Characterize endogenous expression patterns of Ghrelin Receptor in the brain of reporter mouse line

Category: Medicine & Medical Specialties, Oral Presentation
Disclosure: The authors did not report any financial relationships or conflicts of interest
Supplemental Video

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Abstract
Ghrelin, acting through its receptor growth hormone secretagogue receptor (GHS-R), is an important energy sensor and metabolic regulator. However, the regulatory mechanisms of ghrelin signaling are largely unknown due to limited knowledge in sites of expression of GHS-R. Due to the absence of a specific antibody for GHS-R, the study of GHS-R expression has been limited to RNA level by in situ and transgenic reporter. In this research, GHS-R expression is investigated using GFP-Ghsr reporter mice, where GFP reporter is integrated into endogenous Ghsr gene; thus, GFP expression precisely correlates with endogenous GHS-R expression. Immunohistochemistry and immunofluorescence staining of GFP- Ghsr reporter mouse brain was used to identify expression sites of GHS-R. Images were obtained using light microscopy and confocal microscopy, and detailed image analysis was performed. These approaches enabled us to map the precise expression patterns of endogenous GHS-R, which can helped shed more light on the sites of action of ghrelin. Understanding the expression pattern of GHS-R can help researchers further expand their research on the role of ghrelin and possible future receptor targeted drug therapy in obesity and insulin resistance

Learning Objectives
1) Examine the location of Growth Hormone Secretagogue Receptor (GHSR) or ghrelin receptor in various parts of the brain?
2) Discuss the use of immunohistochemistry and confocal microscopy in identifying ghrelin receptor on mouse brain?
3) Discuss the use of these obtained images for further future studies?