

## BIOGRAPHICAL SKETCH

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NAME Alan H. Fairlamb, CBE		POSITION TITLE Wellcome Principal Research Fellow & Head of Division of Biological Chemistry & Drug Discovery		
eRA COMMONS USER NAME FAIRLAMB				
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>				
INSTITUTION AND LOCATION		DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Edinburgh University, UK		B.Sc.	1968	Medical Science (Hons)
Edinburgh University, UK		M.B., Ch.B.	1971	Medicine & Surgery
Edinburgh University, UK		Ph.D.	1975	Biochemistry
University of Amsterdam, Netherlands		Post-doc	1975-76	Molecular Biology

### **Professional experience:**

1976-80	Research Fellow, University of Edinburgh (Dr I B R Bowman)
1980-81	Research Fellow, London School of Hygiene and Tropical Medicine (Prof W Peters)
1981-87	Assistant Professor, The Rockefeller University, New York (Prof A Cerami)
1987-90	Senior Clinical Lecturer, London School of Hygiene & Tropical Medicine
1990-96	Professor of Molecular Parasitology and Head, Biochemistry and Chemotherapy Unit, LSHTM
1996-present	Wellcome Principal Research Fellow, Professor of Biochemistry and Head of Division of Biological Chemistry & Drug Discovery, University of Dundee
2006-present	Co-Director Drug Discovery Unit, University of Dundee

### **Honors and Awards.**

1987	Seymour H. Hutner Prize, Society of Protozoologists
1988	Frederick Murgatroyd Prize, Royal College of Physicians
1989	Fellow of the Linnean Society, London
1991	Ernst A.H. Friedheim Commemorative Lecture, Rockefeller University, New York
1996	John Scaife Commemorative Lecture, Edinburgh
1996	C.A.Wright Medal, British Society for Parasitology
1999	Foreign Corresponding Member of the National Academy of Medicine of Buenos Aires, Argentina
2001	Fellow of the Royal Society of Edinburgh
2005	Fellow of the Academy of Medical Sciences
2005	Kitasato Microbial Chemistry Medal, Kitasato Institute, Japan
2005	Commander of the British Empire for services to medical science
2006	3Rs Prize 2006 for Refinement and Reduction of Animal Models of Leishmaniasis

## Current Research Funding

<b>Awarding body</b>	<b>Dates</b>	<b>Amount</b>	<b>Award details</b>
WELLCOME TRUST (079838)	2006-2016	£3.8 million	<b>Characterization and validation of drug targets in the Kinetoplastida</b> ( <i>Principal Research Fellowship; programme grant support for 2006-2011</i> )
WELLCOME TRUST (077705)	2005-2010	£8.1 million	<b>Drug Discovery for Tropical Diseases</b> ( <i>Co-principal Applicants Alan H Fairlamb and Mike Ferguson; co-applicants Bill Hunter, Ian Gilbert, Daan van Aalten and Julie Frearson</i> )
WELLCOME TRUST (083481)	2008-2012	£1.2 million	<b>Biological Chemistry &amp; Drug Discovery Strategic Award</b> <i>Principal applicant Alan H Fairlamb with co-applicants Mike Ferguson and Julie Frearson</i>

## Scientific Advisory Boards & Committees

1987-1991	WHO/TDR Joint Steering Committee <i>Chemotherapy and Immunology and Pathology of African Trypanosomiasis</i> (member and chair)
1989-present	Member, Kenneth S. Warren Laboratories, New York, USA (formerly Drug & Vaccine Development Corporation)
1990-1993	WHO/TDR Steering Committee <i>Integrated Chemotherapy for Trypanosomiasis, Leishmaniasis and Chagas' Disease</i> (member)
1991	WHO/TDR Macrofil SWG: <i>Targets for New Macrofilaricides</i> (temporary adviser)
1991-1996	Wellcome Trust, <i>Infection and Immunity Panel</i> (member)
1991-1994	Wellcome Trust, <i>Tropical Medicine Interest Group</i> (member)
1993-1996	Wellcome Trust, <i>Genetics Interest Group</i> (member)
1993	WHO/TDR Immal Task Force <i>Antigens as Vaccine Candidates</i> (temporary adviser)
1994	WHO/TDR <i>Stimulating R&amp;D into Medicines for Developing Countries</i> (temporary adviser)
1995-1999	Burroughs Wellcome Fund Advisory Committee (member)
1996-1999	MRC, <i>Physiological Medicine and Infections Board</i> (member)
1998	WHO/TDR SWG: <i>Strategies for Drug Discovery Research</i> (temporary adviser)
1999-2002	WHO/TDR Steering Committee <i>Drug Discovery Research</i> (Chair)
2000	E.C. INCO-DEV grant committee (expert adviser)
2001-2005	WHO/TDR Scientific Working Group <i>Genomes to Drugs and Diagnostics</i> (member)
2003-2004	WHO/TDR Steering Committee <i>Chemotherapy Portfolio Review</i> (Chair)
2003-	DNDi Scientific Advisory Committee (WHO/TDR representative)
2003-2006	RSE Sectional Committee A4, Cell and Molecular Biology (member)
2005	Donor Coordinating Group Review of Medicines for Malaria Venture (expert reviewer)
2005	WHO/TDR Steering Committee <i>Genomes and Discovery Research</i> (Chair)
2006-	WHO/TDR, Scientific and Technical Advisory Committee (member)
2007-	WHO/TDR, TropIKA Advisory Board (member)
2008-	MRC Developmental Pathway Funding Scheme (member)

