

ANTHONY JOHN CLARKE

CURRENT POSITION

Assistant Vice-President (Graduate Studies & Program Quality Assurance)
Professor of Molecular & Cellular Biology
University of Guelph
Guelph, Ontario N1G 2W1

EDUCATION

Ph.D.	Chemistry (Biochemistry)	Waterloo	April, 1983
M.Sc.	Chemistry (Biochemistry)	Waterloo	September, 1980
B.Sc. (Hons.)	Biology and Chemistry	Waterloo	April, 1978

PROFESSIONAL EXPERIENCE

Academic and Research

Position	Dates	Department	Institution
Professor	1998 - present	Microbiology	University of Guelph
Visiting Professor	1997	Chemistry	Carlsberg Research Centre, Copenhagen
Associate Professor	1992 - 1998	Microbiology	University of Guelph
Assistant Professor	1987 - 1992	Microbiology	University of Guelph
Assistant Professor	1986 - 1987	Chem & Biochem	University of Guelph
Research Associate	1984 - 1986	Biological Science	National Research Council Canada, Ottawa
Post-Doctoral Fellow	1983 - 1984	Chemistry	Carlsberg Research Centre, Copenhagen

Administrative

Position	Dates	Department	Institution
A.V.P. (G.S. & QPA)	2010 - present	Office of the Provost	University of Guelph
Interim Dean	2008 - 2010	School of Graduate Studies	University of Guelph
A/Assoc. V.P. (Academic)	2007	Office of the Provost	University of Guelph
A/Assoc. V.P. (Research)	2005 - 2007	Office of Research	University of Guelph
International Liaison Officer	2002 - 2007		University of Guelph
A/ Co-Director	2002 - 2004	Centre for Intl. Programs	University of Guelph
Assistant V.P. (Academic)	2002 - 2010	Office of the Provost	University of Guelph
A/Dean	2001 - 2002	Biological Science	University of Guelph
Chair of Department	1996 - 2001	Microbiology	University of Guelph
A/Chair of Department	1995 - 1996	Microbiology	University of Guelph

RECOGNITION and AWARDS

Invited member of AFMNet (National Centre of Excellence)	2006 - present
College of Biological Science Teaching Excellence Award	2001
President's Distinguished Professor Award	2001
Visiting Professorship, Carlsberg Foundation	1997
Invited member of CBDN (National Centre of Excellence)	1990 - 2005
Research Associateship, National Research Council Canada	1984 - 1986
Post-Doctoral Fellowship, Carlsberg Foundation	1983

ADMINISTRATIVE COMMITTEES

International & National

Euroleague-North America Organization Committee	2002 - 2007
Chair, Physiology and Metabolism Section, Canadian Society of Microbiologists	1994 - 1996
Vice-Chair, Physiol. and Metabolism Section, Canadian Society of Microbiologists	1992 - 1994
Member of Nominating Committee, Canadian Biochemical Society	1989
Six Nations Polytechnic Advisory Committee	2002 - 2005

University of Guelph

President's Executive Council	2005 - present
Vice-President's Academic Council	2001 - present
Risk Management Steering Committee	2007 - 2008
Campus Control Group	2007 - present
Senate	1995 - present
Faculty Collective Agreement Committee	2006 - 2008
	2011
Joint Faculty Policies Committee	1996 - 2001
Faculty Recruitment and Retention Advisory Group	2001 - 2005
Canada Research Chairs Validation Committee - <i>Chair</i>	2005 - present
Graduate Programs Services Council - <i>Chair</i>	2009 - present
Enrolment Coordination Committee - <i>Chair</i>	2007
Learning Commons Steering Committee - <i>Chair</i>	2007
President/Chancellor's Scholars Selection Committee	2007
Student Service Fee Committee - <i>Chair</i>	2002 - 2005
Co-op Programs Coordinating Committee - <i>Chair</i>	2002 - 2005
Research Services Council - <i>Chair</i>	2006 - 2007
Strategic Research Plan Committee	2002 - 2003
University International Research Committee	2003 - 2007
Intellectual Property Committee, <i>Chair</i>	2000 - 2005
	2008 - present
University Biosafety Committee	2005 - 2007
Animal Care Advisory Committee	2001 - 2002
Mass Spectrometry Management Committee	2003 - 2007
Advanced Analysis Centre Organizational Committee	2004 - present
Information Services Committee	2005 - 2008
Information Technology Steering Committee	2007

ADMINISTRATIVE COMMITTEES - continued

University of Guelph Senate Committees

Senate Executive Committee	1998 - 2001
Senate Executive Sub Committee - Graduation and Ceremonials	2007
Standing Committee for Internal Reviews - <i>Chair</i>	2002 - 2005
	2007 - present
Senate International Committee	2002 - 2007
Senate Committee for Open Learning	2002 - 2005, 2007
Senate Committee for Open Learning, Reviews & Approvals Sub-Committee	2002 - 2005
Senate Library Committee	2002 - 2005, 2007
Board of Graduate Studies	2002 - present
Board of Graduate Studies Executive Committee	2008 - present
Graduate Awards Committee	2008 - present
Graduate Programs Committee	2008 - present
Graduate Admissions and Progress Committee	2008 - present
Board of Undergraduate Studies	2007
B.Sc. Program Committee	1994 - 2002
Research Board	1997 - 2002
	2005 - present
<i>Chair</i>	1998 - 2001
<i>Vice- Chair</i>	1997 - 1998
Research Ethics Board - <i>Chair</i>	2005
SSHRC Grant Committee	2005 - 2007
Northern Studies Committee	2005 - 2007
Grant-in-lieu of Salary Committee	2005 - 2007

University of Guelph Building Committees

Athletics Centre Steering Committee	2007 - present
OVC Building Steering Committee - <i>Chair</i>	2006 - 2008
OVC Building A Working Group	2007 - 2008
OVC Building B Working Group	2007 - 2008
Science Complex Steering Committee	2000 - 2007
Science Complex Working Group	2001 - 2007
Science Complex Atrium Committee	2002 - 2008
Science Complex Fundraising Committee	2001 - 2006
Science Complex Relocations Committee	2002 - 2007
Science Complex CFI/OIT Application Committee	2002 - 2003
Biodiversity Institute of Ontario Working Group	2002 - 2006
CFI-ICNet Application Committee	2002 - 2003

College of Biological Science

Dean's Council	1995 - 2001
<i>Chair</i>	2001 - 2002
CBS Restructuring Committee	2002 - 2005
Promotion and Tenure Committee, <i>Chair</i>	2001 - 2002
Alumni Association	1988 - 1994
International Programmes Committee	1987 - 1994

ADMINISTRATIVE COMMITTEES - continued

Department of Microbiology

Awards Committee		1995 - 2003
Undergraduate Curriculum Committee, <i>Chair</i>		1994 - 1998
		1990 - 1992
Promotion and Tenure Committee		1995 - 2001
		1991 - 1993
	<i>Chair</i>	1996 - 2001
Health and Safety Committee	<i>Chair</i>	1992 - 1994
Safety Officer		1989 - 1994
Seminar Coordinator		1989 - 1991

Search Committees

Associate Vice-President Research (Agri-Foods & Partnerships)		2001
Dean, College of Biological Science		2001
Chair, Mathematics and Statistics		2000
Chair, Zoology		2000
Chair, Molecular Biology and Genetics		1999
Director, Bachelor of Arts and Science		2001 - 2002
Director, Guelph-Waterloo Centre for Graduate Work in Chemistry, <i>Co-Chair</i>		2010
CRC (Tier 1) - NSERC Global Health and Nutrition - <i>Chair</i>		2010
CRC (Tier 1) - CIHR/SSHRC Global Health and Nutrition		2010
CRC (Tier 2) - Department of Molecular & Cellular Biology		2010
CRC (Tier 2) - Department of Human Health & Nutritional Sciences		2010
CRC (Tier 1) - Department of Philosophy		2008 - 2009
CRC (Tier 2) - Global Human Security		2008 - 2010
CRC (Tier 2) - Care, Gender and Relationships		2008 - 2010
CRC (Tier 1) - Department of Physics		2007 - 2009
CRC (Tier 2) - Department of Chemistry		2007 - 2008
CRC (Tier 2) - Department of Pathology		2007 - 2008
CRC (Tier 2) - Department of Economics		2007 - 2008
CRC (Tier 1) - Department of Physics		2005 - 2006
CRC (Tier 1) - Department of Psychology		2005 - 2006
CRC (Tier 2) - Department of Sociology & Anthropology		2005 - 2007
CRC (Tier 2) - Department of Environmental Biology		2005 - 2006
CRC (Tier 2) - Department of Land Resource Science		2005 - 2008
CRC (Tier 2) - Department of Mathematics & Statistics		2005 - 2006
CRC (Tier 2) - Department of Computer & Information Science		2005 - 2006
CRC (Tier 1) - Department of Microbiology		2002
CRC (Tier 2) - Department of Botany		2002
CRC (Tier 1) - Department of Human Health and Nutritional Science		2001
CRC (Tier 2) - Department of Zoology		2001
University Research Chair, Department of Molecular Biology & Genetics		2001
Faculty, Department of Botany		2002
Faculty, Department of Microbiology		1995
Faculty, Department of Microbiology		1990
Special Projects and Events Manager		2007
Director of Space and Planning		2007
Manager, Audit Services		2005

PROFESSIONAL ACTIVITIES

Society Memberships

American Chemical Society
American Society of Biochemistry and Molecular Biology
American Society for Microbiology
Canadian Society of Microbiologists
Protein Society

Editorial Boards

Canadian Journal of Microbiology 1995 - present
International Journal of Biochemistry and Cell Biology 2002 - present

Research Grant Panels

Canadian Institutes of Health Research
Microbiology and Infectious Diseases 1999-2001, 2003, 2004, 2006
Site Visit Team Member 1994, 1996
Department of Energy (U.S.) 1992
National Institutes of Health (U.S.) 1991
Ontario Graduate Scholarship 1995, 1999 - 2007
Panel Chair 2000 - 2007
Ontario Ministry of Agriculture, Food, and Rural Affairs 2007

Research Grant Reviews (*ad hoc reviewer of grant proposals for the following agencies*)

