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A. MISSION STATEMENT
A. MISSION STATEMENT

The Department of Microbiology & Immunology, established in 1939, has the unique mandate at the University of Western Ontario of research and teaching in microbiology & immunology. Teaching occurs in the Schulich School of Medicine & Dentistry, Faculties of Science and Health Sciences and the Faculty of Graduate Studies, soon to be restructured as the School of Graduate Studies. Research spans key areas of infection and immunity, namely the molecular and cellular biology of microorganisms and viruses as well as the cellular and molecular biology of the immune system.

The Department of Microbiology & Immunology is a core department of the Schulich School of Medicine & Dentistry and places a special emphasis on biomedical research and teaching with a focus on human disease, infection, and immunity.

The Department of Microbiology & Immunology comprises an important area of the Biomedical Sciences playing several key roles that include:

- Research and Scholarship in basic, clinical, and applied aspects concerning the cellular and molecular biology of microorganisms, viruses, and the immune system.

- Training of undergraduates, graduate students, and post-doctoral fellows in the cellular and molecular biology of microorganisms, viruses, and the immune system.

- Teaching of medical and dental students in basic and clinically relevant aspects of microbiology and immunology.

- Providing hands-on, technical laboratory experience, to the above students in modern research and analytical techniques of cellular and molecular biology as they relate to microorganisms, viruses, and the immune system.

- Educating students on the function and status of the immune system in health and disease, as well as on the impact of microbes and viruses in health, disease, food, environment, and other aspects of our society including the ethical use of microbes.
B. EXECUTIVE SUMMARY

B.1. Faculty Members
B.2. Research
B.3. Undergraduate Programs
B.4. Graduate Programs
B.5. Outreach and Promotional Activities
B. **EXECUTIVE SUMMARY**

In the last 5 years, we have experienced substantial growth in our teaching, research and graduate programs.

B.1. **Faculty Members**

Of the 22 faculty members with primary appointments in Microbiology & Immunology, 15 faculty members are fully supported from the departmental operating budget, while others are funded through the Robarts Research Institute and the Lawson Health Research Institute. In addition, three faculty members hold joint appointments with Microbiology and Immunology and other departments. Six faculty members with primary appointments in other departments have cross-appointments with Microbiology & Immunology.

Since 2003, we have recruited 7 new faculty members as follows: 4 core faculty (Haeryfar, Hertel, Kim, and McCormick), 1 new joint recruitment with the Department of Surgery (Mele), and 2 new retention recruitments with the Department of Medicine (Cairns), and Biology (Trick).

From 2003-2007, 9 core faculty members (Bhatia, Creuzenet, Heinrichs, Kim, Madrenas, McCormick, McFadden, Singh, and Valvano) have received external salary support from various sources: Natural Sciences and Engineering Research Council (Creuzenet), Canadian Institutes of Health Research (Heinrichs, Kim, McCormick, and Singh) and Canada Research Chairs Program (Bhatia, Madrenas, McFadden, and Valvano). Since 2003, Drs. Bhatia and McFadden have relocated to other institutions.

During the last 5 years we have hired 2 limited duties faculty who contribute to teaching (Summers and Cadieux) and recruited 2 post-retirement appointments (Galsworthy and Strejan) to contribute to teaching.

Dr. B. Singh was appointed and renewed as Director of Institute of Infection and Immunity from the Canadian Institutes of Health Research, until December 2009.

Dr. J. Madrenas was appointed first Director of FOCIS.

Dr. B. Chan transferred his RRI appointment to the Department of Microbiology & Immunology.

Dr. G. Dekaban, a Robarts Scientist, has received a tenured Full Professor position in Microbiology & Immunology.

Dr. C. Trick, received the Beryl Ivey Chair in Ecosystem Health, and holds a position in Microbiology & Immunology, joint with the Department of Biology.

Dr. W. Flintoff acted as the first Associate Dean with the portfolio on Basic Medical Sciences and Undergraduate Education, from the Schulich School of Medicine and Dentistry.
B.2. Research

In the last 4 years, faculty members have received research funding from various sources, despite increasing competition and reduced funding available from external sources. In 2004-2005, members in the department attracted $4.6 M in new research funding. From the Canadian Institutes of Health Research alone, our department received 28% of the total UWO funding. Dr. Kang secured a further $3.5 M in research contracts. Research funding for 2006-07 (from all sources) is $8.2 M.

All faculty members are currently funded by one or more research grants.

17 of the current operating grants are 5-year grants.

The Core Facilities in Microbiology & Immunology established within the last 5 years are: a conference room, level 2 laboratory, and a transmission electron microscope in partnership with the Department of Pathology.

The department contributed $490,000 in start up funds for new recruits from our departmental operating dollars accrued for salary recoveries.

The department has committed a further $400,000 for start up funds for 4 new recruitment initiatives in progress.

Faculty members have high research productivity as demonstrated by the number and high quality of publications in high impact scientific journals (e.g. Nature Immunology, Immunity, Embo J, Proceedings of the National Academy of Sciences, Molecular Microbiology, Journal of Immunology, Journal of Bacteriology, PLOS Pathogens, Journal of Virology, Cellular Microbiology, Journal of Biological Chemistry, etc.).

The Department of Microbiology & Immunology holds a weekly external seminar series on topical areas relevant to the research interest of the faculty. Speakers from Canada and the USA are regularly invited to provide lectures and for discussions with faculty, graduate students, postdoctoral fellows.

Microbiology & Immunology hosts the R.G.E. Murray Annual Lectureship series, bringing national and international distinguished scientists to the University for a Special Lecture and discussions with graduate students and faculty.

B.3. Undergraduate Program

Enrolment in our undergraduate programs has increased over the last 4 years. The number of students taking Microbiology & Immunology Courses in 2004 and 2007 was 1052 and 1348, respectively.

We currently offer 11 undergraduate courses.

The number of 4th year Honors students has remained stable over the period of 2004-2007, except for an increase in numbers in the years 2005-2006 due to the "double cohort" effect on the overall enrolment of undergraduates in the UWO.
In addition to the existing modular programs in Microbiology & Immunology, we offer 1 new Honors Specialization module: the Biochemistry of Infection and Immunity, and a Major in Microbiology & Immunology.

We played a significant role in launching the Bachelor of Medical Sciences program and continue contributing to its effectiveness (e.g. participation in the MedSci400E course).

B.4. Graduate Program

Fifty six graduate students are enrolled in 2007. The total value of external scholarships for 2007 is $352,000.

The graduate program in Microbiology & Immunology prepared a brief for the periodic appraisal of the MSc and PhD programs in Microbiology & Immunology at UWO. This brief was submitted to the Ontario Council on Graduate Studies in June 2003. OCGS external appraisers (Dr. Michael Ratcliffe, Toronto and Dr. Stanley Maloy, San Diego State) reviewed the program in 2004. The Microbiology & Immunology graduate program was given a "good quality" assessment by OCGS. This is the highest possible outcome from the assessment of a graduate program in Ontario.

B.5. Outreach and Promotional Activities

The Microbiology & Immunology graduate studies committee, as well as the Undergraduate Education Committee, are committed to outreach programs, in an effort to increase awareness of Microbiology & Immunology as a field, to promote our undergraduate and graduate programs, and to recruit the best possible students.

Our graduate and undergraduate programs have been involved in over a half dozen open houses over the last 3 years alone.

The Microbiology & Immunology graduate students host an Infection and Immunity Research Day with participation of graduate students and postdoctoral fellows from the University of Western Ontario and neighboring universities, and a distinguished scientist as a keynote speaker.
C. FACULTY MEMBERS

C.1. Distribution of Faculty
C.2. Location of Laboratories and Offices
C.3. Awards
C.4. Service & Recognition in Scientific Communities
C.5. Grants and Salary Awards
C. **FACULTY MEMBERS**

C.1. **Distribution of faculty members in the Department of Microbiology & Immunology**

Currently, the Department of Microbiology & Immunology consists of 22 members holding primary appointments at the ranks of Assistant (5), Associate (6), and full Professor (11). From these, Dr. Jana Jass, Assistant Professor, will relocate in Sweden after July 1, 2008. In addition, one Full Professor will take an early retirement in July 2008, and other 3 Full Professors are at or will be near retirement age within the next 5 years. Therefore, the Department has an urgent need to renovate its faculty as a way to maintain its research and teaching programs (Appendix C.1(a)).

From the faculty members indicated above, 15 receive direct salary support from Microbiology & Immunology, one is supported by the Robarts Research Institute, 2 by the Lawson Research Institute, and 4 are in the Division of Clinical Microbiology. These positions are expected to be transferred to the Department of Medicine and will be lost by Microbiology & Immunology.

The Department also has three joint members with the departments of Medicine (Cairns), Surgery (Mele), and Biology (Trick). Four others are cross-appointments and Dr. Peter Cadieux, from Surgery, will add one more faculty member to the complement of cross-appointees in July 2008. Three positions as limited duties are employed for teaching purposes, and two of these include Professor Emeriti (Galsworthy and Strejan). In addition, the Department has 6 faculty members as Casual Appointments (terminology applied according to the rules of the UWO Faculty Association); from these, 3 are Professor Emeriti (Appendix C.1(a)).

The department also contributes to the salaries of Dr. Cairns and Summers.

A compounded list of all faculty members in Microbiology & Immunology during the period 2004-2007 is indicated in Appendix C.1(b).

C.2. **Location of laboratories and offices**

Departmental faculty members are spread out in several buildings such as the 3rd and 5th floors of the Dental Sciences Building, 2nd and 3rd floor of the Health Sciences Addition, 1st and 2nd floor of the Siebens-Drake Research Institute, the Robarts Research Institute, the Lawson Health Research Institute, Cancer Program Ontario, LHSC Westminster Campus and University Campus, and the UWO Research Park.

The multiple locations and physical separation of faculty members imposes a physical barrier that prevents enhanced interactions between faculty members, especially to bridge the areas of molecular and cellular biology of microorganisms and viruses and the immune system. Also, because of its location in the Dental Sciences Building, the department did not benefit in any significant way from access to newly renovated research space in the Medical Sciences Building, where the Department only has control of less than 2,200 sq. ft. that will be turned over the Department of Biochemistry in exchange for 1,000 sq. ft. of older research space in the Siebens Drake Research Institute.
C.3. **Awards**

Most faculty members are past or present recipients of salary awards from national agencies.

Seven faculty members with primary appointments are current recipients of salary awards from the Canadian Institutes of Health Research (CIHR), Canada Research Chairs Program (CRC), and the Natural Sciences and Engineering Research Council (NSERC).

Two (Kim, McCormick) of the five new recruitments in the period of 2004-2005 successfully secured external salary awards from CIHR. In addition, one faculty member (Creuzenet) renewed the University Faculty Award from NSERC, and another (Madrenas) was successfully converted and approved from a Tier II CRC to a Tier I CRC.

