hCG and LH - old hormones with new actions and potential for novel therapeutic applications. C.V. Rao, Department of Ob, Gyn and Women's Health, University of Louisville Health Sciences Center, Louisville, KY 40292 USA.

LH and hCG were discovered more than half a century ago and they were believed to regulate only gonads. This dogma began to change due to a series of published studies from around the world in the last 20 yrs, which demonstrated that LH and hCG can also regulate multiple nongonadal tissues. The tissues list is long, which raised concerns that they might be artifacts of receptor detection procedures. The fact that multiple detection techniques were used, indicates that nongonadal LH/hCG receptors are legitimate entities. Generally, nongonadal tissues contain lower receptor numbers per mg protein, with the same affinity as gonadal receptors. However, the total receptor number per organ, in case of uterus for example, exceeds those in the gonads. There is more data on uterine receptors than on any other nongonadal tissue. The LH and hCG actions vary with the nongonadal tissue and physiological state. The nongonadal receptors offer new perspectives in gonadotropins biology and have far reaching novel potential therapeutic applications. These include the treatment of miscarriages, prematurity, breast and prostate cancers, gynecologic infections, HIV/AID, spinal cord injuries, rheumatoid arthritis, Alzheimer's disease, etc. The genetic models, such as overexpression or deletions of LH and/or its receptors, have revealed a nongonadal phenotype. This phenotype, in the case of uterus, was not found entirely to be secondary to gonadal phenotype. Future challenges remain to fully understand the physiology of nongonadal receptors and to capture the promise of the novel therapeutic uses of LH and hCG.