EDWARD L. JARROLL, Ph.D.

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PERSONAL INFORMATION

Citizenship	U.S.
Place of Birth	Huntington, WV
Home address:	28 Round Hill Road Dobbs Ferry, NY 10522
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EDUCATION

Postdoctoral Training	
	Cornell University, Ithaca, NY Enzymology, Biochemistry, 1980-82 (In the laboratory of Donald Lindmark)
	Oregon Health Sciences University, Portland, OR Microbial Physiology, Biochemistry, and Protozoology, 1977-80 (In the laboratory of E. A. Meyer)
Ph.D.	West Virginia University, Morgantown, WV Biology (Microbiology/Parasitology), 1977 (John E. Hall, Major Advisor)
M.S.	West Virginia University, Morgantown, WV Biology (Invertebrate Zoology), 1971
B.S.	West Virginia University, Morgantown, WV Biology (General), 1969,

ACADEMIC APPOINTMENTS

August, 2012-present	Professor, Biological Sciences. Lehman College, City University of New York.

July, 2009-August, 2012 Professor of Biology and Dean of Natural and Social Sciences Lehman College, CUNY, Bronx, NY- The departments in NSS: Anthropology, Biological Sciences, Chemistry, Economics and Business, Environmental Sciences and geology, Health Sciences, Math & Computer Science, Nursing, Physics and Astronomy, Political Science, Psychology, Sociology, and Social Work

Sept. 2009-present	Member of the Molecular, Cellular and Developmental Biology PhD Program – CUNY Graduate School (Faculty)
Oct. 2009-present	Member of the Biochemistry PhD Program-CUNY Graduate School (Faculty)
2008-2011	Visiting Professor, University of Nottingham Veterinary School. Nottingham, UK
1996- 2009	Professor of Biology, Department of Biology Northeastern University, Boston, MA
2003-2006	Associate Dean, College of Arts and Sciences, Director of the Graduate School Northeastern University, Boston, MA
2002-2007	Director of the Marine Science Center, Northeastern University, Boston, MA
2002-2008	Associate Dean for Faculty Affairs and Director of the Graduate School, College of Arts and Sciences, Northeastern University, Boston, MA
	Director of the Graduate School, College of Arts and Sciences, Northeastern University, Boston, MA- I oversaw 11 doctoral programs and 18 MS programs in the 25 Arts and Sciences departments of our college.
2002-2003	Special Assistant to the Provost for Biotechnology, Program Manager, Biotechnology (On leave from A&S) Northeastern University, Boston, MA
2000-2003	Visiting Professor, Faculty of Biological Sciences, University of Hull, Hull, UK
2000-2001	Interim Associate Dean for Faculty Affairs and Director of the Graduate School, College of Arts and Sciences, Northeastern University, Boston, MA
1998-2006	Board of Directors, Boston Glycobiology Discussion Group, Inc.

	Boston, MA
1998-2001	New England Resource Center for Higher Education. Chairs Think Tank Member, Boston, MA
1996- 2000	Professor and Chair of Biology, Department of Biology Northeastern University, Boston, MA
1996-present	Adjunct Professor of Pharmaceutical Science, Northeastern University, Boston, MA
1996-2000	Advisory Board of the Barnett Institute Northeastern University, Boston, MA
1991-1997	Visiting Professor, Dept. of Infectious Disease West Virginia University Health Sciences Center, Morgantown, WV
1991-1996	Adjunct Scientific Staff, Dept. of Cell Biology Cleveland Clinic Research Foundation, Cleveland, OH
1992-1996	Professor and Chair, Department of Biology Cleveland State University, Cleveland, OH
1991-1996	Chair and Associate Professor, Department of Biology Cleveland State University, Cleveland, OH
1990	Interim Chair, Department of Biology Cleveland State University, Cleveland, OH
1988-1991	Associate Professor with Tenure, Department of Biology, Cleveland State University, Cleveland, OH
1985-1988	Assistant Professor, Department of Biology Cleveland State University, Cleveland, OH
1984-1985	Assistant Professor, Department of Biology West Chester University, West Chester, PA
1981-1982	Senior Research Associate, Department of Preventive Medicine Cornell University, Ithaca, NY
	Assistant Head of Microbiology, Diagnostic Laboratory NYS College of Veterinary Medicine Cornell University, Ithaca, NY

1980-1981	Research Associate, Department of Preventive Medicine Cornell University, Ithaca, NY
1977-1980	Postdoctoral Fellow, Department of Microbiology & Immunology Oregon Health Sciences University, Medical School, Portland, OR
1975-1977	Assistant Professor, Department of Biology Salem College, Salem, WV

NON-ACADEMIC APPOINTMENTS

1994-1995	Consulting Biologist, Viromed Labs, Minneapolis, MN
1993	Consulting Biologist, Premier Medical Technology, Houston, TX
1993	Consulting Biologist, Medical Materials and Technology, Houston, TX
1993	Consulting Biologist, Steris Corporation, Mentor, OH
1987	Consulting Biologist, Peer Consultants, Rockville, MD
1991-1997	Adjunct Staff, Cleveland Clinic Foundation, Department of Cell Biology, Research Institute, Cleveland, OH
1991	Consulting Biologist, Winfield Industries, Escondido, CA
1986-present	Consulting Biologist, Wisconsin Pharmacia, Jackson, WI
1983	Consulting Biologist, Life Systems, Inc., Cleveland, OH
1977	Microbiologist, (Virology Section) West Virginia State Hygienic Laboratory, South Charleston, WV

GRANTS & FUND RAISING

2007	ENHANCE AWARD ($20,000 competitive) from Northeastern University to facilitate funding for faculty returning from long term administrative assignment. **Cyst wall synthase: a novel enzyme from encysting *Giardia* is a key to cytodifferentiation and for potential drug target .**
2006	Society of General Microbiology (UK) Research, **£2,550** Grant at Birkbeck College, U of L. "Carbohydrate analysis of *Balamuthia mandrillaris* trophozoites and cysts."
2004-2007	Fleet Foundation, **$200,000** for 3 years Director for Massachusetts Young Scientist Investigations into the Sea (MYSIS): Summer Marine Science Academy
2004	Foundation Support (Anon.) and University support, **$5-8 million** Director for building a new Marine Science Center ($18 million project)
2004	General Electric Foundation, **$30,000/yr**. Outreach Program in Marine Biology for Lynn Public Schools
2004	New England BioLabs Foundation, **$10,000** Foundation Outreach Program to North Shore High Schools
2000-2004	National Institutes of Health (AI47795), **$152,000** Primary Investigator "*Giardia* encystment: Control of GalNAc synthesis."
2000-2003	U.S. Dept. of Education, **$750,000** Co-investigator, GAANN Fellowships for Scientific Computing
2000-2002	National Institutes of Health, **$319,192** Advanced Training for Minorities in Science (ATOMS) Co-Investigator with Roxbury College Community College, Roxbury Crossing, MA
2000	President's Excellence Award, **$100,000** for Marine Science Center Equipment
1998-2001	Coca-Cola Foundation Career Corridor Program, **$300,000** for 3 years Co-developer, Summer Science Camp
1998-2000	Northeastern University President's Initiative, **$170,000** for 2 years

	Primary Investigator for Summer Science Program for middle and high school science and math students
1998-1999	Northeastern University Office of the Provost, **$20,000** Faculty Development Grant For Academic Common Experience (ACE)
1998-1999	National Science Foundation, **$9,700** Development Grant for Academic Common Experience (ACE) Curriculum to Northeastern University
1996-1999	National Institutes of Health (AI41230), **$115,775** Primary Investigator for "A novel new enzyme and product from encysting *Giardia*."
1994-1997	U. S. Environmental Protection Agency, **$362,538** Primary Investigator for "Development of specific gene probes for *Giardia* spp. to resolve zoonotic origin of waterborne giardiasis."
1993	Fulbright Scholar (Research) Charles University, Prague, Czechoslovakia Laboratory of Prof. Jaroslav Kulda
1991-1994	National Institutes of Health (AI 29591), **$90,640** Primary Investigator for "Synthesis of N-acetylgalactosamine in encysting *Giardia*."
1990-1992	U.S. Environmental Protection Agency (CR-816637-01-0), **$252,661** Primary Investigator for "Development of gene probes for speciation of *Giardia*."
1989-1995	Ohio Board of Regents Academic Challenge Grant, $**560,000** Co-Investigator of Enhancement of the Program in Cell and Molecular Parasitology."
1987-1988	Ohio Board of Regents Research Challenge Grant, **$30,000** Primary Investigator for "Molecular biology of *Giardia* and Trichomonads."
1987	Ohio Board of Regents Research Challenge Grant, **$8,500** Primary Investigator for "Ribosomal genes of *Giardia*."
1986-1992	Ohio Board of Regents Academic Challenge Grant, **$400,000** Co-Investigator for "Program in Cell and Molecular Parasitology."
1986-1988	Thrasher Research Fund (2799-5), **$52,239**

	Primary Investigator for "Chemical composition of the *Giardia* cyst wall."
1986	Ohio Board of Regents Research Challenge Grant, **$19,749** Primary Investigator for "Chemical composition of the *Giardia* cyst wall."
1985	Cleveland State University Research and Creative Activities Award, **$3,000** Primary Investigator for "Metabolism in *Onchocerca* microfilariae."
1982	National Institutes of Health, **$5,000** Primary Investigator for "Energy metabolism of *Onchocerca* microfilariae."
1981	National Institutes of Health, **$5,000** Primary Investigator for "Lipid metabolism of *Giardia*."
1979-1980	U.S. Environmental Protection Agency, **$122,302** Co-Investigator for "Efficacy of water treatment methods on *Giardia* cyst viability."
1979	Medical Research Foundation of Oregon, **$6,500/yr** Primary Investigator for "*In vitro* cultivation of malarial organisms from rodents."
1978-1979	N.L. Tartar Research Fellowship, **$1,200/yr**
1978	International Congress of Parasitology IV Travel Grant, **$500.00**

PEER-REVIEWED PUBLICATIONS

Sulemana, A., Paget, T., and Jarroll, E. *Giardia* exhibits phenotypic heterogeneity (bistability) and trophozoites commit to encyst within hours after being induced. In preparation.

Paget, T., Bagchi, S. and Jarroll, E. Metabolomics in parasitic protozoa. (An invited review in preparation).

Paget, T., Brown, R., Davy, L., Icheanor, G., Bagchi, S., Inwe, K. and Jarroll, E. The effect of nitric oxide on key Giardia metabolic enzymes. (in preparation)

Tsarukyanova, I, van Keulen, H., Paget, T., Harris, K., Goldberg, B., and Jarroll, E. Effect of nitrosylation on encystment regulation in the pathogenic protozoan *Giardia intestinalis*. Submitted

Lindmark, D.G., van Kuelen, H., Paget, T.A. and Jarroll, E. L. (2011) *Giardia* metabolism. In: *Giardia*. (In: S. Svärd and H. Luján, eds). Springer. (Chapter 8). Pp. 127-137.

Siddiqu, R., Jarroll, E. and Khan, N.A. (2009) Balamuthia mandrillaris: Role of galactose in encystment and identification of potential inhibitory targets. ***Exp. Parasitol***. (in press)

Dudley, R., Jarroll, E. and Khan, N. (2009) Carbohydrate analysis of *Acanthamoeba castellanii*. ***Exp. Parasitol***.122:338-343.

Jarroll, E. L., Sener, K. and van Keulen, H. (2009) Giardan: Synthesis, regulation and Inhibition. In: *Giardia and Cryptosporidium*. CABI Press Dec. 2008, Chpt. 31: Pp. 382-397.

Ruqaiyyah Siddiqui[1, 2], Naveed Ahmed Khan[1] and Edward L. Jarroll[3] (2009) The cyst wall carbohydrate composition of *Balamuthia mandrillaris*. Parasitol. Res. 104:1439-1443.

Ruqaiyyah Siddiqui[1], Edward L. Jarroll[2], and Naveed Ahmed Khan[1] (2009) *Balamuthia mandrillaris*: staining properties of cysts and trophozoites and the effect of 2, 6 dichlorobenzonitrile and Calcofluor white on encystment. ***Journal of Eukaryotic Microbiology***. Mar/Apr. 56:2008

Jarroll, E. L. (2007) Biology and importance of *Giardia intestinalis* in human health. (Invited)In: Emerging Protozoan Pathogens. (Khan, N. ed.) Taylor and Francis Publ. London (reviewed and in press).

Lopez, A. Şener, K., Trosien, J., Jarroll, E. and van Keulen, H. (2007) UDP-N-acetylglucosamine 4'-Epimerase from the intestinal protozoan *Giardia intestinalis* lacks UDP-glucose 4'-epimerase activity. ***Journal of Eukaryotic Microbiology*.** 54:154-160.

Sissons J., Alsam S., Goldsworthy G., Lightfoot M., Jarroll, E. L., and Khan, N. A. (2006). Identification and properties of proteases from an *Acanthamoeba* isolate capable of producing granulomatous encephalitis. ***BMC Microbiology*** 6: 42.

Trends in Parasitology. (2005). *Giardia* and *Cryptosporidium* join the 'Neglected Diseases Initiative'. L. Savioli, coordinator. Contributors: Amber Appelbee, Andre Buret, Simone Caccio, Ron Fayer, Joke van der Giessen, Thecla Hekker, Paul Hunter, **Ed Jarroll**, Panagiotis Karanis, V. Kartachev, Peter Kohler, Titia Kortbeek, Mark LeChevallier, Theo Mank, Gertjan Medema, Paul Monis, Merle Olson, Tim Paget, Huw Smith, Andrew Thompson, Jules Tolboom, Peter Wallis.(in press).

Erlandsen S., Jarroll E., Wallis P., van Keulen H.2005. Development of Species-specific rDNA Probes for Giardia by Multiple Fluorescent In Situ Hybridization Combined with Immunocytochemical Identification of Cyst Wall Antigens. ***Journal of Histochemistry and Cytochemistry.*** 53 (8):917-927.

Paget, T., Maroulis, S., Mitchell, A., Edwards, M., Jarroll, E, and Lloyd, D. 2004. Menadione-generated radicals kill Gi*ardia intestinalis* trophozoites and cysts. ***Microbiology***. 150:1231-1236.

Karr, C. and Jarroll, E. 2004. Cyst Wall Synthase: N-acetylgalactosaminyltransferase activity is induced to form the novel GalNAc polysaccharide in the *Giardia* cyst wall. ***Microbiology.*** 150:1237-1243.