C.4. **Service to the scientific community, honors, and awards**

As a reflection of their scientific achievements, members of Microbiology & Immunology are regularly invited to participate in national and international symposia and workshops. They also review manuscripts/applications for journals and granting agencies, and serve on grant review panels and have been recognized for the outstanding contributions in their respective fields.

Some examples of the contributions of faculty members to national and international scientific communities in the last 4 years include: Keystone Symposia (Delovitch, Organizer), FOCIS Annual Meeting (Madrenas, Organizer and Co-Chair), Annual Meeting of the Canadian Society of Microbiologists (McCormick, Creuzenet, Heinrichs; Organizers and Co-Chairs), CIHR-Infection and Immunity Institute’s Symposium for New Investigators (Heinrichs, Madrenas, Singh, Organizer and Co-Chairs).

**Grant Review Panels (only current departmental members are listed):**

<table>
<thead>
<tr>
<th>Cairns</th>
<th>2006-date</th>
<th><strong>Member</strong>, Scientific/Grant Review Panel, Multiple Organ Transplant Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2004-07</td>
<td><strong>Member</strong>, Canadian Institutes of Health Research Grant Review Panel - Immunology and Transplantation</td>
</tr>
<tr>
<td>Chan</td>
<td>2006-date</td>
<td><strong>Member</strong>, Canadian Institutes of Health Research Grant Review Panel – Strategic Training Initiatives</td>
</tr>
<tr>
<td></td>
<td>2006-date</td>
<td><strong>Member</strong>, Canadian Institutes of Health Research Grant Review Panel - Strategic Proof of Principle Committee</td>
</tr>
<tr>
<td></td>
<td>2005-06</td>
<td><strong>Member</strong>, Canadian Institutes of Health Research Grant Review Panel - Cell Biology &amp; Mechanism of Diseases</td>
</tr>
<tr>
<td></td>
<td>2003-04</td>
<td><strong>Scientific Officer</strong>, Canadian Institutes of Health Research Grant Review Panel - Immunology &amp; Transplantation</td>
</tr>
<tr>
<td>Creuzenet</td>
<td>2004-06</td>
<td>External Reviewer, Natural Sciences and Engineering Research Council</td>
</tr>
</tbody>
</table>
**Dekaban**
2007  Member, Canadian Institutes of Health Research Grant Review Panel - Virology & Viral Pathogenesis
2006  Member, Canadian Institutes of Health Research Grant Review Panel - Cell Biology & Mechanisms of Disease
2004-07 Member, Canadian Institutes of Health Research Grant Review Panel - University-Industry Grants

**Delovitch**
2007  Chair, Juvenile Diabetes Research Foundation (JDRF), Innovative Grant Review Panel
2006  Member, Review Panel for JDRF Research Center on Immune Tolerance, Diabetes Research Center, Harvard University (Cambridge, MA)
2006  Chairman, JDRF Innovative Grant Review Panel
2005  Member, JDRF Autoimmune Diabetes Centers of Excellence Scientific Review Panel

**Haeryfar**
2007  External Reviewer, Israel Science Foundation (ISF)
2007  Invited External Reviewer, Canadian Institutes of Health Research - Team Grants Program
2006  Invited External Reviewer, Heart and Stroke Foundation of Canada

**Heinrichs**
2006-08  Member, Canadian Institutes of Health Research Grant Review Panel - Microbiology and Infectious Diseases
2006  Member (invitee), Canadian Institutes of Health Research Grant Review Panel - Microbiology and Infectious Diseases
2005  Member (invitee), Canadian Institutes of Health Research Grant Review Panel - Microbiology and Infectious Diseases
2005  Member, Teleconference for Selection of Canadian Institutes of Health Research Microbiology and Infectious Diseases Review Panel
2004  Member, Postdoctoral Fellowship Competition Review Panel, Health Canada

**Madrenas**
2007-date  Chair, Senior Scholarship Advisory Committee, Alberta Heritage Foundation for Medical Research
2007-08  Member, Canadian Society of Transplantation Basic Science Committee
2007-08  Member, Canadian Society of Transplantation Grants & Awards Committee
2006  Member, Canada Foundation for Innovation (CFI) Genomics Expert Committee for New Initiatives Fund (NIF), and Leading Edge Fund (LEF)
2006  Immune Tolerance Network (ITN) Steering Committee Special Member representing Canadian Institutes of Health Research Institute of Infection and Immunity
2005-date  Co-Chair, National Research Council of the Kidney Foundation of Canada
2005-date  Member, KRESCENT Program Steering Committee, Canadian Society of Nephrology/ Kidney Foundation of Canada/ Canadian Institutes of Health Research
2005-date  Reviewer, Canadian Institutes of Health Research Strategic Training Initiative in Health Research
2004-date  Member, Advisory Board of the Institute of Infection and Immunity, Canadian Institutes of Health Research
2004-07  Member, Senior Scholarship Advisory Committee, Alberta Heritage Foundation for Medical Research.
2004  Member, NIDDK-NIH PO1 Program Review Section
2003-date  Chair, Canadian Institutes of Health Research Grant Review Panel - Immunology and Transplantation
2002-05  Member, National Research Council of the Kidney Foundation of Canada
2002-05  Chairman, Biomedical Scientific Committee of the Kidney Foundation of Canada
2002-05  Member, Canadian Society of Nephrology Ad Hoc Scientific Committee

Valvano
2006-08  Member, Executive Committee, Medical/Scientific Advisory Committee, Canadian Cystic Fibrosis Foundation.
2005-08  Member, Research Subcommittee, Medical/Scientific Advisory Committee, Canadian Cystic Fibrosis Foundation.
2005  Chair, Ad-Hoc Peer Review Committee to evaluate Strategic Training Initiative Grants, Canadian Institutes of Health Research.
2004  Chair, Canadian Institutes of Health Research Grant Review Panel - Microbiology and Infectious Diseases
2004  Member, Microbial Pathogenesis, National Institutes of Health, U.S.A.
2003-06  Member, IUMS Travel Fellowship Program Review panel, International Union of Microbiological Societies.

Editorial Boards of International/National journals (only current departmental members are listed):

Delovitch
2007  Excerpta Medica, Reviewer for diabetes articles
2006  Drug Discovery Today: Mechanisms of Autoimmune Disease (Guest Editor)
2006  Int. Rev. Immunol. Special Issue on NKT Cells (Guest Editor)
2005-date  Current Immunology Reviews
2003-05  Journal of Immunology (Section Editor)
2001-date  BioMed Central Immunology

Koval
1994-date  Associate Editor, Canadian Journal of Microbiology

Madrenas
2007  Associate Editor, Pharmacological Reviews
2006  Associate Editor, Journal of Immunology
2006  Associate Editor, Imunologia (Spain)

Valvano
2005-date  Associate Editor, Canadian Journal of Microbiology
2005-date  Contributing Faculty Member in Faculty of 1000 “Biology”
2002  Anales de Microbiologia (Chile), editor of the section Genetics, Physiology and Biochemistry
Scientific Achievement Awards (only current departmental members are listed):

**Heinrichs**
2006 Fisher Award from the Canadian Society of Microbiologists

**Kang**
2007 McMaster University Distinguished Alumni Award for Science

**Madrenas**
2005 Dean’s Award of Excellence in Research

**Murray** (Founder of the Department of Microbiology & Immunology)
2007 D.Sc. (Honoris causa)-McGill University

**Reid**
2007 Appointed Academic and Research Microbiologist (ARM) by the Canadian College of Microbiologists (CCM) for “accomplishments in the field of microbiology and the qualities of academic and scientific leadership”
2007 Winner of the 2007 Elie Metchnikoff Prize for Nutrition and Health, Moscow (with Dr. A Bruce)
2006 Award for Western Heads East Project, Association of Universities and Colleges of Canada Scotiabank Award for Internationalization
2006 Appointed President of the International Scientific Association for Probiotics and Prebiotics (ISAPP)
2004-07 Expert Committee on Nutritional Aspects of Food, Health Canada

**Singh**
2005 Fellow of the Canadian Academy of Health Sciences (FCAHS), Elected
2004 Fellow of the Royal Society of Canada (FRSC), Elected

**Valvano**
2006 Dean’s award of Excellence for outstanding contributions, Schulich School of Medicine and Dentistry, UWO

Honors/Teaching Awards:

**Colby**
2006 Certificate of Merit Award. The aim of this award is to promote medical education in Canadian medical schools and to recognize and reward faculty's commitment to medical education

**Haeryfar**
2007 Canadian Society for Immunology (CSI) Junior Investigator Travel Award (ICI, Rio de Janeiro, Brazil)

**Madrenas**
2007 Award of Appreciation, Sanofi-Aventis Biotech Challenge
2006 UWO Hippocratic Council ‘Best Curriculum on Earth’ Certificate of Appreciation for Year 2 Immunology Teaching
2005 Hippocratic Council Subject Development Group Award for innovative teaching of Microbiology and Immunology
2005 UWO Hippocratic Council ‘Best Curriculum on Earth’ Certificate of Appreciation for Year 2 Immunology Teaching
2005 UWO Students' Council Teaching Honour Roll Award of Excellence
2005 Who’s Who in Medical Sciences Education
2005 UWO Hippocratic Council Basic Science Teaching Award
2004 UWO Hippocratic Council Basic Science Teaching Award
2004 UWO Hippocratic Council ‘Best Curriculum on Earth’ Certificate of Appreciation for Year 2 Immunology Teaching
2004 UWO Hippocratic Council ‘Best Curriculum on Earth’ Certificate of Appreciation for Year 1 Infection & Immunity Teaching
2004 UWO Students’ Council Teaching Honour Roll Award of Excellence

Valvano
2007 Canadian Institutes of Health Research Operating grant entitled "Lipopolysaccharide export and assembly in Gram-negative bacteria" Ranked No.1 by the Microbiology and Infectious Diseases Grant Review Committee
2005 Certificate of Excellence in Undergraduate Medical Education for the Infection and Immunity block in 1st year, Hippocratic Council Undergraduate Medical Education Committee, Schulich School of Medicine and Dentistry

Invited Scientist/Teaching:

Delovitch
2006 Invited Visiting Scientist, Chinese Diabetes Society and Shandung Medical Society, Jinan/Qingdao, China
2004 Invited Visiting Scientist, Japan Foundation for Aging and Health, Department of Immunology, National Institute of Neuroscience, Tokyo, Japan

Valvano
2007 Graduate Course in the Department of Microbiology, University of Pavia, Italy: Burkholderia pathogenesis

Private Sector Appointments:

Delovitch
2003-04 Vice-President, Diabetogen Biosciences Inc.
2000-04 Founding Scientist & Chief Scientific Officer, Diabetogen Biosciences Inc.
2000-04 Member/Chairman Scientific Advisory Board, Diabetogen Biosciences Inc.