Academy of Sciences of the Czech Republic AFMNEt
Austrian Science Foundation British Columbia Health Care
Biotechnol. & Biological Sciences Res. Council (UK) Canadian Cystic Fibrosis Foundation
Canadian Institutes of Health Research National Institutes of Health (USA)
National Science Foundation (USA) Natural Science & Engineering Research Council
Ontario Centres of Excellence Research Corporation (USA)
Saskatchewan Health Research Foundation U. S. Department of Energy
US-Israel Binational Science Foundation Wellcome Trust Foundation (UK)
ZonMws Priority Medicines (NL)

External Reviewer for Promotion and Tenure

K. Young	Tenure & promotion	University of Arkansas for Medical Sciences	2010
N. Martin	Tenure & promotion	Microbiology & Immunology Queen's University	2006
M. Konaklieva	Tenure	Chemistry, American University Washington, D.C.	2004
P. Rather	Tenure & promotion	Microbiology & Immunology Emory U. School of Medicine	2003
P. Jayaratne	Promotion to Assoc. Professor	Pathology & Molecular Medicine McMaster University	2000
E. Brown	Tenure & promotion	Biochemistry, McMaster University	1998
G. Wright	Promotion to Assoc. Professor	Biochemistry, McMaster University	1998
C. Annette	Promotion to Professor	Chemistry, Trent University	1994

PROFESSIONAL ACTIVITIES - continued

External Examiner of Ph.D. Theses

H. Haiser	Department of Biology, McMaster University	2011
L. Sim	Department of Medical Biophysics, University of Toronto	2010
G. Li	Department of Microbiology, University of Saskatchewan	2009
J. Mark	Department of Biochemistry, University of Ottawa	2008
S. Vijayakumar	Department of Microbiology & Immunology, U.W.O.	2007
S. Jana	India Institute of Technology, Delhi, India	2006
S. E. Lee	Department of Chemistry, U.B.C.	2004
E. H. Rydberg	Department of Biochemistry and Molecular Biology, U.B.C.	2000
G. A. McKay	Department of Biochemistry, McMaster University	1999
X. Liao	Department of Microbiology and Immunology, U.B.C.	1996
J. Davoodi	Department of Biochemistry, University of Ottawa	1996
H. Damude	Department of Microbiology and Immunology, U.B.C.	1995
D. Tull	Department of Chemistry, U.B.C.	1995
H.G. Dallman	Department of Biochemistry, University of Western Ontario	1993

Journal Manuscripts Reviewed (*ad hoc reviewer for the following scientific journals*)

<i>Analytical Biochemistry</i>	<i>FEBS Journal</i>
<i>Antimicrobial Agents & Chemotherapy</i>	<i>FEBS Letters</i>
<i>Applied and Environmental Microbiology</i>	<i>FEMS Microbiology Letters</i>
<i>Applied Enzymology and Microbiology</i>	<i>FEMS Microbiological Reviews</i>
<i>Applied Microbiology and Biotechnology</i>	<i>Food Research International</i>
<i>Archives of Microbiology</i>	<i>Intl. Journal of Biochemistry & Cell Biology</i>
<i>Archives of Biochemistry & Biophysics</i>	<i>International Journal of Biological Science</i>
<i>Biocatalysis and Biotransformation</i>	<i>Gene</i>
<i>Biochemical Journal</i>	<i>Journal of Bacteriology</i>
<i>Biochemistry</i>	<i>J. Biochemical and Biophysical Methods</i>
<i>Biochemistry & Cell Biology</i>	<i>Journal of Biological Chemistry</i>
<i>Biochimica Biophysica Acta</i>	<i>Journal of Industrial Microbiology</i>
<i>Biodegradation</i>	<i>Journal of Molecular Biology</i>
<i>Bioresource Technology</i>	<i>Journal of Peptide Research</i>
<i>Biotechnology Progress</i>	<i>Microbiological Research</i>
<i>BMC Genomics</i>	<i>Microbiology</i>
<i>Canadian Journal of Botany</i>	<i>Molecular Microbiology</i>
<i>Canadian Journal of Microbiology</i>	<i>Nature Chemical Biology</i>
<i>Carbohydrate Research</i>	<i>Plant Physiology</i>
<i>Chemical Biology</i>	<i>Proceedings Natl. Academy of Sciences (USA)</i>
<i>Chemistry and Biological Chemistry</i>	<i>Process Biochemistry</i>
<i>Current Microbiology</i>	<i>Protein Engineering</i>
<i>Enzyme and Microbiological Technology</i>	<i>Protein Expression & Purification</i>
<i>European Journal of Biochemistry</i>	<i>Protein Science</i>
	<i>Trends in Microbiology</i>

PROFESSIONAL ACTIVITIES - continued

Organization of Scientific Conferences

UKCan-BaCWAN Workshop, Niagara-on-the-Lake, Ontario, April, 2010 (*Organizer & Chair*)
Annual Meeting of the Canadian Society for Microbiologists, Guelph, June, 1998 (*LOC Chair*)
International Plant Polysaccharide Meeting, Guelph, July, 1994 (*LOC member*)

Organization of Symposia

"*Liposomes as Delivery Vehicles for Antigens, Antiviral and Antibacterial Agents*",
Canadian Society for Microbiologists Annual Meeting, Charlottetown, P.E.I., June, 1996
"*Biology and Metabolism of Peptidoglycan*"
Canadian Society of Microbiologists Annual Meeting, Vancouver, B.C., June, 1994
"*Biophysics Interdepartmental Group Symposium on Bacterial Cell Surfaces*" University of Guelph,
1990

Invited Lectures/Seminars

2011 Great Wall Symposium, Lisbon, Portugal, October, 2011
9th International Carbohydrate Bioengineering Meeting, Lisbon, Portugal, May, 2011
Department of Biochemistry, University of Toronto, January 2011
Department of Microbiology and Immunology, University of Western Ontario, November, 2010
XXV International Carbohydrate Symposium, Tokyo, Japan, August 2010
110th General Meeting, American Society for Microbiology, San Diego, CA, May 2010.
UK-BaCWAN Annual meeting, Leamington Spa, U.K., November 2009.
92nd Canadian Society of Chemistry Conference and Exhibition, Hamilton, Ontario, June, 2009
Department of Microbiology & Immunology, University of Saskatchewan, Saskatchewan, May 2009
XXIV International Carbohydrate Symposium, Oslo, Norway, July - August, 2008
4th UK Bacterial Cell Wall Biosynthesis Network meeting, Warwick, U.K., March, 2008
CIHR-MRC Workshop on Antibiotic Resistance, London, U.K., February, 2008
North America Peptidoglycan Symposium - The Great Wall, Madison, Wisconsin, December, 2007
COHERE-CHERD Blended Learning: Transforming Higher Education, York University, October, 2007
7th International Carbohydrate Bioengineering Meeting, Braunschweig, Germany, April, 2007
Department of Chemistry, Carlsberg Research Centre, Copenhagen, Denmark, April, 2007
11th International Symposium on Microbial Ecology, Vienna, Austria, August, 2006
XXIII International Carbohydrate Symposium, Whistler, B.C. July, 2006
Soft Matters Seminar Series, University of Guelph, December, 2005
XXII International Carbohydrate Symposium, Glasgow, Scotland, July, 2004
Department of Biochemistry, Memorial University of Newfoundland, October, 2003
Department of Chemistry, Carlsberg Research Centre, Copenhagen, Denmark, April, 2003
Department of Microbiology & Immunology, North Dakota School of Medicine, September, 2002
4th International Carbohydrate Bioengineering Conference, Stockholm, Sweden, June, 2001
Department of Chemistry, Carlsberg Research Centre, Copenhagen, Denmark, June, 2001
Department of Chemistry and Biochemistry, University of Guelph, February 2001
American Chemical Society, Annual Meeting, Washington D.C., August, 2000
3rd International Carbohydrate Bioengineering Conference, Newcastle-upon Tyne, April, 1999
NRC Symposium, Mechanisms and Engineering of β -Glycosidases, Ottawa, January, 1999
PHRI TB Center, New York Public Health Research Institute, New York, December, 1998
Microbiology and Biotechnology Research Centre, Armand Frappier, Montreal, November, 1998
Infectious Diseases Division, Eli Lilly, Indianapolis, November, 1998
Department of Chemistry, Carlsberg Laboratory, Copenhagen, February, 1996
Department of Chemistry, Carlsberg Laboratory, Copenhagen, June, 1995

PROFESSIONAL ACTIVITIES

Invited lectures- continued

UA/UC International Conference on Infectious Diseases, Kananaskis, Alberta, April, 1994
Canadian Society of Microbiologists Annual Meeting, Vancouver, B.C. , June, 1994
Department of Biochemistry, McMaster University, January, 1994
Departments of Microbiology, and Medical Microbiology, University of Alberta, March, 1993
Department of Microbiology and Immunology, Queen's University, November, 1993
American Chemical Society Annual Meeting, Washington D.C., August, 1992
Department of Chemistry and Biochemistry, University of Guelph, 1991, 1992
Department of Botany, University of Guelph, November, 1990
University of Guelph Biophysics Interdepartmental Group, October, 1990
Department of Chemistry, Laurentian University, February, 1987
Department of Chemistry, Lakehead University, February, 1987

TEACHING ACTIVITIES

Courses Taught - Undergraduate

Biology	BIOL*1030, Biology	W99, F00, W01
Chemistry & Biochemistry	19-106, Introductory Chemistry	S86
	19-453, Advanced Biochemistry II	W86, W87
	19-454, Enzymology	W87
Microbiology	MICR*1000, General Microbiology	F96, W97, F97, W98, F98,
	MICR*2030, Microbial Growth	W88, S88, W89, S89, W90, S90,
		W92, S92, W93, F94, F96, F97,
		W98, W99, W00, W01, W02,
		W03, W04, W05, W06, W07,
		W08, W09, W10
	MICR*2020, Microbial Associations	F99, F00, W01
	MICR*4270, Microbial Design	
	MICR*4240, Topics in Microbiology	
	MICR*4310/4320, Research Project I and II	
Molecular Biology & Genetics	MBG*4510 Research Project	

Courses Taught - Graduate

Microbiology	MICR*6040, Advanced Microbial Physiology	
	MICR*6070, Bacterial Structures and Virulence	
	65-625, Advanced Techniques	
Chem & Biochem ((GWC)²)	19-730, Proteins and Nucleic Acids	F86

TEACHING ACTIVITIES - continued

Supervision of Graduate Students

In Progress:

Ph.D.

John Pfeffer
Patrick Moynihan

M.Sc.

Sarah Selander
Asad Zia

Degrees Conferred

Ph.D.

Darrell Cockburn 2010
Edie Scheurwater 2008
Haiqiang Jing* 2008
Blaine Legaree 2007
Joel Weadge 2006
Chris Reid 2005
Neil Blackburn 2001
Steven Watt 1996
Fusheng Guo* 1994
Maria Hernandez* 1994
Mark Bray 1993
Claude Dupont 1991

M.Sc.

Adam Mark 2011
Colin MacDougall 2009
Kristy Johnson 2008
Patrick Moynihan 2008
Calvin Adams 2005
Nooshin Nakai 2002
Anthony Choudhry 1999
Sarah Broughton 1998
Kelly McAllister 1997
Anastazia Jager 1997
Gaynor Watson 1997
Ken Payie 1995
Teresa Sanelli 1994
Henri Strating 1993
Steven Gyorffy 1992
Mark Bray 1990

* co-advised

Training of Research Technicians

Full time

V. Sarabia 1991 - 1993
M. Edwards 1993 - 1995
K. Payie 1995 - 1997
A. Carriere 1995 - 1996
A. Savitch 1996
K. McAllister 1998
E. Verespej 1998 - 1999
K. Bain 1998 - 2001
J. Becker 2002
D. Cockburn 2003
M. Gorzelak 2003 - 2004
C. Vandenende 2004- present
J. McLachlan 2006
J. Parkman 2007
C. Cudmore 2008-2009

Part-time and Summer students

L. Adams 1986
H. Groenevelt 1987
E. Meiering 1987
E. Maine 1988
P. Bray 1990
S. Watt 1991
S. Smith 1991
J. Chase 1992
M. Lem 1992, 1993
A. Cox 1993
S. Langley 1994
S. Broughton 1994
K. Lee 1995
D. Francis 1995
G. White 1996
B. Cawsey 1997
C. Boys 1998
J. Weadge 1998
C. Murray 1999
J. Baird 2000
E. Scheurwater 2000
K. Driezen 2001
C. Adams 2001
K. Driezen 2002
K. Kietly 2002
M. Smith 2003
K. Torbicki 2003
J. Pfeffer 2004, 2005
M. Fraser 2004, 2005
J. Pfeffer 2005
J. Tavares 2005
S. Baynton 2006
C. Clarke 2005-08
J. Denyes 2007
C. Cudmore 2008
A. Marini 2008
N. Matic 2009
S. Salendar 2009, 2010
C. McBride 2010
B. Hunt 2010
E. Edwards 2010
R. Whitney 2011
K. Holland 2011
F. Herlihey 2011

TEACHING ACTIVITIES - continued

Graduate Student Supervisory Committees

Ph.D.

G. Southam (Microbiology)	1987 - 1991
X. Xia (Microbiology)	1987 - 1992
K. Abdullah (Chem. & Biochem)	1987 - 1991
M. Campbell (Chem. & Biochem)	1987 - 1991
J. Devenish (V.M.I.)	1987 - 1992
M. Fatima Somerlate (Env.Biol.)	1987 - 1992
C. Gho (Chem., UW)	1987 - 1990
J. Lightfoot (Microbiology)	1988 - 1991
G. Schoenals (Microbiology)	1988 - 1992
E. Brown (Chem. & Biochem.)	1988 - 1992
R. Jackman (Food Sci.)	1988 - 1992
A. Thariath (Chem., UW)	1988 - 1993
G. Adamson (Chem., UW)	1988 - 1992
P. Holloway (Microbiology)	1989 - 1992
A. Mhashilkar (Chem., UW)	1989 - 1993
R. Fletcher (Chem., UW)	1990 - 1993
H. Mohamed-Salleh (Chem., UW)	1990 - 1994
M. Potter (Microbiology)	1991 - 1994
B. Triesslman (M.B. & G.)	1991 - 1998
J. Oriol (Biomed. Sci.)	1991 - 1993
J. Griffen (M. B. & G.)	1992 - 1999
B. Steer (Chem & Biochem)	1992 - 1995
L. Boubonniere (Microbiology)	1992 - 1993
E. Egbosimba (Microbiology)	1994 - 2000
F. Siddiq (M. B. & G.)	1994 - 1998
C. Tranchant (Food Sci.)	1994 - 1999
C. Lopez-Amaya (Food Sci.)	1994 - 1999
J. DrummelSmith (Microbiology)	1994 - 1999
K. Reid (Chem. & Biochem.)	1995 - 1999
A. Doherty-Kirby (Chem., UW)	1996 - 2005
M. Brown (Chem., UW)	1997 - 2006
K. Payie (Food Science)	1997 - 2001
S. Armstrong (Chem. & Biochem)	1998 - 2001
A. Paiment (Microbiology)	1999 - 2005
N. Kaniuk (Microbiology)	1999 - 2004
X. Wang (Microbiology)	2000 - 2001
S. Qi (Microbiology)	2001 - 2007
P. Wang (Microbiology)	2001 - 2007
M. Koti (Microbiology)	2002 - 2007
M. Mazzorra-Manzano (Food Sci.)	2006 - 2007
K. Larue (Microbiology)	2007 - 2011
L. Willis (MCB)	2007 -
A. Quirk (Chemistry)	2007 -
C. Parr (Food Science)	2008 - 2010

M.Sc.

G. Schoenals (Microbiology)	1987 - 1988
J. Lightfoot (Microbiology)	1987 - 1988
K. McDermid (Microbiology)	1987 - 1990
P. Holloway (Microbiology)	1987 - 1989
J. Chu (Chem. & Biochem)	1987 - 1989
E. Brown (Food Sci.)	1987 - 1989
A. Matte (Microbiology)	1988 - 1991
T. Anderson (V.M.I.)	1988 - 1992
J. Barnard (Chem., UW)	1988 - 1991
V. Goodfellow (Botany)	1991 - 1993
S. Webb (Env. Biol.)	1991 - 1993
L. Palmer (Chem. & Biochem)	1992 - 1994
B. Steer (Chem. & Biochem)	1992 - 1994
J. Kroetsch (Zoology)	1992 - 1994
R. Rumen (Chem. & Biochem)	1992 - 1995
Y. Shad (Chem. & Biochem)	1992 - 1994
V. Wisco (Chem. & Biochem)	1993 - 1996
C. Dodgson (Microbiology)	1993 - 1995
M. Davey (Microbiology)	1995 - 1997
K. LeClair (Food Sci.)	1995 - 1998
N. Allan (Microbiology)	1998 - 2003
C. Wenzel (Microbiology)	2000 - 2005
S. Tsatskis (Microbiology)	2002 - 2005
S. Jeftic (Biochemistry)	2005 - 2007
E. Balodis (Chemistry)	2005 - 2007
A. Quirk (Chemistry)	2005 - 2007
K. Larue (Microbiology)	2005 - 2007
D. Glickman (Biophysics)	2007 - 2008
V. Mann (Chemistry)	2007 - 2009
J. Denyes (MCB)	2009 - 2010
R. Seenath (Biophysics)	2010 - 2011
S. Tremblay (MCB)	2010 -
P. McRorie (MCB)	2010 -
A. Lowe (Chemistry)	2010 -

TEACHING ACTIVITIES - continued

Supervision of Post-Doctoral Fellows

Blaine Legaree	Ph.D., University of Guelph	2007 - 2008
Kathy Daniels	Ph.D., University of Adelaide	1999 - 2001
Shukai Guan	Ph.D., University of Canberra	1998 - 2001
Laura Marrone	Ph.D., University of Waterloo	1998 - 2000
Maria Hernandez	Ph.D., University of Guelph	1997
Zusheng Li	Ph.D., University of Montreal	1994 - 1997
Gilad Bernadsky	Ph.D., University of Tel Aviv, Israel	1991 - 1994
Parween Abdullah	Ph.D., University of Manchester, UK	1991

Examination Committees

Ph.D. Comprehensive (Qualifying) Examinations

C. Chapple	Chem. & Biochem.	1986	Y. Romsicki	Chem. & Biochem.	1995
G. Southam	Microbiology	1988	E. Egbosimba	Microbiology	1996
C. Dupont	Chem. & Biochem	1988	J. Drummelsmith	Microbiology	1997
C. Doige	Chem. & Biochem.	1988	N. Blackburn	Microbiology	1998
G. Shoenhals	Microbiology	1989	J. Yethon	Microbiology	1998
S. Ling	Chem. & Biochem.	1989	S. Dick	Chemistry (Waterloo)	1998
G. Adamson	Chemistry (Waterloo)	1989	M. Vaughan	Chem. & Biochem.	2000
L. Malburg	Microbiology	1990	N. Kaniuk	Microbiology	2001
L. Merner	Microbiology	1990	E. Fridish	Microbiology	2001
P. Holloway	Microbiology	1990	V. Williamson	Chem. & Biochem.	2001
S. Gosselin	Chemistry (Waterloo)	1990	J. Weadge	Microbiology	2002
A. Mhashilkar	Chemistry (Waterloo)	1990	P. Eckford	Chem. & Biochem.	2002
A. Thariath	Chemistry (Waterloo)	1990	H.-S. Jun	Animal & Poultry Sci.	2003
M. Bray	Microbiology	1991	S. Qi	Microbiology	2003
J. Oriol	Biomedical Science	1991	E. Scheurwater	Microbiology	2003
F. Guo	Chemistry (Waterloo)	1992	L. Cuthbertson	Microbiology	2004
H. Duewl	Chemistry (Waterloo)	1992	D. Cockburn	Microbiology	2005
B. Steer	Chem. & Biochem.	1993	V. Kos	Microbiology	2007
S. Watt	Microbiology	1993	J. Pfeffer	Microbiology	2008
H. Strating	Chem. and Biochem.	1994	K. Larue	Microbiology	2008
J. Griffin	Mol. Biol. & Genetics	1994	A. Quirk	Chemistry	2008
L. Marrone	Chemistry (Waterloo)	1995	C. Parr	Food Science	2009
			L. Willis	MCB	2009

TEACHING ACTIVITIES

Examination Committees- continued

Thesis Defence Committees

Ph.D.

A. Udoh	Chem. & Biochem	1986
L. Huang	Microbiology	1988
M. McGavin	Microbiology	1989
J. Landers	Chem. & Biochem	1989
C.-J. Goh	Chemistry (UW)	1989
C. Dupont	Chem. & Biochem	1991
W. Keenleyside	Microbiology	1992
A. Mhashilkar	Chemistry (UW)	1992
G. Adamson	Chemistry (UW)	1992
M. Bray	Microbiology	1993
L. Burrows	Microbiology	1993
R. Fletcher	Chemistry (UW)	1993
A. Thariath	Chemistry (UW)	1993
M. Hernandez	Mol. Biol. Genetics	1994
S. Kofalvi	Botany	1994
H. Salleh	Chemistry (UW)	1994
L. Malburg	Microbiology	1994
R. Kelly	Microbiology	1995
F. Guo	Chemistry (UW)	1995
S. Watt	Microbiology	1996
N. Tout	Microbiology	1997
H. Rocchetta	Microbiology	1998
J. Drummelsmith	Microbiology	2000
E. Egbosimaba	Microbiology	2001
J. Yethon	Microbiology	2001
N. Blackburn	Microbiology	2001
E. Fridrich	Microbiology	2005
V. Matias	Biophysics	2005
A. N. Reid	Microbiology	2005
A.L. Doherty-Kirby	Chemistry (UW)	2005
C.W. Reid	Chemistry	2005
S. Qi	Microbiology	2007
B. Legaree	Chemistry	2007

M.Sc.

B. Fach	Chem. & Biochem	1986
B. Vink	Microbiology	1988
M. Lukevich	Microbiology	1989
M. Homonylo	Microbiology	1989
E. Brown	Food Science	1989
T. Mayers	Microbiology	1990
A. Thariath	Chemistry (UW)	1990
D. Trudeau	Microbiology	1991
M. Bray	Microbiology	1991
S. Gyorffy	Microbiology	1991
V. Goodfellow	Botany	1991
V. Nicholson	V.M.I.	1991
M. Salleh	Chemistry (UW)	1991
J. Lee	Microbiology	1992
S. Webb	Env. Biology	1992
H. Strating	Chem. & Biochem	1993
J. Kroetsch	Zoology	1993
L. Palmer	Chem. & Biochem	1994
T. Sanelli	Chem. & Biochem	1994
K. Payie	Microbiology	1995
D. Rasper	Chem. & Biochem	1995
K. LeClair	Food Science	1997
G. Watson	Chem. & Biochem	1997
A. Jager	Microbiology	1997
M. Davey	Microbiology	1997
K. McAllister	Microbiology	1997
S. Broughton	Microbiology	1998
S. Langley	Microbiology	1998
S. MacLellan	Microbiology	1999
L. McKerral	Microbiology	2001
G. Newton	Microbiology	2001
H. Lawlor	Microbiology	2001
N. Allen	Microbiology	2003
S. Tsatskis	Microbiology	2005
C. Adams	Microbiology	2005
E. Balodis	Chemistry	2007
A. Quirk	Chemistry	2007
B. Vinepal	Biochemistry	2008
D. Pan	Microbiology	2008
D. Glickmam	Biophysics	2008
P. Moynihan	Microbiology	2008
K. Johnsson	Microbiology	2008
C. MacDougall	MCB	2009
L. Rice	MCB	2010
M. Pinto	MCB	2010
A. Mark	MCB	2011

RESEARCH ACTIVITIES

Research Funding

Current Operating Grants

as Principal Investigator

CIHR (MOP 49623)	5-year award, 10/2009 - 09/2014	\$ 111,235 <i>p.a.</i>
CIHR (MOP 81223)	5-year award, 10/2006 - 09/2011	\$ 75,593 <i>p.a.</i>
CIHR/MRC (UK)	2-year award, 05/2009 - 04/2012	\$ 60,000 <i>p.a.</i>
NSERC	5-year award, 05/2011 - 04/2017	\$ 56,000 <i>p.a.</i>
NSERC CRD	3-year award, 04/2011 - 03/2015	<u>\$ 135,000 <i>p.a.</i></u>
		\$ 437,728 <i>p.a.</i>

as Co-Applicant

CIHR (MOP81373)	5-year award, 09/2010 - 08/2016	\$ 141,927 <i>p.a.</i>
(PI - G. Dmitrienko (Waterloo), Co-applicants, A. Clarke, N. Strynadka (UBC))		

Past Operating Grants

as Principal Investigator

Agriculture Canada (ABIP)	07
AFMNet (NCE)	07-09
Canadian Bacterial Diseases Network (NCE)	90 - 01
MRC/CIHR Operating Grants	90-93, 93-97, 97-02, 02-05, 05-11
NSERC Operating	86-88, 88-91, 91-94, 94-98, 98-02, 02-08, 08-10
NSERC Strategic	07-10
OMAFRA (ARFRDF)	06-08
Ontario Ministry of Energy	88-89
Banting Research Foundation	86-87
University of Guelph Research Board	1986

as Co-Investigator

CIHR	07 - 10
NSERC/CIHR Collaborative Grants	02 - 05
NSERC Strategic	98 - 01

University of Guelph Research Facilities

Maintain and operate service facilities for:

- Carbohydrate composition analysis (Dionex)
- Amino acid analysis (Beckman System Gold)

Current Collaborations

- Crystallization and three-dimensional structure of *N. gonorrhoeae* O-acetylpeptidoglycan esterase
(with D. Roper, University of Warwick, UK)
- Crystallization and three-dimensional structure of *P. aeruginosa* lytic transglycosylase
(with A.-M. Thunnissen, University of Groningen, The Netherlands)
- Site-directed mutagenesis and structure-function relationship of glucoamylase.
(with B. Svensson, Carlsberg Laboratory, Copenhagen)
- Development and characterization of β -lactamase inhibitors
(with G. Dmitrienko, Chemistry, University of Waterloo)
- Biophysical analysis of mechanism of cellulose biodegradation
(with J. Lipkowski, Chemistry, J. Dutcher, Physics, University of Guelph and J. Tomashek, Iogen Corp., Ottawa)
- Analysis of *Bacillus anthracis* peptidoglycan
(with J.Dworkin, Columbia University, New York)

PUBLICATIONS

Books

1. Clarke, A.J. (1997) *Biodegradation of cellulose: Enzymology and biotechnology*. CRC Press

Chapters in Books

9. Pfeffer, J.M., P.J. Moynihan, C.A. Clarke, and A.J. Clarke (2011) Control of lytic transglycosylase activity within bacterial cell walls, in *Bacterial Glycomics*, Horizon Scientific Press, Hethersett, Nowrwich, UK. In press.
8. Blackburn, N.T., and A.J. Clarke (2002) Structure and function of lytic transglycosylases from *Pseudomonas aeruginosa* in *Carbohydrate Bioengineering : Interdisciplinary Approaches* (T. T. Teeri, B. Svensson, H.J. Gilbert, & T. Feizi, eds) Royal Soc. Chemistry, Cambridge. pp. 34 - 41.
7. Clarke, A.J., Strating, H., and Blackburn, N.T. (2000) Pathways for the O-acetylation of bacterial cell wall polysaccharides, in *Glycomicrobiology* (Doyle, R.J., ed.) Plenum Publishing Co. Ltd., New York, pp. 187-223.
6. McAllister, K., Marrone, L., and Clarke, A.J. (1999) The structure and function relationship of bifunctional xylanase C from *Fibrobacter succinogenes*, in *Recent Advances in Carbohydrate Bioengineering* (H.J. Gilbert, G. Davies, B. Henrissat, & B. Svensson, eds) Royal Society of Chemistry, Cambridge, pp. 89-98.
5. Bray, M.R. and A.J. Clarke. (1995) The structure and function relationship of *Schizophyllum commune* xylanase A, in *Carbohydrate Bioengineering* (S. Petersen, B. Svensson, & S. Pedersen, Eds.) Elsevier Sciences B.V., Amsterdam.
4. Whitfield, C., W.J. Keenleyside, P.R. MacLachlan, P. Jayaratne and A.J. Clarke. (1995) Identification of *rca* genes in *Escherichia coli* O9:K30:H12 and their involvement in the regulation of expression of the group IA K30 capsular polysaccharide. In *Methods in molecular genetics: Molecular microbiology techniques, Part B*. Academic Press. pp. 301-322.
3. Clarke, A.J., M.R. Bray and H. Strating. (1993) β -Glucosidases, glucanases and xylanases: their mechanism of catalysis in *The Biochemistry and Molecular Biology of β -Glucosidases* (A. Esen, ed.) ACS Books, Washington D.C. pp. 27-41.
2. Clarke, A.J., S. Gyorffy and J. Chase. (1993) Distribution of O-acetylation in the peptidoglycan from *Proteus mirabilis* 19. in *Bacterial Growth and Lysis: Metabolism and structure of the bacterial sacculus* (M.A. dePedro, J.-V. Holtje, W. Löffelhardt, eds.) Plenum Publishing Co. Ltd. pp. 83-89.
1. Bray, M.R. and A.J. Clarke (1992) Pattern of xylo-oligosaccharide hydrolysis and subsite structure of *Schizophyllum commune* xylanase A. in *Xylans and Xylanases* (J. Visser, M. Kusters & A. Voragen, eds.) Elsevier. pp. 423-428.

Referred Journal Articles

92. Cockburn, D. W., and A. J. Clarke (2011) Modulating the pH-activity profile of cellulase by substitution: replacing the general base catalyst aspartate with cysteinesulfinate in cellulase from *Cellulomonas fimi*. *Protein Engineering, Design and Selection*. In press.
91. Hadi, T., J.Pfeffer, A.J. Clarke, and M. Tanner (2011) Water-soluble substrates of the peptidoglycan-modifying enzyme O-acetylpeptidoglycan esterase (Ape1) from *Neisseria gonorrhoeae*. *J. Org. Chem.* 76:1118-1125
90. Laaberki, M.-H., J. Pfeffer, A. J. Clarke, and J. Dworkin (2011) O-Acetylation of peptidoglycan is required for proper cell separation and S-layer anchoring in *Bacillus anthracis*. *J. Biol. Chem.* 286: 5278-5288.
89. Ruiloba de León, S., K. Daniels, and A. J. Clarke (2010) Production and purification of the penicillin-binding protein 3 from *Pseudomonas aeruginosa*. *Prot. Express. Purif.* 73: 177-183.
88. Clarke, C.A., E. M. Scheurwater and A. J. Clarke (2010) The vertebrate lysozyme inhibitor Ivy

- functions to inhibit the activity of lytic transglycosylase . *J. Biol. Chem.* 285: 14843-14847.
87. Moynihan, P. J., and A. J. Clarke (2010) O-Acetylation of peptidoglycan in Gram-negative bacteria: Identification and characterization of peptidoglycan O-acetyltransferase in *Neisseria gonorrhoeae*. *J. Biol. Chem.* 285: 13264-13273.
 86. Quirk, A., Lipkowski, J., Vandenende, C., Cockburn, D., Clarke, A. J., Dutcher, J., Roscoe, S.G. (2010) Direct visualization of enzymatic digestion of a single fiber of native cellulose in aqueous environment by atomic force microscopy. *Langmuir* 26: 5007-5013.
 85. Cockburn, D. W., Vandenende, C., and A. J. Clarke (2010) Modulating the pH-activity profile of cellulase by substitution: replacing the general base catalyst aspartate with cysteinesulfinate in cellulase A from *Cellulomonas fimi*. *Biochemistry* 49: 2042-2050.
 84. Jing, H., D. Cockburn, and A.J. Clarke (2009) Production and purification of the isolated family 2a carbohydrate binding module from *Cellulomonas fimi*. *Protein Expr. Purif.* 64: 63-68.
 83. Legaree, B.A., and A.J. Clarke (2008) Interaction of penicillin-binding protein 2 with soluble lytic transglycosylase B1 in *Pseudomonas aeruginosa*. *J. Bacteriol.* 190: 6922-6926.
 82. J.Brisbin, H. Zhou, J. Gong, P. Sabour, M. R. Akbari, H.R. Haghghi, H. Yu, A. J. Carke, A. J. Sarson, and S. Sharif (2008) Gene expression profiling of chicken lymphoid cells after treatment with *Lactobacillus acidophilus* cellular components. *Developmental and Comparative Immunology* 32: 563-574.
 81. Scheurwater, E.M., and A.J. Clarke (2008) The C-terminal domain of *Escherichia coli* YfhD functions as a lytic transglycosylase. *J. Biol. Chem.* 283: 8363-8373.
 80. Weadge, J.T., and A.J. Clarke (2008) Transacetylations of carbohydrates in organic solvent catalysed by O-acetylpeptidoglycan esterase from *Neisseria gonorrhoeae*. *Biocatal. Biotransform.* 26: 68-75.
 79. Scheurwater, E.M., C.W. Reid, and A.J. Clarke (2008) Lytic transglycosylases: Bacterial space-making autolysins. *Int. J. Biochem. Cell Biol.* 40: 586-591.
 78. Scheurwater, E. M., J.M. Pfeffer, and A.J. Clarke (2007) Production and purification of the bacterial autolysin N-acetylmuramoyl-L-alanine amidase B from *Pseudomonas aeruginosa*. *Protein Expr. Purif.* 56: 128-137.
 77. Reid, C.W., B.A. Legaree, and A.J. Clarke (2007) Role of Ser216 in the mechanism of action of membrane-bound lyti transglycosylase B: Further evidence for substrate-assisted catalysis. Submitted to *FEBS Lett.* 581: 4988-4992.
 76. Legaree, B.A., C. Adams, and A.J. Clarke (2007) Overproduction of penicillin-binding protein 2 and its inactive variants causes morphological changes and lysis in *Escherichia coli*. *J. Bacteriol.* 189: 4975-4983.
 75. Weadge, J.T. and A.J. Clarke (2007) *Neisseria gonorrhoeae* O-acetylpeptidoglycan esterase, a serine esterase with a Ser-His-Asp catalytic triad. *Biochemistry* 46: 4932-4941.
 74. Legaree, B.A, K.E. Daniels, J.T. Weadge, D.Cockburn, and A.J. Clarke (2007) Function of penicillin-binding protein 2 in viability and morphology of *Pseudomonas aeruginosa*. *J. Antimicrob. Chemother.* 59: 411-424.
 73. Reid, C. W., N. T. Blackburn, and A. J. Clarke (2006) Role of arginine residues in the active site of membrane-bound lytic transglycosylase B from *Pseudomonas aeruginosa*. *Biochemistry* 45:2129-2138.
 72. Pfeffer, J.M., H. Strating, J.T. Weadge, and A.J. Clarke (2006) Peptidoglycan O-acetylation and autolysin profile of *Enterococcus faecalis* in the viable but non-culturable state. *J. Bacteriol.* 188:902-908.
 71. Weadge, J.T., and A.J. Clarke (2006) Identification and characterization of O-acetylpeptidoglycan esterase: a novel enzyme discovered in *Neisseria gonorrhoeae*. *Biochemistry* 45:839-851.
 70. Weadge, J.T., J.M. Pfeffer, and A.J. Clarke (2005) Identification of a new family of enzymes with potential O-acetylpeptidoglycan esterase activity in both Gram-positive and Gram-negative bacteria. *BMC Microbiology* 5: 49.

69. Reid, C.W., N.T. Blackburn, B.A. Legaree, F.-I. Auzanneau, and A.J. Clarke (2004) Inhibition of membrane-bound lytic transglycosylase by NAG-thiazoline. *FEBS Letters* 574: 73-79.
68. Reid, C.W., D. Brewer, and A.J. Clarke (2004) Substrate binding affinity of *Pseudomonas aeruginosa* membrane-bound lytic transglycosylase B by hydrogen-deuterium exchange MALDI-MS. *Biochemistry* 43: 11275-11282.
67. Reid, C.W., N.T. Blackburn, and A.J. Clarke (2004) The effect of NAG-thiazoline on morphology and surface hydrophobicity of *Escherichia coli*. *FEMS Microbiol. Lett.* 234: 343-348.
66. Siemann, S., A. J. Clarke, T. Viswanatha, and G. I. Dmitrienko (2003) Thiols as classical and slow-binding inhibitors of IMP-1 and other binuclear metallo- β -lactamases. *Biochemistry* 42: 1673-1683.
65. Siemann, S., D.P. Evanoff, L. Marrone, A.J. Clarke, T. Viswanatha, and G. I. Dmitrienko (2002) *N*-Arylsulfonyl hydrazones as inhibitors of IMP-1 metallo-beta-lactamase. *Antimicrob. Agents Chemother.* 46: 2450-2457.
64. Sieman, S., D. Brewer, A.J. Clarke, G.I. Dmitrienko, G. Lajoie, and T. Viswanatha (2002) IMP-1 metallo-beta-lactamase: effects of chelators and assessment of metal requirement by electrospray mass spectrometry. *Biochim. Biophys. Acta* 1571: 190-200.
63. Blackburn, N.T., and A.J. Clarke (2002) Characterization of soluble and membrane-bound family 3 lytic transglycosylases from *Pseudomonas aeruginosa*. *Biochemistry* 41: 1001-1013.
62. Guan, S., A.J. Clarke, and C.W. Whitfield (2001) Functional analysis of the galactosyltransferases required for biosynthesis of D-galactan I, a component of the lipopolysaccharide O1 antigen of *Klebsiella pneumoniae*. *J. Bacteriol.* 183: 3318-3327.
61. Franklin, K., and A.J. Clarke (2001) Overexpression and characterization of the chromosomal aminoglycoside 6'-*N*-acetyltransferase from *Providencia stuartii*. *Antimicrob. Agents Chemother.* 45: 2238-2244.
60. Strating, H., and A.J. Clarke (2001) Differentiation of bacterial autolysins by zymogram analysis. *Anal. Biochem.* 290: 388-393.
59. Newton, G.J, C. Daniels, L.L. Burrows, A.M. Kropinski, A.J. Clarke, and J.S. Lam (2001) Three component mediated serotype conversion in *Pseudomonas aeruginosa* by bacteriophage D3. *Mol. Microbiol.* 39: 1237-1247.
58. Keenleyside, W.J., A.J. Clarke, and C. Whitfield (2001) Identification of the residue involved in catalysis by the inverting glycosyltransferase Wbbe from *Salmonella enterica* Serovar Borreze. *J. Bacteriol.* 183: 77-85.
57. Blackburn, N.T., and A.J. Clarke (2001) Families of bacterial lytic transglycosylases: peptidoglycan lyases. *J. Mol. Evol.* 52: 78-84.
56. Blackburn, N.T., and A.J. Clarke (2000) Assay for lytic transglycosylases: a family of peptidoglycan lyases. *Anal. Biochem.* 284: 388-393.
55. McAllister, K.A., L. Marrone, and A.J. Clarke (2000) The role of tryptophan residues in substrate binding to catalytic domains A and B of xylanase C from *Fibrobacter succinogenes* S85. *Biochim. Biophys. Acta* 1480: 342-352.
54. Marrone, L., K.A. McAllister, and A. J. Clarke (2000) Characterization of function and activity of domains A, B, and C of xylanase C from *Fibrobacter succinogenes* S85. *Protein Engineering* 13: 101-109.
53. Guo, F., J. Huynh, G.I. Dmitrienko, T. Viswanatha and A.J. Clarke (1999) The role of the non-conserved residue at position 104 of class A β -lactamases in susceptibility to mechanism-based inhibitors. *Biochim. Biophys. Acta* 1431: 132-147.
52. Li, Z., T.J. Beveridge, J. Betts, and A.J. Clarke (1999) Partial characterization of a major autolysin from *Mycobacterium phlei*. *Microbiology* 145: 169-175.
51. Li, Z., A.J. Clarke, and T.J. Beveridge (1998) Gram-negative bacteria produce membrane vesicles which are capable of killing other bacteria. *J. Bacteriol.* 180:5478-5483.
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- awamori*. *Biochemistry* 37: 3753-3759.
49. Fierobe, H.-P., E. Mirgorodskaya, K.A. McGuire, P. Roepstorff, B. Svensson and A.J. Clarke (1998) Restoration of catalytic activity beyond wild-type level in glucoamylase from *Aspergillus awamori* by oxidation of the Glu400→Cys catalytic-base mutant to cysteine sulfinic acid. *Biochemistry* 37: 3743-3752.
 48. Gottschalk, T.E., H.-P. Fierobe, E. Mirgorodskaya, A.J. Clarke, D. Tull, B.W. Sigurskjold, T. Christensen, N. Payre, T.P. Frandsen, N. Juge, K.A. McGuire, S. Cottaz, P. Roepstorff, H. Driguez, G. Williamson, and B. Svensson (1998) Structure, function, and protein engineering of starch-degrading enzymes. *Biochem. Soc. Trans.* 26: 198-204.
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 45. Clarke, A.J., J. Drummelsmith, and M. Yaguchi (1997) Identification of the catalytic nucleophile in the cellulase from *Schizophyllum commune* and assignment of the enzyme to Family 5-Subtype 5 of the β -glycosidases. *FEBS Lett.* 414: 359-361.
 44. Payie, K.G. and A.J. Clarke, (1997) Characterization of gentamicin 2'-N-acetyltransferase from *Providencia stuartii*: Its use of peptidoglycan metabolites for acetylation of both aminoglycosides and peptidoglycan. *J. Bacteriol.* 179: 4106-4114.
 43. Clarke, A.J., D. Francis, and W.J. Keenleyside (1996) The prevalence of gentamicin 2'-N-acetyltransferase in the *Proteeae* and its role in the O-acetylation of peptidoglycan. *FEMS Microbiol. Lett.* 145: 201-207.
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 41. Guo, F., G.I. Dmitrienko, A.J. Clarke, and T. Viswanatha (1996) The role of non-conserved residues at position 167 of class A β -lactamases in susceptibility to mechanism-based inhibitors. *Microbial Drug Resistance* 2: 261-268.
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 32. Watt, S.R., and A.J. Clarke. (1994) Initial characterization of two extracellular autolysins from *Pseudomonas aeruginosa* PAO1. *J. Bacteriol.* 176: 4784-4789.

