

Workshop Summary
FDA Workshop on Testing for
malarial Infections in Blood
Donors

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Food and Drug Administration

Blood Products Advisory Committee Meeting

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Issue

- **FDA seeks public discussion of scientific developments that might support donor testing for malarial infections as part of pre-donation testing or as follow-up testing to permit a reduced deferral period for donors deferred for risk of malaria.**

Topics for Question

- **Malaria in the USA and the main sources of malaria risk to the blood supply**
- **Risks and benefits of screening donors for malaria infections in lieu of risk-based deferrals**
- **Available and emerging technologies to test blood donors for malarial infections**
- **Potential effects of donor testing for malarial infections on the safety and availability of the blood supply under the following scenarios:**
 - **Universal malaria antibody testing of all blood donors**
 - **Testing for donors who are deferred based on a history of possible malaria exposure or had experienced clinical malaria in order to accelerate reentry.**

Background. Antibody testing in Europe and Australia

- **Several European countries and Australia now test deferred at-malaria-risk donors by an EIA that detects antibodies to *P. falciparum* and *P. vivax***
- **In UK, individuals who had malaria or a history of prior residence in endemic countries are deferred indefinitely, all other prospective donors are deferred for one year after each return**
- **At-risk donors having no antibodies by EIA at least six months after the last potential exposure or symptom of malaria are allowed to reenter**
- **In France, travelers are allowed to donate if found negative for malarial antibody at least four months after return**

FDA Workshop on Testing for Malarial Infections in Blood Donors

Natcher Conference Center
Building 45
National Institutes of Health
Bethesda, Maryland, USA

July 12, 2006
7:30 a.m. – 5:30 p.m.

AGENDA*

7:30 Registration

Workshop Chair: Sanjai Kumar, Ph.D., FDA

8:00 Welcoming Remarks: Jesse Goodman, M.D., M.P.H., FDA

Introduction to the workshop: Hira Nakhasi, Ph.D., FDA

Session I. GLOBAL PROBLEM OF MALARIA AND ITS IMPACT ON THE US BLOOD SUPPLY

Chair: Monica Parise, M.D., CDC

- 8: 20 Global problem of malaria, biology of malaria parasites and implications for transfusion-transmitted malaria and detection methods: Sanjai Kumar, Ph.D., FDA
- 8: 40 Malaria in the United States: Monica Parise, M.D., CDC
- 9:00 Malaria in the United States military and its implications for safety of the blood supply: Christian F. Ockenhouse, M.D., Ph.D., Walter Reed Army Institute of Research
- 9:20 Current deferral policies to reduce the risk of transfusion-transmitted malaria and their impact on donor availability: Alan Williams, Ph.D., FDA
- 9: 40 Panel discussion: Moderator: Monica Parise. Panelists: Sanjai Kumar, Christian Ockenhouse, Alan Williams

Q1. What are the main sources of malaria risk to the US blood supply?

Q2. How effective are the current safety interventions?

Session I: Malaria in USA

(Parise, CDC)

- **Travel to Africa accounts for only 0.6% of US travel in 2003, yet, 66.2% of all malaria infections and 85.9% of all *P. falciparum* infections were acquired in Africa in 2003**
- **From 1985-2002, 93% of all malaria deaths in US travelers due to Pf - 73% of those were acquired in sub-Saharan Africa**
- **TTM in US since (1990-2005)**
 - 16 cases; 1 US traveler (Kenya), 1 VFR (Africa), 12- immigrants, 12/14 acquired in Africa, 71% Pf**

Session II. TESTING FOR MALARIA INFECTIONS

Chair: Peter Chiodini, M.B.B.S., Ph.D., London School of Hygiene and Tropical Medicine, UK

10:30 Developing a test to detect malaria infections in blood donors:
P. Nigel Appleton, Newmarket Laboratories Ltd., UK

10:50 Antigen/antibody diagnostic assays for malaria: A CDRH perspective:
Freddie Poole, FDA

11:10 CDC experience with the laboratory tests used to investigate incidents of
transfusion-transmitted malaria: Marianna Wilson, M.S., CDC

11:30 Prospects for DNA-based tests to detect malaria infections: Sanjai Kumar, Ph.D.,
FDA

11:50 Panel discussion: Moderator: Peter Chiodini. Panelists: John Barnwell, Jon
Daugherty, P. Nigel Appleton, Freddie Poole, Marianna Wilson, Sanjai Kumar

Q. How sensitive and specific are the available tests for malaria in detecting the
infection at different clinical stages, and for different *Plasmodium* species?