Sener,K., Shen,Z., Newburg, D. and Jarroll, E. 2004. Amino sugar phosphate levels change during formation of the *Giardia* cyst wall. ***Microbiology.*** 150: 1225-1230.

Jarroll, E. and Sener, K. 2003. Potential Drug Targets in Cyst Wall Biosynthesis by Intestinal Protozoa. ***Drug Resistance Updates.*** 6:239-246.

Lopez, A., Sener, K. Jarroll, E., and van Keulen, H. 2003. Transcription regulation is demonstrated for five key enzymes in *Giardia intestinalis* cyst wall polysaccharide biosynthesis. ***Molecular and Biochemical Parasitology.*** 128:51-57.

Jarroll, E. L. (2002). Encystment in *Giardia*. In: Microbial Development under Environmental Stress. (Ed., Dr. Juan Carlos Gutierrez Fernandez, Spain). Pp.17-28.

Gerwig, G., van Kuik, J.A., Leeflang, B., Kamerling, J., Vliegenthart, J., Karr, C. and Jarroll, E. 2002. Conformational studies of the β (1-3)-N-acetyl-D-galactosamine polymer of the *Giardia lamblia* filamentous cyst wall. ***Glycobiology***. 12(6):1-7.

Jarroll, E. Macechko, P.T., Steimle, P., Bulik, D., Karr, C. van Keulen, H., Lopez, A., Paget, T., Gerwig, G., Kamerling, J., Vliegenthart, J. and Erlandsen, S. 2002. *Giardia* cyst wall filaments and N-acetylgalactosamine synthesis during encystment. In: Giardia:

The Cosmopolitan Parasite, Olson, B., Olson, M. and Wallis, P. (eds), CAB International, Wallingford, UK. Chapter 2. Pp. 15-29.

Khan, N., Jarroll, E., and Paget, T. (2002). Molecular and Physiological Differentiation between pathogenic and Non-pathogenic Acanthamoeba. ***Current Microbiology*** 45: 197-202.

Jarroll, E., Macechko, P.T., Steimle, P., Bulik, D., Karr, C., van Keulen, H., Paget, T., Gerwig, G., Kamerling, J., Vliegenthat, J., and Werlandsen, S. 2001. Regulation of carbohydrate metabolism during *Giardia* encystment. ***Journal of Eukaryotic Microbiology***. 48(1):22-26.

Khan, N., Jarroll, E., and Paget, T. (2001). *Acanthamoeba* can be differentiated by the polymerase chain reaction and simple plating assays. ***Current Microbiology*** 43:204-208.

Khan, N.A., Jarroll, E.L., Walton, D.S., Panjwani, N. & Paget, T.A. (2000). Proteases: a marker for differentiation of pathogenic and non-pathogenic *Acanthamoeba*. ***Journal of Clinical Microbiology.*** 38:2858-2861.

Khan, N.A., Jarroll, E.L., Panjwani, N. & Paget, T.A. (2000). Proteases: a marker for differentiation of pathogenic and non-pathogenic *Acanthamoeba*. ***Investigative Ophthalmology and Visual Science***. 40(4):88296.

Bulik, D., van Ophem, P., Manning, J., Shen, Z., Newburg, D. and Jarroll,E. 2000. UDP-N-Acetylglucosamine Pyrophosphorylase: A Key Enzyme in Encysting *Giardia* is Allosterically Regulated***. Journal of Biological Chemistry***. 275:14722-14728.

Jarroll, E. L. 1999. Sensitivity of Protozoa to Disinfection. Intestinal Protozoa. In: Principles and Practice of Disinfection Preservation and Sterilization (Hugo, B., Ayliffe, G. and Russell, D., eds.), 3rd Ed. Blackwell Scientific Publications, LTD. Oxford, UK (Invited, pp.251-257.

van Keulen, H., Steimle, P., Bulik, D., Boroviak, R. and Jarroll, E. 1998. Cloning of two putative *Giardia lamblia* glucosamine 6-phosphate isomerase genes only one of which is transcriptionally active during encystment**.** ***Journal of Eukaryotic Microbiology***. 45(6): 637-642.

Macechko, P.T., van Keulen, H., Jarroll, E., Mulgrew, T., Gurien, A., and Erlandsen, S. 1998. Detection of *Giardia* trophozoites in archival pathology specimens of human small intestine. ***Microscopy and Microanalysis*****.** Vol. 4 (3):397-403.

Bulik, D., Lindmark, D., and Jarroll, E. 1998. Purification and characterization of UDP-N-acetylglucosamine pyrophosphorylase from encysting *Giardia*. ***Molecular and Biochemical Parasitology*** 95:135-139.

van Keulen H., Feely, D., Macechko, T., Jarroll, E., and Erlandsen, S. 1998. The sequence of small subunit rRNA shows that muskrats and voles are infected with a unique species of *Giardia: G. microti*. ***Journal of Parasitology***. 84:294-300.

Paget, T. A., Macechko, P. T., and Jarroll, E. L. 1998. *Giardia intestinalis*: Metabolic changes during cytodifferentiation. ***Journal of Parasitology***. 84:222-226.

Steimle, P., Lindmark, D., and Jarroll, E. 1997. Purification and characterization of glucosamine 6-phosphate isomerase from encysting *Giardia*. ***Molecular and Biochemical Parasitology***. 84: 149-153.

Erlandsen, S., Macechko, P.T., van Keulen, H., and Jarroll, E.L. 1996. Formation of the *Giardia* cyst wall: Studies on extracellular assembly using *immunogold labeling and high resolution field emission SEM*. ***Journal of Eukaryotic Microbiology***. 43:416-429.

Malek, S., Jarroll, E., Wade, S., Schaff, S., and Lindmark, D. 1996. Selected enzyme activities of *Cryptosporidium parvum*. ***Journal of Eukaryotic Microbiology.*** 43:82S.

Ellis, J., Wyder, Jarroll, E. and Kaneshiro, E. 1996. Changes in lipid composition during in vitro encystation and fatty acid desaturase activity of *Giardia lamblia*. ***Molecular and Biochemical Parasitology***, 81:13-25.

Koudela, B., Karr, C., Meyer, E., Meyer, B., and Jarroll, E. 1996. In vitro excystation of *Spironucleus muris*. ***Journal of Eukaryotic Microbiology***, 43:61-64.

Macechko, P.T., Mulgrew, T., van Keulen, H., Jarroll, E. L., Snover, D.C. and Erlandsen, S. L., 1995. Microscopic detection of *Giardia* trophozoites in archival pathology specimens of human small intestine: light microscopy, low voltage SEM, and confocal scanning laser microscopy using fluorescent in situ hybridization. In: Proc. 53rd Annual Meeting, MSA (G.W. Bailey and A.J. Garratt-Read, eds.), San Francisco Press, San Francisco, CA.

Erlandsen, S.L., Macechko, P.T., van Keulen, H. and Jarroll, E.L. 1995. Beaver and *Giardia* in the environment: a current perspective on the existence of "beaver fever". In symposium: "New Suburban Residents: Living with Beavers", Tufts Center for Animals and Public Policy, Tufts Veterinary School, Worcester, MA.