31. Bray, M.R., and A.J. Clarke. (1994) Identification of a glutamate residue at the active site of xylanase A from *Schizophyllum commune*. *Eur. J. Biochem.* 219: 821-827.
30. Kadurugamuwa, J.L., A.J. Clarke and T.J. Beveridge. (1993) Surface action of gentamicin of *Pseudomonas aeruginosa*. *J. Bacteriol.* 175: 5798-5805.
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27. Oriol, J., K.J. Betteridge, A.J. Clarke and F.J. Sharom. (1993) The equine embryonic capsule is a mucin-like glycoprotein. *Molecular Reproduction and Development.* 34: 255-265.
26. Gyorffy, S. and A.J. Clarke (1992) Production and characterization of a monoclonal antibody to the *O*-acetylated peptidoglycan of *Proteus mirabilis*. *J. Bacteriol.* 174: 5043-5050.
25. Clarke, A.J. and C. Dupont. (1992) *O*-Acetylated peptidoglycan: its occurrence, pathobiological significance, and biosynthesis. *Can. J. Microbiol.* 38: 85-91.
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17. Brown, E.D., M.G. Wynne, A.J. Clarke, & R.Y. Yada. (1990) Purification of two fungal aspartic proteinases using fast protein liquid chromatography. *Agri. Biol. Chem.* 54:1563-1565.
16. Svensson, B., A.J. Clarke, I. Svendsen & H. Moller. (1990) Identification of carboxylic acid residues in glucoamylase G2 from *Aspergillus niger* that are involved in catalysis and substrate binding. *Eur. J. Biochem.* 188:29-38.
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13. Clarke, A.J. (1988) Active-site directed inactivation of *Schizophyllum commune* cellulase by 4',5'-epoxypentyl- β -cellobioside. *Biochem. Cell Biol.* 66:871-879.
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Referred Conference Abstracts

139. Clarke, C.A., E.M. Scheurwater, B. Legaree, C. Vandenende, and A.J. Clarke, "Control of lytic transglycosylase activity on peptidoglycan," UNIA Current Trends in Biomedicine Workshop, "The Dynamics of Peptidoglycan Structure and Function: New Insights into the 'Great Wall.'" Baeza, Spain, October 2010.
138. Thunnissen, A.-M.W.H., G. Fibriansah, P.K. Madoori, E. Scheurwater, and A.J. Clarke, "Break it to make it: structure and action of lytic transglycosylases explored by X-ray crystallography. UNIA Current Trends in Biomedicine Workshop, "The Dynamics of Peptidoglycan Structure and Function: New Insights into the 'Great Wall.'" Baeza, Spain, October 2010.
137. Clarke, A.J., P. Moynihan, and J. Pfeffer. Identification and characterization of a two-component system for the O-acetylation of the essential bacterial cell wall heteropolymer peptidoglycan. International Carbohydrate Symposium, Tokyo, Japan, August 2010.
136. Moynihan, P., and A. J. Clarke. Analysis of PatB, a peptidoglycan O-acetyltransferase from *Neisseria gonorrhoeae*. 110th General Meeting, American Society for Microbiology, San Diego, CA, May 2010.
135. Mark, A., and A.J. Clarke. Characterization of *Escherichia coli* membrane-bound lytic transglycosylase F (MltF). 110th General Meeting, American Society for Microbiology, San Diego, CA, May 2010.
134. Allen, S., O. Tanchak, A. Quirk, A. Clarke, J. Lipkowski, and J. Dutcher. Imaging the enzymatic degradation of individual bundles of cellulose fibers. Annual Meeting of the American Physical Society, Portland Oregon, April 2010.
133. Moynihan, P., and A.J. Clarke. Identification of PatB, a peptidoglycan O-acetyltransferase from *N. gonorrhoeae*. 59th Annual Meeting of the Canadian Society for Microbiologists, Montreal, PQ. June 2009.
132. Clarke, A.J., P. Moynihan, and J.M. Pfeffer. Pathway for the O-acetylation of extracellular polysaccharides: Mechanism of action of peptidoglycan O-acetyltransferase. 8th Carbohydrate

- Bioengineering Meeting, Ischia, Naples, Italy, May 2009.
131. Cockburn, D. and A.J. Clarke. Rational mutagenesis for altering the pH optimum of the endoglucanase CenA from *Cellulomonas fimi*. 109th General Meeting, American Society for Microbiology, Philadelphia, PA. May 2009.
 130. Pfeffer, J. and A.J. Clarke. Inhibition of peptidoglycan de-O-acetylation. 109th General Meeting, American Society for Microbiology, Philadelphia, PA. May 2009.
 129. Moynihan, P. and A.J. Clarke. Investigation of Ape2, a putative peptidoglycan O-acetyltransferase from *Neisseria gonorrhoeae*. 109th General Meeting, American Society for Microbiology, Philadelphia, PA. May 2009.
 128. Tanchak, O.M., S. Allen, D. Cockburn, A.J. Clarke, J. Lipkowski, and J.R. Dutcher. Observation of biodegradation of cellulose fibers using surface Plasmon resonance imaging. American Physical Society, March 16-20, 2009, Pittsburgh, PA.
 127. Quirk, A.I., J. Lipkowski, A.J. Clarke, J. McLachlan, C. Vandenende, J. Dutcher, and S.G. Roscoe. Atomic force microscopy study of the mechanism of cellulose biodegradation. American Physical Society, March 16-20, 2009, Pittsburgh, PA, March 2009.
 126. Glickman, D., O. Tanchak, Reid, M., Quirk, A., Cockburn, D., MacDougall, C., Clarke, A.J., Lipkowski, J., and Dutcher, J. 2009. A QCM-D Study of the Enzymatic Degradation of Cellulose Thin Films. American Physical Society Annual Meeting, Pittsburgh, PA, March 2009.
 125. Chen, H., Cockburn, D., Regli, S., Clarke, A.J., Dutcher, J., Lipkowski, J., Roscoe, S. An atomic force microscopy study of the mechanism of cellulose biodegradation. American Physical Society Annual Meeting, Pittsburgh, PA, March 2009.
 124. Clarke, A.J., Quirk, A., Lipkowski, J., Cockburn, D., Glickman, D. Real-time observation of cellulose biodegradation by atomic force microscopy. Bio-energy II, Rio de Janeiro, Brazil, March 2009.
 123. Scheurwater, E.M., and A.J. Clarke. Domain structure and modulation of activity in membrane-bound lytic transglycosylase from *Escherichia coli*. XXIV International Carbohydrate Symposium, Oslo, Norway, July 27 - August 1 2008.
 122. Cockburn, D., and A.J. Clarke, Optimization of the oxidation of an engineered cysteine to cysteinesulfinic acid in cenA, an endoglucanase from *cellulomonas fimi*. A.I.C.C.S. Annual Meeting, Banff, Alberta, May 2008.
 121. Pfeffer, J.M. and A.J. Clarke. Characterization of the pathway for the o-acetylation of peptidoglycan in *bacillus cereus* atcc10987. A.I.C.C.S. Annual Meeting, Banff, Alberta, May 2008.
 120. Dutcher, J., Touhami, A., Matias, V., Clarke, A.J., Jericho, M., Beveridge, T.J. High resolution structure of bacterial cell sacculi. MAR08 Meeting of The American Physical Society, March 2008.
 119. Cockburn, D., and A.J. Clarke. Site directed mutagenesis and chemical modifications for altering the pH optima of bacterial cellulases. 57th Annual Conference, Canadian Society of Microbiologists, Quebec City, Quebec, June 2007.
 118. Pfeffer, J.M., and A.J. Clarke. Characterization of peptidoglycan O-acetylation in *Bacillus cereus* ATCC 10987. 57th Annual Conference, Canadian Society of Microbiologists, Quebec City, Quebec, June 2007.
 117. Weadge, J.T., and A.J. Clarke. Biochemical characterization of a peptidoglycan de-O-acetylase: a novel enzyme discovered in *Neisseria gonorrhoeae*. Benzon Symposium No. 54: Glycosylation, Opportunities in Drug Development, Copenhagen, DK, June 2007.
 116. Quirk, A.I., J. Lipkowski, A.J. Clarke, J. McLachlan, C. Vandenende, J. Dutcher, and S.G. Roscoe. Atomic force microscopy study of the mechanism of cellulose biodegradation. 90th Canadian Chemistry Conference, Winnipeg, Manitoba, May 2007.
 115. Cockburn, D., and A.J. Clarke. Site directed mutagenesis and chemical modifications for altering the pH optima of bacterial cellulases. 107th General Meeting of the American Society for Microbiology, Toronto, ON, May 2007.

