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Comparative analysis of molecular signature in oral squamous cell carcinoma induced by Areca nut consumption

Hui Ju Wu¹, Jeremy Chen², Nicholas Lomthong³ and Yahya Elshimali⁴¹La Sierra University, USA²JC Clinic, USA³Nimthong MD PC, USA⁴Charles Drew University, USA

Consumption of betel leaf and Areca nut is a tradition dating back thousands of years in areas of South Asia and Southeast Asia. Long term consumption is associated with oral submucosal fibrosis, leukoplakia and squamous cell carcinoma of oral cavity and esophagus. Carcinogen found in betel nuts includes hydroxychavicol, safrole and arecoline. Arecoline, the primary psychoactive ingredient with addictive property, contribute to histological changes in oral mucosa. Arecoline acts by impairing PADPR-inducing DNA repair system, which in term, results in the accumulation of genomic DNA damage. Several studies concluded that over 20% of leukoplakia eventually developed into oral squamous cell carcinoma, suggesting the premalignant component of leukoplakia. Previously, we have designed a NGS gene panel based on multi-approach biochemical pathway analysis. Four overlapping biochemical pathways were identified including cell cycle, MAPKinase, Notch and TP53 pathway. The final design of the NGS gene panel contains 275 non-overlapping genes. Tumor tissue identified from FFPE tissue block as well as surrounding non-cancerous tissues are identified morphologically by microscope genomic DNA from both the tumor and non-tumors site are isolated and sequenced by NGS using the targeted platform. Total of 7 cases have been analyzed preliminarily. 17 specific missense mutations are identified in TP53 pathway including (CHK2, CHK1 and ATM). The results suggest a central role TP53 pathway in the pathogenesis of oral squamous cell carcinoma induced by betel nut extract.

Biography

Hui Ju Wu is currently an undergraduate student at La Sierra University. Her research interest is cancer genetic and oral biology.

angelawu1126@gmail.com

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