

## **Preamble**

The Impact of Evimalar has been considerable. It has developed tools and mechanisms to both influence the future European research area but also to generate similar impact on a global level with a focus chiefly on Africa and Australia. Databases and technologies developed by the membership of Evimalar have a global influence and are used by the entire research community and are recoded in the main report and summarised here. The impact of Evimalar will be long lasting due to these advances, resources and the training that has been imparted during the course of the project.

## **Coordination of the European Research Agenda and beyond.**

The European Virtual Institute of MALARIA Research (Evimalar) was a Network of Excellence (NoE) funded under FP7. It was ultimately an alliance of **54** full members drawn from European Union's leading malaria research groups based in **36** institutions together with **6** leading African Institutions, the ICGB from India and with representation from OzEMalaR, a network of Australian malaria researchers ([www.ozemalar.org](http://www.ozemalar.org)). A further **31** European groups were affiliated to Evimalar. The focus of the network was upon basic biological investigations of the malaria parasite and its interactions with both host and vector. The network evolved during its lifetime incorporating new Full Members and Affiliates on an annual basis based upon application in response to publicised calls and evaluated independently by the External Scientific Advisory Board.

The network was coordinated out of the University of Glasgow and the Administrative Office was established there.

## **1. Shaping the Future Malaria Research Landscape**

The graduation of 22 PhD students (13 female) from the dedicated Evimalar PhD School based in Heidelberg is one of our most noteworthy achievements and it is hoped that they will go forward to form a new generation of malaria researchers. The research activity has been intense yielding 1149 peer-reviewed publications the vast majority of which were from collaborations that stemmed from within the network or its interactions with affiliated organisation such as Ozemalar. This interaction with the federated Australian malaria research community was also indicative of the global influence of the network. Interactions with our African partners remained strong and new members were introduced from the region during the lifetime of the Network.

### **1.a. Evimalar PhD School**

The Evimalar PhD School was established under the leadership of Prof Michael Lanzer at University of Heidelberg in co-operation with the European Molecular Biology Laboratory (EMBL) also in Heidelberg. 22 students were recruited and financed by central Evimalar funds disbursed to EMBL who awarded funding according to their standard PhD fellowship

model for 3.5 years. Students were considered to be EMBL fellows (a significant mark of prestige).

Table of fellows

Call	Name	Institution	1st PI	2nd PI	Country Of Origin
1ST CALL	Nicole Andenmatten	University of Glasgow - UK	Markus Meissner	Maria Mota	Switzerland
	Sujaan Das	NIMR London - UK	Michael Blackman	Dominique Soldati-Favre	India
	Ana Rita Gomes	Global Health Institute Lausanne - CH	Christian Doerig	Oliver Billker	Portugal
	Sanketha Kenthirapalan	MPI Berlin - D	Kai Matuschewski	Andy Waters	Germany
	Alexandra Marie	Institut de Recherche pour le Développement - F	Didier Fontenille	Mario Coluzzi / Bruno Arca	France
	Wiebke Nahrendorf	NIMR London - UK	Jean Langhorne	Robert Sauerwein	Germany
	Liz Stevenson	University of Copenhagen - DK	Lars Hviid	Alister Craig	United Kingdom
	Thuvaraka Thavayogarajah	University Marburg - D	Klaus Lingelbach	Anthony Holder	Germany
2ND CALL	Pablo Suárez Cortés	Istituto superiore di sanità Rome - I	Pietro Alano	David Baker	Spain
	Gabriella Sferra	Istituto superiore di sanità Rome - I	Marta Ponzi	Robert Sinden	Italy
	Mariana de Niz Hidalgo	CRESIB Barcelona - S	Hernando del Portillo	Volker Heussler	Mexico
	George Rugarabamu	University of Geneva - CH	Dominique Soldati-Favre	Chetan Chitnis / Michael Blackman	Tanzania
	Jaishree Tripathi	Instituto de Medicina Molecular Lisboa - P	Maria Mota	Oliver Billker	India
	Samuel Abah	NIMR London - UK	Delmiro Fernandez-Reyes	Mats Wahlgren	Nigeria
	Sonal Sethia	University of Glasgow - UK	Sylke Müller	Henri Vial	India
	Sonia Moliner Cubel	University of Heidelberg - D	Michael Lanzer	Henri Vial	Spain
	Ahmed Salman	Wellcome Trust Oxford - UK	Adrian Hill	Chris Janse	Egypt
	Harshal Patil	University of Glasgow - UK	Andy Waters	Freddy Frischknecht	India
	Kartik Bane	University of Heidelberg - D	Freddy Frischknecht	Dominique Soldati-Favre	India
	Jenny Howard	University of Bordeaux - F	Charlotte Behr	Marita Troye-Blomberg	United Kingdom

36 PIs participate in the PhD Programme. No PI is listed more than once as 1st PI.

Some PIs are listed up to three times as 2nd PI (dissemination of innovative technologies)

Of 72 EVIMalaR members, 48 submitted projects and 36 got a PhD student - 75% of those who submitted a project. The programme was open to all member both full and affiliate.

