Modulation of Adipogenesis in 3T3-L1 Cells Using Natural Products: A Strategy to Prevent Obesity
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HYPOTHESIS
NPs individually and in combination will prevent the maturation of pre-adipocytes (3T3-L1 cells)

METHODS

PURPOSE
• Obesity is a leading cause of preventable death1
• Limited prevention options
• Natural products (NPs) like resveratrol (RES), quercetin (QUE), curcumin (CUR), glycyrrhetinic acid (18GA), epigallocatechin gallate (EGCG), and hydroxycitric acid (HCA) may prevent maturation of pre-adipocytes2 (FIG 1)

RESULTS

CELL VIABILITY ASSAY

FIG 4 – IC50 values of NPs in 3T3-L1 cells with 24 hr attachment and 48 hr treatment. HCA tested but demonstrated no significant effect. Combination of EGCG and CUR 4:1 molar ratio showed effect but no synergy. Data is presented as Mean IC50 ± SD (n=5).

SUMMARY

• CUR and 18GA are the most potent NPs against pre-adipocytes with the lowest IC50 values
• HCA had no significant effect
• EC 4:1 combination not synergistic

Inhibition of Lipogenesis (FIG 5)

• NP inhibition of pre-adipocyte differentiation at 0.1IC50 (from greatest to least): QUE > CUR > RES
• NP inhibition of pre-adipocyte differentiation at 0.5 IC50 seen with all NPs
• QC 15:1 demonstrates inhibition of pre-adipocyte differentiation, though the degree of inhibition was lower than individual natural products

CONCLUSION

• Individual and combination NPs are capable of preventing the maturation of pre-adipocytes

FUTURE STUDIES
• Determine efficacy of other NPs
• Confirm findings in side-by-side experiments for pre-adipocyte differentiation to assess within the same passage
• Look at adipolysis using NPs

REFERENCES

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