PULSUS
WWW.PULSUSCONFERENCE.COM
SciTechnol

Matthias Ugele et al., J Clin Exp Oncol 2018, Volume 7
DOI: 10.4172/2324-9110-C1-008

23rd International Conference on

Cancer Research & Pharmacology

March 26-27, 2018 Edinburgh, Scotland

Label-free leukemia differentiation with high-throughput digital holographic microscopy

Matthias Ugele[1, 5], Markus Weniger[1], Lukas Richter[1], Manfred Stanzel[1], Michael Bassler[2], Stefan Krause[3], Oliver Hayden[4] and Oliver Friedrich[5]

[1]Siemens Healthcare GmbH, Germany
[2]Fraunhofer ICT-IMM, Germany
[3]Medizinische Klinik 5-Hämatologie & Internistische Onkologie, Germany
[4]TranslaTUM-Technical University of Munich, Germany
[5]Friedrich-Alexander-University Erlangen-Nuremberg, Germany

Blood smear analysis is the gold standard for routine diagnosis of hematological disorders and serves as recommendation for further differential diagnosis such as flow cytometric immunophenotyping. Analysis and interpretation of peripheral blood smears is time consuming and depends on interobserver variation. Most recently, label-free imaging based on Digital Holographic Microscopy (DHM) emerged with the potential to perform label-free hematology analysis. Here, we present label-free leukemia differentiation of clinical samples using a differential DHM in combination with three-dimensional hydrodynamic focusing of blood cells. Based on principal component analysis and physical parameters we developed a gating strategy for the differentiation of 10 leukocyte subtypes which enabled the differentiation of Acute Myeloid Leukemia (AML), Acute Lymphocytic Leukemia (ALL), Chronic Lymphocytic Leukemia (CLL) and Myelo Proliferative Neoplasms (MPN). Furthermore, we observed the possibility of MPN subtyping and demonstrated in a one case study the progression of AML from first diagnosis to remission.

Biography

Matthias Ugele got his PhD from Institute of Biotechnology of Fredrick-Alexander Univeristy and is currently associated with Siemens Healthcare. His areas of research are Leukemia studies, Cancer Research.

matthias.ugele.ext@siemens-healthineers.com

Notes: