



Characterization of viral insulin like peptides reveals unique white adipose tissue specific characteristics compared to human insulin



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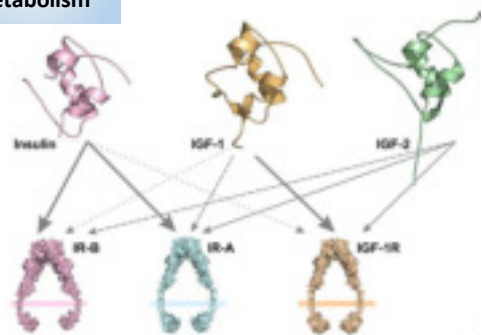
BACKGROUND

Insulin/IGF-system

IGF: insulin like growth factor

Regulation of glucose metabolism

Cell growth, proliferation, differentiation



! Diabetes ! Growth disorders ! Cancer

DISCOVERY

VILPs were identified in 6 viruses

- Iridoviridae family, originally isolated from fish



GIV: Grouper iridovirus, SGIV: Singapore grouper iridovirus, LCDV: Lymphocystis disease virus

- VILPs chemically synthesized in **single chain (= IGF like)** and **double chain (= insulin like)** forms
- Single chain forms previously characterized

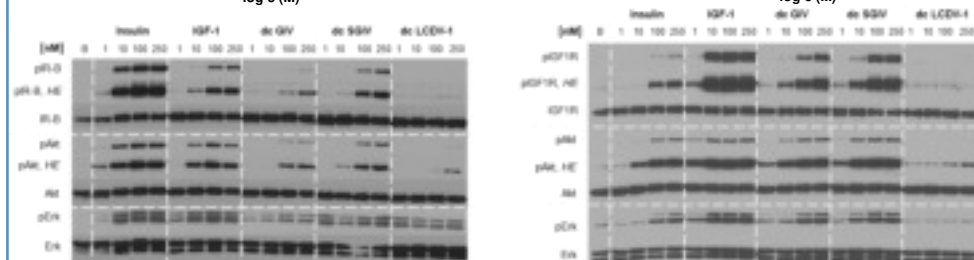
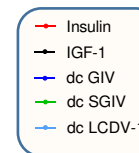
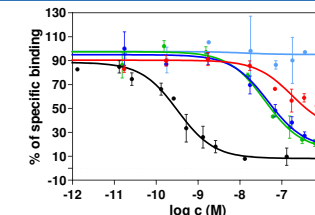
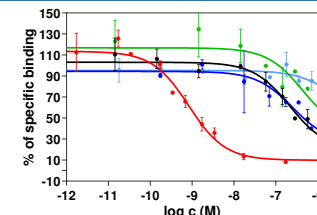
Altindis et al.: PNAS 115(10), 2461-2466 (2018)



Double chain (dc) VILPs bind to human IR and IGF1R and stimulate insulin/IGF signaling in vitro

Insulin receptor isoform B

IGF-1 receptor



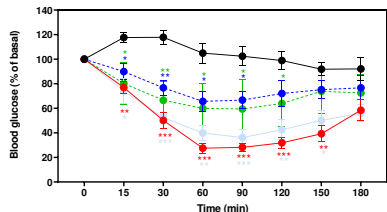
In vivo characterization of dc VILPs reveals white adipose tissue specificity

Insulin tolerance test

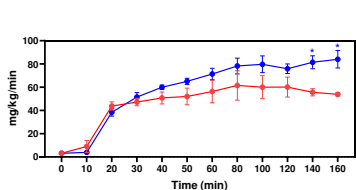
Hyperinsulinemic-euglycemic clamp

Tissue specific glucose uptake

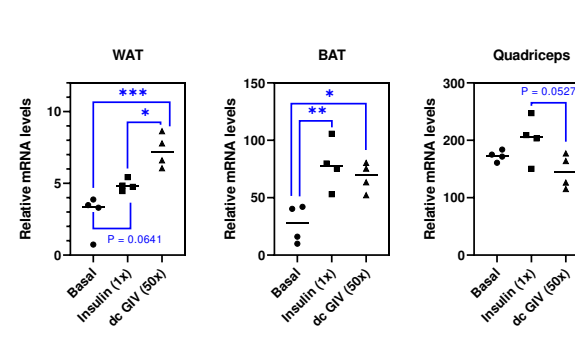
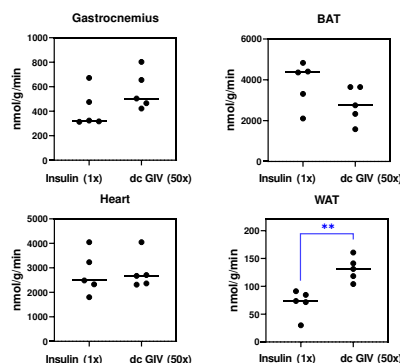
GLUT4 expression



n = 5



n = 4



CONCLUSIONS

- dc VILPs are active ligands with insulin/IGF like properties
- dc GIV VILP has unique characteristics
 - dc GIV VILP stimulates increased glucose uptake specifically in WAT
 - dc GIV VILP stimulates GLUT4 expression specifically in WAT

For more information:

Characterization of Viral Insulins Reveals White Adipose Tissue Specific Effects in Mice

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