Kang
2006 Scientific Director, Curocom Co., Ltd.

Reid
2004 Appointed to Danone Probiotic Advisory Board, Canada
### C.5. Grants and Salary Awards

<table>
<thead>
<tr>
<th>Year</th>
<th>Fund</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-09</td>
<td>Arthritis Society- Operating</td>
<td>$103,420</td>
</tr>
<tr>
<td>2007-08</td>
<td>CIHR/IMHA- Operating</td>
<td>$100,000</td>
</tr>
<tr>
<td>2005-06</td>
<td>CIHR/POP- Operating</td>
<td>$147,282</td>
</tr>
<tr>
<td>2003-07</td>
<td>Arthritis Society- Operating</td>
<td>$284,900</td>
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<td>2002-05</td>
<td>CIHR- Operating</td>
<td>$312,019</td>
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<tr>
<td>2005-10</td>
<td>CIHR- Operating (Co-grant)</td>
<td>$595,000</td>
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<tr>
<td>2005-10</td>
<td>NSERC- Operating</td>
<td>$224,500</td>
</tr>
<tr>
<td>2004-07</td>
<td>NSERC- Operating</td>
<td>$512,500</td>
</tr>
<tr>
<td>2004-05</td>
<td>CIHR- Operating</td>
<td>$100,000</td>
</tr>
<tr>
<td>2003-09</td>
<td>CIHR- Maintenance</td>
<td>$226,164</td>
</tr>
<tr>
<td>2003-08</td>
<td>Networks Center of Excellence</td>
<td>$500,000</td>
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<tr>
<td>2003-09</td>
<td>CIHR- Training</td>
<td>$1,800,000</td>
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<tr>
<td>2007</td>
<td>Western Innovation Fund (UWO)-Operating</td>
<td>$27,000</td>
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<tr>
<td>2007</td>
<td>NSERC- Equipment</td>
<td>$59,000</td>
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<tr>
<td>2007</td>
<td>Academic Development Fund (UWO) - Equipment</td>
<td>$72,112</td>
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<tr>
<td>2006-09</td>
<td>CIHR- Operating</td>
<td>$314,862</td>
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<tr>
<td>2006-11</td>
<td>CIHR- Infrastructure</td>
<td>$433,236</td>
</tr>
<tr>
<td>2006</td>
<td>Academic Development Fund (UWO) - Equipment</td>
<td>$40,833</td>
</tr>
<tr>
<td>2006</td>
<td>NSERC- Equipment</td>
<td>$37,825</td>
</tr>
<tr>
<td>2005-10</td>
<td>NSERC- Operating</td>
<td>$135,000</td>
</tr>
<tr>
<td>2005</td>
<td>CIHR- Equipment</td>
<td>$95,689</td>
</tr>
<tr>
<td>2005</td>
<td>Academic Development Fund (UWO) - Equipment</td>
<td>$77,190</td>
</tr>
<tr>
<td>2003-06</td>
<td>CIHR- Operating</td>
<td>$267,050</td>
</tr>
<tr>
<td>2003-08</td>
<td>Premier’s Research Excellence Award-Salary Award</td>
<td>$150,000</td>
</tr>
<tr>
<td>2007-12</td>
<td>CIHR- Equipment</td>
<td>$696,850</td>
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<tr>
<td>2007-12</td>
<td>CIHR- Equipment</td>
<td>$266,700</td>
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<tr>
<td>2007-10</td>
<td>National Cancer Institute of Canada-Program Grant</td>
<td>$418,965</td>
</tr>
<tr>
<td>2007-10</td>
<td>UWO- Equipment grant</td>
<td>$135,000</td>
</tr>
<tr>
<td>2007-10</td>
<td>Ontario Cancer Research Network- Operating</td>
<td>$503,835</td>
</tr>
<tr>
<td>2006-11</td>
<td>CIHR- Operating</td>
<td>$589,675</td>
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<tr>
<td>2005-06</td>
<td>Ontario Neurotrauma Foundation (ONF)</td>
<td>$74,000</td>
</tr>
<tr>
<td>2005-08</td>
<td>CIHR- Operating</td>
<td>$168,972</td>
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<tr>
<td>2005-07</td>
<td>Multiple Sclerosis Society of Canada</td>
<td>$135,000</td>
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<tr>
<td>2005-08</td>
<td>Ontario Neurotrauma Foundation (ONF)</td>
<td>$150,000</td>
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<td>2004-09</td>
<td>CIHR- Operating</td>
<td>$1,201,600</td>
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<td>2004-09</td>
<td>CIHR- Equipment</td>
<td>$226,163</td>
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<td>2004-05</td>
<td>CIHR- Operating</td>
<td>$50,000</td>
</tr>
<tr>
<td>2003-08</td>
<td>CIHR- Operating</td>
<td>$981,000</td>
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<tr>
<td>2002-03</td>
<td>CIHR- Equipment</td>
<td>$116,102</td>
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<td>2002-05</td>
<td>CIHR- Operating</td>
<td>$169,349</td>
</tr>
<tr>
<td>2002-05</td>
<td>CIHR- Operating</td>
<td>$354,278</td>
</tr>
</tbody>
</table>
2002-07  CIHR- Operating  $525,000
2002-05  Heart and Stroke Foundation of Canada Research Grant  $128,160

Delovitch
2007-10  JDRF Innate Immunity Research Grant- Operating  $190,000
2003-08  CIHR- Operating  $130,000
2000-06  ORDCF- Operating  $90,000
2000-06  Ontario Research and Development Challenge Fund Diabetes Research Centre  $1,000,000

Flintoff
2005-08  CIHR - Operating  $292,371
2004-05  CIHR -Institute of Genetics - Operating  $50,000
2000-2004  CIHR - Operating  $352,212

Haeryfar (Recruited March 2006)
2008  CFI-Leaders Opportunity Fund (LOF)  $497,591
2007-09  Dairy Farmers of Canada/NSERC (CRD)- Operating  $124,000
2007-12  NSERC Individual Discovery Grant  $215,000
2007-08  UWO Academic Development Fund  $8,500
2007-09  The Cancer Research Society- Operating Grant  $125,000
2006  Multi-Organ Transplant Program (MOTP) Grant  $60,000

Heinrichs
2007  CIHR- Operating Grant  $143,500
2007  Inferrex- Operating  $500,010
2006  NSERC- Operating  $161,250
2006  CIHR- Operating  $549,675
2006  NSERC- Equipment  $37,825
2006  Academic Development Fund, UWO- Equipment  $40,833
2005  Academic Development Fund, UWO- Equipment  $18,012
2004  UWO- Western Innovation Fund  $70,000
2004  CIHR- Operating  $73,000
2001-06  PREA  $150,000
2000-04  CIHR New Investigator Salary award  $275,000

Hertel (Recruited February 2005)
2006  NSERC- Equipment  $78,675
2006-11  NSERC- Discovery Grant  $36,000
2006-09  CIHR- Operating  $89,308
2006  Schulich School of Medicine & Dentistry Internal Funding  $14,100
2006  J.P. Bicknell Foundation Award  $62,234
2005-06  Multi-organ Transplant Program (MOTP)  $70,000

Kim (Joined Department August 2004)
2007-11  ERA, Ministry of Research & Innovation, Ontario  $100,000
2005-09  CIHR- China-Canada research initiative- Operating  $90,000
2006-09  NSERC- Operating  $450,500
2005  CFI/OIT- New opportunities fund, Infrastructure grant  $648,056
2004-09  CIHR- New Investigator Award  $250,000
2004-07  CIHR- Operating  $311,382
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**Singh**

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**Valvano**

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Appendix C.1(a)

THE DEPARTMENT OF MICROBIOLOGY & IMMUNOLOGY
CURRENT FACULTY--2007 APPOINTMENTS

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<th>CROSS-APPT.</th>
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<td>Chan, B.</td>
<td>Jevnikar, A.M. (Medicine)</td>
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<tr>
<td>Colby, W.D. (Clinical)</td>
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<td>Galsworthy, S.B. (P. Emeritus)</td>
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<td>Strejan, G.H. (P. Emeritus)</td>
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JOINT APPT.

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<td>Summers, K.</td>
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### Appendix C.1(b)

#### 2004-2007 ALL MEMBERS

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D. STAFF

D.1. Administrative Officer
D.2. Graduate Secretary
D.3. Undergraduate Teaching Coordinator/Safety Representative
D.4 Administrative Assistant to CRC and Department Chair
D.5. Laboratory Technicians
D. **Staff**

D.1 **Administrative Officer:**
Ms. Kim Arts facilitates management of the administrative infrastructure of the Department. Among her duties, she is responsible for Human Resources (faculty, staff and student recruitment and payroll etc.), Financial Affairs of the Department (budgetary and financial planning and implementation, research account management), Implementation and Reporting of three Collective Agreements (UWOSA, UWOFAs and GTA) and deals with both internal and external enquiries and problems.

D.2. **Graduate Secretary:**
Ms. Jennifer Brace handles all aspects of the Graduate Program: promotional materials, applications, scholarships, seminars, advisory and examination committees, theses, etc. She is also responsible for the administration of the external seminars series: placing orders, drafting itineraries, hotels, etc.

D.3 **Undergraduate Teaching Facilitator/IT Consultant:**
Mr. Fred Williams is responsible for all matters related to the undergraduate programs: booking classrooms, examinations, student evaluations, and teaching materials. He is also involved in Open Houses/Information sessions and receptions for graduating students. Mr. Williams also helps coordinating the external seminar series. In addition, he is the departmental webmaster, the resource person for IT issues, the safety representative and first aid contact, and the fire warden for the third floor of the Dental Sciences Building.

D.4. **Administrative Assistant to CRC and Department Chair:**
Ms. Evelynne Ansara is the administrative assistant to the Canada Research Chair in Infectious Diseases and Microbial Pathogenesis, Dr. Miguel Valvano, who is also the current Department Chair. She assists Dr. Valvano and three members of the Infectious Diseases Research Group with regards to scheduling, travel, financial claims and other administrative functions as they arise. She also assists the Administrative Officer in peak times and is responsible for the administrative component of the external seminar series.

D.5. **Laboratory Technicians:** Ms. Lydia Dafoe, Ms. Maria Gaulhofer and Ms. Liz Colley are responsible for all undergraduate teaching laboratories.

Ms. Dafoe received the Dean's Award of Excellence for Staff in 2006.
E. RESEARCH

E.1. Research Funding
E.2. Major Areas of Research Activities
E.3. Interaction and Collaboration
E.4. Seminar Programs
E. **RESEARCH**

E.1. **Research Funding**

The total external research funding from all sources, secured by departmental members is indicated in Appendix E.1. During the period 2004-2007 the funding was never lower than $5.6 M (2005-06). The research funding for the current year is $8.1 M.

