

**Programme
Handbook
2019/20**



**MSc/Diploma/
Certificate in
Tropical Disease
Biology**

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Key Programme Contacts

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Student Advice and Well-being team (First Floor, 66 Wing)

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Introduction to the Programmes

This handbook provides you with specific information about the MSc in Tropical Disease Biology. You will also be provided with a general student handbook which covers issues common to all Masters students studying at the School. It is most important that you are aware of the information provided in these handbooks.

Since 1898, the Liverpool School of Tropical Medicine has gathered students with varied backgrounds from all over the world. The laboratory-based MSc programme has its origin in the MSc in Applied Parasitology and Medical Entomology, started in 1963 by Dr W Crewe on his return from ground-breaking studies on Calabar swelling (caused by *Loa loa*) in Cameroon. Since then the names and content of the programmes have evolved in response to the ongoing challenges we face and the new technologies that have been developed. However, our underlying philosophy of providing excellence in teaching and research relevant to developing countries has not altered. Many of the Masters students we have educated to date have established successful careers in research in the academic or private sectors, or have gone on to work in development as part of government or NGO teams.

MSc/Diploma/Certificate in Tropical Disease Biology

Programme Aims and Learning Outcomes (TDB)

Outline

This programme provides advanced contemporary training in the study and research of medically important pathogens, parasites, arthropods, vector-borne diseases and organisms of importance to public health with particular emphasis on tropical and resource-poor regions of the world. The broad scope of the programme ranges from the biology, immunology, molecular and cellular biology of the organisms of importance to public health and tropical health issues, to their ecology, population biology, and disease epidemiology. In addition to providing a solid foundation in pathogen, parasite and vector biology, the programme provides laboratory and field practical experience of essential methods and techniques highly relevant to a future research career, as well as significant theoretical and practical knowledge in all important and topical areas of tropical health and disease biology. The full programme specification can be viewed on the LSTM website.

Aims

The curriculum has been informed by current national and international priorities and policies in the field of tropical disease biology. The programme aims to:

Equip students with the knowledge and practical skills needed to develop a career in research, training or control of vector-borne diseases, pathogens, parasites, and organisms of importance to public health with particular emphasis on tropical and resource-poor regions of the world.

Provide practical experience of a range of specialised technical and analytical skills relevant to the study of disease vectors, pathogens, parasites, and organisms of importance to public health with particular emphasis on tropical and resource-poor regions of the world.

Enable students to conduct independent research in the laboratory and/or field.

Produce graduates who are experienced, committed, informed, proactive and effective professionals, capable of taking substantial and leading professional roles.

Facilitate high quality learning that is informed by critical analysis of current research.

Subject-based learning outcomes

A. Knowledge and Understanding

Upon successful completion of the programme, a student should have developed and be able to demonstrate:

A1. A systematic understanding and critical awareness of current issues and priorities in the fields of biology, molecular and cellular biology, and control of pathogens, parasites, vectors of disease, and organisms of importance to public health with particular emphasis on tropical and resource-poor regions of the world.

A2. Knowledge of a range of relevant research methods and understanding of how the methods can be applied to address particular research questions.

A3. Ability to apply statistical knowledge and understanding to design a research study and to analyse and interpret critically data.

A4. Knowledge and understanding of the biology, molecular and cellular biology, and epidemiology of pathogens, parasites, vectors of disease, and organisms of importance to public health with particular emphasis on tropical and resource-poor regions of the world.

A5. Critical understanding of current methods for preventing human disease and an appreciation of research developments in the study of organisms of importance to public health, parasite, pathogen and vector biology that may lead to the development of novel control strategies with particular emphasis on tropical and resource-poor regions of the world

B. Cognitive skills

Upon successful completion of the programme a student should be able to:

B1. Analyse, synthesise and evaluate information from a variety of sources in a critical manner

B2. Apply subject knowledge and understanding in a variety of contexts to analyse and reach evidence-based conclusions on complex situations, problems and opportunities

B3. Apply the principles and values of ethical practice with regard to the design and practice of research studies, consent and confidentiality in the collection and presentation of data, and publication

B4. Demonstrate creativity, innovation and originality in the application of knowledge

C. Practical/professional skills

Upon successful completion of the programme a student should be able to:

C1. Formulate a research question, devise an appropriate research strategy and take a systematic approach to project planning and management

C2. Undertake research investigations in a responsible, safe and ethical manner and accurately record the data collected

C3. Effectively manage, analyse and report data collected in the laboratory or field

Programme Structure (TDB)

The programme is offered within a dynamic research-led environment and its content is informed by the cutting-edge research activities of the academic staff. It is designed to enable the professional development of the student, to be relevant to students from both the UK and overseas, and to promote approaches to study that will enable graduates to continue their learning into the future.

