IA-28

Migration and Interaction Tracking for Quantitative Analysis of Phagocyte Pathogen Confrontation Assays

S. Brandes, S. Dietrich, K. Hünniger, O. Kurzai, M. T. Figge

01/03/2017

Migration and Interaction Tracking for Quantitative Analysis of Phagocyte-Pathogen Confrontation Assays

Susanne Brandes[1,2], Stefanie Dietrich[1,2], Kerstin Hünniger[3], Oliver Kurzai[3,4], Marc Thilo Figge[1,2]

[1] Applied Systems Biology, Leibniz Institute for Natural Product Research and Infection Biology, Hans Knöll Institute , Jena, Germany
[2] Friedrich Schiller University, Jena, Germany
[3] Septomics Research Center, Friedrich Schiller University and Leibniz Institute for Natural Product Research and Infection Biology, Hans Knöll Institute, Jena, Germany
[4] Institute for Hygiene and Microbiology, University of Würzburg, Würzburg, Germany

Introduction

Invasive fungal infections are emerging as a significant health risk for humans. The innate immune system is the first line of defense against invading micro-organisms and involves the recruitment of phagocytes, which engulf and kill pathogens, to the site of infection.

To gain a quantitative understanding of the interplay between phagocytes and fungal pathogens, live-cell imaging is a modern approach to monitor the dynamic process of phagocytosis in time and space. Because this requires the processing of large amounts of video data, we developed a novel framework, called AMIT (algorithm for migration and interaction tracking [1, 2]) for the automated high-throughput analysis of multi-channel time-lapse microscopy videos of phagocyte-pathogen confrontation assays.

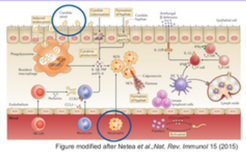
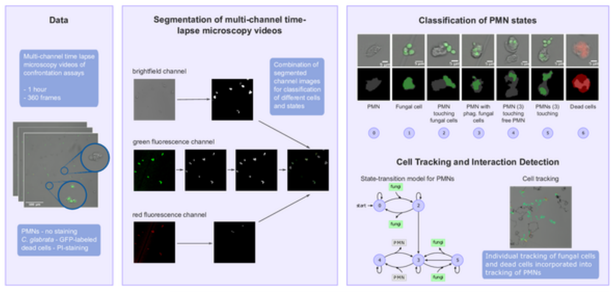


Figure modified after Netea *et al.,Nat. Rev. Immunol* 15 (2015)

Algorithm for Migration and Interaction Tracking



References
[1] Brandes, S., Dietrich, S., Hünniger, K., Kurzai, O., Figge, M.T. *Medical Image Analysis* (2016)
[2] Brandes, S., Mokhtari, Z., Essig, F., Hünniger, K., Kurzai, O., Figge, M.T. (2015) *Medical Image Analysis* (2015)
[3] Essig, F., Hünniger, K., Dietrich, S., Figge, M.T., Kurzai, O. *Fungal Genetics and Biology* (2015)

Contact: stefanie.dietrich@leibniz-hki.de