

Research Supporting Facilities

5.1 Animal house facility

Rabbits, pigeons, domestic fowls, laboratory mice, etc. are being maintained as per the guidelines issued by the concerned authorities. These animals were housed at 22, Sham Nath Marg and 2, Nanak Enclave buildings and were used as blood meal source to mosquitoes of different species and strains maintained at the Institute. Laboratory mice were used in screening the antimalarials, host-parasite interaction studies and maintenance of rodent plasmodia at the parasite bank. Experiments on animals were performed with the approval of the Scientific Advisory Committee (SAC) and Institutional Animal Ethics Committee (IAEC) of the Institute.

5.2 Repository of biological material

5.2.1 Mosquito species

Anopheles stephensi

From urban and semi-urban areas

Nehru Place, Delhi
Nathupura, Delhi
Gurgaon, Haryana
Nanak Enclave, Delhi
Hardwar, Uttaranchal

From rural areas

Ladpur, Haryana
Badhdhana, Haryana
Single Line, Punjab
Faridkot, Punjab

Morphological mutants

Red eye (re) – sex-linked recessive
Black larvae (bl) – autosomal semi-dominant

Golden yellow (gy) – autosomal semi-dominant
Creamish white eye (cw) – new mutant
Black larva white eye (blew) – new mutant

Biochemical variant

Bahadurgarh, Haryana (EST-2)

Anopheles culicifacies Complex

Species A

Dehra, Uttar Pradesh
Burari, Delhi
Rourkela, Orissa
R6-Rourkela, Orissa
RM-4-Chennai, Tamil Nadu

Species B

Acrocentric Y-chromosome lines
Ladpur, Haryana
Haldwani, Uttaranchal
R39-Rourkela, Orissa

Species C

Submetacentric Y-chromosome lines
Jabalpur, Madhya Pradesh
Rourkela, Orissa

Anopheles fluviatilis Complex

Species T

Rourkela, Orissa
Hardwar, Uttaranchal
Haldwani, Uttaranchal

Species U

Hardwar, Uttaranchal

Anopheles sudaicus Complex

Andaman & Nicobar Islands

Morphological mutant

Dark green (Larvae) – mutant

Aedes aegypti

Delhi

Culex quinquefasciatus

Delhi

Morphological mutants

Red eye (re)

Scarlet eye (se)

5.2.2. Parasite species

Human Plasmodia

- Non-adapted cryopreserved isolates of *P. falciparum*, *P. vivax* and *P. malariae*
- Sera/plasma from infected patients

P. falciparum

- Adapted/Characterised isolates
- Different stages of the parasite from culture
- Merozoites (from culture supernatant)
- Ring (by synchronisation)
- Gametocytes (by Hypoxanthine treatment)
- Free parasites for antigen preparation (by Saponin lysis and ultrasonication)

P. vivax

- Sporozoites harvested from artificially fed mosquitoes

Cell Lines

- Hepatoma cell line: Hep G2 A16 used in the *in vitro* cultivation of pre-erythrocytic stage malaria parasites
- Myeloma cell line: SP2
- Hybridomas: 2A 10 (anti-*P. falciparum* sporozoite antibody secreting cells); 2 F2 1 A7 (anti-*P. vivax* sporozoite anti-body secreting cells)

Non-human Plasmodia

- Different species of avian, simian and rodent plasmodia
- Rodent plasmodia infected rats/mice
- Sera/plasma from respective vertebrate hosts

Human malaria parasites in the Parasite Bank

Parasite species	Collection sites (States and districts)	No. of isolates	
<i>P. falciparum</i>	Andhra Pradesh Visakhapatnam	12	
	Assam Sonapur Tezpur	20 6	
	Chhattisgarh Jagdalpur	14	
	Delhi Delhi	191	
	Gujarat Anand Kheda	4 7	
	Haryana Gurgaon	25	
	Karnataka Mangalore	14	
	Madhya Pradesh Mandla/Jabalpur	14	
	Orissa Rayagada Sundargarh	29 42	
	Rajasthan Alwar Bharatpur Jaisalmer	25 35 38	
	Tamil Nadu Chennai Ramanathapuram	3 1	
	Uttar Pradesh Baharaich Gautam Budh Nagar Ghaziabad Allahabad	22 37 17 60	
	West Bengal Kolkata Midnapur	18 1	
	Total	635	
	<i>P. vivax</i>	Karnataka	6
		Delhi, Uttar Pradesh and Orissa	53
		Tamil Nadu	3
	<i>P. malariae</i>	Orissa	5

