



**Serbian Biochemical Society
Ninth Conference**

"Diversity in Biochemistry"

Proceedings

*Faculty of Chemistry – Kolarac Endowment
Belgrade 2019*

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Proceedings

Editor: Ivan Spasojević

Cover design: Zoran Beloševac

Publisher: Faculty of Chemistry, Serbian Biochemical Society

Printed by: Colorgrafx, Belgrade

Serbian Biochemical Society
Ninth Conference
with international participation

University of Belgrade – Kolarac Endowment
14-16.11.2019. Belgrade, Serbia

“Diversity in Biochemistry”

Gonadotropin-releasing hormone regulated transcription of gonadotropin subunit genes

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Two gonadotropins, luteinizing hormone and follicle-stimulating hormone, are synthesized and secreted by anterior pituitary gonadotropes and act on the gonads, controlling gametogenesis and sex hormone production. These hormones are glycoprotein polypeptides, composed of specific beta subunits and a common, alpha subunit. Both transcription and secretion of gonadotropins are regulated by gonadotropin-releasing hormone (GnRH), which is produced by small number of hypothalamic neurons within the preoptic area and mediobasal hypothalamus. GnRH is released and is reaching the pituitary in pulses, a pattern of secretion that is crucial for the proper reproductive functions. This mini review covers mechanisms of transcriptional control of gonadotropin subunit genes by GnRH, predominantly focusing on in vivo experiments with mice and rats and in vitro experiments using primary pituitary cell cultures and immortalized pituitary cell lines derived from these species. We also provide an overview of the promoter regions of gonadotropin genes and major transcription factors involved in GnRH-driven expression of gonadotropin subunit genes.