Production of a biologically active recombinant teleostean growth hormone in E. coli cells

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Abstract

We have isolated and characterized several recombinant lambda phage clones carrying growth hormone (GH) cDNA of striped bass (\textit{Morone saxatilis}). Nucleotide sequence and the predicted amino acid sequence of sbGH was determined from a recombinant clone carrying the longest cDNA insert. The sbGH cDNA encodes a pre-hormone of 204 amino acid residues. Comparison of the predicted amino acid sequence of sbGH with those of other vertebrates revealed different degrees of sequence identity: approximately 98\% with European sea bass; 90\% with bluefin tuna; bonito and red seabream; 71\% with winter flounder; 64\% with salmonids; 55\% with carp; and 38\% with human. Expression of the mature sbGH cDNA (without the signal peptide sequence) in \textit{E. coli} cells under regulation of the lambda phage PL promoter produced a polypeptide of 20 kDa. Following renaturation, this recombinant hormone was shown to be biologically active in a radioreceptor competition binding assay and in the induction of hepatic insulin-like growth factor I (IGF-I) mRNA synthesis in vivo.

Keywords: Striped bass; Growth hormone; Expression in \textit{E. coli}; Renaturation; Competitive receptor binding assay; IGF-I induction