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Cancer biomarkers: from discovery to clinical implementation

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New biomarkers make sense if they provide better or different information compared to existing ones. There is a high interest in identifying, validating and eventually using biomarkers as they may help detecting a disease (e.g.: cancer) or its relapse earlier, assess treatment efficacy or toxicity, improve treatment follow-up or contribute to patient selection.

In oncology, investigated biomarkers may be as diverse as: proteins, circulating tumour DNA, circulating tumour cells, mRNA transcripts, polysomes, miRNAs, metabolites or autoantibodies for instance. Cancer biomarkers may be investigated by ELISA tests, immunohistochemical analyses, western blots, mass spectrometry or 'omics' among others.

However, many early claims of candidate biomarkers are in fact not substantiated, since they need to fulfil several stringent criteria along the way. Beyond this wide diversity in biomolecules and assays, several common pitfalls and challenges have been identified. Based on experience from the lab and the clinics as well as from the literature, some reasons for spurious findings are reviewed, with examples from transcriptomics, proteomics and heat shock proteins. This may contribute to provide more solid ground for the long and challenging endeavours to clinical implementation.

Biography

Renaud Seigneuric holds a French and a Canadian PhD in Biomedical Engineering. He completed his postdoctoral fellowship at the Maastro lab, one of the 5 Siemens centres of excellence (Maastricht, the Netherlands). He patented, together with clinicians, lists of biomarkers leading towards more individualized cancer therapies. He was appointed in 2007 as assistant professor in biophysics (University de Bourgogne, Faculty of Medicine and Pharmacy, Dijon, France). Working at different scales, his translational research is devoted to cancer detection and treatment. He was recently nominated by the Who's Who in Medicine and Healthcare (2011-2012).