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Application of nanomedicine in the treatment of malaria

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Abstract

Malaria is one of the world's deadliest infectious diseases. Each year over 1.5 million people die and an estimated 40% of the world's population is at risk. Over 90% of deaths occur in sub-Saharan Africa where on average a child dies of malaria every 12 seconds. Currently no effective vaccine against malaria is available. A major reason for the failure to eradicate malaria has been the shortcomings of malaria preventive and curative drug treatments**.** Nanomedicine is a new technology utilizing nanometre scale (generally 100 nm) drug delivery systems as therapeutics, able to confer advantages which include improved drug pharmacokinetic profiles (improved absorption, bioavailability, elimination half-life), organ, cell and parasite targeted drug delivery, and reduction in drug toxicity. Nanomedicine can address the challenges of current antimalarials, by reformulating the drugs in nanomedicine drug delivery systems (NMDDS). Nanomedicine has already impacted other diseases, e.g. cancer, exemplified by the reformulation of doxorubicin to provide a potent, and extended half-life therapy with reduced side effects. Our vision is to see nanomedicine do the same for malaria chemotherapy, radically improving treatment outcomes using currently available drugs, saving lives, and advancing the global goal of eradicating malaria. Results from our preliminary studies in mice, using our novel NMDDS recorded significant enhancement, in the pharmacokinetic properties of drugs reformulated in NMDDS when compared to the non-formulated drugs.

Biography

Paula Melariri was born in 1974 and she completed her PhD in 2010 at the University of Cape Town, South Africa. She is a Senior Researcher and malaria project manager in the Encapsulation and Drug Delivery group, Council for Scientific and Industrial Research, South Africa. Dr Melariri is leading the research activities in developing novel nanomedicine treatments for malaria. She is passionate about neglected tropical diseases and infectious diseases of poverty. Dr. Melariri has published several articles and is a reviewer to several journals.