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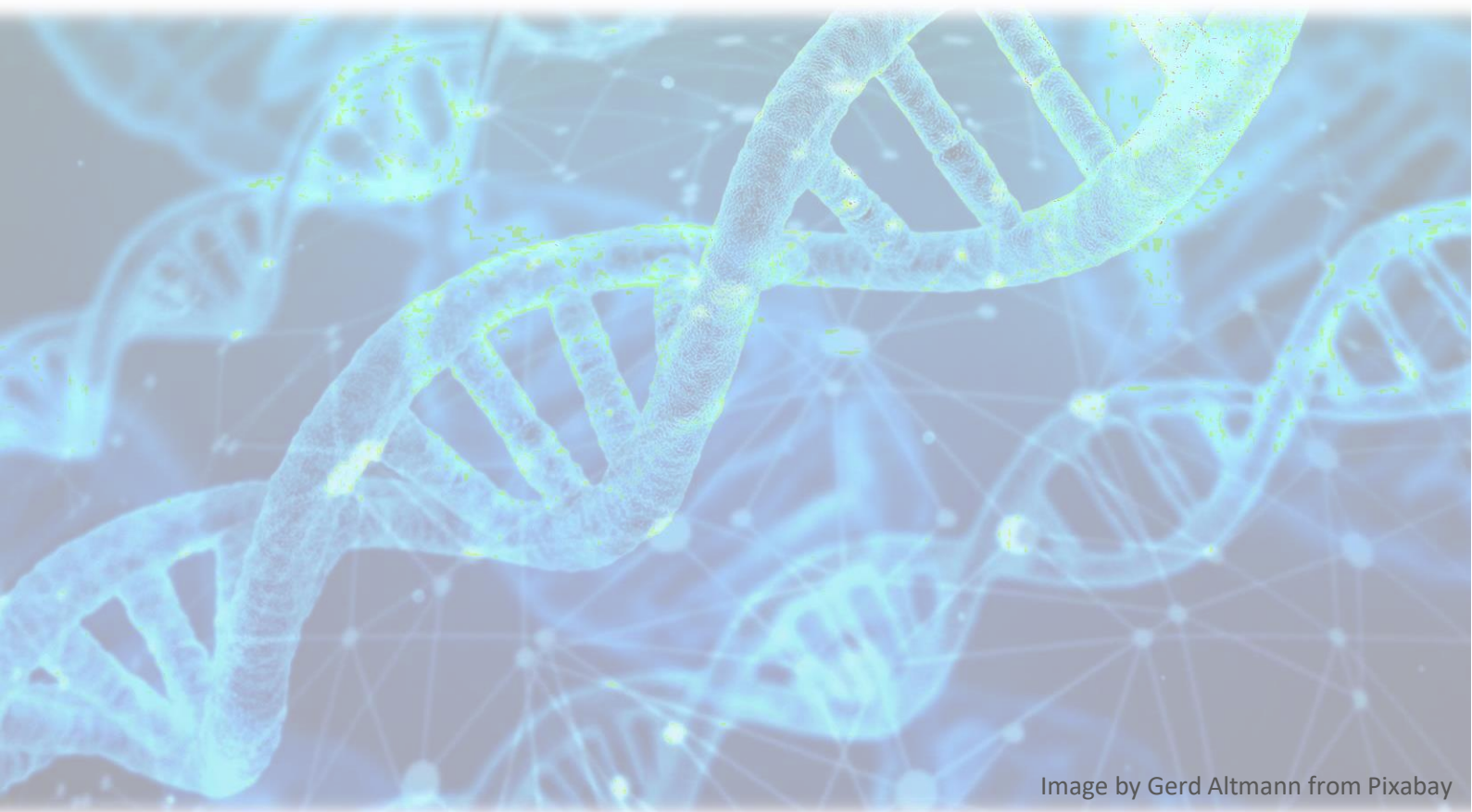


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Effect of Tualang Honey on the Regulation of Liver Lipid Metabolizing Enzymes Gene Expression in a 12% High Cholesterol Diet-Induced Obese Rats

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Abstract

Obesity disrupts liver lipid metabolism by altering lipid-metabolizing enzyme expression. Although treatments for obesity exist, their use is often limited by adverse effects, leading to increasing interest in natural products for treating obesity. Thus, this study aims to investigate the effect of Tualang honey (TH) on liver lipid-metabolizing enzyme gene expression in obese rats due to their beneficial biological properties. Thirty male Sprague-Dawley rats were randomly assigned into five groups (n=6 per group). All rats were initially fed their respective diets for 12 weeks, followed by specific treatments for the subsequent 6 weeks. Group 1 was fed a normal diet (ND) without treatment, while Group 2 received a normal diet supplemented with TH at 3.0 g/kg. Group 3 was given a 12% high-cholesterol diet (HCD) alone, whereas Group 4 received a 12% HCD treated with TH (3.0 g/kg). Lastly, Group 5 was provided with a 12% HCD treated with Orlistat (10 mg/kg). At the end, the rats were sacrificed, livers excised for lipid-metabolizing enzymes gene expression study. Gene expression of acetyl-CoA carboxylase (ACC), sterol regulatory element binding protein-1 (SREBP-1), and HMG-CoA reductase was significantly upregulated, while carnitine palmitoyl transferase-1 (CPT-1) was significantly downregulated in Group 3 compared to Group 1 ($p<0.01$). When compared to Group 3, TH supplementation in Group 4 significantly downregulated ACC (1.7-fold), SREBP-1 (1.3-fold), and HMG-CoA reductase (1.5-fold) while upregulating CPT-1 expression (0.7-fold) ($p<0.01$). TH may exert its anti-obesity effects by regulating the expression of genes involved in lipid metabolism.

Keywords: lipid metabolism, gene expression, obesity, liver, tualang honey