**Evi Lianidou, 10/10/ 2018**

**Submitted abstract for xMAP Connect Amsterdam 2018**

**Presentation title: "Multiplex PCR-coupled Liquid Bead Array for the Molecular Characterization of Circulating Tumor Cells (CTCs) in Breast Cancer at the Single Cell Level”**

**Abstract**

“Liquid biopsy” has a high potential to give detailed information on tumor genome evolution over time, through simple blood draws that can be used for serial monitoring of the patients. This is a strong advantage towards the classic biopsy approach that is not allowing monitoring of primary tumors evolution during time, while sampling of metastatic sites is not always possible for practical reasons. Liquid biopsy has a strong potential to be translated into individualized targeted treatments. The liquid biopsy approach is based on the extraction of molecular information on the primary tumor by analyzing in detail tumor-derived genetic material from: Circulating Tumor Cells (CTC), cell free circulating tumor DNA (ctDNA), circulating miRNAs and exosomes. A variety of analytical systems are continuously been developed for liquid biopsy analysis. Especially molecular assays based on the nucleic acid analysis in CTCs like RT-qPCR, multiplex RT-qPCR, liquid bead arra (LUMINEX platform) and next generation sequencing technologies are very powerful since they can be automated and high throughput. Quality control and standardization in liquid biopsy analysis is very important for the incorporation of this breakthrough concept into prospective clinical trials testing its clinical utility. Especially CTC molecular characterization at the single cell level holds considerable promise for the identification of therapeutic targets and resistance mechanisms in CTCs as well as for the stratification of patients and real-time monitoring of systemic therapies. This lecture will be mainly focused on the recent advances in the field and the development of a Multiplex PCR-coupled Liquid Bead Array for the Molecular Characterization of Circulating Tumor Cells (CTCs) in Breast Cancer at the Single Cell Level.

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***Short Summary***

Dr. Evi Lianidou is Professor of Analytical Chemistry and Clinical Chemistry at the Department of Chemistry, University of Athens, Greece. Dr Lianidou has established a Molecular Diagnostics Laboratory focused on Liquid Biopsy at the Department of Chemistry since 1998 (<http://en.actc-lab.chem.uoa.gr/>). Her lab is specializing in the Analysis of Circulating Tumor Cells (ACTC), and has access to many patient samples through extensive clinical collaborations. Her main research interests are on the development and clinical evaluation of: a) single-plex and multiplex quantitative RT-qPCR assays for the detection and molecular characterization of CTCs, b) multiplex assays for gene expression in CTCs based on the liquid bead array, c) DNA methylation assays in CTCs and ctDNA, d) highly sensitive assays for mutation analysis in CTCs and in ctDNA, and evaluation of circulating miRNAs as tumor biomarkers in plasma. Dr. Lianidou has 108 publications (https://www.ncbi.nlm.nih.gov/pubmed/?term=lianidou) and has organized together with Prof K. Pantel: a) the 7th International Symposium on Minimal Residual Disease in Athens, (<http://ismrc2009.chem.uoa.gr>) , b) a scientific meeting on CTCs “Advances in Circulating Tumor Cells: From Basic Research to Clinical Practice” ([www.actc2012.org](http://www.actc2012.org)), and c) the 2nd ACTC meeting, (October 8th-11th, 2014), in Crete, Greece ([www.actc2014.org](http://www.actc2014.org)). Dr. Lianidou is now organizing the 3rd ACTC meeting, (October 4th-7th, 2017), in Rhodes, Greece ([www.actc2017.org](http://www.actc2017.org)). Prof Lianidou is PI in the European TRANSCAN group “CTC-SCAN” and in the EU IMI Network Project “CANCER-ID” (www.cancer-id.eu) and serves on the Editorial Boards of many international journals including Clin Chemistry, Clin. Cancer Res, Breast Cancer Res, Cancer Res, Oncotarget, and many others. Dr. Lianidou is an elected member and Chair of the Committee for Clinical Molecular Biology Curriculum of the International Federation of Clinical Chemistry (IFCC), (<http://www.ifcc.org/ifcc-education-division/emd-committees/c-cmbc/>) and is coordinating the M.Sc. program of Clinical Chemistry, at the Department of Chemistry, University of Athens (<http://en.clinical-chemistry.chem.uoa.gr/>).