Type: Invited Presentation

Final Abstract Number: 05.003
Session: Grand Challenges in Malaria
Date: Thursday, April 3, 2014
Time: 10:15-12:15
Room: Room 2.40

Novel antimalarial targets and the antimalarial pipeline

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Relatively speaking, antimalarial drug discovery from phenotypic whole cell screening has been far more successful than target-based approaches in delivering selective antimalarial drug candidates for a variety of reasons. It has recently been demonstrated that chances of discovering cell permeable and active antimalarials with potentially novel modes of action are significantly maximized through phenotypic screening. Compounds may easily be dismissed from target-based screening approaches if the desirable activity against the target is not achieved. The identification of novel antimalarial drug targets that may be relevant at all stages of the malaria parasite life cycle has been challenging to say the least. The absence of ready access to enabling technologies to allow the study of the malaria parasite life cycle stages is in part responsible for this. Some of these technologies are starting to emerge and are facilitating the discovery and evaluation of novel drug targets. Within the context of the antimalarial pipeline, although the currently available chemotherapeutic armamentarium for malaria is severely limited, re-engagement of the pharmaceutical industry through precompetitive research consortia in which there are shared resources and costs, thus mitigating the risks involved in drug discovery, is significantly changing the landscape as recently demonstrated through partnerships between the pharmaceutical industry and not-for-profit Product Development Partnerships (PDPs) such as Medicines for Malaria Venture (MMV). This lecture will address platform technologies and how these have been utilized in the discovery of novel antimalarial drug targets. An update on the antimalarial pipeline will also be presented. In conclusion, new and emerging enabling technologies have facilitated the discovery of novel antimalarial drug targets and boosted the antimalarial pipeline.

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Insecticide resistance: will mosquitoes be our nemesis?

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Malaria parasites are transmitted to humans by anopheline mosquitoes. The parasite undergoes an obligatory sexual stage within the mosquito midgut that takes up to 14 days to complete. This presents a window of opportunity for us to control the mosquito populations before they have sufficient time to become infective. Unfortunately, both mosquitoes and parasites have been around a lot longer than humans and so far have managed to find ways of getting around all the drugs and insecticides that we throw at them. In Africa today there are approximately 140 recognised species of *Anopheles* mosquitoes. Only 4 of these are really good vectors of malaria parasites and are widespread over the continent. Three of them are highly adapted to humans and human habitations and should, therefore, be easy to control using current technology. The fourth is more cosmopolitan and is equally happy to feed on cattle as well as humans and rest both indoors and outdoors, making it a much more difficult vector to control. All four species have developed high levels of resistance to the insecticides we use for vector control and given the limited number of chemicals that are approved by the World Health Organization for vector control, there is an urgent need for new and innovative methods for controlling malaria vector mosquitoes.

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The increase of *Mycobacterium tuberculosis* drug resistance in low and middle-income countries

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Background: Drug-resistant TB, and particularly multidrug-resistant TB (MDR-TB) that is resistant to rifampicin and isoniazid, is a major public health problem that threatens progress made in TB care and control worldwide. WHO estimates that there were 450,000 (range: 300,000-600,000) new cases of MDR-TB worldwide in 2012.

Objective: To present a global update on anti-TB drug-resistance surveillance.