

ORAL PRESENTATION

Open Access

Modeling the spatio-temporal dynamics of malaria parasite population genetics

Edward Wenger*, Joshua Proctor, Philip Eckhoff

From Challenges in malaria research: Core science and innovation
Oxford, UK. 22-24 September 2014

A model of malaria transmission dynamics is presented that tracks the genetic barcodes of individual *Plasmodium falciparum* infections using seasonally-driven effective reproduction rates for clonal propagation, external importation, and the outcrossing of strains both within and between infections. We explore quantitatively the relationship between transmission intensity and genetic observations, for example the repeated observation of identical strains and their persistence across successive transmission seasons. Extending to a spatially connected network of human and parasite populations, we model the sensitivity of genetic sequencing to identify the relative contributions of local hotspots versus re-importation in sustaining transmission in pre-elimination settings. Finally, we model the effects of local transmission intensity and anti-malarial drug pressure on the population-level genetic signatures of emerging drug resistance.

Published: 22 September 2014

doi:10.1186/1475-2875-13-S1-O17

Cite this article as: Wenger et al.: Modeling the spatio-temporal dynamics of malaria parasite population genetics. *Malaria Journal* 2014 13(Suppl 1):O17.

Submit your next manuscript to BioMed Central
and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit



Institute for Disease Modeling, Bellevue, WA, USA



© 2014 Wenger et al; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.