

عنوان مقاله:

Identification of other Cellular Receptors for Edema Factor of Bacillus anthracis by Independent Inhibition of Protective Antigen Evidenced by Inhibition of Embryo Growth and Angiogenesis

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خلاصه مقاله:

Edema factor (EF) is one of the major secretory proteins of anthrax bacteria along with protective antigen (PA) and lethal factor (LF). Edema factor is a calmodulin-and calcium-dependent adenylate cyclase that increases intracellular levels of cAMP. Intracellular trafficking of EF occurs through PA by binding to ATR/CMG γ receptors, which are also involved in other physiological functions of cells. cAMP is a secondary messenger which activates multiple signaling cascades involved in the cytokinetics of actin molecules and cell junction formation. The present study evaluated the effect of EF on growth and angiogenesis patterns in chicken embryos in the in ovo model. Angiogenesis in the chorioallantoic membrane (CAM) of an embryonated chicken egg was decreased and embryo growth was delayed by EF despite the absence of trafficking moiety PA, which is required for transferring the EF molecule inside the cell. Angiogenesis inhibition and embryo growth retardation indicate the use of an alternative receptor by EF to modulate these cellular functions. Additionally, docking was performed between EF as a ligand and hepatocyte growth factor receptor (cMET) and vascular endothelial growth factor (VEGF) receptors, which are mainly involved in growth and angiogenesis. The analysis revealed a very strong binding of EF to cMET receptor (in terms of the number of hydrogen bonds and energy) compared to its ligand hepatocyte growth factor (HGF), which indicates the use of cMET receptor by EF and induction of angiogenesis and embryo growth retardation possibly by competitive inhibition of HGF ligand or receptor-mediated endocytosis.

کلمات کلیدی:

angiogenesis inhibition, Edema factor, CAM, embryo growth retardation, CAMP, signaling molecule

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