

# Diclofenac pretreatment effects on the toll-like receptor 4/nuclear factor kappa B-mediated inflammatory response to eccentric exercise in rat liver

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Acute exercise is a stress stimulus that may cause cell damage through the activation of the toll-like receptor (TLR)4 pathway, resulting in the translocation of nuclear factor kappa B (NF- $\kappa$ B) into the cell nucleus and the upregulation of inflammatory genes. Nonsteroidal anti-inflammatory drugs, such as diclofenac, are often prescribed to counteract exercise-induced inflammation. Aims: This study analyzed effects of diclofenac pretreatment on the TLR4/NF- $\kappa$ B pathway in rat liver after an acute eccentric exercise. Main methods: Twenty male Wistar rats were divided in four groups: control-saline, control-diclofenac, exercise-saline and exercise-diclofenac. The rats received saline or diclofenac (10 mg/kg) for 7 days prior to an eccentric exercise bout. Key findings: After exercise there was an increase in TLR4, myeloid differentiation primary response gene 88 (MyD88), TIR domain-containing adaptor inducing interferon (TRIF) and p65 NF- $\kappa$ B subunit protein levels. Exercise also resulted in increased mRNA and protein expression of interleukin (IL)-6, inducible nitric oxide synthase (iNOS) and tumor necrosis factor (TNF)- $\alpha$ . Proinflammatory effects of exercise were prevented by the administration of diclofenac, which blunted the activation of the TLR4/NF- $\kappa$ B pathway and the inflammatory response in the liver of exercised rats. Significance: Results from the present study highlight the role of TLR4 as a target for anti-inflammatory interventions. © 2016

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Acute exercise

Diclofenac

Inflammation

Liver

NF- $\kappa$ B

TLR4

diclofenac

I kappa B

immunoglobulin enhancer binding protein

inducible nitric oxide synthase

interleukin 6

messenger RNA

myeloid differentiation factor 88

toll like receptor 4

toll like receptor adaptor molecule 1

transcription factor RelA

tumor necrosis factor alpha

autacoid

diclofenac

immunoglobulin enhancer binding protein

Tlr4 protein, rat

toll like receptor 4

animal experiment

animal model

animal tissue

Article

cell differentiation

controlled study

eccentric exercise

exercise

exercise induced liver inflammation

exercise induced liver inflammation

experimental hepatitis

gene expression

male

nonhuman

nucleotide sequence

protein expression

rat

real time polymerase chain reaction

treatment duration

upregulation

Western blotting

animal

antagonists and inhibitors

drug effects

liver

metabolism

physiology

treatment outcome

Wistar rat

Animals

Diclofenac

Inflammation Mediators

Liver

Male

NF-kappa B

Physical Conditioning, Animal

Rats

Rats, Wistar

Toll-Like Receptor 4

Treatment Outcome