

LECTURE SERIES & WORKSHOPS

# INFECTION & IMMUNITY

# 19

MAY 2016

Thursday



## WORKSHOP \*

House of BioHealth  
Room Françoise  
Barré-Sinoussi

10.00 - 11.30 am

## LECTURE

Lycée Technique  
d'Esch/Alzette  
Salle de Projection \*

1.00 - 2.30 pm

\* Registration is mandatory  
by sending an email to  
[florence.henry@lih.lu](mailto:florence.henry@lih.lu)



### SPEAKER

## Prof Michael MEYER-HERMANN

Head of Department at the Helmholtz Centre for Infection Research, Professor at the Technische Universität Braunschweig, Directors board of the Braunschweig Integrated Centre of Systems Biology, Braunschweig, Germany, Adjunct fellow at the Frankfurt Institute for Advanced Studies Frankfurt/Main, Germany

### HOST:

Department of Infection  
and Immunity

### RESPONSIBLE LIH SCIENTIST:

Dr Feng He  
([feng.he@lih.lu](mailto:feng.he@lih.lu))

## OPTIMISATION OF ADAPTIVE ANTIBODY RESPONSES

### ABSTRACT

Upon infection innate immune responses are mounted which control but do not clear the infection. Adaptive immune responses by T cells and by antibody forming cells are mounted much slower but are pre-selected to optimally fight the infection. Specialised antibodies are essential not only for final clearance of infections but also for vaccination. At every vaccination, a so-called germinal centre (GC) reaction is initiated. In a GC, B lymphocytes divide and mutate their encoded antibody. The mutated B cell is subsequently subject to selection giving rise to an evolutionary process of generating optimised antibodies and memory within the organism on a time scale of 10 days.

The functional principles of how B cells get diversified and selected will be presented. A particular emphasis is set on the mutual interaction of mathematical models and multi-photon imaging. These two powerful techniques together were able to unravel the limiting role of T cell help in the GC for B cell selection. It will be explained, why T cells control the number of divisions of B cells. More recently, the analysis of brainbow experiments allowed to monitor different clones in their evolution within the GC. This analysis revealed bursts of clones which may dominate a whole GC reaction as well as co-existence of many clones on long term. These findings have major implications for the design and development of new vaccines.

\* Opposite Luxembourg Institute of Health, House of BioHealth,  
29, rue Henri Koch, L-4354 Esch/Alzette