Details of characterised *P. falciparum* Isolates at the Parasite Bank

Species/Strains of parasite	No. of isolates
Adapted isolates susceptible to chloroquine	54
Adapted isolates resistant to chloroquine	52
NF-54 : an infective gametocyte producing strain of <i>P. falciparum</i>	1
3D 7A : a clone of NF-54	1
A-4 : a clone with binding property to CD36	1
Dd2 : a clone which can invade trypsin treated erythrocytes	1
Field isolates which can invade trypsin treated erythrocytes	3
Field isolates which can invade neuraminidase treated but not trypsin treated erythrocytes	3
Field isolates which can invade normal erythrocytes but not neuraminidase or trypsin treated erythrocytes	3
Field isolates which can invade both neuraminidase treated and trypsin treated erythrocytes	5
Field isolates which can form rosettes	3
Field isolates which can bind to CSA	1
Field isolates which can bind to CD36	9
Field isolates which can bind to ICAM-1	2
Isolates with isoenzyme profile of GPI, GDH, ADA and LDH markers	22
Isolates with MSP-1, MSP-2 and GLURP markers	40

Non-human malaria parasites available at the Parasite Bank

Parasite species	Source	Susceptibility to antimalarials
Simian malaria parasites		
<i>P. cynomolgi bastianelli</i>	NICD, Delhi	Not done
<i>P. knowlesi</i>	NICD, Delhi	Not done
<i>P. fragile</i>	CDRI, Lucknow	Not done
Avian malaria parasites		
<i>P. gallinaceum</i>	NICD, Delhi	Not done
<i>P. relictum</i>	Wild, Delhi	Not done
Rodent malaria parasites		
<i>P. berghei</i> NK-65	PGI, Chandigarh	Not done
<i>P. berghei</i> NK-65*†	CDRI, Lucknow	CQ sensitive
<i>P. berghei</i> *	CDRI, Lucknow	CQ resistant
<i>P. berghei</i>	CDRI, Lucknow	Quinine resistant
<i>P. chabaudi</i>	INSERM, Paris	Not done
<i>P. vinckei petteri</i> 279 BY	INSERM, Paris	Not done
<i>P. yoelii yoelii</i> 265 BY**	INSERM, Paris	Not done
<i>P. yoelii nigeriensis</i> **†	LSHTM, London	Not done
<i>P. yoelii nigeriensis</i>	CDRI, Lucknow	Multi-resistant
<i>P. yoelii</i>	ICGEB, New Delhi	Not done

*Oocyst positive in *An. stephensi*; **Oocyst and sporozoite positive in *An. stephensi*; †Infective gametocyte producing strain.

5.3 Library

The Institute has one of the best libraries in the country in the field of malaria having more than 6735 books, 4083 bound journals, 3573 reprints, 18 video cassettes, 27 audio cassettes, 20 microfilms, 19 theses and 106 national and international reports. About 52 journals (39 Foreign and 13 National) are being subscribed besides 8 journals which are received on complimentary and exchange basis. Two magazines and six newspapers are subscribed. About 201 new books were added during this financial year.



The library renders its services not only to the scientists/research scholars of the Institute but also to various national and international universities and organisations. During the year modernisation process has been expedited and entry into LIBSYS software of about 6308 books and 2000 journals had been completed. Library is also serving its users through DELNET. Other services such as information retrieval, citation index, internet facility, inter library loan facility, reprographic services, etc. are also being provided to the users. J Gate and JCCC@ICMR & Proquest Medical database are being provided to NIMR scientists in Delhi and IDVC field units located in different parts of India. In the process of modernisation application of barcode system is under progress.



OBITUARY

Dr. C. Usha Devi (1948–2005)

Dr. Usha Devi joined MRC in 1981 as Assistant Research Officer and served in different capacities for about 25 years. She was Assistant Director when she passed away on 5 October 2005. Her efforts in establishing the Malaria Parasite Bank and also screening of medicinal plants for their antimalarial activity are highly appreciated. She has published more than 35 research papers and her services to this institute shall be remembered always.