114. Pfeffer, J.M., and A.J. Clarke. Characterization of the peptidoglycan O-acetylation pathway in *Bacillus cereus*. 107th General Meeting of the American Society for Microbiology, Toronto, ON, May 2007.
113. Moynihan, P.J., and A.J. Clarke. The role of Ape2 in the O-acetylation of peptidoglycan in *Neisseria gonorrhoeae*. 107th General Meeting of the American Society for Microbiology, Toronto, ON, May 2007.
112. Legaree, B., and A.J. Clarke. The role of the non-penicillin-binding domain in the function of penicillin-binding protein 2 from *Escherichia coli* and *Pseudomonas aeruginosa*. VIIIth European Symposium of the Protein Society. Stockholm, Sweden, May, 2007.
111. Weadge, J.T., and A.J. Clarke. Structure function relationship of O-acetylpeptidoglycan esterase from *N. gonorrhoeae*: substrate binding and catalytic mechanism. 7th Carbohydrate Bioengineering Meeting, Braunschweig, Germany, April 2007.
110. Pfeffer, J.T., and A.J. Clarke. Characterization of the pathway for the O-acetylation of peptidoglycan in *Bacillus cereus* 10987. First National Conference on Gram-Positive Pathogens, Omaha, NE, October 2006.
109. Clarke, A.J. Role of peptidoglycan acetylation and autolysins in entry into and resuscitation from the VBNC state. 11th International Symposium on Microbial Ecology, Vienna, Austria, August 2006.
108. Clarke, A.J., J.T. Weadge, and P. Moynihan. The mechanism of action of O-acetylpeptidoglycan esterase: Studies with Ape1 and Ape2 from *Neisseria gonorrhoeae*. XXIII International Carbohydrate Symposium, Whistler, B.C., July 2006.
107. Legaree, B., and A.J. Clarke. Using affinity chromatography to investigate protein-protein interactions involved in peptidoglycan synthesis in *Pseudomonas aeruginosa*. 56th Annual Conference, Canadian Society of Microbiologists, London, Ontario June 2006.
106. Scheurwater, E., and A.J. Clarke. Studies into the lytic transglycosylase activity of YfhD from *Escherichia coli*. 56th Annual Conference, Canadian Society of Microbiologists, London, Ontario, June 2006.
105. Quirk, A.I., C. Brosseau, C. Vandenende, S.G. Roscoe, J. Lipkowski, and A.J. Clarke. electrochemical investigation of cellulose films on Au(111). 89th Canadian Chemistry Conference, Halifax, N.S., May 2006.
104. Vandenende, C., and A.J. Clarke. Characterization of MltA, a Putative Lytic Transglycosylase in *Pseudomonas aeruginosa*. 106th General Meeting, American Society for Microbiology, Orlando, Florida, May 2006.
103. Pfeffer, J.T., E. Scheurwater, and A.J. Clarke. AmiB, a Hypothetical *N*-acetylmuramyl-L-alanine Amidase in *Pseudomonas aeruginosa*. 106th General Meeting, American Society for Microbiology, Orlando, Florida, May 2006.
102. Moynihan, P., and A.J. Clarke. Ape2 and its role in the O-acetylation of peptidoglycan in *Neisseria gonorrhoeae*. 106th General Meeting, American Society for Microbiology, Orlando, Florida, May 2006.
101. Scheurwater E., and A.J. Clarke. Identification of the catalytic domain in the endo-acting soluble lytic transglycosylase F from *Escherichia coli*. 106th General Meeting, American Society for Microbiology, Orlando, Florida, May 2006.
100. Cockburn, D.W., and A.J. Clarke. Cysteinesulfinic acid replacement of catalytic residues as a method for altering the pH optima of bacterial cellulases. 106th General Meeting, American Society for Microbiology, Orlando, Florida, May 2006.
99. Pfeffer, J.M., H. Strating, J.T. Weadge, and A.J. Clarke. Peptidoglycan metabolism in enterococci: O-acetylation and autolysin profile. 2nd International ASM-FEMS Conference on Enterococci, Helsingor, Denmark, August 2005.
98. Reid, C. W., D. P. Brewer, and A. J. Clarke. Analysis of the membrane bound lytic transglycosylase B active site by hydrogen/deuterium exchange MALDI-MS. 53rd American Society for Mass

- Spectrometry Conference, San Antonio, Texas, June 2005.
97. Adams, C., and A.J. Clarke. The association between *Pseudomonas aeruginosa* penicillin binding protein 2 and *Escherichia coli* lytic transglycosylase induces a morphological change in *Escherichia coli*. Canadian Society of Microbiologists Annual Meeting, Halifax, N.S., June 2005.
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 95. Weadge, J.W., and A.J. Clarke. Structure function relationship of a peptidoglycan de-*O*-acetylase: A novel enzyme discovered in *Neisseria gonorrhoeae*. 6th Carbohydrate Bioengineering Meeting, Barcelona, Spain, April 2005.
 94. Reid, C.W., and A.J. Clarke. Bacterial lytic transglycosylases. Alberta Ingenuity Centre for Carbohydrate Science 2nd Annual Carbohydrate Symposium, Lake Louise, Alberta, April 2005.
 93. Sweet, A and A.J. Clarke. Characterization of the 26-kDa autolysin from *Pseudomonas aeruginosa*., CBDN Annual Meeting, Banff, Alberta, February 2005.
 92. Scheurwater, E. and A.J. Clarke. Characterization of a novel lytic transglycosylase in *Escherichia coli*. CBDN Annual Meeting, Banff, Alberta, February 2005.
 91. Weadge, J.W., and A.J. Clarke. Production and characterization of a peptidoglycan de-*O*-acetylase: A novel enzyme discovered in *Neisseria gonorrhoeae*. CBDN Annual Meeting, Banff Alberta, February 2005.
 90. Adams, C. and A.J. Clarke. An investigation of the morphological change of *Escherichia coli* cells induced by the overexpression of penicillin-binding protein 2 from *Pseudomonas aeruginosa*. CBDN Annual Meeting, Banff Alberta, February 2005.
 89. Cockburn, D., and A.J. Clarke. Genetic and chemical engineering of cellulase: conversion of its catalytic base to Cysteinsulfinic acid. 22nd International Carbohydrate Symposium, Glasgow, Scotland, July 2004.
 88. Reid, C.W., and A.J. Clarke. Analysis of ligand binding to *Pseudomonas aeruginosa* lytic transglycosylase B by hydrogen/deuterium exchange coupled with MALDI mass spectrometry. 22nd International Carbohydrate Symposium, Glasgow, Scotland, July 2004.
 87. Weadge, J.T., and A.J. Clarke. Production and characterization of peptidoglycan de-*O*-acetylase: A novel enzyme discovered in *Neisseria gonorrhoeae*., Canadian Society of Microbiologists Annual Meeting, Edmonton, AB, June 2004.
 86. Reid, C.W.; D. Brewer, F.-I. Auzanneau, and A.J. Clarke. Active site characterization of the membrane bound lytic transglycosylase B from *Pseudomonas aeruginosa*. Canadian Society for Chemistry Annual Meeting, London, ON, June 2004.
 85. Adams, C. and A.J. Clarke. Cloning and over-expression of PBP2 and RodA from *Pseudomonas aeruginosa* PA01. 104th General Meeting, American Society for Microbiology, New Orleans, LA, May 2004.
 84. Sweet, A. and A.J. Clarke. Characterization of the 26-kDa autolysin from *Pseudomonas aeruginosa*. 104th General Meeting, American Society for Microbiology, New Orleans, LA, May 2004.
 83. Weadge, J.T., and A.J. Clarke. Kinetic analysis of a peptidoglycan de-*O*-acetylase from *Neisseria gonorrhoeae*. 104th General Meeting, American Society for Microbiology, New Orleans, LA, May 2004.
 82. Scheurwater, E.M., and A.J. Clarke. Characterization of Yfhd, a novel lytic transglycosylase in *Escherichia coli*. 104th General Meeting, American Society for Microbiology, New Orleans, LA, May 2004.
 81. Reid, C.W., and A.J. Clarke. Structure-function studies of the membrane-bound lytic transglycosylase B (MltB) from *Pseudomonas aeruginosa*. 103rd General Meeting, American Society for Microbiology, Washington, D.C., May 2003.
 80. Legaree, B.A., and A.J. Clarke. Kinetic analysis of peptidoglycan fragments binding to penicillin-binding protein 2 of *Pseudomonas aeruginosa* using surface plasmon resonance. 103rd General

- Meeting, American Society for Microbiology, Washington, D.C., May 2003.
79. Weadge, J.T., and A.J. Clarke. Kinetic analysis of a peptidoglycan de-*O*-acetylase from *Neisseria gonorrhoeae*. 103rd General Meeting, American Society for Microbiology, Washington, D.C., May 2003.
 78. Scheurwater, E.M., and A.J. Clarke. YfhD, a hypothetical lytic transglycosylase in *Escherichia coli*. 103rd General Meeting, American Society for Microbiology, Washington, D.C., May 2003.
 77. Sweet, AL, and A.J. Clarke. Isolation and purification of a 26-kDa autolysin from *Pseudomonas aeruginosa*. 103rd General Meeting, American Society for Microbiology, Washington, D.C., May 2003.
 76. Reid, C.L., N. T. Blackburn, B. Legaree, and A.J. Clarke. Mechanism of action of lytic transglycosylases: Evidence for substrate-assisted catalysis. 5th Carbohydrate Bioengineering Meeting, Groningen, The Netherlands, April 2003.
 75. Reid, C, N.T. Blackburn, and A.J. Clarke. Inhibition of *Pseudomonas aeruginosa* lytic transglycosylases by NAG thiazoline. XXIst International Carbohydrate Symposium, Cairns, Australia, July 2002.
 74. Weadge, J., and A.J. Clarke. The pathway for the *O*-acetylation of peptidoglycan: Characterization of a peptidoglycan de-*O*-acetylase. 102nd annual meeting of the A.S.M., Salt Lake City, Utah, May 2002.
 73. Blackburn, N.T., and A.J. Clarke. A structure-function study of the lytic transglycosylases of *Pseudomonas aeruginosa*. Canadian Society of Microbiologists Annual Meeting, Waterloo, Ontario, June 2001.
 72. Clarke, A.J. Structure and function relationship of soluble lytic transglycosylase B from *Pseudomonas aeruginosa*. 4th Carbohydrate Bioengineering Meeting, Stockholm, Sweden, June 2001.
 71. Daniels, K.E., and A.J. Clarke. Penicillin-binding protein 2 of *Pseudomonas aeruginosa*: Structure and function. 4th Carbohydrate Bioengineering Meeting, Stockholm, Sweden, June 2001.
 70. Blackburn, N.T., and A.J. Clarke. Characterization of the differences in activity catalysed by two peptidoglycan lytic transglycosylases (autolysins) from *Pseudomonas aeruginosa*. 101st annual meeting of American Society for Microbiology, Tampa, Florida, May 2001.
 69. Blackburn, N.T., and A.J. Clarke. Structure and function of membrane-bound lytic transglycosylase B from *Pseudomonas aeruginosa* PAO1. 20th International Carbohydrate Symposium, Hamburg, Germany, August, 2000.
 68. Clarke, A.J., and N.T. Blackburn. Peptidoglycan lytic transglycosylases: nature's hybrid of lysozyme and chitinase. American Chemical Society Meeting, Washington D.C., August, 2000.
 67. Daniels, K.E., and A.J. Clarke. Characterization of a major autolysin from *Pseudomonas aeruginosa* PAO1. Canadian Bacterial Diseases Network Annual Meeting, Canmore, Alberta, May, 2000.
 66. Strating, H. and A.J. Clarke. Analysis of *Enterococcus hirae* and *Enterococcus faecalis* autolysin specificity towards *O*-acetylated peptidoglycan. 1st International ASM Conference on Enterococci. Banff, Alberta, February, 2000.
 65. Blackburn, N., and A.J. Clarke. Cloning, purification, and initial characterization of two lytic transglycosylases (autolysins) from *Pseudomonas aeruginosa* PAO1. *Pseudomonas '99*, Maui, Hawaii, September 1999.
 64. Clarke, A.J., K.A. McAllister, and L. Marrone. The structure and function relationship of domains A, B, and C of *Fibrobacter succinogenes* xylanase C. 1st Gordon Conference on Cellulase and Cellulosomes, Proctor Academy, Mass., July 1999.
 63. Franklin, K, and A.J. Clarke. Cloning and overexpression of gentamicin 2'-*N*-acetyltransferase from *Providencia stuartii*. Protein Society Annual Meeting, Boston, MA, July 1999.
 62. Marrone, L., and A.J. Clarke. Cloning and overexpression of the class B β -lactamase from *Bacillus cereus* 5/B/6. Protein Society Annual Meeting, Boston, Mass., July 1999.

