Abstract

Irisin is a recently discovered hormone secreted by muscle that plays a role in fat and energy metabolism. Because energy metabolism is closely linked to reproduction, we hypothesized that irisin may have effects in the reproductive system. In this study we examined the effects of irisin on luteinizing hormone (LH) secretion in murine pituitary cells and on estradiol (E2) secretion in human granulosa cells.

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Methods

A) Preparation of adult mouse pituitary cell lines (mPA12, mPA13) were obtained from CELLab/Biosystems Inc. or Cedars Sinai Medical Center. Pituitary cells have been cultured in Dulbecco’s Modified Eagle Medium (DMEM) supplemented with 10% fetal bovine serum (FBS), 100 UI penicillin and 100 mg/ml streptomycin at 37°C, 5% CO₂. In this study, we used adult pituitary cells that had been cultured no longer than 48 hours. Two-way analysis of variance (ANOVA) was used to compare mean LH or E2 for various combinations of GnRH and irisin or insulin. All experiments were performed in duplicate.

Results

In these preliminary in-vitro experiments, irisin has been found to stimulate LH (p<0.016, dose-dependent manner) in mouse pituitary cells. In the presence of insulin (50 ng/mL), this effect of irisin is lost. In the presence of GnRH, however this effect was blunted.

Conclusions

These preliminary in-vitro experiments indicate that irisin seems to interfere with the effects of GnRH on LH and may exert a repressive effect on LH production. Further studies are needed to clarify the mechanisms of these interactions.

References


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Does Irisin Have an Effect on Female Reproductive Function? Initial in-Vitro Studies

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