Kelvin K Tsai, J Pharmacogenomics Pharmacoproteomics 2014, 5:5
http://dx.doi.org/10.4172/2153-0645.S1.002

OMICS Group Conferences
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2nd International Conference on
Predictive, Preventive and Personalized Medicine & Molecular Diagnostics
November 03-05, 2014 Embassy Suites Las Vegas, USA

Linking tissue micro architectures to rationalized molecular diagnostics in glandular cancers

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Disruption of tissue microarchitectures represents an early step of epithelial tumorigenesis and the degree of which has been widely used for the histopathological grading of glandular cancers. Molecular portraits of structural differentiation may identify key regulatory pathways and improve outcome prediction in human glandular cancers. To translate this concept to clinics and to facilitate patient-tailored cancer treatment decision, we performed comparative genomic analysis of glandular microarchitectures generated in a three-dimensional organotypic culture system which recapitulated the differentiated morphology and exocrine functions of human glandular epithelial tissues to identify differentiation and microarchitecture-specific gene signatures. This knowledge-based and model-informed biomarker strategy allows us to develop a highly accurate and robust 6-gene molecular diagnosis which can reflect tumor differentiation and cancer stem cell activity, thereby enabling a rationalized classification and prognostic prediction of pancreatic cancer patients. Similarly, we developed a 6-gene microarchitecture-specific signature which can prognostically classify prostate cancer patients with a remarkable accuracy. Thus, by exploiting the genomic program associated with glandular microarchitecture formation, we can identify differentiation-specific molecular subtypes and related prognostic markers that significantly enhance prognostic prediction of human glandular cancers. This strategy is now being used to develop differentiation-specific biomarkers in other types of glandular cancers that have high pathogenetic significance and clinical utility.

Biography

Kelvin K Tsai completed his MD from Taipei Medical University and his PhD from Harvard University and Postdoctoral studies from University of California, San Francisco. He is currently the Associate Investigator and attending Physician at National Institute of Cancer Research, a NIH-equivalent research institute in Taiwan. He is the author of more than 20 papers in high-impact basic and translational research journals and several issued or pending patents.

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