Jarroll, E. and Paget, T. 1995. Carbohydrate and amino acid metabolism in *Giardia*: A review. ***Folia Parasitologica***, 42:81-89.

van Keulen, H., Homan, W., Erlandsen, S., Shields, J. and Jarroll, E. L. 1995. A three nucleotide signature sequence in small subunit rRna divides human *Giardia* in two different groups. ***Journal of Eukaryotic Microbiology***, 42:392-394.

van Keulen, H., Gutell, R.R., Erlandsen, S.L., and Jarroll, E.L. 1994. Structural Analysis of rRNA from *Giardia*. In: *Giardia*: From Molecules to Disease. (Thompson, A., Reynoldson, J. and Lymbury, A., eds.). CAB International, Oxon, UK. pp. 68-69.

Erlandsen, S.L. van Keulen, H., Brelje, T., Gurien, A., Jakubowski, W., Schaefer, F. W. III, Wallis, P. Feeley, D. and Jarroll, E. 1994. Molecular approach to the speciation and detection of *Giardia*: Fluorochrome-rDNA probes for identification of *Giardia lamblia, Giardia muris*, and *Giardia ardeae* in laboratory and environmental samples by in situ hybridization. In: *Giardia*: From Molecules to Disease. (Thompson, A., Reynoldson, J. and Lymbury, A., eds). CAB International, Oxon, UK. pp. 64-65.

Jarroll, E. L. Macechko, P.T., Steimle, P.A., Lindmark, D. G. and Erlandsen, S. L. 1994. Enzymes of galactosamine synthesis in encysting Giardia are induced. In: *Giardia*: From Molecules to Disease. (Thompson, A., Reynoldson, J. and Lymbury, A., eds.) CAB International, Oxon, UK. pp. 198-199.

Paget, T.A., Manning, P., Erlandsen, S. and Jarroll, E.L. 1994. Metabolic changes during encystment and excystment in *Giardia duodenalis*. In: *Giardia*: From Molecules to Disease. (Thompson, A., Reynoldson, J. and Lymbury, A., eds.) CAB International, Oxon, UK. pp. 197-198.

Jarroll, E. L., 1994. Biochemical mechanisms of action of antigiardial drugs. In: *Giardia*: From Molecules to Disease. (Thompson, A., Reynoldson, J. and Lymbury, A., eds.). CAB International Oxon, UK. pp. 329-337.

Paget, T., Manning, P., Jarroll, E. (1993). Oxygen uptake in cysts and trophozoites of *Giardia lamblia*. ***Journal of Eukaryotic Microbiology.*** 40:246-250.

van Keulen, H., Gutell, R., Gates, M., Campbell, S.R., Erlandsen, S., Jarroll, E.L., Kulda, J. and Meyer, E. 1993. Unique phylogenetic position of Diplomonadia based on the small subunit ribosomal RNA sequence of *Giardia ardea, G. muris, G. duodenalis* and *Hexamita* sp. ***FASEB Journal***. 7: 223-231.

Paget, T.A., Kelly, M.L., Jarroll, E.L., Lindmark, D.G., and Lloyd, D. 1993. The effects of oxygen on the fermentation products of *Giardia lamblia*. ***Molecular and Biochemical Parasitology***. 57:65-72.

Macechko, P.T., Steimle, P.A., Lindmark, D.G., Erlandsen, S.L., and Jarroll, E.L. (1992) Galactosamine synthesizing enzymes are induced when *Giardia* encyst. ***Molecular and Biochemical Parasitology***. 56:301-310.

van Keulen, H., Gutell, R.,Campbell, S.R., and Jarroll, E.L. (1992). The nucleotide sequence of ribosomal DNA and large subunit rRNA structure of *Giardia muris*. ***Journal of Molecular Evolution***. 35:318-328.

Jarroll, E.L, 1992. Sensitivity of Protozoa to Disinfectants. In: Principles and Practice of Disinfection Preservation and Sterilization (Hugo, B., Ayliffe, G. and Russell, D., eds.), Blackwell Scientific Publications, LTD. Chapter 8. 180-186. Oxford, UK (Invited).

van Keulen, H., Horvat, S., Erlandsen, S.L. and Jarroll, E.L. (1991). Nucleotide sequence of the 5.8 S and large subunit rRNA genes and internal transcribed and part of the external space from ***Giardia ardeae***. ***Nucleic Acids Research***. 19:6050

Manning, P., Erlandsen, S. and Jarroll, E.L. (1991). Carbohydrate and amino acid analysis of *Giardia muris* cysts. ***Journal of Protozoology***. 39:290-296.

van Keulen, H., Campbell, S.R., Erlandsen, S. and Jarroll, E.L. (1991). Cloning and restriction enzyme analysis distinguishes *Giardia duodenalis, G. muris* and *G. ardeae*. ***Molecular and Biochemical Parasitology***. 46:275-284.

Jarroll, E.L. 1991. *Giardia* cysts: Their Biochemistry and metabolism.In: Biochemical Protozoology. Taylor and Francis Publishers, London. pp. 52-60.

Campbell, S.R., van Keulen, H., Erlandsen, S.L., Senturia, J., andJarroll, E.L. 1990. *Giardia* sp.: Comparison of electrophoretic karyotypes.***Experimental Parasitology***. 71:470-482.

Erlandsen, S.L., Bembrick, W.J., Wells, C., Feely, D., Knudson, L., Campbell, S.R., van Keulen, H. and Jarroll, E.L. 1990. Axenic culture and characterization of *Giardia ardeae* from the Great Blue Heron (*Ardeae herodias*). ***Journal of Parasitology***. 76:717-724.

Erlandsen, S., Bemrick, W., Shupp, D., Shields, J., Jarroll, E., Sauch, J. and Pauley, J. 1990. High resolution immunogold localization of *Giardia* cyst wall antigens using field emission SEM with secondary and backscatter electron imagining. ***Journal of Histochemistry and Cytochemistry***. 38:625-632.

Paget, T., Lloyd, D., Jarroll, E., Manning,P., and Lindmark, D. 1989. Respiratory activity in *Giardia* sp. In: Biochemistry and Molecular Biology of "Anaerobic" Protozoa. (Lloyd, D., Coombs, G., and Paget, T., eds.). Harwood Academic Publ. London. pp 186-201.

Rubin, A., Evers, D., Eyman, C., and Jarroll, E. 1989. Inactivation of gerbil-cultured *Giardia lamblia* cysts by free chlorine. ***Applied and Environmental Microbiology.*** 55(10):2592-2594.
Jarroll, E.L., and Lindmark, D. 1990. *Giardia* metabolism. In: Giardiasis. (Meyer, E., ed.). Elsevier Press., Amsterdam, The Netherlands. Chapter 3 pp. 61-76.

van Keulen, H., Campbell, S. and Jarroll, E.L. 1989. Differentiation between *Giardia lamblia* and *G. muris* by rRNA gene organization and orthogonal field-gel-electrophoresis karyotype analysis. In: Biochemistry and Molecular Biology of

"Anaerobic" Protozoa. (Lloyd, D., Coombs, G. and Paget, T., eds.). Harwood Academic Publ. London. pp 217-231.

Jarroll, E.L., Gaspano, J., Hare, D., and Lindmark, D. 1989. Proteinases of *Giardia*. In: Biochemistry and Molecular Biology of "Anaerobic" Protozoa. (Lloyd, D., Coombs, G., and Paget, T. eds.) Harwood Academic Publ. London, pp 202-216.

Jarroll, E.L., Manning, P., Berrada, A., Hare, D. and Lindmark, D. 1989. Biochemistry and metabolism of *Giardia*. ***Journal of Protozoology***. 36(2):190-197.