Of the 20 EVIMalaR countries, 40% of all consortium countries host a PhD student.

Student newsletters can be viewed here: <http://www.evimalar.org/phd-school/phd-school-newsletters.html>

### 1.b. Evimalar Fellowships

Often the most difficult step in a scientific career is to obtain the first fellowship following a successful defence of a PhD thesis. Recognising this Evimalar created 5 post-doctoral fellowships that provided two years salary. They were awarded to:

#### 2010

Dr. Kerstin Stegmann (London School of Hygiene and Tropical Health)

Dr. Valentina Mangano (University of Rome)

#### 2011

Carolina Nersesian (Bernhardt Nocht Institute for Tropical Medicine),

Liliana Mancio Silva (Instituto de Medicina Molecular)

Paco Pino (University of Geneva).

Applications were received in response to calls placed on the Evimalar website and the ESAB evaluated the applications

### 1.c. Training Courses

Evimalar sponsored and Network members organised and delivered a number of skills based training courses to disseminate expertise and technologies both within and without the network. These formed part of a continuing commitment to capacity building both within and outside the ERA

#### **2014**

- **6 - 12 March: Malaria Experimental Genetics** - Wellcome Trust Genome Campus, Hinxton, Cambridge, UK

#### **2013**

- **20 - 25 October: Working with parasite database resource workshop** - Wellcome Trust Genome Campus, Hinxton, Cambridge, UK
- **5 - 15 August: Workshop on Advanced Imaging Techniques for Malaria Researchers** - University of Technology, Sydney
- **16 - 18 May: An EVIMalaR workshop for Imaging Malaria Parasites** - University of Heidelberg, Germany
- **11 - 13 May: BioMalPar Workshop** - EMBL Heidelberg, Germany
- **3 - 9 March: Malaria Experimental Genetics** - Wellcome Trust Genome Campus, Hinxton, Cambridge, UK

#### **2012**

- **16 - 22 January: Mali Cell Biology Workshop** - Malaria Research & Teaching Center, Mali
- **4 - 10 March: Malaria Experimental Genetics** - Wellcome Trust Genome Campus, Hinxton, Cambridge, UK
- **16 May: New tools for P. berghei reverse genetics** - EMBL, Heidelberg, Germany
- **16 - 20 May: Imaging Malaria Parasites Workshop** - University of Heidelberg, Germany
- **10 - 13 June: Genomic Epidemiology of Malaria** - Wellcome Trust Genome Campus, Hinxton, Cambridge, UK
- **10 - 14 September: Metabolomics of Protozoan Parasites Workshop** - University of Glasgow, Scotland, UK
- **21 - 26 October: Working with Parasite Database Resources** - Wellcome Trust Genome Campus, Hinxton, Cambridge, UK
- **13 - 14 December: Paradigms in Parasite Imaging** - University of Heidelberg, Germany

#### **1.c. African initiatives to Shape the Future Research Agenda**

The following meetings were organised that in general helped shape discussion towards a greater self-determination and infrastructure/capacity building based upon skills and training within Africa.

#### **2015**

- **03 - 04 February - AfriMalaR Meeting** - Addis Ababa, Ethiopia

#### **2013**

- **9 October: MIM - Women and Science Breakfast Seminar** - Hilton Hotel, Durban
- **6 - 11 October: 6th Multilateral Initiative on Malaria Pan African Conference (MIM) 2013** - Th International Convention Centre, Durban SA
- **6 October: EVIMalaR Workshop: Career Opportunities for African Malaria Researchers** - MIM Conference, Durban

## 2012

- **16 - 22 January: Mali Cell Biology Workshop** - Malaria Research & Teaching Center, Mali
- **15 - 18 October: Challenges & Opportunities in Africa** - University of Cape Town, South Africa

### 1.d. Ozemalar

A reciprocal exchange initiative was established between Evimalar and Ozemalar the confederated community of malaria researchers in Australia funded under the auspices of the NHMRC - European Union (EU) Collaborative Research Grants scheme which supported Australian participation in leading international collaborative research under FP7. The general aims of the scheme were

- promote and facilitate interaction between colleagues, peers and potential research partners;
- communicate the scientific achievements of Evimalar/OzEMalaR participants; and
- create professional development opportunities for them, in particular for postgraduate students and early career postdoctoral fellows.

