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&
6th International Conference on **Big Data Analysis and Data Mining**
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Liquid biopsies: A multitude of potential clinical applications for cancer patients

Over the past years, the concept of liquid biopsies has been introduced as an alternative to a conventional tissue biopsy. However, identifying circulating tumour cells (CTCs) in multiple ways from lung cancer patients based on EpCAM as the identifiable antigen (Ag), or other enrichment technologies has met with limited success. Here we report a holistic approach interrogating liquid biopsies using CTC enumeration and characterization, DNA Integrity Index and gene expression (RNA seq) from total blood. CTC enumeration from healthy controls and lung cancer (LC) patients was generated using Imagestream™, a multispectral imaging flow cytometry system. Changes in gene expression from total blood RNA were assessed from 3 LC-matched tissue and blood samples, with three matched tissue and blood samples from controls; using RNA sequencing. Moreover, plasma samples were collected from 29 LC patients and 19 controls and Alu repeat ratio and confounders were measured. CTCs were seen in all LC patients. We report significantly higher levels of CTCs (based on pan-cytokeratin marker) in LC patients compared to controls; these levels were associated with a poorer prognosis. Using RNA seq, we identified 272 genes differentially expressed in the tumour tissue compared to controls, and 335 in cancer blood samples compared to control bloods. Of all these, 21 genes have statistical significant expression differences between sample and control in both tissue and blood samples. Finally, a higher DNA Integrity Index was seen in advanced LC cases compared to both early stage and controls. In this study, we provide evidence that the presence of genetic tumour material in the blood opens the potential for liquid biomarker discovery and in some instances might work as a surrogate to tissue biopsies.

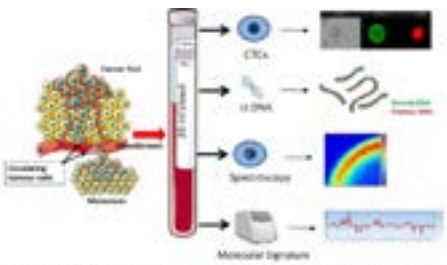

Figure 1. Multiple uses of Liquid Biopsies for Diagnostic or Prognostic Purposes

Recent Publications

1. Harper C (2009) The neuropathology of alcohol-related brain damage. Alcohol Alcohol 44(2):136-40.
2. Heilig M and Egli M (2006) Pharmacological treatment of alcohol dependence: Target symptoms and target mechanisms. Pharmacology and therapeutics 111(3):855-76.
3. Li X, Schwacha M G, Chaudry I H and Choudhry M A (2008) Acute alcohol intoxication potentiates neutrophil-mediated intestinal tissue damage after burn injury. Shock 29(3):377-383.
4. Room R, Babor T and Rehm J (2005) Alcohol and public health. Lancet 365(9458):519-30.
5. Sullivan E V and Zahr N M (2008) Neuroinflammation as a neurotoxic mechanism in alcoholism: Commentary on "Increased MCP-1 and microglia in various regions of human alcoholic brain". Experimental neurology 213(1):10-7.

Biography

Emmanouil Karteris is a Senior Lecturer and Head of the CBCEL. So far, he has published 54 research manuscripts and presented over 100 research abstracts in leading national and international conferences. Many of these papers are generating a strong and influential impact not only to the biomedical field but also to the society as they deal with topical issues such as the effect of stress during pregnancy and use of liquid biopsies as cancer biomarkers. He is also an Expert in intellectual property for life sciences. The main areas of his research focus on the relationship between 7-transmembrane domain receptors and nuclear receptors with relation to placental physiology and metabolic complications during pregnancy and the effects of endocrine disrupting chemicals in human reproduction.

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