The programme comprises a three day field trip and an introductory induction week, followed by taught modules totalling 120 credits and a 60-credit dissertation (Table 1). A 10-credit module (5 ECTS credits) represents 100 hours of student learning activity including assessment and self-directed study.

Required modules are necessary to achieve the programme learning outcomes and must be taken by all students following the programme. The optional modules listed have been identified as most suitable for contributing to the attainment of the programme learning outcomes. However, depending on their background or interests, students may opt to replace these optional modules with modules offered as part of other LSTM MSc programmes, subject to the agreement of the Director of Studies for the programme. NB Students should be aware that choosing modules other than those indicated as optional may result in an 'unnamed' award (refer to programme specification for details). (see Table 2)

Table 1: Modular structure of MSc TDB Programme (required modules are shown in bold)

w/b	Week	Mon	Tues	Wed	Thurs	Fri (am)	Fri (pm)
02/09	Field trip	Registration (3.9.19) + Field Trip (4.9.19-6.9.19)					
09/09	Induction	Induction + Introduction to Key Skills					
16/09	1	TROP 936: Research Methods in Parasitology and Vector Biology (30 credits)		TROP 939: Biology of Tropical Health, Pathogens and Vectors of Disease (30 credits)		Research Methods(am) and Key Themes (pm)	
23/09	2						
30/09	3						
07/10	4						
14/10	5						
21/10	6						
28/10	7						
04/11	8						
11/11	9						
18/11	10						
25/11	11						
02/12	12						
09/12	13						
16/12		Christmas Holiday					
23/12		Revision + Assessments					
01/01*	14	Revision + Assessments					
06/01	15	Semester 2 (60 credits)		Block 1		TROP775 Key Aspects in Molecular & Cellular Biology of Tropical Diseases & Vectors (20 credits) OR TROP 719: Parasite Epidemiology & Control (20 credits)	
13/01	16						
20/01	17						
27/01	18						
03/02	19			Block 2		TROP 741: Vector Population Biology and Control (20 credits) <u>or</u> TROP 739: Immunology of Tropical Diseases (20 credits)	
10/02	20						
17/02	21						
24/02	22						
02/03	23			Block 3		TROP 971: Statistical Methods for Epidemiological & Clinical Research (10 credits) OR TROP 969 Key Topics in Snakebite (10 credits) OR TROP975 Medical Bacteriology (10 credits)	
09/03	24						
16/03	25			Block 3		TROP 971: Statistical Methods for Epidemiological & Clinical Research (10 credits) OR TROP 970 Applied Bioinformatics (10 credits)	
23/03	26						
30/03	27			Block 3		Assessments	
06/04*	28						
13/04*	29			Block 3		Reading Week	
20/04	30						
27/04	31			Block 3		Preparation for Research Presentations + 1 st semester re-sits	
04/05**	32						
Weeks 33-48 (11/5/20**- 23/8/20) Dissertation hand-in 27/08/20		Semester 3 (60 credits)		Research Project TROP942			
						Deferred Holiday	

* School closed for New Year BH (1/1/20) & Easter Bank Holidays 10/4/20 and 13/4/20

** School closed for May Bank Holiday Fri 8/5/20 & 25/5/20

Table 2: Optional modules offered in Semester 2 for LSTM MSc programmes. Optional modules recommended for students on MSc TDB are shaded. Required modules are shaded and in bold. Other modules can be taken by MSc TDB students subject to the approval of the Director of Studies

