Undergraduate Research and Mentoring in New Biology

Network analysis of cellular adhesion and angiogenesis genes of RAW 264.7 macrophages as affected by lunasin treatment

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Lunasin is a peptide with Arginine-Glycine-Aspartic (RGD) acid motif associated with reducing the risk of developing certain chronic diseases such as cancer. We aimed to analyze cellular adhesion and angiogenesis genes of RAW 264.7 macrophages affected by lunasin treatment using computer software Pajek and DAVID webserver. Initial analyses of genes showed that lunasin treatment affected pathways involved in ErbB signaling, p53 signaling and VEGF signaling. This result further confirms that lunasin will have an impact on genes associated with the process of cellular adhesion and angiogenesis, which are important pathways involved in tumorigenesis. Our research will support the potential chemopreventive and chemotherapeutic use of lunasin against cancer. We are also working with BxPC-3 cells (human pancreatic cells) and the flavonoid apigenin. Human pancreatic cell RNA are extracted and divided into two groups, one group treated with 50μM of apigenin for 24h and the other without apigenin. The objective of the research is to compare the effect of apigenin on gene expression of inflammatory pancreatic cancer cells. We will be using modern bioinformatics tools to analyze the data and find important interactions among genes that were modified under the different treatment conditions in the experiments. Supported by The Undergraduate Research and Mentoring in New Biology program, NSF award #1041233.