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Review

The kinin B_2 receptor gene structure, product processing and expression in adult and fetal rats: evidence for gene evolution

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ABSTRACT. We examined the structure of the rat kinin B_2 receptor gene (KB_2r) and encoding messenger RNA (mRNA) processing. Differently from the closely related mouse and rabbit genes that have three exons and two introns, the rat gene purportedly consists of four exons and three introns. There are two purported gene products; one of them contains an upstream ~180-bp open reading frame region ("exon-X") potentially expressed as a result of alternative processing. To examine the processing of rat KB_2r mRNA, cDNA amplicons were generated using primer pairs directed towards 5' or 3' exon or intron flanking regions. Analyses of intron/exon primary cDNA amplicons showed that introns 1 to 3 are removed sequentially and that "exon-X" removal follows that of intron-3. No evidence was found for "exon-X" expression in polyadenylated (mature) mRNA of adult Wistar, Wistar Kyoto, spontaneously hypertensive or Sprague-Dawley rat tissues. Nor was "exon-X" detected in tissues subject to inflammatory stimulus expressing B_1 kinin receptor mRNA or in 1- to 21-day-old rat embryos or fetuses. The lack of evidence for the expression of "exon-X" in mature mRNA indicates

that the structure of the rat gene is similar to that of the mouse, rabbit and human genes, all consisting of three exons and two introns. The "exon-X" fragment may result from interstitial gene duplication, be a fragment of the ancestral gene, or most likely heterologous transposon insertion of an exon-like fragment into intron-2 of the KB_2r gene.

Key words: Alternative processing; Rat embryos; Kinin B_2 receptor gene

