Institut für Biochemie

UNI FREIBURG

Biochemical Colloquium

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Institute of Molecular Medicine
Lisbon, Portugal

Thursday, January 23rd 2014, 14:00

Albertstraße 21, Seminar Room 09.020

"Plasmodium liver stages and anti-malarial strategies: development of a new vaccination approach against malaria"

Malaria is one of the most prevalent infectious diseases worldwide. With half of the world's population at risk of contracting this disease, there are over 200 million malaria infections leading to nearly one million deaths every year.

Plasmodium parasites, the causative agents of malaria, undergo two consecutive stages within their mammalian hosts, replicating inside liver cells before infecting red blood cells and causing disease symptoms. Despite being totally asymptomatic, the hepatic or pre-erythrocytic stage of infection holds immense immunologic and prophylactic potential for anti-malarial intervention, and is a powerful source of insight into novel aspects of host-parasite interactions.

Vaccines will undoubtedly play a key role in efforts to eliminate and eventually eradicate malaria. Whole organism pre-erythrocytic (WOPE) vaccines against malaria are among the most promising immunization strategies against this disease. Currently, such strategies are based on the attenuation of *Plasmodium falciparum* sporozoites. With funding from the Bill & Melinda Gates Foundation, we developed a bold new approach to WOPE vaccination, based on the use of rodent *P. berghei* parasites as the immunizing agent. We demonstrated that this strategy meets the basic requirements for safety and for effective antigen presentation to liver hepatocytes. We are investigating the degree of cross-species protection conferred by *P. berghei* against *P. falciparum*, as well as the added protection afforded by the genetic engineering of *P. falciparum* immunogens onto the *P. berghei* platform. Data will be presented regarding cellular and humoral responses resulting from immunization with the rodent parasite-based vaccine, as well as their ability to specifically recognize and inhibit infection by *P. falciparum*. Finally, the pros and cons of the use of *P. berghei* as a vaccination platform against human malaria will be discussed in the context of currently available alternatives.