LUXEMBOURG INSTITUTE OF HEALTH
RESEARCH DEDICATED TO LIFE

LECTURE SERIES & WORKSHOPS

INFECTION & IMMUNITY

15
SEP. 2016
Thursday

LECTURE
Lycée Technique
d'Esch/Alzette
Salle de Projection *
1.00 - 2.30 pm

MEET & GREET * NEW
with cakes and coffee
House of BioHealth,
Room Françoise
Barré-Sinoussi
3.00 - 4.30 pm

11 12 1 2 3 4 5 6

*Please register sending a mail to florence.henry@lih.lu

SPEAKER
Prof. Dr. Klaus PFEFFER
Professor Heinrich-Heine-University Düsseldorf, Institute of Medical Microbiology.
Director, Institute of Medical Microbiology and Hospital Hygiene.

HOST:
Department of Infection and Immunity

RESPONSIBLE LIH SCIENTIST:
Prof. Dirk Brenner (dirk.brenner@lih.lu)

INTERFERON INDUCIBLE GUANYLATE BINDING PROTEINS (GBPS) IN IMMUNE DEFENSE

ABSTRACT

Host defense against invading pathogens is critically dependent upon interferon induced anti-microbial effector programs. Recently, we have discovered that vast number of interferon induced genes are GTPases belonging to the family of guanylate binding proteins (GBPs). GBPs are essential for immunity against intracellular pathogens, especially for Toxoplasma gondii control. Now the molecular interactions of murine GBPs (mGBP1/2/3/5/6), homo- and hetero-multimerization properties of mGBP2 and its function in parasite killing were investigated by mutational, Multiparameter Fluorescence Image Spectroscopy, and live cell microscopy methodologies. Control of T. gondii replication by mGBP2 requires GTP hydrolysis and isoprenylation thus, enabling reversible oligomerization in vesicle-like structures. mGBP2 undergoes structural transitions between monomeric, dimeric and oligomeric states visualized by quantitative FRET analysis. mGBPs reside in at least two discrete subcellular reservoirs and attack the parasitophorous vacuole membrane (PVM) as orchestrated, supramolecular complexes forming large, densely packed multimers comprising up to several thousand monomers. This dramatic mGBP enrichment results in the loss of PVM integrity, followed by a direct assault of mGBP2 upon the plasma membrane of the parasite. These discoveries provide vital dynamic and molecular perceptions into cell-autonomous immunity.

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