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Aspirin inhibition of a novel target upstream of COX pathway leads to tumor regression in oral squamous cell carcinoma

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Aspirin is an anti-inflammatory, anti-thrombotic and cardioprotective drug has been clinically reported to be effective in colorectal, esophageal, breast, lung, prostate, liver and skin cancers. Here we report the chemopreventive and chemotherapeutic effect of Aspirin on oral squamous cell carcinoma-Gingivobuccal sulcus (OSCC-GB) and its underlying molecular mechanism. We have identified that Aspirin inhibits a novel phospholipase (PLA), upstream of the arachidonic acid metabolism pathway and thereby inhibits the downstream components of COX pathway. Binding of aspirin to PLA2 enzymes may partly contribute to its anti-inflammatory action, however the exact mechanism by which this occurs has not been shown. The inhibitory effect of Aspirin on OSCC-GB cell lines (ITOC-03 and ITOC-04) was shown by MTT and clonogenicity assay. Further, the inhibition of arachidonic acid metabolism (AAM) pathway components was confirmed at transcript level by qPCR and at protein level by Western blot and Immunofluorescence. Wound healing assay showed the decreased migratory potential of OSCC cell lines while the cell cycle analysis showed an increase in G0/G1 phase and a reduction of S phase on treatment with Aspirin. Following the in vitro findings we performed in vivo studies on NOD-SCID mice. Tumor regression was seen in both the OSCC cell line (ITOC-03 and ITOC-04) induced tumors. We further validated our findings with immunohistochemistry. We have established a novel mechanism of tumor inhibition by Aspirin in OSCC-GB.

Biography

Kshama Pansare has completed her PhD from Aston University, UK and is currently working as Postdoctoral Research Associate at ACTREC, TMC, India under the International Cancer Genome Consortium Project.

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