## **Top 20 selected publications: (from a total of 199)**

- Fairlamb, A.H., Weislogel, P.O., Hoeijmakers, J.H.J., and P. Borst (1978) Isolation and characterization of kinetoplast DNA from bloodstream form of *Trypanosoma brucei*. *Journal of Cell Biology* 76: 293-309 PMID: 10605439
- Fairlamb, A.H., Blackburn, P., Ulrich, P., Chait, B.T., and A. Cerami (1985) Trypanothione: a novel bis(glutathionyl)spermidine co-factor for glutathione reductase in trypanosomatids. *Science*, 227: 1485-1487. PMID: 3883489
- Shames, S.L., Fairlamb, A.H., Cerami, A., and C.T. Walsh (1986) Purification and characterization of trypanothione reductase from *Crithidia fasciculata*, a newly discovered member of the family of disulfide--containing flavoprotein reductases. *Biochemistry*, 25: 3519-3526 PMID: 3718941
- Fairlamb, A.H., Henderson, G.B., and A. Cerami (1989) Trypanothione is the primary target for arsenical drugs against African trypanosomes. *Proceedings of the National Academy of Sciences USA*, 86: 2607-2611 PMID: 2704738
- Carter, N.S., and A.H. Fairlamb (1993) Arsenical-resistant trypanosomes lack an unusual adenosine transporter. *Nature*, 361: 173-175 PMID: 8421523
- Carter, N.S., Berger, B.J., and A.H. Fairlamb (1995) Uptake of diamidine drugs by the P2-nucleoside transporter in melarsen-sensitive and resistant *Trypanosoma brucei brucei*. *Journal of Biological Chemistry*, 270: 28153-28157 PMID: 7499305
- Tovar, J., Cunningham, M.L., Smith, A.C., Croft, S.L., and A.H. Fairlamb (1998) Downregulation of *Leishmania donovani* trypanothione reductase by heterologous expression of a *trans*-dominant mutant homologue: effect on parasite intracellular survival. *Proceedings of the National Academy of Sciences USA*, 95:5311-5316 PMID: 9560272
- Tovar, J., Wilkinson, S., Mottram.,J.C., and A.H. Fairlamb (1998) Evidence that trypanothione reductase is an essential enzyme in *Leishmania* by targeted replacement of the *tryA* gene locus. *Molecular Microbiology*, 29:653-660 PMID: 9720880
- Bond, C.S., Zhang, Y., Berriman, M., Cunningham, M., Fairlamb, A.H., and W.N. Hunter (1999) The crystal structure of *Trypanosoma cruzi* trypanothione reductase in complex with trypanothione and the structure based discovery of new natural product inhibitors. *Structure*, 7:81-89 PMID: 10368274
- Alphey, M.S., Bond, C.S., Tetaud, E., Fairlamb, A.H., and W.N. Hunter (2000) The structure of reduced tryparedoxin peroxidase reveals a decamer and insight into reactivity of 2Cys-peroxiredoxins. *Journal of Molecular Biology*, 300:903-916 PMID: 10891277
- Oza, S.L., Tetaud, E., Ariyanayagam, M.R., Warnon, S.S., and A.H. Fairlamb (2002) A single enzyme catalyses formation of trypanothione from glutathione and spermidine in *Trypanosoma cruzi*. *Journal of Biological Chemistry* 277: 35853-35861 PMID: 12121990
- Gardner, M.J., Hall, N., Fung, E., White, O., Berriman, M., Hyman, R., Carlton, J.M., Pain, A., Nelson, K.E., Bowman, S., Paulsen, I.T., James, K., Eisen, J.A., Rutherford, K., Salzberg, S.L., Craig, A., Kyes, S., Chan, M.S., Nene, V., Shallom, S.J., Suh, B., Peterson, J., Angiuoli,