61. Blackburn, N., and A.J. Clarke. Expression of two autolysins from *Pseudomonas aeruginosa*. Protein Society Annual Meeting, Boston, Mass., July 1999
60. Strating, H. and A.J. Clarke. Metabolism of peptidoglycan during differentiation of vegetative cells of *Proteus mirabilis* to swarmer cells. American Society for Microbiology Annual Meeting, Chicago, Illinois, May 1999.
59. McAllister, K.A., L. Marrone, and A.J. Clarke. Identification of two essential tryptophan residues that participate in binding of substrate to Domain B of xylanase C from *Fibrobacter succinogenes*. 3rd Carbohydrate Bioengineering Meeting, Newcastle upon Tyne, UK, April 1999.
58. Clarke, A.J. Innate peptidoglycan hydrolases and their use in wall turnover and β -lactam antibiotic lysis of pathogens. CIAR Workshop on Bacterial Peptidoglycan, Elora, Ontario, August 1998.
57. Fierobe, H.-P., A.J. Clarke, E. Mirgorodskaya, P. Roepstorff, and B. Svensson. 2-Fold and 700-fold superior enzymic activity compared to wild-type *Aspergillus* glucoamylase and a catalytic base mutant Glu400Cys, respectively, is obtained by oxidation of Cys400 in this mutant to the cysteinsulfinic acid. XIXth International Carbohydrate Symposium, San Diego, CA, August 1998.
56. Clarke, A.J., K.G. Payie, K.A. Bain, J. Weadge, and L. Burrows. The pathway for the *O*-acetylation of peptidoglycan. Gordon Conference - Bacterial Cell Surfaces, New London, New Hampshire, June 1998.
55. Choudhry, A, and A.J. Clarke. Inhibition of peptidoglycan biosynthesis by the affinity label *N*-bromoacetylglucosamine. Canadian Society of Microbiologists Annual Meeting, Guelph, Ontario, June 1998.
54. Choudhry, A., and A.J. Clarke. Inhibition of peptidoglycan *o*-acetylation and cell growth by the affinity label *n*-bromoacetylglucosamine. American Society for Microbiology Annual Meeting, Atlanta, Georgia, May 1998.
53. Frandsen, T.P., Fierobe, H.P., Clarke, A.J., Palcic, M.M., Stoffer, B.B., Mirgorodskaya, E., Roepstorff, P., and Svensson, B. Glucoamylase: Structure, energetics and mechanism of the isomaltose transition-state complex and of a highly active, oxidized catalytic-base Glu→Cys mutant. 25th Federation of Asian and Oceanian Biochemists and Molecular Biologists Symposium. Manila, Phillipines, December 1997.
52. McAllister, K., and Clarke, A.J. Identification of two tryptophan residues that participate in binding of substrate to Domain B of xylanase C from *Fibrobacter succinogenes*. TRICEL '97, Ghent, Belgium, August, 1997.
51. Strating, H., and Clarke, A.J. A novel SDS-PAGE method for the analysis of autolysin specificity towards *O*-acetylated peptidoglycan. Canadian Federation of Biological Sciences Annual Meeting, Quebec City, June, 1997.
50. Clarke, A.J., Drummelsmith, J., and Yaguchi, M. Identification of the catalytic nucleophile of *Schizophyllum commune* cellulase and placement of the enzyme in family a, subtype 2 of the β -glycosidases. 2nd Intl. Carbohydrate Bioengineering Symposium, LaRochelle, France, April 1997.
49. McAllister, K., and Clarke, A.J. Purification of Domain B of *Fibrobacter succinogenes* S85 XynC and involvement of tryptophans in substrate-binding. American Society for Microbiology Annual Meeting, Miami, Florida, May 1997.
48. Li, Z., Beveridge, T.J., and Clarke, A.J. Purification and Initial Characterization of a Major Autolysin from *Mycobacterium phlei*. American Society for Microbiology Annual Meeting, Miami, Florida, May 1997.
47. Fierobe, H.-P., Stoffer, B.B., Clarke, A.J. and Svensson, B. Homologue substrate binding loop replacement and catalytic gap closing in protein engineered *Aspergillus awamori* glucoamylase. XVIII International Carbohydrate Symposium, Milan, Italy, July 1996.
46. Francis, D, Keenleyside, W.J. and Clarke, A.J. The prevalence of gentamicin 2'-*N*-acetyltransferase in the *Proteeae* and its role in the *O*-acetylation of peptidoglycan. Canadian Society of Microbiologists Annual Meeting, Charlottetown, P.E.I. June, 1996.
45. Li, Z., Clarke, A.J. and Beveridge, T.J. Localization and possible function of the 26-kDa major

- autolysin of *Pseudomonas aeruginosa*. American Society for Microbiology Annual Meeting, New Orleans, Louisiana, May, 1996.
44. Strating, H. and Clarke, A.J. Characterization of autolysins from vegetative and swarming cells of *Proteus mirabilis* with specificity toward either *O*-acetylated or chemically-de-*O*-acetylated peptidoglycan. American Society for Microbiology Annual Meeting, New Orleans, Louisiana, May, 1996.
 43. Guo, F., Dmitrienko, G.I., Clarke, A.J., and Viswanatha, T. The role of Asp104 and Ile167 in the inactivation of class A β -lactamases. The Envelope in Bacterial Physiology and Antibiotic Action. Garda (Verona) Italy, September, 1995.
 42. Payie, K., and Clarke, A.J. The relationship between the *O*-acetylation of peptidoglycan and cellular morphology in *Providencia stuartii*. The Envelope in Bacterial Physiology and Antibiotic Action. Garda (Verona) Italy, September, 1995.
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 40. Bray, M.R. and Clarke, A.J. The structure and function relationship of *Schizophyllum commune* xylanase A. International Bioengineering, Elsinore, Denmark. April, 1995
 39. Bray, M.R. and Clarke, A.J. Identification of a tyrosyl residue essential for substrate binding in *Schizophyllum commune* xylanase A. International Plant Polysaccharide Symposium, Guelph, Ontario. July, 1994.
 38. Bray, M.R. and Clarke, A.J. Identification of a tyrosyl residue at the substrate binding site of *Schizophyllum commune* xylanase A. Eighth Symposium of the Protein Society, San Diego, CA. July, 1994.
 37. Clarke, A.J. An overview of the biosynthesis, maturation and turnover of peptidoglycan. Canadian Society of Microbiologists Annual General Meeting, Vancouver, B.C. June, 1994.
 36. Watt, S.R. and Clarke, A.J. EDTA-induced lysis of *Pseudomonas aeruginosa* is mediated by endogenous autolysins. Canadian Society of Microbiologists Annual General Meeting, Vancouver, B.C. June, 1994.
 35. Payie, K. and Clarke, A.J. Relationship between the peptidoglycan *N*-*O* acetyltransferase and the AAC(2') gentamicin *N*-acetyltransferase of *Providencia stuartii*. Canadian Society of Microbiologists Annual General Meeting, Vancouver, B.C. June, 1994
 34. Clarke, A.J. Peptidoglycan as a target for antimicrobials: Other potential chinks in the armour. UA-UC International Conference on Infectious Diseases, Kananaskis, Alberta. May, 1994.
 33. Bernadsky, G., X.-W. Liao, T.J. Beveridge, R.E.W. Hancock, and A.J. Clarke. Penicillin-binding protein 5 of *Pseudomonas aeruginosa* has autolytic activity. American Society for Microbiology Annual General Meeting. Las Vegas, Nevada. May, 1994.
 32. Watt, S.R. and Clarke, A.J. Initial characterization of two novel autolysins isolated from *Pseudomonas aeruginosa* PAO1. Canadian Society of Microbiologists/Society for Industrial Microbiology Joint Annual Meeting. Toronto, Ontario. August, 1993.
 31. Watt, S.R. and Clarke, A.J. Isolation and characterization of two extracellular autolysins from *Pseudomonas aeruginosa* PAO1. *Pseudomonas* 1993: Fourth International Symposium on *Pseudomonas*. Vancouver, B.C. August 1993.
 30. Bernadsky, G., Beveridge, T.J. and Clarke, A. J. Characterization of the *Pseudomonas aeruginosa* autolysins by renaturing polyacrylamide gel electrophoresis. American Society for Microbiology Annual Meeting, Atlanta, Georgia. May 1993.
 29. Kadurugamuwa, J.L., A.J. Clarke, T. Mok and T.J. Beveridge. Surface action of gentamicin on *Pseudomonas aeruginosa* (PAO1). American Society for Microbiology Annual Meeting, Atlanta, Georgia. May 1993.
 28. Clarke, A.J., Bray, M.R. and Strating, H. β -Glucosidases, glucanases and xylanases: Their mechanism of catalysis. American Chemical Society Symposium on the Biochemistry and

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