Wks								
15-16	06/01	Organisation & Management TROP708	Complex Humanitarian Emergencies TROP807	Key Concepts in Sexual & Reproductive Health TROP923	Quality Improvement in Global Child Health TROP910	Parasite Epidemiology and Control TROP719***	Key Aspects in Molecular & Cellular Biology of Tropical Diseases and Vectors TROP775***	HIV in Resource Limited Settings TROP974
	13/01							
17-18	20/01	HR Planning & Management TROP915						
	27/01							
19	03/02	Reading week/Assessments						
20-21	10/02		Systematic Reviews for Policy and Practice TROP973		Global Climate Change & Health TROP927	Vector Population Biology & Control TROP741	Immunology of Tropical Diseases TROP739	
	17/02							
22-23	24/02	Health Promotion TROP976	Development of a Disease Control Programme TROP706	Reproductive Sexual & Adolescent Health TROP926				
	02/03							
24	09/03-13/03	Reading week/Assessments						
25-26	16/03	Management of Refugee and Displaced Populations TROP941	Key Topics in Snakebite TROP969	Quality Improvement in Maternal & Newborn Health TROP972	Statistical Methods for Epidemiological & Clinical Research TROP971*	Medical Bacteriology** Trop 975		
	23/03							
27-28	30/03	Health in Humanitarian Emergencies TROP900	Applied Bioinformatics TROP970	Media, Policy & Advocacy in Humanitarian Action TROP809	Statistical Methods for Epidemiological & Clinical Research TROP971*	Humanitarian Operations TROP901	Child Nutrition TROP776	
	06/04							
29-32	13/04	Assessments						
	20/04	Reading week						
	27/04	Preparation for Research Presentations + 1 st semester re-sits						
	04/05	Research Presentations						

*TROP971 –module runs twice – students should only choose once

**Students on the Tropical Disease Biology programmes should normally only undertake TROP975 if they are intercalating medical students or have a clinical background, due to the clinical content of the module.

***Students on TDB must choose one of these modules

Assessment Schedule (TDB)

Module Title	Timing	Assessment Strategy	% of module mark
Semester 1			
TROP 936 (R)	In module	Short/long answer exam	50
	End of module	2500-word research proposal (minimum mandatory mark 40%)	50
TROP 939 (R)	In module	2-hour MCQ exam	60
		2-hour examination testing practical pathogen identification and diagnostic skills, with critical analysis of findings relating to the tropical pathogens and vectors responsible for transmission.	40
		500-word formative critical review of a relevant topic in tropical disease and vector biology.	0
Semester 2 Block 1			
TROP 719 (O)	In module	Poster with 15-minute oral presentation	50
	End of module	2-hour exam (essay)	50
TROP775 (O)	In module	1.5 hour exam (essay)	30
	End of module	2000 word practical report	60
	In module	10 minute critical analysis and presentation of research journal paper	10
Semester 2 Block 2			
TROP 741 (O)	End of module	2-hour exam (essay)	65
		1500-word critical review	35
TROP 739 (O)	End of module	2-hour exam (essay)	50
		3000-word laboratory report	50
Semester 2 Block 3			
TROP 971 (O)	End of module	2000-word report based on analysis of a data set	100
TROP 970 (O)	End of module	Poster with 15-minute oral presentation	100
TROP 969 (O)	End of module	3000-word assignment	100
TROP975 (O)	End of module	1500 word written assignment	60
		1 hour exam (multiple choice)	40
Semester 3			
Research Project (R)	In module	10-minute oral presentation of research proposal.	10
	End of module	16,000-word research dissertation	90

Important Dates

MSc Project choices deadline – 18 October 2019

Deadline for Semester 2 module choices – 31 October 2019

Allocating/defining dissertation topics: September-October 2019

Developing proposal for Dissertation Project: September 2019-January 2020

Submission to Masters Ethics Committee (if required): February 2020

Fieldwork: April/May – June/July 2020

Dissertation writing: June – August 2020

Dissertation Submission deadline: 27 August 2020

Board of Examiners meeting: October 2020

Release of results: Following Board of Examiners meeting

Graduation Ceremonies: December 2020

Research Project

Many students carry out a laboratory or data/literature-based dissertation project in LSTM but students can opt to conduct a fieldwork-based project overseas. Whilst overseas, students are supervised by a designated person in the host country, as well as by a member of LSTM staff who most often will remain in the UK though be in contact remotely via emails, telephone or other means as appropriate. All projects have the key aims of developing students' skills in formulating a research question, designing and implementing a research project and critically interpreting and presenting the findings. Further information regarding the dissertation will be provided elsewhere.

