Organised by Kulliyyah of Medicine IIUM

VIRTUAL MEDICAL RESEARCH SYMPOSIUM

MEDICAL RESEARCH DURING PANDEMIC: ADAPTING & INNOVATING IN ADVERSITY

14TH DECEMBER 2021

PROGRAMME BOOK

24 YEARS
EST. 1997
KULLIYYAH OF MEDICINE

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ABSTRACT BOOK

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PNC157

THE EFFECT OF TRANSIENT RECEPTOR POTENTIAL VANILLOID 4 (TRPV4) LIGANDS ON FATTY ACID-BINDING PROTEIN 4 (FABP4) ADIPOCYTES SIGNALLING IN DIFFERENT DURATION OF DIFFERENTIATION

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Introduction: Fatty acid-binding protein 4 (FABP4) is one of the adipocyte lipid chaperone proteins (LCPs) and is commonly related to metabolic diseases. The progression of obesity and diabetes was thought to be associated with increased mitochondrial calcium uptake. Ligands of transient receptor potential vanilloid 4 (TRPV4) are known to affect adipocytes' intracellular calcium concentration. This study was intended to determine the effect of TRPV4 ligands on adipocytes FABP4 signalling at different phases of cell differentiation. **Materials and Methods:** Primary adipocyte cultures from male Wistar rats were differentiated in high glucose media (17.5 mM/L) and divided into 2 groups. The first group was differentiated up to day 5, while the other group was up to day 9. They were treated with 100nM GSK101 (TRPV4 agonist) and 500nM HC067 (TRPV4 antagonist) for 24-hours. RNA extracted from adherent adipocytes was subjected for RT-PCR analysis, while cell lysate and conditioned media were collected for western blotting. The data was interpreted by GraphPad Prism Software (San Diego) and ImageJ (National Institutes of Health, USA). **Results:** GSK101 markedly upregulated FABP4 expression, whereas HC067 caused its downregulation among day 9 treated groups ($p<0.05$). A significant reduction of cytosolic FABP4 was observed in the day5-HC067 treated group ($p<0.001$), unlike those treated on day 9. Despite TRPV4 ligands stimulation, FABP4 secretion was only observed on day 9 differentiation. **Conclusion:** Since FABP4 was only secreted by mature adipocytes and increased intracellular calcium affects its signalling time-dependently, these help us to understand the association of adipocytes LCPs regulation towards progression of metabolic diseases.

ABSTRACT ID PNC157

The Effect of Transient Receptor Potential Vanilloid 4 (TRPV4) Ligands On Fatty Acid-Binding Protein 4 (FABP4) Adipocytes Signalling In Different Duration of Differentiation

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INTRODUCTION

FABP4
- Adipocyte lipid chaperone protein (LCP)
- No secretory signal sequence[1]
- ? mechanism of release

TRPV4 Regulates adipocytes' intracellular calcium (Ca^{2+})[2]

TRPV4 ligands → ? → FAPB4 adipocyte signalling

METHODOLOGY

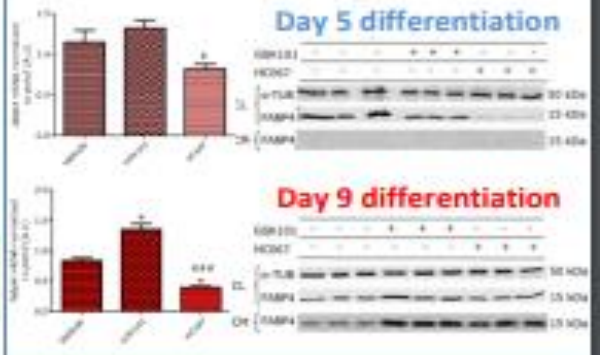
1° adipocytes in high glucose media (17mMol/L)

Day 5 differentiation | Day 9 differentiation

24hour incubation
- TRPV4 agonist (GSK101 100 nM)
- TRPV4 antagonist (HC067 500 nM)

- Adherent cell - Gene expression (GE)
- Cell lysate (CL) - Protein expression
- Culture media (CM) - Protein secretion

RESULT



DISCUSSION

Day 5: GSK101 does not affect FABP4 signalling, unlike HC067

Day 9: GSK101 ↑FABP4 GE ($p<0.05$) and HC067 ↓FABP4 GE ($p<0.05$); CL and CM protein does not correlate to GE → post-translational modification[3]

∴FABP4 secreted by mature adipocytes[4]

∴ ↑Ca^{2+} uptake in insulin resistance-induced cells → linked to pathogenesis of metabolic diseases[2]

CONCLUSION

1) Intracellular calcium affects adipocytes FABP4 signalling time-dependently
2) FABP4 as a potential biomarker for progression of metabolic diseases

REFERENCES

1) Josephrajan, A., et al. Diabetes, 2019. **68**(9): p. 1767-1777.

2) Sánchez, J., A. Valencia-Vásquez, and A. García Cuevas. Endocrinology and Metabolism, 2021. **36**: p. 1-10.

3) Prentice, K.J., J. Saksi, and G.S. Hotamisligil. Journal of Lipid Research, 2019. **60**(4): p. 734-740.

4) Schlottmann, I., et al. International Journal of Obesity, 2014. **38**(9): p. 1221-1227.

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