

Abstract of Presentation

Presentation Title:

Angiostasis and Angiogenesis Regulated by Angiopoietin-1/Tie2 Receptor System

Abstract:

Angiopoietin-1 (Ang1) is a ligand for endothelium-specific receptor tyrosine kinase Tie-2. In adult vasculature, Ang1/Tie2 signaling is thought to be involved in both maintenance of vascular quiescence and promotion of angiogenesis. However, it is unknown how Tie2 signal regulates these distinct biological functions.

Here, we report that Ang1 bridges Tie2 at cell-cell contacts, resulting in *trans*-association of Tie2 in the presence of cell-cell contacts. In clear contrast, in the isolated cells, extracellular matrix (ECM)-bound Ang1 locates Tie2 at cell-substratum contacts. Furthermore, Tie2 activated at cell-cell or cell-ECM contacts leads to preferential activation of Akt and Erk, respectively. Preferential activation of Akt pathway by *trans*-associated Tie2 selectively induces Krüppel-like factor 2 expression, thereby attenuating inflammation. In contrast, preferential Erk activation by ECM-anchored Tie2 enhances endothelial migration.

Considering these findings, we propose that *trans*-associated Tie2 and ECM-anchored Tie2 might be preferable for vascular quiescence and angiogenesis via Akt and Erk activation, respectively.