

## **Malaria and leishmaniasis infection and co-infections: pathogenesis and new potential therapeutic interventions**

Malaria and leishmaniasis are parasitic diseases caused by protozoan of the genus *Plasmodium* and *Leishmania*, respectively. Among the tropical parasitic diseases, they are responsible for millions of cases every year, and thousands of fatalities. Co-infections exist in those populations living in geographical areas where the diseases overlap. In the absence of any vaccine, chemotherapy remains the only weapon to fight these infections. However, cost, toxicity and resistance to conventional drugs, make very urgent the need for new drugs and safe treatments. The immune system of the host can influence the outcome of both infections. In the co-infections, immune mediators produced against one parasite can promote or prevent the establishment of another infection. Macrophages, key cells in the pathogenesis of both malaria and leishmaniasis, provide a first line of defense against pathogens and regulate the activation of T Lymphocytes through the production of inflammatory mediators. Moreover, macrophages can kill ingested microorganism through the production of reactive oxygen species and nitric oxide.

We will present evidences that macrophage activation is influenced by the presence of malaria products such as malaria pigment (hemozoin) or by leishmania amastigotes, thus determining unexpected, often unbalanced responses to the pathogens.

The antiplasmodial, antileishmanial and cytotoxic activity of new compounds will be also presented highlighting the results obtained against asexual and sexual (gametocytes) stages of *P.falciparum* and against promastigote and amastigote stages of *L. infantum*.

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### Biosketch

Nicoletta Basilico is Assistant Professor of Pathology in the Faculty of Pharmacy and in the Faculty of Dental Medicine of the University of Milan, Milan, Italy since 2003. She got her Degree in Biological Science and her PhD in Microbiological Science at University of Milan in 1996. In 1995 she was Visiting Fellow at the Division of Experimental Therapeutics, Walter Reed Army Institute of Research, Washington, USA. After the PhD, she completed her post-doctoral training in the Lab of Parasitology and Immunology at the University of Milan. The scientific activity of Dr Nicoletta Basilico is documented by 79 papers on international scientific journals, 107 communications to Congresses, 4 book chapters and one international patent. As PI, she received funding from the University of Milan, from the Ministry of Foreign Affair (MAE) and from Fondazione Cariplo, Milano. She participated in several projects from EU FP6 and FP7 Programs, from the Bill & Melinda Gates Foundation, from WHO-TDR and from Italian Institutions, including the Italian Government and Public Agencies. Her scientific activity has been mainly focused on antimalarial and antileishmanial drug discovery; on the development of new methods to study the mechanism of action of quinoline and artemisinin antimalarials; studies on parasite-host relationships, in particular, the role of parasite products, namely hemozoin, on host innate immunity; studies on the effects of antimalarial drugs on angiogenesis and human erythroid differentiation in relationship to malaria anemia.