Paget, T., Jarroll, E.L., Manning, P., Lindmark, D. and Lloyd, D. 1989. Respiration in cysts and trophozoites of *Giardia muris*. ***Journal of General Microbiology***. 135:145-154.

Hare, D., Jarroll, E.L., and Lindmark, D. 1989. *Giardia lamblia*: Characterization of proteinase activity in trophozoites. ***ExperimentalParasitology***. 68(2):168-175.

Jarroll, E.L., Manning, P., Lindmark, D., Coggins, J., and Erlandsen, S. 1989. *Giardia* cyst wall-specific carbohydrate: Evidence for the presence of galactosamine. ***Molecular and Biochemical Parasitology***. 32:121-132.

Jarroll, E.L. 1988. Effect of disinfectants on *Giardia*. ***Critical Reviews in Environmental Control***. 18:1-28.

Jarroll, E.L., Hammond, M., and Lindmark, D. 1987. *Giardia lamblia*:Uptake of pyrimidine nucleosides. ***Experimental Parasitology***. 63:152-156.

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ABSTRACTS AND INVITED SEMINARS

Alimatu Sulemana, Tim Paget, Edward Jarroll (2011) Bistability in *Giardia lamblia* encystment. American Society of Parasitology Annual Meeting. Anchorage, Alaska. June, 2011

Elizabeth Sara Mo, Edward L Jarroll, Marlena Watson, Tim Arnold Paget (2011) Metabolic variation between human infective *Giardia* assemblages. American Society of Parasitology Annual Meeting. Anchorage, Alaska. June 2011.

Iryna G Tsarukyanova, Harry van Keulen, Timothy A. Paget, Kristina Harris, Edward Lee Jarroll, Burt Goldberg. (2011) Effect of nitrosylation on encystment regulation in the protozoan *Giardia intestinalis.* American Society of Parasitology Annual Meeting. Anchorage, Alaska. June 2011.

A.Sulemana, V. Hough, T. Paget, and E. Jarroll. (2010). Irreversibility of Encystment in *Giardia lamblia*. American Society for Microbiology. Annual Meeting. San Diego, CA. May 2010.

H. Van Keulen , I. Tsarukyanova , T. A. Paget , B. Goldberg , D. Lindmark , K. Harris , E. Jarroll (2010). Protein nitrosylation a regulator for metabolic switching and encystment in *Giardia*. ISOP Annual Meeting. Kent, UK. July 2010.

H. Van Keulen , I. Tsarukyanova , T. A. Paget , B. Goldberg , D. Lindmark , K. Harris , E. Jarroll (2010). Protein nitrosylation a regulator for metabolic switching and encystment in *Giardia*. ICOPA XII Meeting. ,Melbourne, Australia August 2010.

K.M. Harris, W.Q. Jiang, D. Lloyd, E. Jarroll, Harry van Keulen, T.A. Paget, and B. Goldberg (2010). Polyamine Metabolism in *G. intestinalis*. American Chemical Society Annual Meeting (Biochemistry Section)

Khan, N. A., Mortazavi, P., Alsam, S., Sissons, J., Kim, KS, Goldsworthy, G., and Jarroll, EL (February 1 - 4, 2010). *Acanthamoeba* and blood-brain barrier: the breakthrough. 2nd International Conference on Drug Discovery and Therapy, Dubai, UAE.

E. Jarroll, B. Goldberg, D. Eichinger, K. M. Harris', T. Paget, D., Lindmark, and H. van Keulen Nitric oxide effect on *Giardia* encystment. Third International *Giardia* and *Cryptosporidium* Conference. Orvieto, Italy. October, 2009.

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E. Jarroll, B. Goldberg, D. Eichinger, K. M. Harris', T. Paget, D. Lindmark, and H. van Keulen, Regulatory Effect of Nitric Oxide on *Giardia* Encystment (Mini-conference oral presentation – invited). International Society of Protistology. Rio de Janiero, Brazil, Aug. 2009. (Poster)

B. Goldberg, D. Eichinger, K. M. Harris', T. Paget, D. Lindmark, H. van Keulen, and E. Jarroll. Metabolic enzymes are altered during *Giardia* Encystment. International Society of Protistology. Rio de Janiero, Brazil, Aug. 2009. (Poster)

Naveed Ahmed Khan, Parisa Mortazavi, Selwa Alsam, James Sissons, Kwang Kim, Edward L. Jarroll and Graham Goldsworthy. Mechanisms associated with traversal of the blood-brain barrier by *Acanthamoeba*. Free Living Amoeba Meeting. 2009. Tenerife, Spain.

Edward. L. Jarroll, Ricky Dudley, Ruqaiyyah Siddiqui, and Naveed Ahmed Khan. Biochemical analyses of *Acanthamoeba* and *Balamuthia* carbohydrates. Free Living Amoeba Meeting. 2009. Tenerife, Spain.

B. Goldberg, D. Eichinger, K. M. Harris', T. Paget, H. van Keulen, and E. Jarroll 2008. Nitrosylation of specific bioenergetic and encystment pathway proteins may exert metabolic control in *Giardia* and *Entamoeba*. Annual meeting International Society for Protozoology. Dalhousie University. Halifax, NS, Canada July, 2008.

Jarroll, E. 2008. Synthesis of a novel β1,3 N-acetylgalactosamine polysaccharide during encystment. Invited speaker. Department of Microbiology. Medfield School of Pharmacy, University of Kent, Kent UK. May. 14, 2008

Jarroll, E. 2007. Cyst wall formation in *Giardia*: Induced synthesis of a novel β1, 3 N-acetylgalactosamine polysaccharide during encystment. Invited speaker. Department of Biology. University of NC Greensboro. Mar. 20, 2007.

Sener, K., van Keulen, H. And Jarroll, E. (2007) Cyst wall formation in *Giardia*: Induced synthesis of a novel β1,3 N-acetylgalactosamine polysaccharide (Giardan) during encystment. Second International Conference on *Giardia* and *Cryptosporidium*. Morelia, MX. May 13-19. (Invited).

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Newburg D, Sener K, Zuojun S, Jacewicz M S and Jarroll E. Quantification of Aminosugar Phosphates by Capillary Electrophoresis. FASEB J 2003;17:A164. (Presented at Experimental Biology 2003, San Diego, CA, April 11-15)

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Sener, K., Shen, Z., Newburg, D. and Jarroll, E. (2003). Levels of sugar phosphate intermediates in *Giardia* change during encystment. International Congress on Anaerobic Protozoa. Hilo, HI. July, 2003.

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Khan, N. A., Paget, T. A., Walton, D. S., Jarroll, E. L., & Temple, G. S. (1999). The use of protease activity for the differentiation of pathogenic and non-pathogenic *Acanthamoeba* species. 24th Annual Public Health Laboratory Service Conference. September 13 – 15, Warwick, England, UK.

Bulik, D. and Jarroll, E. 1999. UDP-GlcNAc pyrophosphorylase is a regulatory enzyme in encysting *Giardia*. EuroCarb X. National University of Galway, Ireland. July 11-16, 1999.
Khan, N., Jarroll, E., Walton, D., and Paget, T. 1999. Proteases; a marker for differentiation of pathogenic and non-pathogenic Acanthamoeba. Royal Society of Tropical Medicine and Hygiene. London. April, 1999.

