Nucleotide sequence of the intronless gene expressing a member of the globin VIIB subfamily from Chironomus thummi (Diptera)

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Chironomus thummi fat body cells secrete more than 10 different haemoglobin into the haemolymph during larval development (1). In contrast to the mosaic structure of vertebrate and legume globin genes, the C. thummi genes encoding globins III and IV contain no introns (2). Whether the globin III/IV subfamily lost its introns after separation 350 million years ago (3) from other C. thummi globin subfamily lineages, or whether lack of introns is a general feature of this insect's globin genes is not known. Screening a genomic library with the cDNA for globin VIIB-3 (4), we isolated a recombinant clone with an 18 kb insert containing a cluster of globin VIIB subfamily genes. The sequence of one part of the clone (below) includes an intronless globin gene (VIIB-4) which is transcribed in the 4th instar (S1 nuclease protection analysis not shown). Preliminary analysis of different fragments of the 18 kb insert revealed other intronless globin VIIB subfamily members, at least one of which is transcribed and all of which have the structural requisites for transcription. Thus, absence of introns in expressed C. thummi globin genes is not unique to the globin III/IV subfamily.

In addition, the following are underlined: "TATA" box (196); initiator Met codon (270); stop codon (753); poly(A) addition recognition site (809). Sequences 270-317 infer a 16 amino acid, hydrophilic signal peptide, expected for a secretory protein. Templates were prepared in mp18 and mp19 by forced orientation cloning, and both DNA strands were sequenced by the dideoxy termination procedure (5).

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