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An integrated genomic analysis reveals frequent genetic alterations in the spindle checkpoint genes of the cell cycle in bladder cancer

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Bladder cancer is one of the most common cancers worldwide with transitional cell carcinoma (TCC) being the predominant form. Here, we report an integrated analysis of TCC by whole-genome, whole-exome, and transcriptome sequencing of 99 individuals with TCC. Beyond confirming recurrent mutations in genes previously identified as mutated in TCC, we identified additional altered genes and pathways that are implicated in TCC. Notably, we discovered frequent alterations in *STAG2* and *ESPL1*, two genes involved in the spindle checkpoint of the cell cycle. Furthermore, we also detected a recurrent fusion involving *FGFR3* and *TACC3*, another spindle checkpoint gene. To our knowledge, it is the first recurrent fusion that occurs in multiple types of solid tumors. Overall, 32 (32%) of the 99 tumors harbored genetic alterations in spindle checkpoint genes. Our analysis provides the first evidence that genetic alterations affecting the spindle checkpoint could be involved in bladder tumorigenesis and implicates a novel therapeutic possibility for bladder cancer.

Biography

Zhiming Cai, Ph.D. in Management and Medicine, is a Professor, and Ph.D. supervisor. He is the current president of Shenzhen Second People's Hospital (The First Affiliated Hospital of Shenzhen University, the director of the Genitourinary Institution of Shenzhen University. In 1989, he started to persue his Ph.D. degree of Urinary Surgery in Sun Yat-Sen University, majored in genitourinary system oncology and male reproductive medicine. He is the principal investigator of 17 national fundings including "973", "863", National Nature Science Foundation of China (NSFC), published more than 160 articles, in which over 50 was included in Science Citation Index (SCI), including 3 papers published in Nature Genetics, Nature Biotechnology as the first author or corresponding author.

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Cyclooxygenase and 5-Lipoxygenase inhibitors for cancer therapy

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Pro inflammatory enzymes (PLA2, COX and LOX) in related to arachidonic acid cascade are the best target for development of drugs for inflammation and other diseases including cancer, Alzheimer etc. Over expression of COX and LOX have role in some cancers especially prostate, pancreatic, colon cancers etc. COX and LOX dual inhibitors related are the best therapeutics for some cancers including inflammation. Natural products containing wide structurally diverse chemical entities may serve as a source for identification of new lead compounds. *Borassus flabellifer* plant parts have been reported for medicinal properties including anti-inflammatory (Leaves shoot and male flowers), antimicrobial (shoot and seed coat), cyctotoxic (shoot), antioxidant (fruit, leaves and seed coat), anticancer (seed coat), antidiabetic (fruit and root) and immunosuppressive (shoot) activities. In earlier, we reported antimicrobial, anticancer and antioxidant activities of *B. flabellifer* seed coat. In present study, we carried out *in vivo* anti-inflammatory and *in vitro* proinflammatory enzymes (PLA2, COX-1, COX-2 and 5-LOX) inhibitory studies of *B. flabellifer* seed coat extract were performed and found good activity. Further isolation of active principle from *B. flabellifer* seed coat extract under progress.

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