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Bulik, D. and Jarroll, E. 1998. UDP-N-Acetylglucosamine pyrophosphorylase is activated by glucosamine 6-phosphate in encysting *Giardia*. . Molecular Parasitology Meeting. Woods Hole Marine Biology Laboratory. Sept. 13-17.

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Karr, C. and Jarroll, E. 1997. A novel enzyme and polysaccharide form the *Giardia* cyst wall. Molecular Parasitology Meeting. Woods Hole Marine Biology Laboratory. Sept. 24-28.

Jarroll, E. 1997. A novel enzyme and polysaccharide form the cyst wall of *Giardia.* Massachusetts Institute of Technology, Department of Biology. Invited Lecture.

Bulik, D., Lindmark, D. and Jarroll, E. 1997. UDP-N-Acetylglucosamine pyrophosphorylase - A potential regulatory point in the galactosamine biosynthetic pathway in encysting *Giardia*. International Congress of Protozoology. Sydney, Australia. July 21-25, 1997.

Karr, C. and Jarroll, E. A novel enzyme and product from encysting *Giardia*. Annual meeting of the American Society for Microbiology. May, 1997. Miami Beach, Florida.

Jarroll, E. 1997. A novel polysaccharide is synthesized when *Giardia* encysts. Boston Area Glycobiology Discussion Group. January, BU Medical School (Invited).

Jarroll, E. 1996. *Giardia* and bile: A novel new polysaccharide. University of Utrecht, The Netherlands. Dept. of Biochemistry. (Invited).

Malek, S., Lindmark, D., Jarroll, E., Wade, S., and Schaaf, S. 1996. Detection of selected enzymes in *Cryptosporidium parvum*. Society of Protozoologists Annual Meeting. June. Univ. of Arizona, Tucson, AZ.

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Jarroll, E. 1995. *Giardia*: Encystment inducible enzyme pathway. Invited Lecture. London School of Hygiene and Tropical Medicine.

Steimle, P., and Jarroll, E. 1995. Purification and characterization of glucosamine 6-phosphate isomerase from encysting *Giardia*. American Society for Cell Biology Annual Meeting. Washington, D.C., December, 1995.

Jarroll, E. 1995. *Giardia* and bile: they encyst on it. American Midwest Conference of Parasitology. Univ. of Wisconsin, Milwaukee, June. (invited)

Denys, G., Antloga, K. and Jarroll, E. 1995. Microbicidal efficacy of the Steris EcoCycle 10th Biohazardous Waste Destruction, Decontamination and Disposal System. American Society for Microbiology Annual Meeting. May 21-25. Washington, D.C.

Jarroll, E. 1995. An evaluation of the effectiveness of Potable Aqua® against *Giardia*. Fourth International Conference on Travel Medicine. Acapulco, Mexico. April.

Paget, T. A., and Jarroll, E. L. 1995. Carbohydrate metabolism in trophozoites and cysts of *Giardia intestinalis*. Society for General Microbiology. Annual Meeting. April 4-7, Bath, UK

Ellis, J. E. Jarroll, E. L., Jayasimhulu, K. and Kaneshiro, E. S. 1994. Lipid compositional changes during in vitro encystment of *Giardia lamblia*. American Society of Tropical Medicine and Hygiene Annual Meeting. Nov. 13-17, Cincinnati, OH.

Jarroll, E. L., Karr, C., and Koudela, B. 1994. In vitro excystation of *Spironucleus muris*. Society of Protozoologists. Annual Meeting. June. Cleveland State University, Cleveland, OH.
Karr, C., Lindmark, D. G. and Jarroll, E. L. 1994. Cyst wall synthetase: A novel enzyme induced during *Giardia* cyst wall formation. Society of Protozoologists. Annual Meeting. June. Cleveland State University, Cleveland, OH.

Steimle, P. A. and Jarroll, E. L. 1994. Purification and characterization of glucosamine 6-phosphate isomerase from encysting *Giardia*. Society of Protozoologists. Annual Meeting. June. Cleveland State University, Cleveland, OH.

Erlandsen, S., Gurien, A., van Keulen, H. and Jarroll, E., 1992. Use of Molecular Techniques for RDNA for *Giardia* speciation. Proceedings of the American Water Works Quality and Technology Conference. (invited)

Erlandsen, S.L., Gurien, A., van Keulen, H., Waggoner, A., A., Breije, T. and Jarroll, E., 1992. Development of fluorochrome conjugated rDNA probes for the identification *Giardia* species by in situ hybridization. American Gastroenterological Association and American Association for the Study of Liver Diseases. Annual Meetings. San Francisco, CA, May. (contributed)

Jarroll, E.L. 1992. Biochemical mechanisms of action of antigiardial drugs. *Giardia*: From Molecules to Disease and Beyond. Section review. Perth, Western Australia, Dec. 6, 1992.

Erlandsen, S.L., van Keulen, H., Breije, T. Gurien, A., Jakubowski, W., Schaefer, F.W., Wallis, P., and Jarroll, E.L., 1992. Molecular approach to the speciation and detection of *Giardia*: Fluorochrome-rDNA probes for identification of *Giardia lamblia, Giardia muris,* and *Giardia ardeae* in laboratory and environmental samples by in situ hybridization. *Giardia*: From Molecules to Disease and Beyond. Invited Symposium. Perth, Western Australia, Dec. 6, 1992.
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Paget, T.A., Manning, P., Erlandsen, S.L., and Jarroll, E.L. 1992. Metabolic changes during encystation and excystment in *Giardia duodenalis*. *Giardia*: From Molecules to Disease and Beyond. Invited Symposium. Perth, Western Australia. Dec, 6, 1992.

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Jarroll, E., Macechko, P.T., Steimle, P. and Lindmark, D. 1992. Inducible enzymes of galactosamine synthesis in encysting *Giardia*. Society of Protozoologists. Annual Meeting. July 10-15, 1992. University of British Columbia, Vancouver, B.C.

Steimle, P. and Jarroll, E. 1992. Encysting *Giardia* exhibit glucosamine 6-phosphate isomerase activity. Society of Protozoologists. Annual Meeting. July 10-15, 1992. University of British Columbia, Vancouver, B.C.

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Erlandsen, S.L., Gurien, A., van Keulen, H., Shaefer, F. III, Waggoner, A., Breije, T., and Jarroll, E. 1991. In situ hybridization (ISH) detection of rRNA/rDNA in *Giardia* trophozoites and cysts using oligomeric probes directly conjugated with carboxymethylindocyanine dyes or indirect detection with digoxygenin labeled probes: Use of cytoskeletal preparations to facilitate nuclear detection of rDNA. American Society for Cell Biology, Annual meeting December 8-12, 1991. Boston, MA.

Paget, T.A., Tedjame-Mortty, G.E., Daisley, R.W., Manning, P., and Jarroll, E.L. 1991. The effects of indol-2, 3-derivatives on cysts of *Giardia*. British Pharmaceutical Conference, Liverpool University, Liverpool, UK. September 1991.

Steimle, P. and Jarroll, E.L. 1991. Encysting *Giardia* exhibit UDP-N-acetylglucosamine pyrophosphorylase activity. American Society of Parasitologists. Annual Meeting, University of Wisconsin, Madison. August, 1991.