Research support comes from various sources including among others CIHR, NSERC, CFI, PREA, Heart and Stroke Foundation, Juvenile Diabetes Foundation, Cystic Fibrosis Foundation, Kidney Foundation of Canada, and the Canadian Network for Vaccines and Immunotherapeutics.

Faculty and students continue to publish work their work in very good to excellent journals such as Nature, Nature Immunology, Nature Medicine, Proceedings of the National Academy of Sciences, Journal of Experimental Medicine, Blood, Journal of Bacteriology, Journal of Biological Chemistry, Virology, Journal of Immunology, and Cellular Microbiology, Molecular Microbiology.

E.2. **Major Areas of Research Activities**

Our major research activities are within the broad scope of infection and immunity with a special focus on:

- Cellular and molecular biology of pathogenic microorganisms and viruses, and
- Cellular and molecular biology of the immune system

This research extends to all levels, from basic science to clinical applications. Short descriptions of research interests of our faculty members are regularly posted and updated in the Department’s Web site (Appendix E.2).

**Research strengths**

- **Immunology, Transplantation and Autoimmunity:** Type I Diabetes, T cell activation, antigen processing and presentation, histocompatibility complex in autoimmunity, chemokines and transplantation, models to study aspects of rejection and tolerance in transplantation.

- **Microbial pathogenesis and innate immunity:** Virulence factors of *Burkholderia cepacia*, *Staphylococcus aureus*, *Helicobacter pylori*, *Campylobacter jejuni*; lipopolysaccharide biosynthesis and assembly; iron transport in *S. aureus*; probiotics; macrophage cell death mechanisms; superantigens.

- **Viral pathogenesis:** mechanisms of latency of cytomegalovirus; adenovirus and control of the cell cycle; retroviruses and gene therapy for spinal cord injury patients; vaccines for immunotherapy.

- **Cell biology:** Roles of adhesion molecules in mediating cell movement, growth, and development; mammalian folate transport; cell biology of macrophages.
Recognition of Research Excellence

CRC Tier 1 Chair in Infectious Diseases and Microbial Pathogenesis (Valvano).

CRC Tier 1 Chair in Molecular Virology (McFadden). Dr. McFadden has relocated to another institution but efforts are in progress to recruit another outstanding virologist to take the Tier 1 CRC in Molecular Virology, currently vacant.

CRC Tier 1 Chair in Transplantation and Immunobiology (Madrenas): Dr. Madrenas had previously a Tier 2 CRC but it was converted and upgraded into a Tier I given his outstanding accomplishments over a 5-year period.

CRC Tier 2 Chair in Stem Cell Biology and Regenerative Medicine (Bhatia): Dr. Bhatia relocated to another institution.

CIHR New Investigator award (Kim)

CIHR New Investigator award (McCormick)

NSERC UFA award (Creuzenet)

CIHR Infection & Immunity Institute Directorship (B. Singh)

PREA/ERA awards (Creuzenet, Kim, McCormick)

Dean’s Award of Excellence in Research, Faculty of Medicine and Dentistry (Madrenas)

Dean’s Award of Excellence for outstanding contributions to the Schulich School of Medicine and Dentistry (Valvano)

E.3. Interaction and Collaboration

Departmental Members interact extensively with members in the department. Interaction and collaboration are promoted by our weekly graduate student and external departmental seminars.

There are various research interest groups:

Transplantation Research: Madrenas, Singh, Zhong (deceased in 2006)

Type I Diabetes: Chan, Delovitch, Madrenas, Singh

Intravital videomicroscopy, cell migration, trafficking, and homing: Chan, Morris

Infectious Diseases Research Group: Creuzenet, Haeryfar, Heinrichs, Hertel, Kim, McCormick, Valvano

Wound Healing: Chan, Heinrichs, Reid, Valvano

Superantigen group: Cairns, Heinrichs, Kim, Madrenas, McCormick

Probiotics: Heinrichs, Kim, McCormick, Reid
Members of our department also collaborate with researchers across campus, nationally, and around the world:

**Chan**
Cattolica University, Italy; Laboratory of National Research Council, Quebec; RRI; University of British Columbia; UWO

**Creuzenet**
Institut Armand Frappier; University of Alberta; University of Guelph; Université de Montréal; Washington State University; UWO

**Haeryfar**
Brigham Young University; National Institutes of Health; Scripps Research Institute; UWO

**Heinrichs**
University of British Columbia; UWO

**Hertel**
Emory University; Stanford University; UWO

**Kang**
McGill University; McMaster University; Seoul National University; University of California, Davis

**Kim**
Harvard University; The Scripps Research Institute; University of British Columbia; University of North Carolina at Chapel Hill; Xiamen University, China; UWO

**Madrenas**
Bristol Myers Squibb; La Jolla Institute of Allergy and Immunology; NYU Skirball Institute; University of Barcelona, University Central de Venezuela; UWO

**McCormick**
Boston Biomedical Research Institute, University of Illinois Urbana-Champaign, UWO

**Reid**
C. Hansen Research, Denmark; Dresden University of Technology, Germany; Fundação Oswaldo Cruz/Ministry of Health, Brazil; Glasgow Caledonian University; Kenya Medical Research Institute; Moscow State University; National Research Center, Egypt; University of Benin, Nigeria; University of California San Francisco; University Hospital Maastricht, Netherlands; University of Lublin, Poland

**Singh**
London Health Sciences Centre; Robarts Research Institute University of California San Francisco; University of Alberta, Edmonton

**Valvano**
University of Calgary; University of Chile; University of Edinburgh; University of McMaster; University of Pavia; University of Vienna
E.4. Seminar Programs

The Department of Microbiology & Immunology maintains highly competitive research grants in part by providing an excellent external seminar series. Our seminar series consists of weekly visits of leading scientists to the department for interaction, exchange of ideas, and possible future collaborative research initiatives. Visiting speakers represent our broad base of interests in the areas of infection and immunity, and they are recognized national and international leaders or emerging leading researchers. A sample of the External seminar program for the years 2006 and 2007 is in Appendix E.4 (a).

In addition, the Department of Microbiology & Immunology sponsors two special lectureships series:

The REG Murray Annual Lectureship, where scientists with outstanding careers from all over the world are invited for a special lecture and visit with faculty and graduate students (Appendix E.4(b).

The Infection & Immunity Research Forum (Appendix E.4 (c). This is a research day with the participation of graduate students and postdoctoral fellows from the UWO and neighboring universities, and the presentation of a distinguished Lecture. The event is entirely organized by graduated students in our department, and replaces an also very successful series of 3M Distinguished Lectureship series.
Bacteriology

Dr. Carole Creuzenet

We aim at identifying the role played by surface carbohydrates in the virulence of two genetically related gastro-intestinal human pathogens that cause very different and specific pathologies: Campylobacter jejuni and Helicobacter pylori. One hallmark of these two bacteria is to produce glycosylated proteins. We have made great progress in the elucidation of the N- and/or O-linked protein glycosylation pathways in these bacteria, and in the determination of their role in pathogenesis. We are now investigating the role of glycosylation on the function of select glycoproteins. Other significant research topics in the laboratory also include investigating the biosynthesis and role of C. jejuni capsular components, and investigating the use of lactobacilli as probiotics to treat/prevent H. pylori infections.

Accepting Graduate Students

Dr. Diane Cuppels

I am developing environmentally-acceptable plant disease control measures based on a molecular and genetic understanding of how bacteria, both pathogenic and beneficial, interact with plants and each other. Specifically, we are examining how environmental factors affect the colonization of tomato seed and seedlings by disease-causing xanthomonads and how biocontrol streptomyces interact with tomato pathogens using both scanning electron microscopy and confocal laser scanning microscopy.

• plant microbiology

Dr. David Heinrichs

As an established major source of life threatening hospital infections, the Staphylococcus aureus superbug is also causing serious infections in the community. The primary focus of my laboratory is on the study of S. aureus proteins that are essential for the acquisition of iron, a critical nutrient. Bacterial proteins involved in the acquisition of host iron sources are considered virulence factors, and studying how these proteins operate will allow us to design rationale approaches to inhibit their function and thus attenuate S. aureus infections.

Accepting Graduate Students

• bacterial virulence
• molecular genetics
• membrane transport
• immunobiology of superantigens
• probiotics
Dr. Jana Jass

Urinary tract infections are one of the most prevalent infections in the western world. It is believed that bacteria migrate from the intestinal tract or the vagina, to the bladder using specific virulence factors to overcome host defenses. We focus on the virulence mechanisms and intercellular signaling in chronic urogenital infections primarily caused by *Escherichia coli* and *Enterococcus faecalis*. Furthermore, we are interested in the role of vaginal microflora on the pathogens and possible role in modulating/promoting the progression of bladder infections. With the increasing development of antibiotic resistance in many uropathogens, we are investigating the mechanisms of probiotic *Lactobacillus* sp. to prevent infection by monitoring virulence factor expression and host inflammatory responses.

Dr. Susan Koval

Research in our laboratory is directed towards an understanding of the structure and function of bacterial surface components. We have a long-standing interest in paracrystalline protein surface layers (S-layers) and flagella of both Bacteria and Archaea. Our current research is focussed on the prokaryotic obligate predators *Bdellovibrio* and like organisms (BALOs). These bacteria have a developmental life cycle which includes a free-living attack phase and a periplasmic growth phase. We are interested in the mechanism of attachment and invasion of predators to the Gram-negative prey cells, with the goal of determining the components of predator and prey surfaces that dictate binding and attachment. We are also developing non-culture methods to identify and detect BALOs in environmental samples.

Dr. Tom Linn

The general interest of my lab centers on the transcriptional and translational control mechanisms that regulate gene expression in prokaryotes. Recently we have begun to examine regulating expression of virulence genes in *Bacillus cereus*. *B. cereus* is a human and animal pathogen that is most commonly associated with food poisoning, but it can also cause serious local and systemic infections. Moreover it is closely related to *Bacillus anthracis*, the causative agent of anthrax.

Dr. John McCormick

Our major research focus includes a detailed structural and functional characterization of a group of potent "superantigen" toxins produced by the notorious human pathogens *Streptococcus pyogenes* and *Staphylococcus aureus*. Our goals include the development of novel inhibitors for these toxins and harnessing their properties for immunotherapeutic agents. We are also interested in host-pathogen and interspecies bacterial communication systems. This work includes communication between pathogenic and commensal or probiotic organisms, and we are utilizing proteomic and *in vivo* expression technology systems to achieve these goals.

