

Epoxyazadiradione exhibit anti-cancer activities by modulating lncRNAs expression in pancreatic cancer

Vipin Rai, Nikee Awasthee, Sumit Singh Verma, Subash C. Gupta

Department of Biochemistry, Institute of Science, Banaras Hindu University, Varanasi-221 005, Uttar Pradesh, India

Background: *Azadirachta indica* (neem), a medicinal plant under Meliaceae family, is found in the Indian subcontinent. One of the limonoids, epoxyazadiradione (EPA), is a phytochemical isolated from the seeds of this tree. This is widely used in traditional medicine to treat a variety of human ailments. Although EPA has shown promise against some cancer types, its efficacy against pancreatic cancer and the underlying mechanism remains elusive. **Aim:** We examined the anti-cancer activity of EPA against pancreatic cancer cells. We also examined the underlying mechanism. **Methods:** Pancreatic cancer cell lines (PANC-1 and MiaPaCa-2) were used during the study. We performed MTT assay, clonogenic colony formation assay for cytotoxicity. The western blotting was performed to examine the expression pattern of various apoptotic proteins. Real-time PCR was performed to detect quantitative lncRNAs expression. **Results and Discussion:** After treatment with EPA, the viability and proliferation of pancreatic cancer cells was decreased in a dose- and time-dependent manner. EPA suppressed the expression of apoptotic proteins involved in survival, proliferation, migration and invasion. EPA also suppressed the expression of MMP-9 in a concentration-dependent manner in pancreatic cancer cells. In addition, the limonoid also modulated the expression of lncRNAs (MEG-3, GAS-5, H19 and MHRT). **Conclusion:** EPA exhibited strong anti-cancer activities against pancreatic cancer by modulating multiple cancer-related signalling molecules.