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van Keulen, H. Erlandsen, S. L. and Jarroll, E. L. 1991 Use of DNA as a tool for identification of *Giardia* species. Molecular Parasitology Meeting, Woods Hole, MA Sep 22 -25.
Weiss, J.B., Nash, T.E., Jarroll, E.L., van Keulen, H., and White, T.E. 1991. Specific detection of *Giardia lamblia (G. duodenalis)* by the polymerase chain reaction. American Society for Microbiology. Annual Meeting, 1991. Dallas, TX.

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Berrada, A., Shields, J., van Keulen, H., Erlandsen, S., and Jarroll, E.L., 1990. Identification and localization of cyst wall proteins in encysting *Giardia*. Society of Protozoologists. Annual Meeting, June, University of Maryland.

Macechko, P.T. and Jarroll, E.L. 1990. *Giardia* synthesize galactosamine (GalN) during encystment, Society of Protozoologists. Annual Meeting, June, University of Maryland.

Manning, P.M., Erlandsen, S., and Jarroll, E.L. 1990. Localization of glucose in *Giardia muris* cysts, Society of Protozoologists. Annual Meeting, June, University of Maryland.

Jarroll, E.L. 1990. Encystment-included biosynthetic pathway for N-acetylgalactosamine in *Giardia*. In: Biochemical protozoology in drug design (a symposium). University of Stirling, Stirling, Scotland, August.(invited speaker).

Jarroll, E.L. 1990. Giardia proteinases. In: Biochemical protozoology in drug design (a symposium). University of Stirling, Stirling, Scotland, August. (invited speaker).

van Keulen, H., Campbell, S., Erlandsen, S. and Jarroll, E.L. 1990. Ribosomal DNA comparisons of *Giardia* species. International Congress of Parasitology. August, Paris, France.
Paget, T., Jarroll, E.L., Manning, P., Lindmark, D. and Lloyd, D. 1990. Respiratory activity in cysts of *Giardia lamblia*. International Congress of Parasitology. August, Paris, France.

Campbell, S., van Keulen, H., Erlandsen, S., and Jarroll, E.L. 1990. Electrophoretic karyotype comparisons of *Giardia* species. International Congress of Parasitology VII. August, Paris, France.

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Coggins, J.R. and Jarroll, E.L. 1988. Analysis of *Giardia muris* cyst wall ultrastructure and composition. American Society of Parasitologists. Annual Meeting, Vancouver, Winston-Salem, NC.

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van Keulen, H., Campbell, S., and Jarroll, E.L. 1988. Differentiation between *Giardia lamblia* and *G. muris* by rRNA gene organization and orthogonal field alternation gel electrophoresis-karyotype analysis. Symposium on Anaerobic Protozoa. Cardiff, Wales.

Gaspano, J. and Jarroll, E.L. 1988. Comparison of proteinase activity in several strains of *Giardia*. Symposium on Anaerobic Protozoa. Cardiff, Wales.

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Erlandsen, S.L., Bemrick, W.J., Feely, D.E., Januschka, M.M., Sherlock, L., Jarroll, E.L., and Meyer, E.A. 1987. Two different patterns of excystation in *Giardia* cysts. American Society of Parasitologists. Lincoln, NE.

Jarroll, E.L. 1987. Biochemistry and metabolism of *Giardia lamblia*. In: Symposium on the Metabolism of Anaerobic Protists. Society of Protozoologists. Annual Meeting, Urbana, IL.
Jarroll, E.L., Hare, D.F., and Lindmark, D.G. 1987. Proteinases of *Giardia lamblia* trophozoites. Society of Protozoologists. Annual Meeting, Urbana, IL.

Campbell, S.R., Jarroll, E.L., van Keulen, H., and Pavelka, M. 1987. Orthogonal field alternation gel electrophoretic analysis of *Giardia* Society of Protozoologists. Annual Meeting, Urbana, IL.

Jarroll, E.L. 1985. Resistance of *Giardia* cysts to chemical disinfectants. Chemical Disinfection II Conference. SUNY-Binghamton.

Jarroll, E.L., Hammond, M. and Lindmark, D.G. 1982. Uptake of pyrimidine nucleosides by *Giardia lamblia* trophozoites. Society of Protozoologists. Urbana, IL.

Jarroll, E.L. and Lindmark, D.G. 1982. Metabolism of *Giardia* trophozoites. Fifth International Congress of Parasitology. Toronto, Canada. (invited speaker).

Lindmark, D.G. and Jarroll, E.L. 1982. Pyrimidine salvage in the trophozoites of *Tritrichomonas foetus*. American Society for Microbiology. Annual Meeting, Atlanta, Ga.

Jarroll, E.L., Lindmark, D.G., Shin, S. and Timoney, P. 1982. Metabolism of the contagious equine metritis bacterium. American Society for Microbiology. Annual Meeting, Atlanta, GA.
Lindmark, D.G., Jarroll, E.L., Shin, S. and Timoney, P. 1981. Energy metabolism of the etiological agent of contagious equine metritis. Central NY Branch of the American Society for Microbiology. SUNY-Binghamton.

Jarroll, E.L., Lindmark, D.G. and Hallick, L.M. 1981. In vivo DNA replication in binucleate trophozoites of *Giardia lamblia*. Central NY Branch of the American Society for Microbiology. SUNY-Binghamton.

Lindmark, D.G., Jarroll, E.L., Shin, S. and Timoney, P. 1981. Energy metabolism of the etiological agent of contagious equine metritis. Central NY Branch of The American Society for Microbiology, Rochester, NY.

Jarroll, E. 2007. Giardan: Structure, Synthesis, Regulation and Inhibition. Annual Meeting International Society of Protozoology. Providence, RI (invited speaker in Drug Development Section).

Jarroll, E. 2007. Cyst wall formation in *Giardia (Diplomonadida)*: Induced synthesis of a novel β1,3 N-acetylgalactosamine polysaccharide during encystment. Department of Biological Sciences. Auburn University.

Jarroll, E.L., Lindmark, D.G. and Hallick, L.M. 1981. In vivo DNA replication in binucleate trophozoites of *Giardia lamblia*. American Society of Parasitologists. Annual Meeting, Montreal, Canada.

Lindmark, D.G. and Jarroll, E.L. 1981. Pyrimidine salvage by trophozoites of *Giardia lamblia*. American Society of Parasitologists. Annual Meeting, Montreal, Canada.

Jarroll, E.L., Meyer, E.A. and Morse, S.A. 1980. Lipid metabolism in *Giardia* trophozoites. Society of Protozoologists. Annual Meeting, Georgetown, Washington, D.C.

Meyer, E.A., Jarroll, E.L., Radulescu, S. and Rau, C. 1980. The in vitro interaction of *Giardia lamblia* with macrophage: The role of specific immunoglobulin G as opsonin in phagocytosis. International Congress of Immunology. Paris, France.

Bertram, M.A., Jarroll, E.L. and Meyer, E.A. 1980. Comparison of the electrophoretic mobility of enzymes of *Giardia* isolated from human, cat and guinea pig hosts. American Society for Microbiology. Annual Meeting, Miami, FL.

Jarroll, E.L., Bingham, A.K. and Meyer, E.A. 1980. Effect of chlorine on *Giardia lamblia* cyst survival. American Society for Microbiology. Annual Meeting, Miami, FL.

Jarroll, E.L. and Meyer, E.A. 1979. The behavior of *Plasmodium berghei* in a modified Trager and Jensen culture system. American Society of Tropical Medicine and Hygiene. Annual Meeting, Tuscon, AZ.

