

ELIZABETH FRANCIS and JAMES WALTERS, Dept of Applied Science, Bluefield State College, Bluefield, WV 24701. Effect of dietary cholesterol and fatty acid on transcriptomes of intestinal cells in zebrafish (*Danio rerio*).

Absorption of dietary cholesterol into intestinal enterocytes takes place in the presence of other lipids such as triacylglycerides, phosphatidylcholine, phosphatidylethanolamine, and fatty acids. To facilitate transport, non-esterified cholesterol, along with fatty acids and phospholipids, are formed into micelles in the lumen which interact with the brush border of enterocytes. The mechanism by which cholesterol is taken up by enterocytes remains unclear despite the discovery of key proteins involved in regulating cholesterol absorption (NPC1L1, ABCG5, ABCG8). This research investigates changes in gene expression in intestinal enterocytes using a zebrafish model. We fed 6dpf zebrafish larvae diets of a) 1% BSA, b) 1% BSA and 1mM OA, or c) 1% BSA, 1mM OA, and 1mM cholesterol for 3h. Intestinal tissue was dissected for RNA extraction and cDNA synthesis followed by RNA sequencing performed at the Marshall University Genomics Core Facility. Our experimental design allows us to distinguish between genes regulated by a specific dietary fatty acid versus those used when cholesterol is present. By identifying targets that are specifically involved in cholesterol uptake and processing we expect to find molecular targets for drug therapies to lower dietary uptake of cholesterol and hence, its impact on dyslipidemias.

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