Assessing the Expression of Angiogenesis-Related Receptors in Endothelial Cell RNA

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The transforming growth factor beta (TGFB) superfamily consists of a group of regulatory proteins that bind to membrane receptors and generate an intracellular signal to regulate cellular processes in growth and development. TGFB signaling also plays an important role in angiogenesis, which is the process of forming new blood vessels from existing ones. This process is a crucial event during the development of cancer, a leading disease worldwide. This project aimed to study the profile of TGFB receptors Activin Receptor-Like Kinase 1 (ACVRL1), Endoglin, and TGFB Receptor 1 (TGFBR1), expressed by endothelial cells, which are cells that line the blood vessels and are involved in angiogenesis, which is sponsored by TGFB. Pre-isolated RNA from human umbilical vein endothelial cells (HUVECS) was synthesized into cDNA, and Real-Time PCR (RTPCR) was used to detect the gene exrpession of the receptors. A statistical analysis of the data collected was performed using the BioRad Maestro program. The results of the experiment supported the hypothesis: the receptors ACVRL1, Endoglin, and TGFBR1 are expressed in the endothelial cell RNA. These results suggest that because endothelial cells are involved in TGFB-sponsored angiogenesis, Activin Receptor-Like Kinase 1 (ACVRL1), Endoglin, and TGFB Receptor 1 (TGFBR1) receptors are expressed in their RNA. The results help us understand the ligand-receptor relationships of the TGFB pathway, and its effects will provide insight into our understanding of angiogenesis in cancer which will assist in developing novel therapeutic approaches.

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