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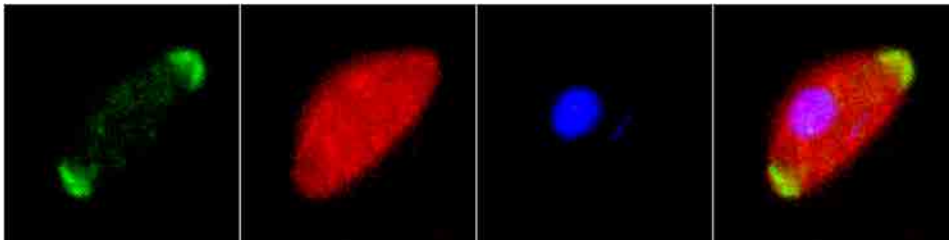
Malaria is one of the most devastating infectious diseases worldwide, causing major public health, social and economic problems globally. 3.4 billion people (half of the world's population) live in areas at risk of malaria transmission, and in 2012 malaria caused an estimated 207 million clinical episodes, and 627,000 deaths. In addition to the social toll of the disease both on individuals and governments, the direct costs incurred by illness, treatment and premature death have been estimated to be at least US$ 12 billion per year. The lack of an efficient vaccine and the alarming emergence of resistant parasites to currently available drugs urgently call for the identification of new treatment strategies. Protein kinases are prominent drug targets in cancer and represent highly interesting targets for malaria drug development as well. Our laboratory is a world-leader on the study of functional kinomics of the human malaria parasite Plasmodium falciparum. Unravelling the biological functions of the parasite protein kinases will inform on specific potential targets for antimalarial drug discovery.

Research Projects

1. **Cell cycle regulation in *P. falciparum***
2. **Why and how does malaria hijack red blood cell kinases?**
3. **The modulation of apoptotic mechanisms in the host cell by *Plasmodium falciparum***



Malaria parasites in human red blood cells, stained with antibodies against an uncharacterised protein kinase

Selected significant publications:

1. **Doerig C**, Rayner J, Scherf A and Tobin A. 2015. Post-translational modifications in malaria parasites. *Nature Rev. Microbiol.* 13, 160-172.
2. Alam M, Solyakov I, Bottrill AR, Flueck C, Siddiqui F, Singh S, Mistry S, Viskaduraki M, Chitnis CE, **Doerig C**, Moon RW, Green JL, Holder AA, Baker DA and Tobin, AB. 2015. Phosphoproteomics reveals malaria parasite Protein Kinase G as a signalling hub regulating egress and invasion. *Nature Communications* 6, 7285.
3. Sicard A, Semblat JP, **Doerig C**M, Hamelin R, Moniatte M, Spicer JA, Srivastava A, Retzlaff S, Heussler V, Waters AP and **Doerig C**. 2011. Activation of a PAK-MEK pathway in malaria parasite-infected erythrocytes. *Cell. Microbiol*.13, 836-845.
4. Solyakov L, Halbert J, Graciotti M, Semblat JP, Dorin-Semblat D, Bottrill A, Mistry, S, Abdi A, Fennell C, Demarta C, Bouza Y, Nivez MP, Eschenlauer S, Lama T, Reininger L, Agrawal S, Kern S, Pradel G, Alam MM, Tobin AB and **Doerig C**. 2011. Global kinomic and phospho-proteomic analyses of the human malaria parasite Plasmodium falciparum. *Nature Communications* 2, 565.
5. Ward P, Equinet L, Packer J, and **Doerig C**. 2004. Protein kinases of the human malaria parasite Plasmodium falciparum: the kinome of a divergent Eukaryote. *BMC Genomics* 5, 79.