Accepting Graduate Students

Dr. Gregor Reid

With ten times more bacteria in us than human cells, ever wondered who's really the boss? Our lab is interested in understanding how indigenous and exogenously applied (probiotics) lactobacilli confer health benefits in the gut and urogenital tract. Our projects include: (i) Gene array studies post-probiotic use, and understanding anti-inflammatory and anti-infective properties of lactobacilli; (ii) Clinical studies on the use of probiotics to prevent preterm labour, urinary tract infections, yeast vaginosis and allergies, and alternatives to antibiotics.

http://www.uwo.ca/mmn/facultyindex.htm (2 of 7) 10/15/2007 4:29:00 PM

Appendix E.2
Dr. Miguel Vaivano
We work on two projects: (i) Mechanism of assembly of O antigen lipopolysaccharide (LPS), and (ii) Pathogenesis of the Burkholderia cepacia complex. LPS is a complex glycolipid on the surface of Gram-negative bacteria. We study the structure-function of membrane proteins needed for O antigen synthesis to design inhibitors that will interfere with this process, which may be useful as novel antimicrobials. The Burkholderia cepacia complex (Bec) is a group of related species that are a major health risk for patients with the genetic disease cystic fibrosis. We discovered that Bec bacteria survive in free-living amoebae and macrophages. We work on the elucidation of bacterial virulence factors involved in intracellular persistence.

Dr. Wayne Flitoff
Folates are essential nutrients for mammalian cells. Alterations in folate levels are risk factors for various diseases i.e. neural tube defects, heart disease and stroke, and colon cancer. The folate pathway is also a target for chemotherapeutic strategies to control malignancies. We have been studying the mechanism of how cells obtain folates through the membrane protein, the reduced folate carrier. We are currently investigating the substrate-binding site and translocation pathway using site directed mutagenesis, cryo scanning mutagenesis, transfections, and expression studies.

Dr. Vince Morris
My laboratory is investigating the signaling pathways involved in the migration of melanoma cells in extracellular matrix proteins present in skin. We are also studying hormone-stimulated migration of keratinocytes during wound healing.

Dr. Jim Koropatnick
Metal ions are everywhere in our environment. Some are purely toxic, others are essential for life -- and some are both. We are exploring the roles of metallothioneins, and metal ion and amino acid transporter proteins, that affect the toxicity and physiological activity of metals. Metallothioneins can mediate the activity of zinc-requiring transcription factors (NF-κB and the glucocorticoid receptor) and that function is being explored in immune and other cells (funded by the CIHR). In addition, we are developing antisense drugs to target mRNAs (thymidylate synthase and bcl-2) that mediate anticancer drug resistance (funded by the CIHR); and to measure hypoxic response in primary human tumours (in collaboration with clinical researchers in the London Regional Cancer Program).
Immunology

Dr. Ewa Cairns

Our laboratory is interested in rheumatic autoimmune diseases. Specifically, our current research focuses on the pathogenesis of Rheumatoid Arthritis (RA). We are studying the role of MHC class II molecules as well as auto-antigens (e.g. citrullinated proteins) in the development of this disease. Our research is performed using human RA clinical specimens and humanized (MHC class II) tg mice as animal model for RA.

- autoimmunity
- immunobiology of superantigens

Dr. Bosco Chan

The research interest of Bosco Chan is in the study of cell movement. Regulated cell movement represents an essential feature in diverse biological processes which include embryogenesis, wound healing, tumor metastasis and immune surveillance. Cell movement within tissue requires interactions with diverse stromal matrix proteins, such as collagen, fibronectin and laminin. Two research foci are pursued.

- chemokinesis
- chemotaxis
- biotherapeutics

Dr. Terry Delovitch

Our laboratory research focuses on the role of dysregulated immune responses in susceptibility to autoimmune type 1 diabetes (T1D). Using nonobese diabetic (NOD) mice that spontaneously develop T1D, we are studying how a numerical and functional deficiency in invariant natural killer T (iNKT) cells, that is manifested before birth, leads to a breakdown of immune tolerance and predisposes these mice to T1D. Our objective is to determine the cellular and molecular interactions between iNKT cells, dendritic cells and regulatory T cells (Tregs) that elicit protection from T1D with an aim to develop an iNKT cell-based therapeutic protocol for protection against T1D in the clinic.

- autoimmune type 1 diabetes

Dr. Caigan Du

Understanding the immunology in organ transplant rejection, such as tubulitis in renal allograft, is critical in the successful development of effective therapy for patients with transplant, and is our primary goal in the lab. Currently our research focuses on three areas: 1) the mechanism and regulation renal tubular epithelial cell apoptosis; 2) renal inflammatory responses in kidney transplant rejection; and 3) development of drug therapy using small molecular compounds for organ transplant rejection.

- transplant
- kidney

Dr. Sung Kim

Macrophages residing in almost all tissues are specialized phagocytes positioned in the first line of host defense and a rich source of cytokines regulating immune responses. Different microbes manipulate macrophage to live in harmony with their host or target macrophages to colonize and proliferate. Our laboratory investigates the molecular and signalling mechanisms by which macrophages interact and respond to different microbes, including Bacillus anthracis, commensals and probiotics. Our researches will provide new tools and therapeutic strategies for treating inflammatory and infectious diseases.

- anthrax lethal toxin
- probiotics

Accepting Graduate Students

2007 Department of Microbiology & Immunology Self-Study

Appendix E.2
The focus of interest in the Madrenas laboratory is regulation of the activation of T lymphocytes through their antigen receptor. These cells are the "brains" of the adaptive immune response, so their activation is a key step for proper development of immunity. The laboratory uses many different approaches to study this issue: from fundamental protein biochemistry to cell biology and to clinical assessment, using models that expand from recombinant molecules, to cellular systems to mouse and human diseases.

Accepting Graduate Students

Dr. Mansour Haeryfar

(1) Cytotoxic T lymphocyte (CTL) development in response to viral pathogens and tumor antigens; (2) Immunodominance hierarchies of CD8+ T cells; (3) Direct priming and cross-priming in CD8+ T cell responses; (4) Immunobiology of dendritic cells and other antigen-presenting cells in immunity and tolerance 5) Modulation of innate and adaptive immune responses by regulatory/suppressor lymphocytes such as naturally occurring CD4+CD25+ regulatory T (nTreg) cells, natural killer T (NKT) cells, etc. (6) Non-classical pathways of T cell activation and costimulation

- immunobiology of superantigens
- CTL biology
- antiviral immunity
- tumor immunology
- immunobiology of superantigens
- biotherapeutics

Dr. Anthony Jevnikar

The Jevnikar laboratory has primary interests in the study of autoimmune diseases, including diabetes and lupus kidney disease, and the prevention of kidney transplant rejection. Type 1 diabetes is caused by overactivity of the immune system which leads to damage of insulin producing cells within the pancreas.

- transplantation
- autoimmunity

Dr. Tina Mele

Although the survival of heart allografts has improved with development of potent immunosuppressive regimens, acute and chronic rejection are constant threats. The administration of immunosuppressive drugs following solid organ transplantation is essential to prevent rejection of the allograft. Thousands of lives have been saved by the use of immunosuppressive regimens but serious complications, including malignancy and opportunistic infections, still occur as a result of these treatment regimens. Induction of transplantation tolerance, defined as donor-specific unresponsiveness sustained in absence of immunosuppression, would avoid these serious complications. Despite intensive research in this area, the mechanisms have still not been completely identified. My laboratory is interested in further understanding the role of T regulatory cells in transplantation tolerance.
Dr. Wei-Ping Min
My research is focused on tolerance induction through gene silencing and immune modulation. There are two major themes in our research: i) establishing tolerance for preventing graft rejection in transplantation and treatment of autoimmune diseases, and ii) breaking tumor-derived immune suppression for treatment of cancer. The ultimate goals of our research are to dissect the mechanisms underlying dendritic cell-mediated immune modulation, and to develop novel immune-based and RNAi-based therapies.

Dr. Bhagi Singh
Autoimmune diseases affect 5-7% of the population. The focus of our laboratory is to develop specific immunotherapeutic approaches for autoimmune type 1 diabetes (T1D). For this purpose we investigate the regulation of autoimmunity by understanding the molecular, cellular and genetic basis of the T cell-mediated immune responses in diabetes.

Dr. Kelly Summers

Virology

Dr. Greg Dekaban
Dr. Dekaban's research is focused on two areas: (1) Vaccine research is focused on developing novel vaccine vectors that carry immunomodulatory genes or utilize dendritic cell-based vaccines that result in prime-boost vaccine regimens that yield strong cell-mediated immune responses. This research is aimed at developing improved vaccines for HIV/AIDS and cancer. (2) Develop novel acute anti-inflammatory treatments for spinal cord injury based on understanding the mechanisms at the cellular and molecular level that control inflammation in the injured spinal cord.

Dr. Laura Hertel
Human cytomegalovirus (CMV) is a widespread and incurable herpesvirus that can become life-threatening in immunocompromised individuals. Dendritic cells (DC) are major targets of CMV infection, immunomodulation, and reactivation from latency. We seek to identify the cellular and viral genes required for successful infection of DC and for viral subversion of DC functions with the ultimate goal of developing new antivirals.

Accepting Graduate Students
Dr. C. Yong Kang

We are working on the molecular biology of several RNA viruses. Our ultimate goal is to control viral diseases. We are taking two approaches: the first approach is the development of efficacious vaccines against various human viral diseases including AIDS, hepatitis and hemorrhagic fever, and the second approach is the development of viral-specific antiviral therapeutic agents by using state-of-the-art technologies of genetic engineering and biotechnology. For the development of antiviral therapeutic agents, we have been investigating the molecular mechanism of homologous viral interference mediated by defective interfering particles using the vesicular stomatitis virus system and the viral reverse genetics.

Dr. Joe Mymryk

My research is focused on using small DNA viruses as tools to explore and discover fundamental mechanisms regulating eukaryotic cell growth and gene expression. We study the early viral proteins of the small DNA tumor viruses, particularly human adenovirus E1A and papillomavirus E7, which can convert normal cells into cancer. Our goal is to exploit these viral oncoproteins to identify and characterize cellular regulatory pathways that, when altered, contribute to cancer formation and its spread.

