

Saurav Ranjitkar, oral, Plant derived antimicrobials have similar cytotoxic effects on cancerous and non-cancerous cells. Major advisor- Cindy Tian.

Plant derived antimicrobials have similar cytotoxic effects on cancerous and non-cancerous cells. Saurav Ranjitkar¹, DeLong Zhang¹, Fei Sun¹, Saleh Salman¹, Wu He², Kumar Venkitanarayanan¹, Edan Tulman³, and Xiuchun Tian¹Departments of Animal Science¹ and Pathobiology³, University of Connecticut, Storrs, CT, USA ²Flow Cytometry Facility, Center for Open Research Resources and Equipment, Storrs, CT, USA

Essential oils and their active components, referred here as plant derived antimicrobials (PDAs), have been used for their antimicrobial, anti-inflammatory and antioxidant properties. Many reports also document PDAs' cytotoxic effects on cancerous cells, raising the hope that they may be used for cancer treatments. Due to the lack of specificity, we hypothesize that PDAs are cytotoxic to both cancerous and non-cancerous cells. Using *trans*-cinnamaldehyde (TCA), carvacrol, and eugenol, we assessed their cytotoxicity on HeLa and fibroblasts (CCD-1123Sk, CCD) by MTT, LDH assays, flow cytometry, and quantitative real time PCR. After 24 hours of treatment carvacrol and TCA significantly decreased viability (by more than 50%) at 100 µg/ml, whereas eugenol was ineffective until 400 µg/ml. Cell detachment and significantly increased apoptosis were observed with 100 µg/ml of TCA on both cell types. Real Time quantitative RT-PCR for apoptotic genes (*Bcl2*, *Casp3* and *Casp8*) and necrosis genes (*Mkl1*, *Ripk1* and *Ripk3*) did not show any significant differences between control and treated cells of both types, with the exception of eugenol treated HeLa cells where expression of *Bcl2*, *Mkl1* and *Ripk1* was significantly higher than controls. Taken together we conclude that the three PDAs studied here have the same cytotoxic effects on both cancerous and non-cancerous cells.