Nichola C Garbett, J Cancer Sci Ther 2016, 8:9(Suppl)
http://dx.doi.org/10.4172/1948-5956.C1.084

Plasma thermograms: A new approach for cancer biomarker studies

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Plasma thermograms are an emerging technology for plasma proteome research and a clinical diagnostics tool. This approach utilizes the established thermoanalytical technique differential scanning calorimetry to generate thermal denaturation profiles of the abundant proteins in blood plasma. These thermal denaturation profiles, called plasma thermograms, are highly sensitive to changes in the thermodynamic properties of the abundant proteins in the disease state and can be used to differentiate patient samples on the basis of clinical status. A growing number of reports have demonstrated the utility of plasma thermograms in a variety of conditions, including a number of cancers and autoimmune diseases. We have shown that plasma thermogram profiles for healthy plasma can be resolved into the sum of the denaturation profiles of the abundant plasma proteins. However, in disease plasma, the profile is radically altered as a result of protein modifications or interactions in the disease proteome. Plasma thermograms therefore represent a unique approach to cancer proteome studies providing a new dimension in biomarker research and indicating the potential use of plasma thermograms as a novel diagnostic technology.

Biography

Nichola C Garbett has completed her BSc and PhD in Chemistry from the University of Kent at Canterbury. She has completed her Post-doctoral fellowships at the University of Mississippi Medical Center, University of Mississippi and University of Alabama at Birmingham before joining the University of Louisville School of Medicine where she is currently an Assistant Professor of Medicine. Her research applies biophysical approaches to the study of biomolecules and their interactions with emphasis on developing new technologies for medical diagnostics. She is a Co-Inventor of an emerging diagnostic tool utilizing differential scanning calorimetry for early detection, diagnosis and monitoring of patients.

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