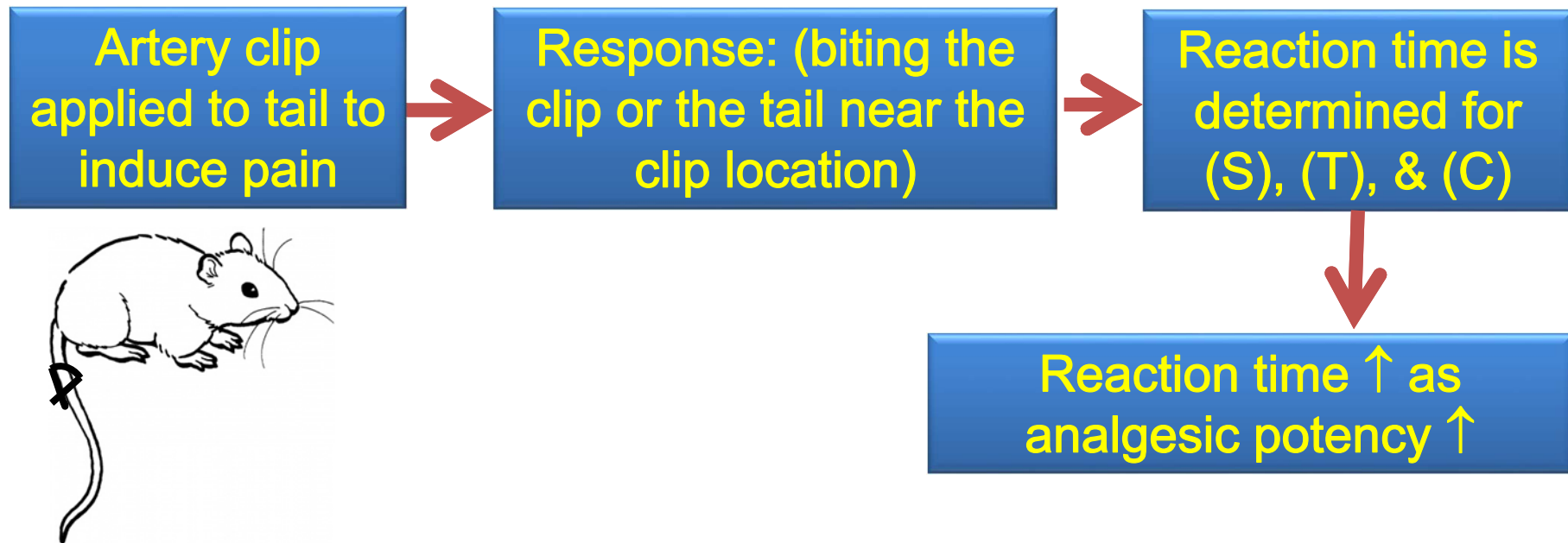


CENTRAL ANALGESIC ACTIVITY

1. Mechanical Hyperalgesia Model (Tail clip method)
2. Thermal Hyperalgesia Models
 - A. Radiant Heat (Tail-Flick) method
 - B. Hot Plate method
 - C. Tail Immersion method
3. Electrical Shock Hyperalgesia Models
 - A. Electrical Stimulation of Tail
 - B. Grid Shock Test
 - C. Tooth Pulp Stimulation

I. Mechanical hyperalgesia (Tail Clip Method)

Purpose, rationale and procedure



II. A. Radiant Heat (Tail-Flick) Method

Purpose, rationale, and procedure

Heat stimulus
(infra red lamp)
applied to
animal tail

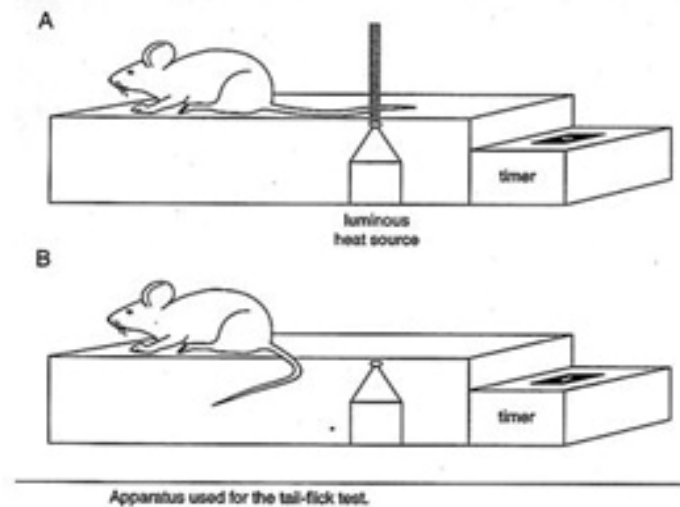
Response: (mouse
flicks the tail aside
within 6s)

Reaction time is
determined for
(S), (T), & (C)