Jarroll, E.L., Bingham, A.K. and Meyer, E.A. 1979. Inactivation of *Giardia* cysts: A comparison of six water disinfection methods. American Society of Parasitologists. Annual Meeting, Minneapolis, MN.

Jarroll, E.L., Bingham, A.K., Meyer, E.A., and Radulescu, S. 1978. Effect of temperature on *Giardia* cyst survival as determined by eosin staining and excystation. International Congress of Parasitology IV. Warsaw, Poland.

Jarroll, E.L. 1978. The epizootiology of *Bothriocephalus rarus* Thomas in the newt, *Notophthalmus viridescens*. International Congress of Parasitology IV. Warsaw, Poland.

GRADUATE THESES

Jarroll, E.L. 1977. Population dynamics and epizootiology of *Bothriocephalus rarus* (Pseudophyllidea) in *Notophthalmus viridescens*. Ph.D. Thesis. West Virginia University.

Jarroll, E.L. 1971. Some aspects of the biology of *Veigaia* (Acarina: Mesostigmata). M.S. Thesis. West Virginia University.

PROFESSIONAL REVIEWS

Reviewer for Journal of Veterinary Diagnostic Investigation, 2005-present
Medical Research Council, United Kingdom, Ad Hoc Reviewer, 2003-present
Board of Reviewers - Journal of Eukaryotic Microbiology (Journal of Protozoology), 1993-1999, and 2001-present
Reviewer for Parasitology Today, 2000
Reviewer for Parasitology Research (as required)
Reviewer for National Academy of Sciences/US AID, 1996
Board of Reviewers - Applied & Environmental Microbiology, 1996-present
Reviewer for Journal of Clinical Microbiology, 1995
Reviewer for Molecular and Biochemical Parasitology, 1995
Reviewer for American Heart Association, Summer Fellowship, 1994-present
Reviewer for Antimicrobial Agents and Chemotherapy, 1994-present
Reviewer for International Journal of Parasitology, 1994-present
Reviewer for Applied and Environmental Microbiology, 1992-present
Reviewer for Microbiological Reviews, 1991-Present
Reviewer for Journal of General Microbiology, 1990-Present
Reviewer for Journal of Parasitology, 1989-Present
Reviewer for Journal of Protozoology, 1989-Present
Reviewer for Journal of Lipid Research, 1988
Reviewer for Addison-Wesley Co., 1979

Grant Reviews for National Institutes of Health (as required)
Grant Reviews for National Science Foundation (as required)
Grant Reviews for National Environmental Research Council (United Kingdom)
Grant Reviews for U.S. Environmental Protection Agency
Grant reviewer for U.S. Department of Agriculture (*Giardia/Trichomonas*)
Grant Reviewer for the Wellcome Trust (London, United Kingdom)
Reviewer for Thrasher Research Fund
Member Research Allocation Committee (NEOA) American Heart Association 1996
Reviewer BBSRC United Kingdom
External Reviewer-Department of Biology and Biomedical Sciences, Aga Khan University Medical School. Karachi, Pakistan. December 2010.

AWARDS AND HONORS

Tau Beta Pi National Engineering Honorary
Alpha Chi National Academic Honorary
Chair, Biochemistry Section, Second International Conference on *Giardia* and *Cryptosporidium.* Mexico, May 2007.
Chair, Biochemistry Section. Annual meeting Society of Protozoology. Warwick, RI, July, 2007.
Chair, Biochemistry Section, Giardiasis in the Rockies Conference. Canmore, Alberta, Canada. October, 2000.

Co-Chair of Workshop on Molecular Pathogenesis of Intestinal Protozoan Infections. 9th International Congress of Parasitology. Makuhari, Chiba, Japan. August, 1998.
Chair, Water Treatment Section, Annual Meeting Society of Protozoologists and American Society of Parasitologists. San Juan, Puerto Rico. June 2000.
Organizer, Symposium on Protozoan encystment: Sugar-coating the Protozoa. Annual Meeting Society of Protozoologists and American Society of Parasitologists. San Juan, Puerto Rico. June 2000.
Co-Chair of Biochemistry Section - American Society of Parasitology Annual Meeting, Kona, Hawaii, August, 1998.
Chair of Biochemistry Section - Society of Protozoologists Annual Meeting, Cleveland, OH, 1994
Fulbright Research Scholarship, 1993
Chair of Section IV International Conference on Chemical Disinfection. SUNY-Binghamton, 1988
Who's who in Science & Engineering
Who's Who Among Students in American Colleges and Universities
Who's Who in American Men and Women in Science

COMMITTEE MEMBERSHIP AND SERVICE

At Cleveland State University

University Advisory Committee for AAUP Contract Proposal 1995-96
University Health Issues Subcommittee, Chair 1991
Graduate Admissions Officer (Biology) 1989-1991
Temporary Advisory Committee (Biology, Chair) 1989-1991
Ad Hoc Committee for Graduate Curriculum Revision (Biology) 1989
Ad Hoc Committee for Dean's Merit (College of A & S) 1989
University Health Issues Subcommittee 1988-1995
Graduate Recruitment Officer (Biology) 1987-1996
University Radiation Safety Committee 1987-1996
Teaching Assistantship Awards Committee (Biology) 1987-1990
Undergraduate Committee for Curriculum and Academic Standards (Biology) 1987-1989
Speaker's Bureau (University) 1986-1996
Graduate Committee for Curriculum and Academic Standards (Biology) 1986-1991

At Northeastern University

Departmental Executive Committee 2007-present
Chair, University Biosafety Committee 2007-present
Administrative Evaluation and Oversight Committee (Faculty Senate) 2003-2007
Executive Committee of the Graduate Council 2000-present
Research Council 2000-2006
Graduate Council 2000-2006
University Five Year Budget Committee 1999-2001
CAS Promotion and Tenure Committee 1998-2001
Chair, Faculty Senate Financial Subcommittee 1998-2000
Member, University Committee on Funding Priorities 1998-1999

CAS Agenda Committee 1998-2000
Member, Faculty Senate 1997-99, 1999-2001
Faculty Senate Financial Subcommittee 1997-2000
Council of Chairs 1996-present
Advisory Committee - Barnett Institute 1996-2006
CAS Centennial Committee 1996-1998
CAS Roles & Responsibilities (ad hoc) 1996

At Lehman College-City University of New York

Research Advisory Board 2009-2012
Master's in Public Health Advisory Board 2009-2012
Provost's Council 2009-2012

In Professional Societies

Member, American Society for Microbiology
Member, American Society for Cell Biology
Society of Protozoologists, Chair, Education Committee 1999-2000
Society of Protozoologists, Nominating Committee, 1997-1998
American Society of Parasitology
Royal Society of Tropical Medicine & Hygiene, Fellow
American Society of Tropical Medicine & Hygiene
Helminthological Society of Washington
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Former V Provost for Research and Graduate Education while I was Chair of Biology and Associate Dean at Northeastern.

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Former Associate Dean in A&S and then V. Provost for UG Education while I was Chair of biology and then Associate Dean.

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He was the Chair at Cleveland State who hired me to CSU and then he was a faculty member in the department when I served as Chair.

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He is a research colleague and the newly hired Chair of Chemistry at Lehman College. He was formerly at Kent University in the UK.

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