TCG Lifesciences | Chembiotek

Inflammation Models

We provide preclinical research services using validated rodent models of inflammation to support drug discovery. Our offerings include acute and chronic inflammation models in mice and rats. With expertise in study design, biomarker analysis, and histopathology, we deliver accurate, reproducible data to advance your anti-inflammatory therapeutics.

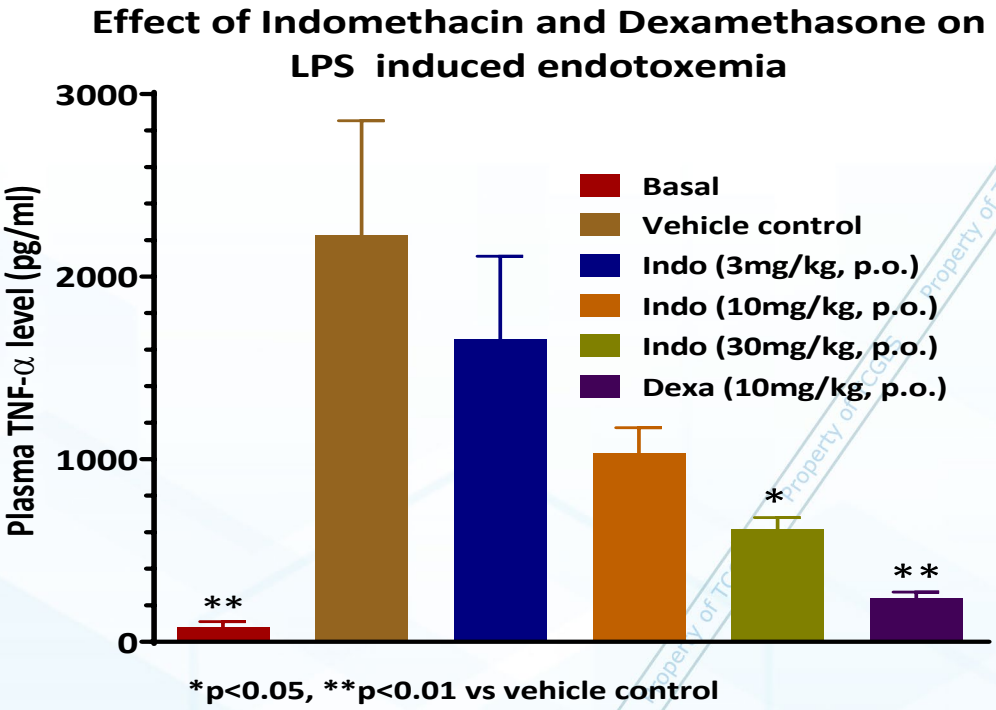
Acute Inflammation

- **Carrageenan-Induced Paw Oedema**
- **Carrageenan–Air Pouch Inflammation**
- **LPS-Induced Endotoxaemia**

  The lipopolysaccharide (LPS)-induced endotoxaemia model is a well-established experimental system used to study systemic inflammation and sepsis-like conditions in animals, particularly rodents. LPS, a component of the outer membrane of Gram-negative bacteria, is administered—usually via intraperitoneal or intravenous injection—to trigger a robust immune response. This results in the release of pro-inflammatory cytokines such as TNF-α, IL-1β, and IL-6, mimicking the cytokine storm seen in sepsis. The model is valuable for investigating the pathophysiology of systemic inflammation, organ dysfunction, and for testing potential anti-inflammatory therapies.

Validation results

- Animals: Male BALB/c mice
- Induction: IP injection of LPS solution
- Endpoint: Plasma level of TNF-α at 90 min post LPS



Statistical analysis: One way ANOVA followed by Dunnett's Multiple Comparison Test

- **LPS-Induced Lung Inflammation**

  The LPS-induced lung inflammation model is commonly used to study acute lung injury (ALI) and inflammatory responses in the respiratory system. In this model, lipopolysaccharide (LPS), a component of Gram-negative bacterial cell walls, is typically administered via intratracheal instillation. LPS activates toll-like receptor 4 (TLR4) on immune and epithelial cells, leading to the production of pro-inflammatory cytokines, chemokines, and recruitment of neutrophils to the lungs. This results in pulmonary oedema, tissue damage, and increased alveolar-capillary permeability—hallmarks of ALI. The model is widely used to evaluate the mechanisms of lung inflammation and to test anti-inflammatory or protective therapies.

