Synthesis and Characterization of Mouse Prolactin (mPRL) Expressed in the Periplasmic Space of *Escherichia coli*

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Prolactin is a neurohormone included in the cytokines super family and is also one of the most versatile hormones in terms of biological action as more than 300 different biological effects have been demonstrated. Considering that there is 41% difference between the amino acid sequence of murine and human prolactin and also that most of *in vivo* applications of human prolactin are based on heterologous models (i.e. involving rats and mice), it is desirable always to inject in the animal mouse prolactin instead of human, when immune response is expected. For this reason we decided to carry out for the first time in periplasmic space the synthesis, purification and characterization of mouse prolactin (mPRL) in *E. coli*. So a vector carrying the thermoregulated λP_L promoter, a sequence of DsbA signal peptide which is responsible for the secretion to periplasmic space and the cDNA of mPRL was constructed, similarly to that used for hPRL expression (Soares et al. J Biotechnol. 2008; 133:27-35). The *E. coli* W3110, RR1 and RB791 strains were transformed with a λP_L-DsbA-mPRL plasmid for the expression of mPRL. The highest expression levels of mPRL were obtained with W3110: 1.2 µg/mL/OD_{600}. Such levels are relatively similar to those obtained in our laboratory for hPRL in earlier work. After fermentation at the laboratory scale, mPRL was purified and characterized by chemical and physical methods as SDS-PAGE, Western Blotting, reversed-phase and size-exclusion HPLC, its biological activity being confirmed by the rat lymphoma Nb2 cells *in vivo* bioassay.

Key words: mouse prolactin, *Escherichia coli*, ?P_L promoter, DsbA signal sequence, Nb2 cells *in vivo* bioassay.

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