S., Perteua, M., Allen, J., Selengut, J., Haft, D., Mather, M.W., Vaidya, A.B., Martin, D.M.A., Fairlamb, A.H., Fraunholz, M., Roos, D.S., Ralph, S., McFadden, G.I., Cummings, L.M., Subramanian, M., Mungall, C., Venter, J.C., Carucci, D.J., Hoffman, S.L., Newbold, C., Davis, R.W., Fraser, C.M., and B. Barrell (2002) Genome sequence of the human malaria parasite *Plasmodium falciparum*. *Nature*, 419: 498-511 PMID: 12368864

Vickers, T.J., Greig, N., and A.H. Fairlamb (2004) A trypanothione-dependent glyoxalase I with a prokaryotic ancestry in *Leishmania major*. *Proceedings of the National Academy of Sciences USA*, 101: 13186-13191 PMID: 15329410

Wyllie, S., Cunningham, M.L., and A.H. Fairlamb (2004) Dual action of antimonial drugs on thiol redox metabolism in the human pathogen *Leishmania donovani*. *Journal of Biological Chemistry*, 279: 39925-39932 PMID: 15252045

Vickers, T.J., Wyllie, S., and A.H. Fairlamb (2004) *Leishmania major* elongation factor 1B complex has trypanothione S-transferase and peroxidase activity. *Journal of Biological Chemistry*, 279: 49003-49009 PMID: 15322082

Berriman, M., Ghedin, E., Hertz-Fowler, C., Blandin, G., Renauld, H., Bartholomeu, D.C., Lennard, N.J., Caler, E., Hamlin, N.E., Hass, B., Böhme, U., Hannick, L., Aslett, M.A., Shallom, J., Marcello, L., Hou, L., Wickstead, B., Alsmark, C.M., Arrowsmith, C., Atkin, R.J., Barron, A.J., Bringaud, F., Brooks, K., Carrington, M., Cherevach, I., Chillingworth, T.J., Churcher, C., Clark, L.N., Corton, C.H., Cronin, A., Davies, R.M., Doggett, J., Djikeng, A., Embley, T.M., Feldblyum, T., Field, M.C., Fraser, A., Goodhead, I., Hance, Z., Harper, D., Harris, B.R., Hauser, H., Hostetler, J., Ivens, A., Jagels, K., Johnson, D., Johnson, J., Jones, K., Kerhornou, A.X., Koo, H., Larke, N., Landfear, S., Larkin, C., Leech, V., Line, A., Lord, A., Macleod, A., Mooney, P.J., Moule, S., Martin, D.M.A., Morgan, G.W., Mungall, K., Norbertczak, H., Ormond, D., Pai, G., Peacock, C.S., Peterson, J., Quail, M.A., Rabinowitsch, E., Rajandream, M.A., Reitter, C., Salzberg, S.L., Sanders, M., Schobel, S., Sharp, S., Simmonds, M., Simpson, A.J., Tallon, L., Turner, M.R., Tait, A., Tivey, A.R., Van Aken, S., Walker, D., Wanless, D., Wang, S., White, B., White, O., Whitehead, S., Woodward, J., Wortman, J., Adams, M.D., Gull, K., Ullu, E., Barry, J.D., Fairlamb, A.H., Opperdoes, F., Barrell, B.G., Donelson, J.E., Hall, N., Fraser, C.M., Melville, S.E., and N.M. El-Sayed, (2005) The genome of the African trypanosome, *Trypanosoma brucei*. *Science*, 309: 416-422 PMID: 16020726

Dawson, A., Gibellini, F., Sienkiewicz, N., Tulloch, L.B., Fyfe, P.K., McLuskey, K., Fairlamb, A.H., and W.N. Hunter (2006) Structure and reactivity of *Trypanosoma brucei* pteridine reductase; inhibition by the archetypal antifolate methotrexate. *Molecular Microbiology*, 61:1457-1468 PMID: 16968221

Konig, J., and A.H. Fairlamb (2007) A comparative study of type I and type II trypanedoxin peroxidases in *Leishmania major*. *FEBS Journal* 247: 5643-5658 PMID: 17922848

Sienkiewicz, N., Jarosławski, S., Wyllie, S., and A.H. Fairlamb (2008) Chemical and genetic validation of dihydrofolate reductase-thymidylate synthase as a drug target in African trypanosomes. *Molecular Microbiology*, 69: 520-533 PMID: 18557814

Alphey, M.S., Konig, J., and A.H. Fairlamb (2008) Structural and mechanistic insights in type II trypanedoxin-dependant peroxidases. *Biochemical Journal*, 414: 375-381 PMID: 18522537