Session II Testing for Malaria Infections (Nigel Appleton, Newmarket Labs)

- EIA sensitivity: Pf: 94%; Pv: 100%. Cross-reactive: Pm: 80%; Po: 67%

- EIA new version:

1 antigen	Sensitivity	69%
2 antigen	Sensitivity	73%
3 antigen	Sensitivity	82%
4 antigen	Sensitivity	99%

Session II Testing for Malaria Infections (Sanjai Kumar, FDA)

- **Highly infectious nature of malaria parasites causes a potential risk from a few parasites that could be present in a unit of blood**
- **Highest sensitivity achieved: 2 to 20 parasites/ml or 1000 parasites in a unit of blood**
- **Minimum number of infectious parasites present in a unit of blood: Not known (biggest road block)**
- **Possible solutions:**
 - **A technology for parasite concentration**
 - **An accurate knowledge of the minimum parasite burden in infected donors would allow to determine the required assay sensitivity**

Session III. PERSPECTIVES ON TESTING FOR MALARIA INFECTIONS IN BLOOD DONORS

Chair: Roger Dodd, Ph.D., American Red Cross

- 1:30 United Kingdom experience regarding malaria antibody tests and their contribution to blood safety: Peter Chiodini, M.B.B.S., Ph.D., London School of Hygiene and Tropical Medicine, UK
- 1:50 French experience with malaria antibody testing: Olivier Garraud, M.D., Ph.D., University of Saint-Etienne, France
- 2:10 (a) Australian experience with malaria antibody testing; and
(b) Feasibility of implementing a malaria test for the US blood donors: Susan Stramer, Ph.D., American Red Cross
- 2:40 Enhancing US blood availability by testing for *Plasmodium* spp. infection: David Leiby, Ph.D., American Red Cross
- 3:00 Estimated risks and benefits of blood donor screening for malaria compared with donor deferrals for geographical exposure: Steven Anderson: Ph.D., M.P.P., FDA
- 3:20 Panel discussion: Moderator: Roger Dodd. Panelists: Celso Bianco, Peter Chiodini, Olivier Garraud, Susan Stramer, David Leiby, Steven Anderson, Louis Katz, Steven Kleinman
- Q1. What are the lessons learned from testing for malarial antibodies amongst blood donors in Europe and Australia?
- Q2. What are the pros and cons of universal donor screening compared with testing only for donor reentry?

Session III Testing for Malaria Infections in Blood Donors

- **Prof Chiodini, UK**

–Donor testing for malarial antibodies in at-risk populations

2004	42947 tested	1209 RR	2.82%
2005	66994	1368	2.04%
J-M 06	11988	236	1.97%

- **Prof Garraud, France**

- **# of donations tested: 75,016 (≈3.5%)**

Negatives: 97.42%

Positives: 1%

Indeterminate: 1.59%

Session III Testing for Malaria Infections in Blood Donors (Susan Stramer, ARC)

- **Total malaria deferrals (23, 611, 536 presenting donors)**

2000-2005 (mean donation rate 1.69)

	No.	%	Projected total lost donor
Travel	241,777	1.01	410,844
Resident	25, 339	1.69	42, 635
Malaria 495		.002	831
Total	267,611	1.13	454,310

- **Australian EIA experience- at risk donors (7/17/05-3/30/06)**
26, 356 donors screened (vistors/residents/infection)
2.28% RR

Session III Testing for Malaria Infections in Blood Donors (David Leiby, ARC)

- **EIA Newmarket testing of Non-deferred donors**

N 3,229

1R 21 (0.65%)

RR 11 (0.34%)

11 RR Donors: 2-no travel; 2-born or lived in Africa; 1 travel to India; 4-previously dx/tx for malaria > 3 years ago, at least 3 lived/born in Africa

Confirmatory testing: CDC

Session IV. ROUND TABLE DISCUSSIONS

Moderator: Jay Epstein, M.D., FDA

1. What are the desirable characteristics of laboratory tests to detect malaria infections in blood donors?
2. What are the risks and benefits of donor screening for malaria infections in lieu of risk-based deferrals?
 - C. What are the prospects for the use of a malaria antibody test in the US?
 - I. To screen blood donors;
 - II. To reenter deferred blood donors.
 - D. What are the prospects for the use of DNA-based methods as blood screening tests in the US?

Panelists: Hira Nakhasi, Monica Parise, Matthew Kuehnert, Alan Williams, Peter Chiodini, Roger Dodd, Jerry Holmberg, Tom McCutchan, Louis Katz, Olivier Garraud, Steven Anderson

4:45 **OPEN DISCUSSIONS**

5:25 Closing Remarks: Jay Epstein, M.D.

Session IV

- **Donor deferral: Majority of clinical infections and TTM from donors born or lived in Africa. Doubts about 1 year deferral policy for all travelers especially those going to resorts in Mexico**
- **Parasite detection-**
 - DNA based tests: Technology deemed not ready due to its inability to detect a few parasites in a unit of blood**
 - Antibody testing: Experiences in UK, France and Australia were found to be satisfactory based on detection of 2/4 species**

Session IV

- **Antibody testing in the US-**
 - **Universal testing: Mixed responses but issue should remain open especially if there is sudden surge in malaria infections in the US**
 - **Testing in at-risk populations: More data needed for geography based distribution and species prevalence to decide the number of species representation in the assay**
 - **Some members of blood banking industry expressed concern regarding logistics related to database configuration to accommodate donor testing in a selected population**