

# Prosthodontics & Orthodontics

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## The mechanism of pomegranate extract (*Punica granatum L*) in killing oral cavity cancer cells through VEGF expression and apoptosis

Cancer is one of the leading causes of death throughout the world. In 2013, it was the number seven cause of death In Indonesia, by reaching 1.4% or an estimated 347,792 people. Among them, squamous cell carcinoma is the most common cancer in the oral cavity, patient survival is less than 50 %. Despite rapid advances in the field of surgical therapy, radiation, and chemotherapy, the treatment of cancer has not been completed. Meanwhile, new cases continue to emerge every year. The development and growth of cancer cells is caused by several factors, including; Apoptotic barriers and angiogenesis activity. The formation of angiogenesis is induced by growth factors, one of which is dominated by VEGF. With these backgrounds, authors want to inhibit cancer cell growth by increasing apoptosis of cancer cells and inhibiting the formation of angiogenesis. Pomegranate (*punica granatum L*, PGL) is one of the plants that has an active ingredient of ellagic acid (EA), EA in some studies has anti-cancer activity in vitro, but EA is difficult to absorb. Bioavailability of pomegranate / PGL fruit extract is better than EA because it is easily absorbed and contains polyphenol. The aim of this study was to determine the mechanism of action of whole pomegranate extract (PGL) in killing oral cavity cancer cells through VEGF expression and apoptosis. The research method used was experimental laboratories, 24 mice (Balb / c), males, aged 5 months were divided randomly into 3 groups: KO (not suffering from cancer and not given PGL), K1 (had cancer and was

not given PGL, P1 (have cancer and is given PGL). Mice become cancerous by: injecting the buccal mucosa of the right mouse with benzopirene 0.04 mg dissolved in 0.04ml olive oil, 3 times a week for 4 weeks. Giving PGL at a dose of 75 mg / kg BW / day for 4 weeks. Examination using immunohistochemistry and tunnel assay techniques. The results showed that administration of pomegranate whole extract (PGL) group P1 could kill cancer cells by decreasing VEGF expression  $0.183 \pm 0.098$  compared to KO group  $0.133 \pm 0.103$  did not differ significantly, differ significantly in comparison with K1 group  $0.350 \pm 0.104$ . Whole pomegranate extract (P1) killed cancer cells by increasing apoptosis expression highest  $0.367 \pm 0.196$  compared to the KO group  $0.083 \pm 0.132$  and K1  $0.050 \pm 0.054$  significantly different than KO and K1. In conclusion, the mechanism of action of pomegranate extract (PGL) / P1 in killing cancer cells is by increasing apoptosis expression and decreasing VEGF expression.

### Biography

Sri Hernawati has completed her PhD at the age of .... years from Airlangga University. She is the vice dean of Faculty of Dentistry University of Jember, Indonesia. She has published more than 10 papers in reputed journals.