Accepting Graduate Students

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Updated September 6, 2007 by [FMR Williams]
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### Appendix E.4 (a)

#### Seminars 2006-2007

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<th>Host</th>
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<td>Dr. Shawn Lewenza</td>
<td>Candidate for the Functional Genomics Position</td>
<td>Miguel Valvano</td>
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<tr>
<td>Institute Pasteur</td>
<td>&quot;Investigating the role of lipoproteins in Pseudomonas aeruginosa</td>
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<tr>
<td>Paris, France</td>
<td>pathogenesis and biofilm formation&quot;</td>
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<td>Dr. Jose Teodoro</td>
<td>Candidate for the Functional Genomics Position</td>
<td>Miguel Valvano</td>
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<tr>
<td>University of Massachusetts</td>
<td>&quot;Identification of novel viral and cellular pathways targeting</td>
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<td>Program in Gene Function &amp; Expression</td>
<td>tumor growth&quot;</td>
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<td>Dr. John McCormick</td>
<td>Candidate for the Functional Genomics Position</td>
<td>Miguel Valvano</td>
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<tr>
<td>Lawson Health Research Institute</td>
<td>&quot;Genome plasticity in group A streptococci and the superantigen</td>
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<tr>
<td>Dr. Michael Imperiale</td>
<td>&quot;Adenovirus Assembly and DNA Packaging&quot;</td>
<td>Joe Mymryk</td>
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<tr>
<td>University of Michigan</td>
<td>&quot;Sensing the stress: You have the help-bacterial model&quot;</td>
<td>Miguel Valvano</td>
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<tr>
<td>Dr. Satish Raina</td>
<td>&quot;Bronchial epithelium, mucus and host defenses&quot;</td>
<td>Miguel</td>
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<td>Jagiellonian University in Krakow, Poland</td>
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<td>Valvano</td>
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<tr>
<td>Dr. André Cantin</td>
<td>&quot;Life on the edge: insights into how Campylobacter jejuni navigates</td>
<td>Carole</td>
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<tr>
<td>University of Sherbrooke</td>
<td>the complex virulence-transmission cycle&quot;</td>
<td>Creuzenet</td>
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<tr>
<td>Dr. Erin Gaynor</td>
<td>&quot;Vaccine Acceptance and Dissemination: How long will it take</td>
<td>Greg Dekaban</td>
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<tr>
<td>University of British Columbia</td>
<td>before HPV vaccines save lives in Africa?&quot;</td>
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<tr>
<td>Dr. Paul Ritvo</td>
<td>&quot;Live Therapeutics: Genetically Modified Lactococcus lactis in</td>
<td>Gregor Reid</td>
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<td>University of Toronto</td>
<td>Medicine&quot;</td>
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<tr>
<td>Dr. Lothar Steidler</td>
<td>&quot;A global analysis of one-carbon donor metabolism and transport in</td>
<td>Bhagi Singh</td>
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<td>ActoGeniX NV, Zwijnaarde, Belgium</td>
<td>the protozoan parasite Leishmania&quot;</td>
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<tr>
<td>Dr. Marc Ouelette</td>
<td>&quot;Molecular microbiology of the TonB interactome&quot;</td>
<td>David</td>
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<td>Université Laval</td>
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<td>Dr. James Coulton</td>
<td>Infection &amp; Immunity Research Day</td>
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<td>Dr. Norma Andrews</td>
<td>&quot;HERV-K18 superantigen and its implications for EBV&quot;</td>
<td>Quim Madreras</td>
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<td>Yale University School of Medicine</td>
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<td>Dr. Brigitte Huber</td>
<td>&quot;Wiskott-Aldrich Syndrome protein - forging the link between T</td>
<td>Bosco Chan</td>
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<td>Tufts University</td>
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<td>Dr. Kathy Siminovitch</td>
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<td>Toronto General Research Institute</td>
<td>cell activation and the actin cytoskeleton</td>
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<td>Dr. France Daigle</td>
<td>&quot;Bacterial gene hunting with SCOTS.&quot;</td>
<td>Carole Creuzenet</td>
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<td>Dr. Quim Madrenas</td>
<td>&quot;Infectious Music: how microbes shaped our music&quot;</td>
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<td>Dr. Seth Bordenstein</td>
<td>&quot;Nature's Russian Doll: Bacteriophage in Bacterial Endosymbionts&quot;</td>
<td>Bob Murray</td>
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<td>Dr. Donald Woods</td>
<td>&quot;Pathogenesis of Disease due to Burkhoderia pseudomallei and Burkhoderia mallei&quot;</td>
<td>Miguel Valvano</td>
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<td>Dr. Jim Smiley</td>
<td>&quot;New twists to host shut off by herpes simplex virus&quot;</td>
<td>Laura Hertel</td>
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<td>Dr. Eric Sundberg</td>
<td>&quot;Superantigen-mediated T cell activation: Structure, Function and Therapeutic Development&quot;</td>
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<td>Dr. Subash Sad</td>
<td>Differentiation of CD8 T cells during infection with intracellular pathogens</td>
<td>Mansour Haeryfar</td>
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<td>Dr. Derrick MacFabe</td>
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<td>Dr. Leda Raptis</td>
<td>&quot;A novel pathway of Stat3 activation&quot;</td>
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<td>Dr. Michelle Barry</td>
<td>&quot;Poxviruses: Control of Apoptotic Death and Protein Degradation&quot;</td>
<td>Laura Hertel</td>
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<td>Dr. Khashayarsha Khabzae</td>
<td>&quot;Immune responses that PROMOTE colon cancer&quot;</td>
<td>Mansour Haeryfar</td>
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<td>Dana Farber Cancer Institute, Harvard Medical School</td>
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<td>Dr. Lynn Enquist</td>
<td>&quot;Imaging herpes virus infections of neural tissue and neurons&quot;</td>
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<td>Dr. Christine Posavad</td>
<td>&quot;Natural and vaccine-induced T cell responses to HSV in humans&quot;</td>
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<td>Dr. Roy Duncan</td>
<td>&quot;Lost in translation: Polycistrionic viral mRNAs and alternate mechanisms of translation initiation&quot;</td>
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<td>Dr. Scott Hultgren</td>
<td>&quot;Uropathogenic E. coli: More to the Picture than Meets the Eye&quot;</td>
<td>Gregor Reid</td>
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<td>Dr. Gabriel Nunez</td>
<td>&quot;Function of TLRs and NLRs in Immunity and Disease&quot;</td>
<td>Miguel Valvano</td>
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<td>Dr. Hassan Javanbakht</td>
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<td>&quot;Retroviral Restriction factors&quot;</td>
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<td>Dr. Bruce Beutler</td>
<td>RGE Murray Lecture</td>
<td>&quot;How we sense infection and respond to it: the forward genetic approach&quot;</td>
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<td>Dr. Marco Vignuzzi</td>
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<td>&quot;Population Dynamics of Viral Pathogenesis: Fidelity, Mutation and Cooperativity in the RNA Quasispecies&quot;</td>
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<td>Dr. Robert Perry</td>
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<td>&quot;Transporter ProP of Escherichia coli: Osmosensor and Osmoregulator&quot;</td>
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<td>Dr. Stephen Jameson</td>
<td>&quot;T cell homeostasis&quot;</td>
<td>University of Minnesota</td>
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<td>Dr. Rafick-Pierre Sékaly</td>
<td>&quot;T cell homeostasis in HIV infection&quot;</td>
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<td>&quot;CVB3 Pathogenesis: An Integrative Approach&quot;</td>
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<td>Dr. Rafael Garduno</td>
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<td>Dr. Scott Gray-Owen</td>
<td>&quot;The Pathogenic Neisseria: Dancing with Humans&quot;</td>
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<td>Dr. Michele Barry</td>
<td>&quot;Lessons from Studying Poxviruses: Modulation of Apoptotic Death &amp; Protein Degradation&quot;</td>
<td>University of Alberta</td>
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2007 Department of Microbiology & Immunology Self-Study  
Section E  
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### Appendix E. 4(b)

**RGE Murray Annual Lectureship**

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<th>Speaker</th>
<th>Institution/Department</th>
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<td>Dr. Bruce Beutler</td>
<td>Scripps Research Institute, La Jolla, California</td>
<td>&quot;How we sense infection and respond to it: The forward genetic approach&quot;</td>
<td>May 3, 2007</td>
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<td>Dr. Norma Andrews</td>
<td>Professor of Microbial Pathogenesis, Yale University School of Medicine, New Haven, CT</td>
<td>&quot;Intracellular pathogens: New turns in the road to lysosomes&quot;</td>
<td>November 24, 2006</td>
</tr>
<tr>
<td>Dr. B. Brett Finlay</td>
<td>Departments of Biochemistry &amp; Molecular Biology, Medical Microbiology &amp; Immunology, The University of British Columbia</td>
<td>&quot;Pathogenic E. coli disease: The role of the pathogen, host, and microbiota&quot;</td>
<td>June 18, 2006</td>
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<tr>
<td>Speaker</td>
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<tr>
<td>Ronald N. Germain, M.D., Ph. D.</td>
<td>Deputy Chief, Laboratory of Immunology, Chief, Lymphocyte Biology Section, Laboratory of Immunology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, DHHS</td>
<td>&quot;Understanding Adaptive Immunity: From Molecules to Models to Movies&quot;</td>
<td>May 25, 2006</td>
</tr>
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<td>Dr. John Collier</td>
<td>Microbiology &amp; Molecular Genetics, Harvard Medical School</td>
<td>&quot;Anthrax toxin and the problem of toxin translocation across membranes&quot;</td>
<td>March 31, 2005</td>
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<tr>
<td>Dr. Pascale Cossart</td>
<td>Professor, Pasteur Institute</td>
<td>&quot;Infection by Listeria monocytogenes: from Cell Biology and Genomics to Pathophysiology&quot;</td>
<td>February 23, 2004</td>
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<tr>
<td>Dr. Abigail Salyers</td>
<td>Professor, University of Illinois at Urbana-Champaign</td>
<td>&quot;Antibiotic Resistance Gene Transfer by Intestinal Bacteria&quot;</td>
<td>May 9, 2002</td>
</tr>
<tr>
<td>Dr. W. Ford Doolittle</td>
<td>Professor, Dalhousie University, Director, CIAR Program in Evolutionary Biology</td>
<td>&quot;Chopping down, or at least uprooting, the Tree of Life&quot;</td>
<td>May 9, 2001</td>
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<tr>
<td>Dr. Richard J. Ulevitch</td>
<td>Professor and Chair, Department of Immunology, Scripps Research Institute</td>
<td>&quot;Multilevel Regulation of Innate Immunity&quot;</td>
<td>June 6, 2000</td>
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<td>Dr. Julian Davies</td>
<td>Emeritus Professor, University of British Columbia, Chief Scientific Officer, TerraGen Discovery Inc.</td>
<td>&quot;The New Microbiology&quot;</td>
<td>May 14, 1999</td>
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<td></td>
<td>Presented as part of &quot;Challenges of Microbial and Immune Diseases in the Next Millennium&quot;, the 60th Anniversary Symposium of the Department of Microbiology and Immunology</td>
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</table>
The Graduate Students from the Department of Microbiology and Immunology at the University of Western Ontario are proud to present the second annual Infection and Immunity Research Forum. Thank you to all of you who attended our first annual IIRF on November 24, 2006 and made a success! We hope to see you again next year!

2007 Keynote Speaker

**Dr. Jonathan W. Yewdell**
Chief, Cellular Biology Section
Laboratory of Viral Diseases
NIAID, NIH
Bethesda, MD
"TBA"
Friday, November 16, 2007
University Hospital Aud. A
University of Western Ontario

Graduate students and post-doctoral fellows will be invited to submit an abstract for oral or poster presentations.

Please check next year for further information.

* A unique forum for graduate students and post-doctoral fellows to showcase their research.

