

Joint Event on
Cancer Treatment & Breast Cancer and Biomarkers

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Development of the unique diagnostic platform for HER2-positive breast cancer patient (Hybrid sensor and actuator system for cancer diagnostics)

Breast cancer is the most frequent cancer among women and responsible for approximately 15% of all their cancer deaths. Approximately 20% of patients with early-stage HER2-positive breast cancer can benefit from Herceptin (trastuzumab) therapy which was approved by FDA in 2006. Therefore, an early diagnosis of biomarkers is a critical factor in breast cancer therapy. The Oncompass Medicine Hungary Ltd., as a member of the ADMONT – “Advanced Distributed Pilot Line for More-than-Moore Technologies” project aimed to develop a novel diagnostic platform for detection of HER2-positive circulating tumor cells (CTCs) from blood next to the patient’s bed. The platform design based on the lab-on-chip solution is supported by MtM (More-than-Moore) technology. LED-based photodetectors observes the colorimetric response of CTCs with different level of HER2 expression. Commercially available CTC isolation method was optimised to improve CTC yield from blood-based cellular model system and patient derived material. An alkaline phosphatase-based (AP) detection system was set on blood-based cellular breast cancer model system to assess the sensitivity of the detector arrays and meet the characteristics of the prototype device. Our developments introduce a unique integrated diagnostic system that is faster, cost-effective and requires less number of cells or sample material than conventional techniques such as flow cytometry (FACS), fluorescence in situ hybridization (FISH) and immunohistochemistry (IHC). As a novel molecular diagnostic system for personalized medicine, it enables detection of HER2-expression to select patients for cancer therapy and also screening of therapy response, based on a less-invasive and easily repeatable sampling. The research leading to these results has received funding from NEMZ_15-1-2016-0002 project.

Biography

Anna Sipos is completing her PhD in Pharmaceutical Sciences at the Semmelweis University, Budapest, Hungary. She has a research practice of over 10 years working in EU universities on projects related to cancer research and immunological disorders. She has published more than 12 papers in reputed journals and presented more than 9 abstracts at prestigious national and international conferences. Currently, she is a Research Biologist at Oncompass Medicine Hungary Ltd. Her research interests are focused in the DNA damage repair processes, molecular diagnostic and biomarkers of cancer.

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