

Application Forum

Discovery of novel therapies for rheumatic diseases and associated pain requires suitable and relevant disease models: a comparison of monoarthritis and polyarthritis efficacy models.

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INTRODUCTION

Chronic pain associated with rheumatic diseases such as rheumatoid arthritis (RA) and osteoarthritis (OA) affects millions of people every year. This pain subsequently affects almost every aspect of a person's life and has a substantial impact on economics such as health insurance, lost wages, reduced productivity and increased incidence of depression and suicide. These facts highlight the need for relevant disease models to assess new therapies for both inflammation and pain associated with the disease.

POLYARTHRITIS VS MONOARTHRITIS DISEASE MODELS

Complete Freund's Adjuvant (CFA) has been widely used for the induction of rheumatoid arthritis in rats. Injection of the CFA in the tail base results in a chronic arthritis involving multiple joints (adjuvant induced arthritis). While using end readouts such as clinical signs, scores, body weights, response to mechanical and thermal stimuli, and a record of the spontaneous pain (footprint of pain) allows evaluation of a proposed therapy, there are many disadvantages to the experimental polyarthritis model. The adjuvant, when injected into the tail base, promotes a widespread systemic disease that results in severe discomfort and stress on the animals.

By injecting the CFA intrarticular and periarticular into a rat or mouse joint, you achieve a localized, less severe monoarthritis within a few days. The disease represents many of the features of rheumatoid arthritis such as pannus formation, without complicating factors such as poor animal mobility, altered weight gain, systemic disease, and severe disease such as joint ankylosis. Other advantages to the monoarthritis model is that arthritis can be induced in various species and strains that allow for genetic background studies (e.g. transgenic mice), the uninjured joint acts as a control reducing the number of animals required per study, and the injection technique can be applied to other RA models allowing the local administration of test compound when required. The addition of pain measurements to the clinical readouts also allows for therapeutic evaluation of analgesia in rats (figure 1).

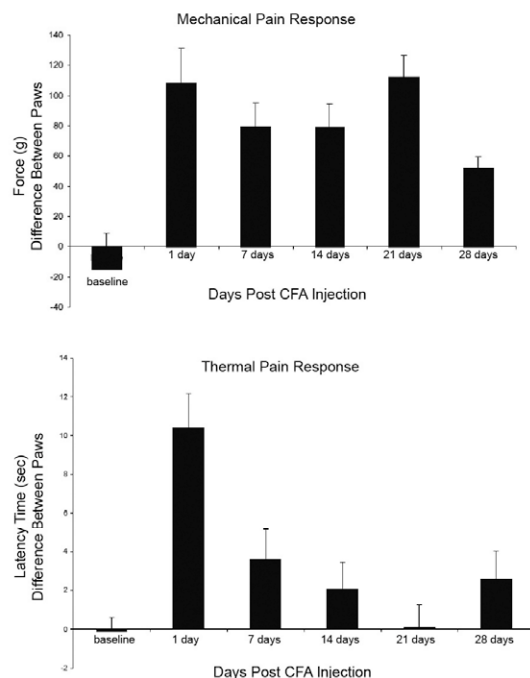


Figure 1: Response to mechanical pain (force required to move paw) and response to thermal pain (time to remove paw) in the CFA-induced Monoarthritis model in rats.

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Collagen induced arthritis (CIA), Collagen antibody induced arthritis (CAIA)

Adjuvant-induced polyarthritis and monoarthritis and associated pain

Collagen reagents, adjuvants and related ELISAs
ArthritoMab™ Antibody Cocktail
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