Where appropriate, research proposals must be approved by the MSc Ethics Review Panel of the Liverpool School of Tropical Medicine and by in-country Ethics boards or committees. Further information and guidance on preparing a submission to the Ethics Committee will be provided during TROP934.

Castle Head Field Course

The programmes begin the week prior to the formal induction programme with the Field Course held in Castle Head, near Grange-Over-Sands in Cumbria. The purpose of the Field Course is to introduce you, in nature, to representatives of most of the parasite and insect groups which you will study in detail later, as well as methods of collecting and studying these in the field.

It is also intended that you should get to know each other and some of the staff under relaxed informal conditions. The Field Course is not formally assessed. You will be issued with a Handbook for this Field Course.

Teaching Staff

Name	Main Interest	Location	Ext.	Email@lstmed.ac.uk
Dr A Acosta-Serrano	Trypanosomes	CTID – 3 rd Flr	3304	Alvaro.acosta-serrano
Dr E Adams	Parasitology	CTID – 2 nd Flr	3196	Emily.adams
Dr N Beeching	Clinical Infectious Diseases	Gilles wing – 3 rd Flr	3835	Nicholas.beeching
Prof G Biagini	Malaria	CTID – 2 nd Flr	3151	Giancarlo.biagini
Dr G Camarda	Malaria	CTID – 2 nd Flr	2580	Grazia.camarda
Dr N Casewell	Snake Venoms	CTID 3 rd Flr	9329	Nicholas.casewell
Prof A Craig	Malaria	CTID – 2 nd Flr	3161	Alister.craig
Dr L Cunningham	NTDs	CTID 3 rd Flr	3196	Lucas.cunningham
Dr R Dacombe	Microbiology	McGraith Wing 3 rd Fl	2582	Russ.dacombe
Prof M J Donnelly	Vector Biology	CTID – 1 st Flr	3296	Martin.donnelly
Dr T Edwards	Molecular Biology	CTID – 3 rd Flr	3196	Thomas.edwards
Dr L Ford	Parasitology	CTID – 2 nd Flr	2558	Louise.ford
Prof P Garner	Cochrane Global Health	McGraith Wing 3 rd Fl	3201	Paul.garner
Dr L Haines	Vector Biology	CTID – 2 nd Flr	2529	Lee.haines
Mr Greg Harper	Dagnall Lab	Gilles wing – 1 st Flr	3213	Gregory.harper
Prof R Harrison	Snake Venoms	Main Bld – 3 rd Flr	3164	Robert.harrison
Dr I Hastings	Stats & Epidemiology	CTID – 2 nd Flr	3183	Ian.hastings
Prof J Hemingway	Vector Biology	CTID – 3 rd Flr	3281	Janet.hemingway
Dr E M Hodel	Pharmacology	CTID – 2 nd Flr	2547	Evamaria.hodel
Mrs J Jones	Lab Diagnostics	CTID – Ground Flr	3220	Jayne.jones
Dr J La Course	Helminth Biochemistry	Gilles Wing – 1 st Flr	3153	James.lacourse
Dr G Lycett	Vector Biology	Main Bld – 1 st Flr	3156	Gareth.lycett
Dr A Lynd	Vector Biology	CTID – 1 st Flr	2536	Amy.lynd
Dr P J McCall	Vector Biology	Main Bld – 1 st Flr	3132	Philip.mccall
Mrs M Midgley	Dagnall Lab	Main Bld – 2 nd Flr	3129	Maria.midgley
Dr C Minetti	NTDs	Wolfson Bld	2569	Corrado.minetti
Prof D Molyneux	Parasitology	Gilles wing – 1 st Flr	2593	David.molyneux
Dr K Mondragon-Shem	Vector Biology	CTID – 3 rd Flr	9366	Karina.mondragonshem
Dr M Paine	Vector Biology	CTID – 1 st Flr	3310	Mark.paine
Prof R Pleass	Malaria	CTID – 3 rd Flr	3315	Richard.pleass
Dr L Reimer	Vector Biology	Main Bld – 1 st Flr	3107	Lisa.reimer
Prof H Ranson	Vector Biology	CTID – 1 st Flr	2525	Hilary.ranson
Dr A Roberts	Microbiology	CTID 3 rd Flr	3247	Adam.roberts
Dr C Rose	Trypanosomiasis	CTID 3 rd Flr	3727	Clair.rose
Dr S S Ibrahim	Parasite Biochemistry	CTID – 1 st Flr	3871	Sulaimansadi.ibrahim
Dr M Stanton	Parasitology	Gilles wing – 1 st Flr	2593	Michelle.stanton
Dr M Stewart	Research Methods	Gilles wing – 1 st Flr	3292	Martyn.stewart
Prof R Stothard	NTD Epidemiology	CTID – 3 rd Flr	3724	Russell.stothard
Prof M Taylor	Filariasis	CTID – 2 nd Flr	3112	Mark.taylor
Dr B Thomas	NTDs	Wolfson Bld	3180	Brent.thomas
Prof S Torr	Vector Biology	CTID – 2 nd Flr	3383	Steve.torr
Dr J Turner	Filariasis	CTID – 2 nd Flr	3119	Joseph.turner
Dr B Urban	Parasitology	CTID – 3 rd Flr	3380	Britta.urban
Dr S Wagstaff	Bioinformatics	Main Bld – 3 rd Flr	3164	Simon.wagstaff
Prof S A Ward	Malaria	CTID – 2 nd Flr	3147	Steve.ward
Dr V Watson	Microbiology	CTID – 2 nd Flr	2582	Victoria.watson
Dr G Weedall	Bioinformatics	CTID 2 nd Flr	3108	Gareth.weedall
Dr D Weetman	Vector Biology	CTID – 1 st Flr	3225	David.weetman
Dr E Wright	Microbiology	Old School, Comm Rm	2554	Elli.wright