Reaction time \uparrow as
analgesic potency \uparrow

Mice with reaction time $> 6s$ are rejected

Exclusion Criterion



II. B. Hot Plate Method

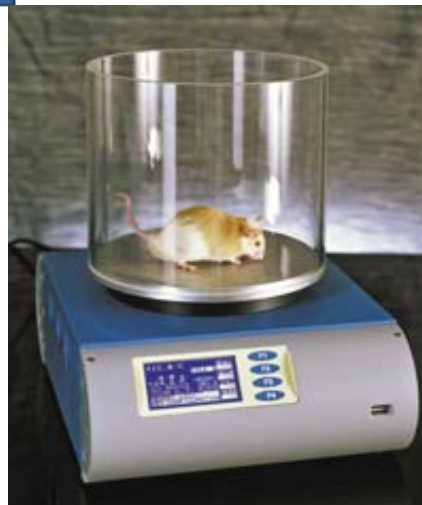
Purpose, rationale, and procedure

Mice paws are sensitive to temperatures that do not damage the skin

Response: (Jumping, withdrawal or paw licking)

Reaction time is determined for (S), (T) central analgesics, & (C)

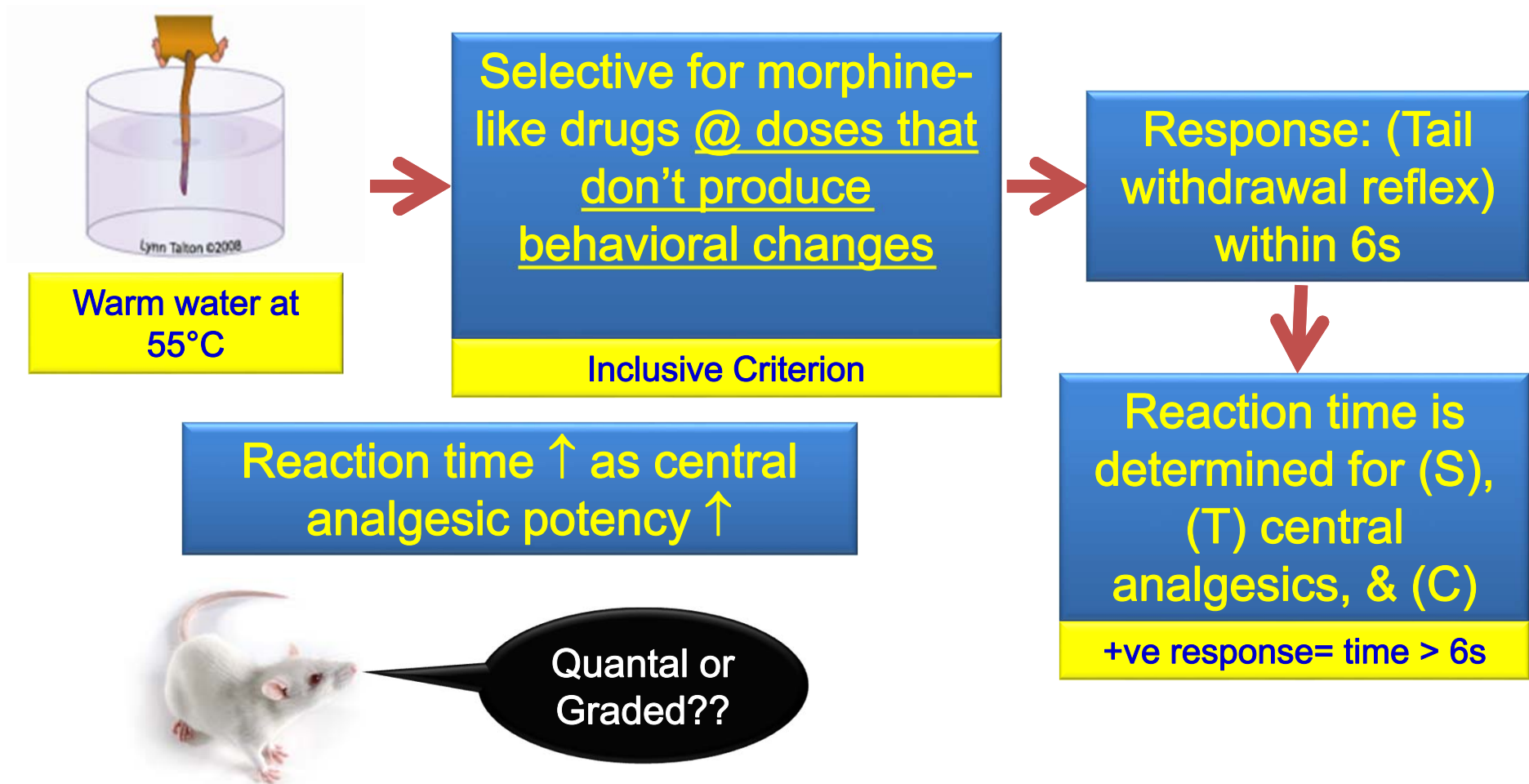
Reaction time \uparrow as central analgesic potency \uparrow



