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Altered plasmalogen content and fatty acid saturation following epithelial to mesenchymal transition in breast epithelial cell lines

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Abstract

Epithelial to mesenchymal transition (EMT) is a developmental event characterized by phenotypic switching from a polarized epithelial phenotype to an unpolarized mesenchymal phenotype. Changes to plasma membrane function accompany EMT yet the differences in lipid composition of cells that have undergone EMT are relatively unexplored. To address this the lipidome of two cell models of EMT in breast epithelial tissue, D492 and HMLE, were analyzed by untargeted LC-MS. Detected masses were identified and their abundance was compared through multivariate statistical analysis. Considerable concordance was observed in eight lipid components between epithelial and mesenchymal cells in both cell models. Specifically, an increase in phosphatidylcholine and triacylglycerol were found to accompany EMT while phosphatidylcholine- and phosphatidylethanolamine plasmalogens, as well as diacylglycerols decreased. The most abundant fatty acid lengths were C16 and C18 but mesenchymal cells had on average shorter and more unsaturated fatty acids. The results are consistent with enhanced cell mobility post EMT and reflect a consequence of oxidative stress pre- and post EMT in breast epithelial tissue.

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