Proudly sponsored by

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<tr>
<th>Department of Microbiology and Immunology</th>
<th>Roche Diagnostics</th>
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</table>
The Graduate Students from the Department of Microbiology and Immunology at the University of Western Ontario are proud to present the first annual Infection and Immunity Research Forum November 24, 2006.

2006 Keynote Speaker

Dr. Norma W. Andrews: "Intracellular pathogens: New turns in the road to lysosomes."

Abstracts of the oral and posters presentations can be found here.

Oral presenters: The winner of the $500 Roche Award was

- Michelle McCully Department of Microbiology and Immunology, University of Western Ontario, "Up-regulation of receptor interacting protein 2 correlates with rapid resolution of peritoneal dialysis-associated peritonitis."

Poster presentations: The five-$100 prizes were awarded to

- Carla Bauer Dept Pathology and Molecular Medicine, McMaster University, "Cigarette smoke impairs induction of Type 1 interferons in primary lung fibroblasts."
- Katarina Kaluzny Dept of Molecular and Cellular Biology, University of Guelph, "Investigation of wzy alpha and beta O antigen polymerases in Pseudomonas aeruginosa."
- W. Monty McKillop Dept of Microbiology and Immunology, University of Western Ontario, "Characterization of CD11d leukocyte integrin expression."
- Ryan Noyce Dept of Biochemistry and Biomedical Sciences, McMaster University, "Characterization of the IRF3-mediated antiviral response to virus particle entry."
- Alanna Watson Dept of Microbiology and Immunology, University of Western Ontario, "Regulation of growth factor-stimulated chemotaxis and chemokinesis of primary murine keratinocytes."
F. UNDERGRADUATE PROGRAMS

F.1. Program Implementation
F.2. Courses in Microbiology & Immunology
F.3. Linkage with Other Disciplines
F.4. Other Initiatives
F.5. Awards
F. UNDERGRADUATE PROGRAMS

F.1 Program Implementation

Program Objectives
Our undergraduate programs provide fundamental training in the theory and practice of Microbiology & Immunology.

We have a research-intensive environment and our course offerings reflect the interests of the faculty members. We also feel it is important to provide hands-on training in our discipline. We provide a 2nd year laboratory course that introduces students to microbiology, a 3rd year laboratory course that continues to develop their understanding of microbiology and introduces them to principles of immunology, and a laboratory module in the integrated MedSci400E course. Students graduating in our program develop a variety of skills (critical thinking, research, writing, problem solving, etc.) that are sought after in the marketplace.

Undergraduate Education Committee
This committee comprises: S. Koval (Chair), K. Summers, T. Linn, S. Kim, M. Haeryfar, V. Morris, J. McCormick (483 Coordinator), M. Valvano (ex-officio) D. Colby (ex-officio), F. Williams (Teaching Coordinator), and a Student Rep.

The Committee is responsible for academic counseling, undergraduate teaching, curriculum, enrollment, liaison with the UWO Education Policy Committee (EPC), Bachelor in Medical Sciences Steering Committee (BMScSC), and the Dean’s Academic Programs (DAP).

Academic Counseling
The Faculty of Science provides general student counseling and services, related to grievances, appeals, etc. for those students in the BMSc and BSc programs.

Members of the Undergraduate Program Committee provide specific counseling for Microbiology & Immunology programs and courses. Academic counseling is available throughout the year via email (mni-uec@uwo.ca).

Course Instructor and Assistance to Students
During the 2006-07 school year 32 Instructors (Professors, Associate Professors, Assistant Professors, and Guests) shared 420 lecture hours and 352 laboratory teaching hours. Large course enrolments continue to tax our resources. All of our courses are now available via WebCT. This online teaching tool is a valuable supplement to the pedagogical lectures. Some of our Instructors are located off-campus making it very difficult to have in-person office hours. WebCT provides a solution to this problem; as well, the Department maintains office space for these Instructors on site.

Enrolment
Enrolment in our undergraduate programs has increased over the last 4 years. The number of students taking Microbiology & Immunology Courses in 2004 and 2007 was 1052 and 1348, respectively (Appendix F.1(a)). Enrolment pressure in our courses continues in spite of the passing of the double cohort. We project that this trend will continue based on data from "intent to register" forms.
Program/Course Review and Evaluation
Teaching evaluations are conducted for each course and instructor as mandated by the University. Reviews for Instructors are available from the UWO website. All Department members are encouraged to provide input to the program at Faculty meetings and Departmental Retreats. The Department hosts a teaching retreat each year. Course Instructors provide SWOT analysis, and members are encouraged to provide input. The Teaching Resource Centre has assisted in providing Faculty development. A summary of student evaluation of our courses is contained in Appendix F.1(b).

New Academic Choices
Under the New Academic Choices, the Department of Microbiology & Immunology offers the following modules (Appendix F.1(c)).

a) Honors Specialization in Microbiology & Immunology
b) Honors Specialization in Biochemistry of Infection and Immunity
c) Specialization in Microbiology & Immunology
d) Major in Microbiology & Immunology
e) Minor in Microbiology & Immunology

By offering a Minor, Major, and Specialization, students have a great deal of flexibility in their educational choices. Students interested in a broad spectrum can obtain an Honors Degree with a double Major. Similarly interested students can combine our minor with any program across Campus.

The Honors fourth year program is intended for students who have performed at an above-average level in their preparatory courses (cell biology, microbiology, immunology, genetics, and biochemistry) and who are keen to explore one or more of these areas in depth. Advanced coverage of bacteriology, genetics, immunology, and virology is given in a series of half courses. These courses are also open to any student in the BSc or BMSc programs with the necessary prerequisites. Advanced laboratory training is given in the core course Microbiology & Immunology 483E.

A new module, Honors Specialization in Biochemistry of Infection and Immunity, was recently established jointly with the department of Biochemistry. Students interested in pursuing more of the biochemical aspects of microbiology will benefit from this module. We have combined appropriate courses from Biochemistry with a choice of 4th year courses in Microbiology & Immunology including the 4th year research project.

F.2. Courses in Microbiology & Immunology

F.2.1. 200 Level Courses

220a is a required course in all of our modules. This course fulfills the requirements of many Pharmacy and Ophthalmology schools in Canada and the United States, and it is on high demand by many senior students.

221b is a survey course that has been very popular over the years. Many students change their registration to our program after taking this course.
MICROIMM 220a: BIOLOGY OF PROKARYOTES
Instructors: Drs. S.F. Koval, P. Cadieux, C. Creuzenet

Calendar Copy: This course examines the fundamental aspects of the structure, physiology, genetics, and phylogenetic relationships of the Bacteria and Archaea. Examples of diverse and environmentally important organisms are presented.
Prerequisite(s): Biology 022 or 023 and Chemistry 020 or 023
Co-requisite(s): Biochemistry 280a
Anti-requisite(s): The former Biology 359b
2 lecture hours, 3 laboratory hours, 0.5 course

Objectives: The course will begin with a consideration of the structural, genetic, metabolic properties, and phylogeny of Bacteria and Archaea. It will continue with a description of how these organisms are detected, cultivated, identified, and controlled. The second part of the course will present contemporary applications. These will include microbial analysis of drinking water, antibiotic resistance, and microbial communities.

Lecture Topics: Introduction, identification and culture of bacteria, Structural features of the prokaryotic cell, Growth and its control, DNA replication and cell division, Mechanisms of genetic transfer, Phylogeny and molecular chronometers, Energetics, Antibiotic resistance, Food and water microbiology.

Laboratory work: Microscopy, Isolation of bacteria; Staining, Types of media, Identification, Lactobacilli, Antibiotics, Water Analysis.

Evaluation: midterm exam 35%, final exam 40%, laboratory 25%

MICROIMM 221b: BIOLOGY OF INFECTION AND IMMUNITY
Instructors: Drs. S.B. Galsworthy, K. Summers, Y. Kang

Calendar Copy: The biology of selected pathogens and the diseases they cause. An examination of host/parasite relationships and strategies used by microbes to survive in their hosts. Aspects of clinical disease will be studied including diagnosis and treatment based on modern molecular techniques and the nature of host immune responses.
Prerequisite(s): Biology 022 or 023.
3 lecture hours, 0.5 course.

Objectives: Students will acquire knowledge of fundamental processes by which infectious organisms invade or colonize the human body and produce disease. The immunological mechanisms used by the infected host to resist infection and disease are also a major theme of this course. This course makes extensive use of the World Wide Web. Lecture notes, a course conference, and convenient access to the latest information on infectious diseases will enhance your learning.

Lecture topics:
Hallmarks of microbial pathogens: infectivity, host specificity, specificity of resistance.
Genetic determination of resistance, susceptibility, and virulence.
Highlights of the immune system: primitive resistance mechanisms, specificity of recognition, humoral immunity, cellular immunity, aberrant responses.
Bacterial models: Making the connection: colonization.
Toxins: Molecules at the crossroads between host and parasite. Intracellular survival strategies. Viral models: Influenza, measles, HIV, papilloma, polio, smallpox, rabies.
Detection: Molecular epidemiology, tracking new pathogens.
Strategies for alleviation and prevention Antibiotics: microbial rivalries and resistance mechanisms
Vaccines
Future trends: global warming, new diseases

Evaluation: Mid-term exam: 25%, Project: 25%, Final exam: 50%

F.2.2. **300 Level Courses**

357a, 360b, and 361G are core courses in our program. Students are introduced to a breadth of topics in microbiology and immunology.

**MICROIMM 357a: IMMUNOLOGY**

**Instructors:** Drs. B. Chan, M. Haeryfar

**Calendar Copy:** Elementary concepts of immunity, structure and function of the immune system, antigens and antibodies, complement, genetic basis of the immune response, humoral and cellular immunity, immunological tolerance, organ and tissue transplantation, allergy and autoimmunity.

**Anti-requisite(s):** the former Biology 358a.

**Prerequisite(s):** Biochemistry 280a, Biology 281b.

2 lecture hours, 0.5 course.

**Objectives:** To familiarize students with the basic concepts of the structure and normal function of the immune system as well as with aspects of immune system pathology.

**Lecture Topics:** Components of the immune system, natural vs. acquired immunity, lymphocyte development and maturation, T and B lymphocytes, antigens and antigen presentation, transplantation and the major histocompatibility complex (MHC), the immunoglobulins (antibodies), the complement system, immunity to infectious diseases, vaccines, allergy, immunodeficiency, immunoproliferative disorders, autoimmune diseases, cancer immunology.

**Evaluation:** 2 Mid-term tests (multiple choice): 25% each, Final exam (multiple choice): 50%

**MICROIMM 360b: DIVERSITY OF PROKARYOTES AND VIRUSES**

**Instructors:** Drs. S. Koval, V. Morris

**Calendar Copy:** A study of selected groups of **Bacteria** and **Archaea** that exhibit metabolic and physiological diversity (heterotrophs, phototrophs, autotrophs, chemolithotrophs, extremophiles). Molecular systematics and identification of prokaryotes. Introduction to the structure and replication of bacterial and animal viruses (including HIV and SARS). Viral responses to host cell defenses.