Evimalar/Ozemalar funded 39 exchanges of which 22 were undertaken by female participants. Ozemalar funding continues.

## 2. Formation of a durable mechanism for continued coordination of research.

We have created a European Economic Interest Group (EEIG) named EVIMALAR that is available for use by the 13 founding members as a mechanism to apply for further funding from national and international funding agencies. It is registered at Companies House in Edinburgh and will operate under Scottish law. The University of Glasgow has been elected as the first administrative manager of the EEIG where the registered office is located. Prof. A.P. Waters (University of Glasgow), the Scientific Director of Evimalar will serve in the same capacity for the newly established EEIG.

## COMPANY DETAILS

**Name & Registered Office:**  
 EVIMALAR EEIG  
 10 THE SQUARE  
 UNIVERSITY OF GLASGOW UNIVERSITY  
 AVENUE  
 GLASGOW  
 G12 8QQ

**Company No.:** GS000009

**Date of Incorporation:** 20/04/2015  
**Country of Origin:** United Kingdom

**Status:** Active

**Company Type:** Other company type  
**Nature Of Business (SIC):**  
 None Supplied

**Accounting Reference Date:**  
**Last Accounts Made Up To:** (NO ACCOUNTS FILED)  
**Next Accounts Due:**  
**Last Return Made Up To:**  
**Next Return Due:**

**Mortgage: Number of Charges:** ( 0 outstanding / 0 satisfied / 0 part satisfied )

**Previous Names**

No previous name information has been recorded over the last 20 years.

**Founding Members**

1. University of Glasgow, UK (Administrating Member (AM))
2. London School Hygeine & Tropical Medicine, UK  
(Non-Administrating Member (NAM))
3. Liverpool School Tropical Medicine, UK (NAM)
4. Instituto de Medicina Molecular, PT (NAM)
5. Centre de Recerca en Salut de Barcelona, SP(NAM)
6. Forth-IMBB, Crete, Greece(NAM)
7. Instituto Superiore di Sanita, IT (NAM)
8. University of Rome, IT (NAM)
9. University of Torino, IT (NAM)
10. University of Heidelberg,DR (NAM)
11. University of Leiden, NL (NAM)
12. Radboud University Nijmegen, NL (NAM)
13. Biomedical Primate Research Centre, NL (NAM)

### 3. Generation of resources with sustained utility beyond the lifetime of the network (see <http://www.evimalar.org/resources/>)

The membership of Evimalar created numerous tools, technologies, resources that have a global impact and utility. Many of these were directly promoted by Evimalar actions. Some examples are:

#### A. Database resources

A resource grant was awarded to and a resource grant to Prof Chris Newbold and Dr Matt Berriman, University of Oxford and Wellcome Trust Sanger Institute to facilitate malaria parasite genome curation and annotation work that is enshrined in GeneDB.org and transmitted to PlasmoDB.org.

Dr Chris Janse and colleagues created RGMGM.eu which is a database of published and many unpublished lines of genetically manipulated rodent malaria parasite lines (generally *P. berghei*).

EVIMalaR-SEEK is an online database of research relating to malaria in Europe and beyond. It is funded by the European Virtual Institute of Malaria Research (EVIMalaR), an EC FP7 Network of Excellence. It was established by EVIMalaR Research Cluster 4 (Modelling and Systems Biology) and is co-ordinated by the Bioinformatics Support Service at Imperial College London.

The Leiden SharePoint site is a resource with relevance for researchers working with rodent malaria parasites and is maintained by the [Leiden Malaria Research Group](#). The information includes laboratory protocols, datasets and background information on the rodent model of malaria research from the Leiden Group. It also contains information on transgenic reporter parasite lines and plasmids available from the Leiden Group. The information on the site is password protected. A password can be obtained on request by filling an access/password request form on the website. As of March 2013 the site has more than 400 registered members (principally malaria researchers from all over the world).

The by now popular Malaria Parasite Metabolic Pathways (MPMP) website (more than 125,000 visitors and more than 70 times cited in the literature) has undergone important improvements and appeared recently on the web and can be reached by the URL: <http://mpmp.huji.ac.il>. In addition to the known features of maps of metabolic pathways and biological processes, including those which are specific to the parasite such as invasion, cytoadherence non-mevalonate biosynthesis of isoprenoids, the pictorial database of sub-cellular localization of proteins is now fully deployed. The new website has an intricate search engine and the components of the maps and tables are linked on line to GeneDB and PlasmoDB as well as to KEGG and BRENDA and of course to PubMed. All these links allow a deeper probing of genes and the function of their products

## **B. Genetic resources**

The Sanger Institute Malaria Programme has generated a resource of tool plasmids, protocols and hundreds of *P. berghei* genetic modification vectors, which were distributed to many Evimalar labs and are available for all to view and request on [PlasmoGEM.sanger.ac.uk](http://PlasmoGEM.sanger.ac.uk)

DiCre technologies for conditional genetic engineering of parasite genomes have been pioneered by Evimalar Members who introduced the technology for *T. gondii* and which was adapted in collaboration for different malaria parasites.

