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Biological Activities of Tethered Equine Chorionic Gonadotropin (eCG) and Its Deglycosylated Mutants

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Equine chorionic gonadotropin (eCG), which consists of highly glycosylated α- and β-subunits, is a unique member of the gonadotropin family because it elicits response characteristics of both follicle-stimulating hormone (FSH) and luteinizing hormone (LH) in other species than the horse. To determine whether α and β subunits can be synthesized as a single polypeptide chain (tethered-eCG) and also display biological activity, the tethered-eCG molecule was constructed and transfected into Chinese hamster ovary (CHO-K1) cells. LH- and FSH-like activities were assayed in terms of testosterone production and aromatase activity in primary cultured rat Leydig cells and granulosecells, respectively. The tethered-eCG was showed similar LH- and FSH-like activities to the dimeric eCG. In addition, to investigate the biological role of the oligosaccharde in synthesis of eCG as a single polypeptide, we constructed deglycosylated mutant eCGs by site-directed mutagenesis. LH-like acitivty of a partially deglycosylated eCGs (T-βα56, T-βcα56) was decreased remarkedly in comparison with the T-βα, suggesting that the oligosaccharide site at Asn56 of α-subunit plays a pivotal role.

Key words: ***eCG, tethered-eCG, in vitro LH- and FSH- activity***