Essay Writing Guidelines

During the programme you will be asked to write a number of essays for the assessment of modules. The length of the essay will be specified in the assessment guidance for each module. Essays are an essential part of the learning process and are designed to help develop and deepen your understanding.

One important feature of essay writing, on this programme, is the use of appropriate literature and the correct acknowledgement of it. Most of the essay titles require the most up to date information. This information is not (usually) found in books, but in scientific journals, and it is strongly recommended that the full facilities of the library including web-based sources are used to obtain the required information.

The following publications available in the LSTM library are good starting points to find up to date information on topics relevant to your essays:-

Trends in Parasitology (formerly Parasitology Today). This is a current awareness journal published monthly and is ideal for students wishing to be kept up to date with current ideas in parasitology and entomology.

Advances in Parasitology. An annual publication gathering useful, concise articles on various research issues in the field of parasitology.

The "**Annual review of**" series give useful, "state-of-the-art" overviews of various topics. Available in the School library are: *Annual Review of Biochemistry*, *Annual Review of Entomology*, *Annual Review of Microbiology*.

Practical Classes

The programme contains a great deal of practical work of all types and in order to take full advantage, it is essential that you keep a well-ordered laboratory notebook. The notebook can be used for your own notes and drawings and any handouts provided for the practical.

The practicals which follow many parasitology lectures may allow you to observe stages of parasites in blood and stools and are highly relevant to diagnosis, which is also emphasised in the diagnostic parasitology sessions. In addition, there are fixed demonstrations in the laboratory which illustrate other important features of the parasites and pathogens under study. You are advised to make notes and simple sketch drawings of the material you see in these classes.

The entomology demonstrations following many lectures contain specimens illustrating the topics covered in the lectures. The special entomology practicals allow you to experience a number of important practical entomological techniques such as dissections of various types.

The basic laboratory techniques practicals contain a wide range of techniques that are considered important for all students and which will be highly relevant to all your future laboratory work.

Within the optional modules more advanced experiments will be carried out and it is very important that these are written up properly. A proper record will include details of the aims of the experiment, the materials and methods, the results and the conclusions.

Prizes

Jervis Prize

The Jervis Prize is awarded at the final Examiner's meeting to the candidate with the highest mark in the overall examination for MSc in Tropical Disease Biology.

David Smith Memorial Prize

The David Smith Memorial Prize is awarded to a student from a developing country who has contributed most to the collective and team work of students on her/his programme. It is open to students on any programme.