## **C. Outreach Resources for communication with External Stakeholders**

A revised edition (the 6<sup>th</sup>) of Methods in Malaria Research was compiled and published. It contains protocols provided by 122 scientists from the global malaria community. The manual is considered a “working document” that, with the help of our readers and users, will continuously grow and evolve as new and improved methods are developed. We, and the contributors hope that the manual will help and assist researchers at all stages of their careers in carrying out frontline research.

<http://www.malariacom.com/about-us/resources.html> is outreach and educational resource of Evimalar featuring graphic magazines that explain what is malaria and what the Evimalar Scientists do – available in print or to red online in 9 different languages including disease endemic African languages and Hindi. In addition the educational resource contains teacher presentation packs that allow educators to explain malaria to schoolchildren.

#### 4. Addressing Gender Issues in Malaria Research.

At all stages and in all activities Evimalar remained aware and proactive regarding gender balance. The statistics are reproduced here from the larger Final Report and in general were distributed favourably to females. Awards made from Evimalar funding, PhD studentships and post-doctoral fellowships clearly favoured females.

<b>2009-2010</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
The new selection of Evimalar PhD students	3	7	10
The new selection of affiliated members of Evimalar	5	3	8
The new selection of Post doctoral fellowships awards	0	2	2
The talk and poster prizes awards at the last BioMalPar meeting in HD	2	2	4
<b>2010-2011</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
The new selection of Evimalar PhD students	6	6	12
The new selection of affiliated members of Evimalar	6	2	8
The new selection of Post doctoral fellowships awards	1	2	3
The talk and poster prizes awards at the last BioMalPar meeting in HD	4	4	8
Ozemalar exchanges with Australia	4	3	7
The new selection of PI's	3	2	5
<b>2011-2012</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>

The new selection of affiliated members of Evimalar	2	2	4
The new selection of full members of EVIMalaR		1	1
New member of ESAB		1	1
New admin staff member		2	2
Ozmalnet/IRSES exchanges		2	2
The talk and poster prizes awards at the last BioMalPar meeting in HD	3	2	5
<b>2012-2013</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
The new selection of affiliated members EVIMalaR	3	1	4
New Admin Staff		2	2
Ozmalnet/IRSES exchanges	13	19	32
The talk and poster prizes awards at the last BioMalPar meeting in HD	2	3	5
<b>2013 - 2015</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
<b>No new members</b>			
<b>No new staff</b>			
The talk and poster prizes awards at the last BioMalPar meeting in HD	<b>2</b>	<b>2</b>	<b>4</b>
<b>Totals</b>	<b>57</b>	<b>68</b>	<b>129</b>

In addition specific activities were organised to debate the issue of gender both in modern society as well as within the arena of Biomedical Scientific research. Specifically, in Durban at the 2013 Multilateral Initiative on Malaria (MIM) meeting a scientific breakfast was held to discuss Career tracks for African women in African Research; and sponsored a “Women in Science Meeting” that was held in Rome in 2013 and attended by 50 participants (3 male delegates).

Evimalar Gender themed activities:

#### **2014**

- **13 May - Enhancing Career Confidence - EVIMalaR Breakfast Seminar - EMBL Heidelberg**
- **12 May - Foundations for Growth - EVIMalaR Career Development & Gender Meeting - EMBL Heidelberg**



- **12 - 14 February - EVIMalaR Career Development and Gender Meeting** - Rome, Italy

## **2013**

- **9 October: MIM - Women and Science Breakfast Seminar** - Hilton Hotel, Durban

## **5. Communication with External Stakeholders**

- Set up of a NoE Website ([www.malariacomics.com](http://www.malariacomics.com) Delivered & continually developed and updated) Intelligent comic website established and translated into 9 languages
- Interaction with malaria scientific community. Workshops, cluster & Annual Meetings (Delivered)
- Interactions with stakeholders/relevant organisations. Attendance at National Funding Body Meetings, Horizon 2020, Gates, Wellcome & MRC (delivered)
- Interaction with industry/SMEs via task force.
- Interactions with general public (delivered) Intelligent comic website and hard copy distributed to the general public through schools and science centre exhibitions.