Electrically heated surface at 55-56 °C

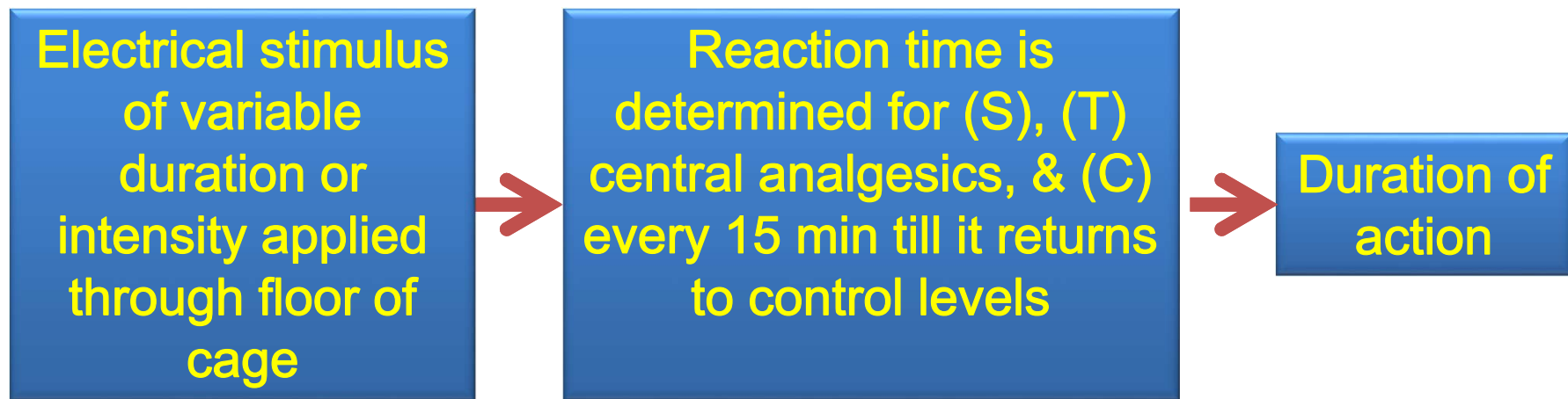
II. C. Tail Immersion Method

Purpose, rationale, and procedure



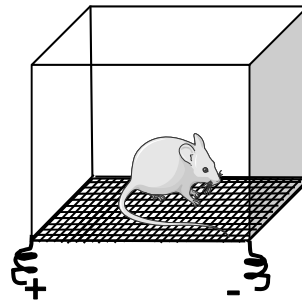
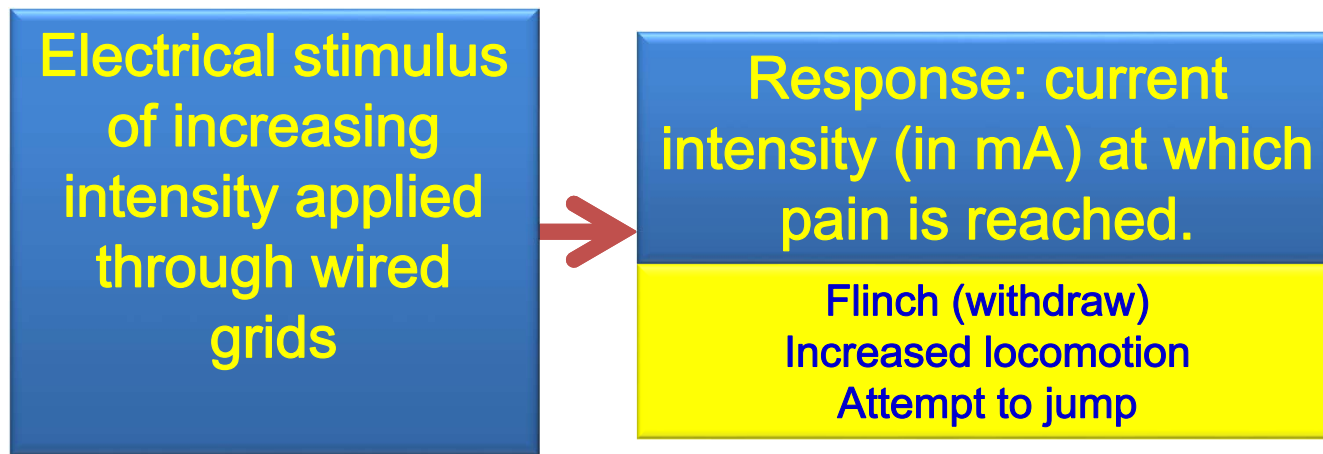
III. A. Electrical Stimulation of the Tail

Purpose, rationale, and procedure



III. B. Grid Shock Test

Purpose, rationale, and procedure



III. C. Tooth Pulp Stimulation

Purpose, rationale, and procedure