Validation results

- Animals: Male Wistar rats
- Induction: Intratracheal instillation of LPS (0.05mg/kg)
- Endpoint: Total neutrophil count, 4-hour post LPS challenge

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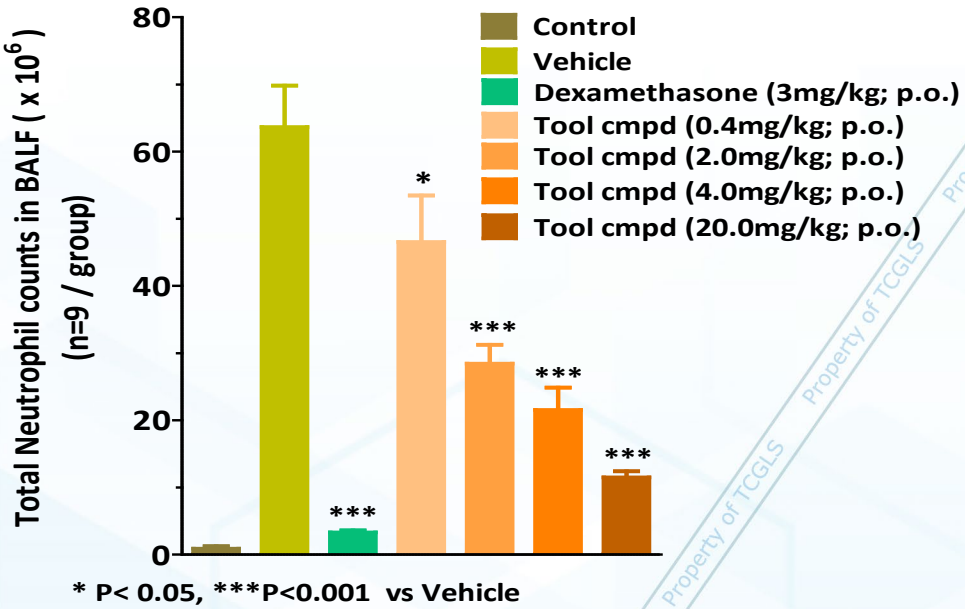
Effect of tool compound on LPS induced pulmonary inflammation in Wistar rats



Statistical analysis: One way ANOVA followed by Dunnett's Multiple ComparisonTest
BALF: Bronchoalveolar lavage fluid

Chronic Inflammation

- **Collagen-Induced Arthritis**
- **BDL/CCL4-Induced Liver Fibrosis**
- **BDL-Induced Liver Cirrhosis**
- **Non-Alcoholic Steatohepatitis**
  - Rapid NASH Mouse Model

***In Vivo* POC of lead can be generated in 4-weeks' timeframe**

Non-alcoholic fatty liver disease (NAFLD) is the condition where fat builds up in the liver even without alcohol consumption. If untreated, it can progress to non-alcoholic steatohepatitis (NASH), a more severe form of liver inflammation and damage. These two chronic liver diseases account for the majority of liver-related illness and death worldwide, highlighting the urgent need for effective treatments for NASH.

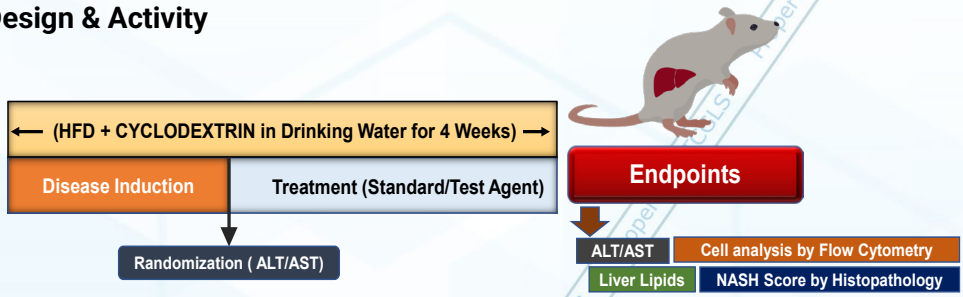
In the process of drug discovery for NASH, developing preclinical models that closely resemble human pathophysiology remains a challenge. Compared to other models developed so far with change in diet, chemical exposure or even genetic modification, we found high-fat diet (HFD) and CDX (2-hydroxypropyl-β-cyclodextrin) induced mouse model to develop quickly in about a month with endpoints correlating well with human disease.

In our validation study with this model also, NASH features, including steatosis followed by liver inflammation was clearly evident. More importantly, Elafibranor (ELA), the re-purposed drug and currently in clinical trials for treating NASH also produced expected results in this model.

