

# MICROBIOLOGY

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## Transcription factor c-Rel plays a role in driving experimental acute and chronic ileitis in rats

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**Statement of the Problem:** Genetic and environmental factors, including the commensal microbiota, have a crucial role in the development of inflammatory bowel disease (IBD). IBD is also associated with chromosome 2p16, which contains REL, which encodes c-Rel, a subunit of NF- $\kappa$ B. Aberrant activation of the transcription factor NF- $\kappa$ B is associated with acute and chronic intestinal inflammation in rats and plays a key role in cytokine gene regulation, in patients with IBD. c-Rel is required also within cells of the innate immune system for the activation of T cell-dependent as well as innate mechanisms of mucosal inflammation.

**Aim:** The purpose of this study is to investigate the expression of the NF- $\kappa$ B subunit c-Rel in the development of acute and chronic ileitis in rats.

**Methodology & Theoretical Orientation:** Male Wistar rats weighing 200-250 g were housed in standard wire-mesh bottom cages at constant temperature of 25 °C and 12/12 hours light/dark cycles. Acute ileitis was induced in fed rats (n=10) by one subcutaneous injections of indomethacin, an inhibitor of the cyclooxygenase pathway of arachidonic acid (15 mg/kg). Chronic ileitis was induced by two subcutaneous injections of indomethacin (10 mg/kg in 5% freshly prepared NaHCO<sub>3</sub> at 37 °C) were administered 24 hours apart. Expression of c-Rel mRNA was determined by real-time reverse-transcription polymerase chain reaction performed using a CFX96™ Real-Time PCR Detection Systems (Bio-Rad Laboratories, Inc., USA). GAPDH was used as endogenous control to normalize gene expression data and a relative quantitation value. All statistical analyses were performed using STATISTICA 6.0 software. Results are expressed as mean values $\pm$ SEM.

**Findings:** The expression of c-Rel was assessed in ileum. Greater expression of c-Rel predominated during chronic ileitis in rats compared to control group ( $4.8\pm0.7$ ,  $P<0.003$ ). Consistent with the pronounced expression during chronic disease, the level of c-Rel expression was also elevated in rats with acute ileitis ( $4.1\pm1.1$ ,  $P<0.02$ ).

**Conclusion & Significance:** In summary, these results suggest that the expression of c-Rel in ileum is essential for initiating intestinal inflammation and may advance our understanding of IBD pathogenesis and that targeting NF- $\kappa$ B-c-Rel can be used as a novel molecular approach for the treatment of patients with IBD.

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