Network Analysis on Cellular adhesion and Angiogenesis Genes of RAW 264.7 Macrophages as Affected by Lunasin Treatment

Angelina Jaimes, Vermont P. Dia, Elvira Gonzalez de Mejia
Department of Food Science and Human Nutrition, College of ACES, University of Illinois at Urbana-Champaign

Abstract
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 using computer software Pajek and website DAVID affected by lunasin treatment. Analysis 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.

Introduction
- Colorectal cancer (CRC) is the third most common cancer in the United States in men and women.
- Lunasin is a soy peptide composed of 43 amino acids that contains a unique Arg-Gly-Asp (RGD) amino acid motif.
- Pajek is computer software for analysis and visualization of very large networks and was developed in November of 1996.
- The objective of this study is to identify key regulatory pathway involved in cellular adhesion and angiogenesis affected by lunasin treatment in RAW 264.7 macrophages using Pajek Network Analysis Software.

Materials and Methods
- The entrance ID's were uploaded to website DAVID.
- Built input and output degree vectors.
- Found pathways and gene functions on DAVID.
- Used Pajek to build networks.
- Materials and Methods

Results

Conclusions
- Lunasin affected genes associated with cellular growth and proliferation, and angiogenesis in epidermal growth factor receptor (ErbB), protein 53 (P53), and in vascular endothelial growth factor (VEGF) signaling pathways.
- Cellular adhesion and angiogenesis genes affected by lunasin treatment changed signaling pathway function (VEGF, P53, and ErbB).
- Genes that were either upregulated or downregulated affected final function in the pathways such as cell proliferation and eventually lead to affecting cancer development.
- Consumption of soy may be useful to prevent comorbidities such as cancer.

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References