Model Description

Model Name	Rapid NASH Model
Mouse Strain	C57BL/6J
Our original diet induced NASH:	HFD + cyclodextrin in drinking water (HFCC+CDX)
Standard Drug	Elafibranor

❑ Short Study Design & Activity



❑ Model Validation Selected Data

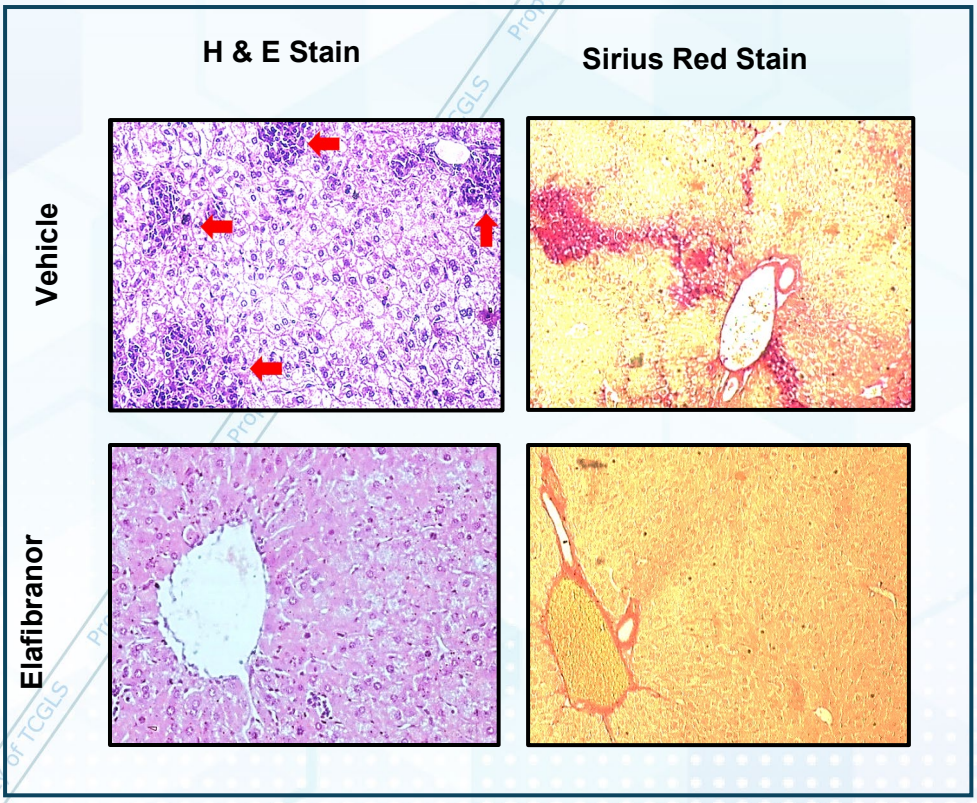


Figure 1: Representative H&E (left panel) and Sirius Red (right panel) staining in HFD+CDX fed with vehicle/Elafibranor

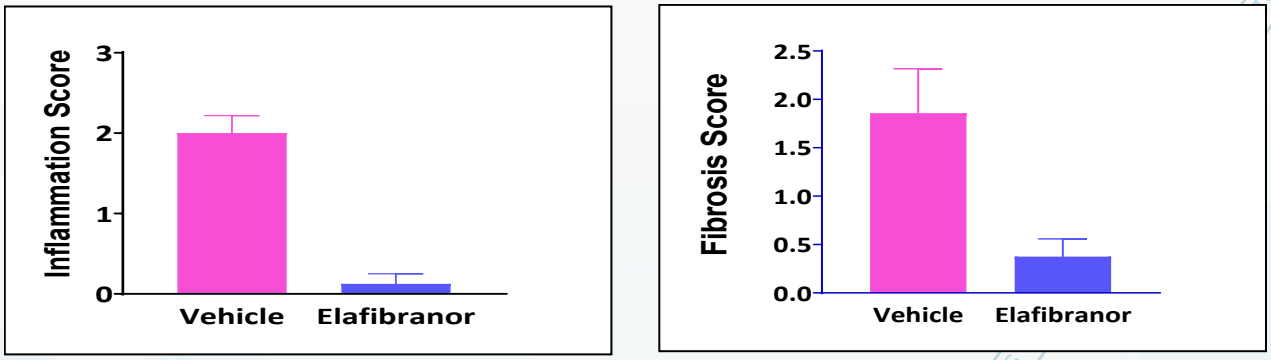


Figure 2: NASH activity score for inflammation (left panel), and fibrosis (right panel) in HFD+CDX fed with vehicle/Elafibranor

- **Hepatic Encephalopathy**