David Smith was a member of staff of the School for many years and was head of the Tropical Medicine Division in the School at the time of his tragically early death. A former Director of the UK Medical Research Councils unit in Kisumu, Kenya, he was also at one time head of the vector-borne disease division of the Kenyan Ministry of Health. He worked extensively in Africa on the control of tropical diseases, including malaria, sleeping sickness and haemorrhagic viral infections. In addition he had extensive knowledge of South America and Asia and worked for a year on secondment to the British Government's overseas development ministry, assisting them in developing more effective policies in health and disease control. He played a key role in the establishment of the Malaria Consortium as a joint operation of the Liverpool and London Schools.

Andrew Campbell Memorial Fund

Andrew Campbell was an MSc student who died tragically shortly after completing the programme in 1986. In his memory, a fund was raised for the benefit of future students on the former Master of Science in Applied Parasitology and Medical Entomology Programme. Students registered on the MSc in Tropical Disease Biology are eligible to apply to this fund.

Approximately £100 is available to the student who makes the best appropriate case for the use of the money in the furtherance of his/her career in tropical medicine when they leave Liverpool.

Applications, which should outline the proposed use of the money and explain how this will benefit your career, on not more than one side of A4, are invited **before the end of September** each year. The award (if any) will be made at the October Board of Examiner's meeting, and the result notified to the successful candidate by the end of October. Send your application to the Programme Administrator.

Reading List

This list comprises texts providing a background to the programme, primarily the first term. Some are affordable and you may wish to purchase them. Many are comprehensive texts providing broad and detailed information on a subject and are available in the LSTM and/ or Harold Cohen libraries. Further recommended reading will be provided throughout the programme. Please note that this is not an exclusive list and there are many other useful texts held in the library. Also remember that these texts only provide basic background information and that a thorough and up-to-date knowledge of any field can only be gained by reading the scientific literature. All of the relevant journals are available in the Donald Mason Library.

General texts – Pathogens and Parasites

Not all content of the following texts will be appropriate to this programme, and students are advised to consult with staff as to recommended aspects for each text during the programme.

Murray, P. R. (2017). **Basic Medical Microbiology**. 1st Edition. Elsevier. ISBN-13: 978-0323476768
ISBN-10: 0323476767

Murray, P.R. Rosenthal, K.S. Pfaller, M.A. (2015). **Medical Microbiology**. 8e 8th Edition. Elsevier. ISBN-10: 0323299563 ISBN-13: 978-0323299565

Farrar, J. et al. (2013) **Manson's Tropical Diseases**. 23rd Edition. Saunders Ltd. ISBN: 978-0-7020-5101-2

Zeibig, E. (2012) **Clinical Parasitology: A Practical Approach**. 2nd edition. Saunders. ISBN-10: 1416060448 ISBN-13: 978-1416060444

Beeching, N. & Gill, G. (2014). Lecture Notes: Tropical Medicine. 7th Edition edition. Wiley-Blackwell; ISBN-10: 0470658533 ISBN-13: 978-0470658536

Peters, W. & Pasvol, G. (2002) **Color Atlas of Tropical Medicine and Parasitology**, Elsevier, London, 5th edition.

Cox, F.E.G., Kreier, J.P., Wakelin, D. (Eds.) (2006) **Topley and Wilson's Microbiology and Microbial Infections**. 10th edition.

Beaver P.C., Jung, R.C. & Cupp, E.W. (1984) **Clinical Parasitology**. Lea & Febiger, 9th edition.

Cheesbrough, M. (2005) **District Laboratory Practice in Tropical Countries**. Cambridge University Press.

Despommier, D.D., Gwadz, R.G., Hotez, P., Knirsch, C. (2006). **Parasitic Diseases**, Apple Trees Productions, LLC, Pub., New York , NY. 5th edition. Second printing.

Roberts, L.S. & Janovy, J. (2009). **Gerald D Schmidt & Larry S Roberts' Foundations of Parasitology**. 8th edition. McGraw Hill Higher Education.

General texts - Vector Biology

Service, M.W. (2004) **Medical Entomology for Students**. Cambridge University Press, 3rd edition.

Lane, R.P. & Crosskey, R.C. (1993) **Medical Insects and Arachnids**. Chapman & Hall, London.

Beaty, B.J. & Marquardt, W.C. (1996) **The Biology of Disease Vectors**. Colorado University Press.

Lehane, M.J. (2005) **Biology of Blood-sucking in Insects**. Cambridge University Press.