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Inhibition of VEGF: a novel mechanism to control angiogenesis by *Withania somnifera*'s key metabolite Withaferin A

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Abstract

Purpose

Angiogenesis, or new blood vessel formation from existing one, plays both beneficial and detrimental roles in living organisms in different aspects. Vascular endothelial growth factor (VEGF), a signal protein, well established as key regulator of vasculogenesis and angiogenesis. VEGF ensures oxygen supply to the tissues when blood supply is not adequate, or tissue environment is in hypoxic condition. Limited expression of VEGF is necessary, but if it is over expressed, then it can lead to serious disease like cancer. Cancers that have ability to express VEGF are more efficient to grow and metastasize because solid cancers cannot grow larger than a limited size without adequate blood and oxygen supply. Anti-VEGF drugs are already available in the market to control angiogenesis, but they are often associated with severe side-effects like fetal bleeding and proteinuria in the large number of patients. To avoid such side-effects, new insight is required to find potential compounds as anti-VEGF from natural sources. In the present investigation, molecular docking studies were carried out to find the potentiality of Withaferin A, a key metabolite of *Withania somnifera*, as an inhibitor of VEGF.