

Do White Adipose Adipocytes Express Receptors for Gut Hormones?

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Background: The gastrointestinal tract is the portal for the entry of dietary nutrients, and a number of intestinal hormones such as ghrelin, glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP) are involved in their absorption and storage. A direct effect on adipose tissue is highly likely if specific receptors for these peptide hormones can be identified in the tissue. While specific receptors for GIP have been reported in adipocytes, studies have been inconclusive with regard to GLP-1 and nothing is known with respect to ghrelin.

Aims: To determine: (1) if the genes for the ghrelin, GLP-1 and GIP receptors are expressed in mouse (3T3-L1) and human (Simpson-Golabi-Behmel syndrome; SGBS) adipose tissue cell culture systems; (2) at what stage of adipocyte maturation, receptors for ghrelin, GLP-1 and GIP are expressed; (3) to assess whether receptors for GIP (GIPR), GLP-1 (GLP-1R) and ghrelin (ghrelinR) are expressed in each of the major mouse adipose tissue depots.

Outline methods: Species specific primers were designed and RT-PCR was performed on RNA extracted from mouse adipose tissue depots, and 3T3-L1 and SGBS cells. Expression of the genes for GIPR, GLP-1R and ghrelinR was examined.

Results: (1) GLP-1R, GIPR and ghrelinR mRNA was detected in several tissues, including four major white adipose tissue depots in mice. (2) 3T3-L1 and human SGBS adipocyte cell culture studies show that GIPR, GLP-1R and ghrelinR genes are expressed late post-differentiation.

Conclusion: GIP, GLP-1 and ghrelin receptors are expressed in the major mouse fat depots as well as mouse and human adipocyte cell culture systems. Hormonal signals from the intestine may influence adipocyte function.

Biography:

Suha is an MB ChB, MSc, PhD qualified professional in the fields Chemical Pathology and Metabolic Medicine. With a broad based experience in both national and international environments. Previously she worked as a Clinical Research Fellow at the Biomedical Research Centre (BMRC), University of East Anglia (UEA). During her research project she established culture and manipulation of a new parasite to the labs as well as investigating the effects of this parasite on gut intestinal epithelia and as a result Suha has a numerous publications and received awards for her work. Moreover, whilst conducting research she got involved in facilitating both Problem Based Learning (PBL) and Inter Professional Learning (IPL) for students from the Medical School at UEA.