



Institut de Recherches en Technologies et  
Sciences pour le Vivant

## Séminaire d'Institut

Lundi 19 septembre 2011

À 11 h 00 - Accueil du CEA Grenoble

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### Malaria: The plant connection

Malaria is a major global health problem. The World Health Organization estimates that 500 million are infected and 1 million people die each year. There is currently no vaccine and the parasite is now resistant to most of our existing drugs. Our research has recently revealed that the malaria parasite was originally a plant-like organism that survived by photosynthesis. We find major genetic traces of a plant-like metabolism in malaria parasites. This tells us that the parasite moved from its life in the ocean as a unicellular plant to a new, parasitic lifestyle eating the blood in our veins. Importantly, this revelation offers us new ways to combat the disease using drugs and herbicides initially designed to kill plants. We are finding that these herbicidal compounds, some of which are non-toxic to humans, work against malaria too. Our team identified the relic chloroplast in malaria parasites - a discovery that has revolutionised our understanding of one of the world's major pathogens and opened up new strategies to battle the deadly disease. Working in a botany department, we focussed our basic research on the biology and evolution of protists, the kingdom of life that includes algae as well as many other unicellular organisms. Our research showed, quite unexpectedly, that the parasite responsible for malaria (*Plasmodium*) is related to algae and contains a relict plastid – the chloroplast organelle that is responsible for photosynthesis in algae and higher plants (McFadden *et al.*, *Nature*, 1996, **381**: 482). The relict plastid no longer contains chlorophyll but has a circular DNA genome similar to all other plastids. This fundamental scientific discovery opened up novel approaches for studying and combating malaria. Our team have identified many new drug targets in the relict plastid of malaria parasites, vastly increasing the number of strategies for the development of much needed new malaria drugs.

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