**Antirequisite:** The former Microbiology & Immunology 450b

**Prerequisites:** Biochemistry 280a, Biology 281b, Microbiology & Immunology 220a.

Biochemistry 381a is recommended

2 lecture hours, 1 tutorial hour, 0.5 course
Objectives: Microbiology & Immunology 360b will emphasize the diversity of bacteria and viruses. The first half of the course will introduce the importance of prokaryotic cells to the biosphere and methods for analyzing microbial communities. Specific examples of physiological diversity will be discussed, as well as prokaryotes that live in extreme environmental conditions. The second half of the course will provide an introduction to virology. The T-even bacteriophage, lambda, and mu will be featured as contrasting examples of bacterial viruses. Several examples of human viruses will also be given, emphasizing the role of viruses in transfer of genetic information as well as in induction of disease.

Lecture Topics: Molecular systematics, Methods in Microbial Ecology, Microbial diversity (phototrophs, lithotrophs, anaerobes, extremophiles), Community structure, Introduction to viruses, Bacteriophages: Lytic development, Lysogeny and Genetic analysis, Baculoviruses as cloning agents, Mammalian viruses, Microbes as oncogenic agents.

Evaluation: midterm exam (Prokaryotes) 50%, final exam (Viruses) 50%.

MICROBIOLOGY & IMMUNOLOGY 361G: LABORATORY TECHNIQUES IN MICROBIOLOGY & IMMUNOLOGY
Instructors: Drs. K. Summers, T. Linn

Calendar Copy: This course consists of a series of laboratory exercises designed to familiarize students with techniques of immunology, bacterial genetics, virology, and molecular biology. Prerequisite(s): Biology 281b, Biochemistry 381a, Microbiology and Immunology 220a, Microbiology & Immunology 357a.
Co-requisite(s): Microbiology & Immunology 360b.
5 laboratory hours, 0.5 course.
Enrollment is limited: priority will be given to students who have achieved at least 70% in Microbiology & Immunology 357a and Biochemistry 381a.

Objectives: Laboratory work will be from the disciplines of immunology, bacterial genetics and virology with an emphasis on the interdisciplinary nature of most techniques.

Laboratory work: Immunization; immunodiffusion, Purification of antibody, ELISA, Titration of Complement, Immunofluorescence, UV Mutagenesis, Molecular cloning laboratory, Analysis of mutants, Transformation, Baculovirus infection, Bioinformatics.

Evaluation: immunology laboratories 35%, cloning assignment 25%, baculovirus assignment 15%, Bioinformatics Assignment, 10%, Laboratory Performance 5%.

F.2.3. 400 Level Courses

Our 400 level courses are focused on state of the art topics in Microbiology & Immunology and are taught by experts in each field.

MICROBIOLOGY & IMMUNOLOGY 461b: MOLECULAR VIROLOGY
Instructors: Drs. V.L. Morris, L. Hertel, G. Dekaban and J.S. Mymryk

Calendar Copy: Cellular and molecular mechanisms of virus reproduction including approaches to the analysis of virus structure, virus-cell interaction, and virus infection. Oncogenes and viral transformation of cells to cancer cells. Examples will be taken mainly from animal viruses.
Prerequisites: Biochemistry 280a, Biology 281b, Microbiology & Immunology 360b. 2 lecture hours, 2 tutorial hours, 0.5 course.

Objectives: The emphasis of this course will be on the experimental approach to analyzing animal virus-host relationships at the cellular and molecular level under the topics outlined below. Material will also be given on other viruses and virus-like systems. The course will consist of both lectures and tutorials and will be evaluated as outlined below.

Lecture Topics: Virus structure, Strategies of infection and reproduction of the major animal and bacteria, RNA and DNA viruses, the molecular biology of virus growth, Antiviral strategies. Retroviruses, oncogenes, and their role in cancer, Virus-like organisms, Interaction of viruses with their host.

Evaluation: Each student (as part of a group of 4-5 students) will make a presentation during a tutorial hour on a topic of current interest in Virology. There will be two written exams.

MICROBIOLOGY & IMMUNOLOGY 465a: BACTERIAL PATHOGENESIS

Calendar Copy: A course offering an integrated view of the genetic, biochemical and structural aspects of bacteria that contribute to infection. Lectures and student presentations cover modern topics in microbial pathogenesis focusing on medically important microorganisms.
Prerequisites: Biochemistry 280a, Biology 281b, Microbiology & Immunology 220a, Microbiology & Immunology 360b.
3 lecture hours, 0.5 course.

Lecture Topics: Protein secretion, Chaperones, Stress responses (pH, temperature, osmolarity), Uptake of molecules, Bacterial polysaccharides (genetics and biosynthesis, regulation of expression, antigenic variation), Antigenic variation in prokaryotes, Mechanism of invasion and survival of intracellular bacteria, Secretion and intracellular targets of bacterial toxins.

Evaluation: 4 midterm exams: 25% each

MICROBIOLOGY & IMMUNOLOGY 467b: MOLECULAR GENETICS OF GENE EXPRESSION
Instructors: Drs. T.G. Linn, J. Koropatnick and J. Mymryk

Calendar Copy: An advanced course examining the application of genetics and modern molecular biological approaches to the analysis of gene expression in both prokaryotes and eukaryotes. Topics will include transcriptional control mechanisms in prokaryotes and eukaryotes, effect of chromatin structure on transcription, and manipulation of eukaryotic genes for the analysis of gene expression.
Prerequisite: Biology 281b, Biochemistry 381a.
2 lecture hours, 0.5 course.

Lecture Topics: Prokaryotic transcriptional regulation including a description of promoters and their interaction with RNA polymerase. Regulation of transcriptional initiation by both positive and negative control mechanisms and by alternative sigma factors. Description of transcriptional terminators and mechanisms of regulating termination. Eukaryotic
transcriptional regulation including a description of RNA polymerase structure, promoter structure and basal transcription factors. Discussion of the structure and function of transcriptional activators. The role of chromatin structure, DNA methylation and nucleosome dynamics in transcriptional regulation. Manipulating eukaryotic genes to analyze gene expression by techniques such as mutation and selection, gene targeting and transgenics.

Evaluation: Mid-term and Final Exams.

MICROBIOLOGY & IMMUNOLOGY 473a: ADVANCED IMMUNOLOGY
Instructors: Drs. E. Cairns, S. Kim, G. Strejan, T. Delovitch, J. Koropatnick, B. Chan.

Calendar Copy: This course covers advanced concepts in organization and regulation of the immune system. Includes structure and function of immunoglobulins and other immune cell receptors, B and T lymphocyte interactions and signal transduction, cellular regulation by cytokines, immunological effector mechanisms, and diseases of the immune system.

Prerequisites: Biochemistry 280a, Biology 281b, Microbiology & Immunology 357a.
2 lecture hours, 0.5 course.

Lecture Topics: Hematopoiesis; cell surface receptors; antigen processing and presentation; cellular interactions and signal transduction; cytokines; cell adhesion molecules; structure and function of immunoglobulins; tolerance and immunoregulation; organ and bone marrow transplantation; autoimmunity; cancer immunotherapy; immunology of AIDS.

Evaluation: 2 mid-term exams: 35% each, final exam: 30%

MICROBIOLOGY & IMMUNOLOGY 483E: RESEARCH PROJECT AND SEMINAR
Coordinator: Dr. J. McCormick with Faculty Supervisors

Calendar Copy: The major laboratory course for students in Honors Microbiology & Immunology. The course consists of lectures on laboratory safety, biosafety, use of animals in research, scientific integrity; an independent research project (topic and advisor chosen by consultation between student and faculty); scientific communication (two seminars and a written report).

Antirequisite(s): Biochemistry 483E, Biochemistry 484, Microbiology & Immunology 484.
Prerequisite(s): Enrolment limited to students in Year 4 of Honors Microbiology & Immunology Program or Honors Specialization Microbiology & Immunology.
15 hours per week, 1.5 course.
Enrolment in this course is limited.
This course is offered in conjunction with the Department of Biochemistry and its similar course Biochemistry 483E.

F.2.4. Medical Undergraduate Teaching

MEDICINE 116: INFECTION & IMMUNITY
Instructors: Drs. W. Colby, J. Madrenas, M. Valvano

The medical curriculum has been altered several times over the past few years. The Infection & Immunity (Year 1) section is now taught in a block during the last three weeks of October. This course outlines the attributes of infectious agents relevant to understanding the causation,
control, and management of infectious diseases. The course also provides a general understanding of the molecular and cellular basis of immune response, as well as its roles in defense against infections and diseases due to abnormal immune response. Patient-centered learning will enable the student to explore the common experiences of illness related to specific diseases in a contextual and focused manner.

F.2.5. Dental Undergraduate Teaching

**DENTISTRY 211: GENERAL AND ORAL MICROBIOLOGY**  
*Instructors:* Drs. W. Colby, G. Strejan, V. Morris, G. Reid

Nature and function of bacteria, viruses, and other microorganisms of import to clinical dentistry; role of the immune system in health and disease; infection control and therapy; infections of the oral cavity in normal and immunosuppressed patients.

F.3. Linkage with Other Disciplines

**Microbiology & Immunology 483E and Biochemistry 483E** are coordinated collaboratively. Students in these modules may choose to work with our faculty members or with those in Biochemistry.

**Honors Specialization in Biochemistry of Infection and Immunity** (described above in section F.1), also coordinated collaboratively with the department of Biochemistry.

**Bachelor of Medical Sciences.** Our Department has been an integral part of the BMSc program. Departmental members sit on the Advisory Committee and participate in promotional events. We provide an excellent laboratory experience for students in the 400E laboratory course, which is a component of the Medical Sciences Honors Specialization Module.

**MICROIMM 106: MICROBIOLOGY AND IMMUNOLOGY**  

A survey course for Nursing Program students dealing with properties of pathogenic bacteria, viruses, fungi, and protozoa, and aspects of diagnosis, treatment, and prevention of infections caused by these agents. Restricted to students in the Nursing programs.

F.4. Other Initiatives

**Outreach**  
Our faculty members support the **High School Science Fair**, and graduate students have acted as judges. They also participate in **High School Co-op and Mentorship programs**

**Welcome Reception**  
In the fall, we hold a reception for our 4th year Honors students. This allows them to meet faculty on an informal basis.

**Graduation Luncheon**  
In the spring on Convocation we host a reception for Honor's Graduates and their guests.
F.5. **Awards**

The Dr. G.E. Hall Scholarship is given annually to the student who has earned the highest academic average in the year prior to entering the Honors Specialization program.

The Federation of Chinese Canadian Professional (Ontario) Education Foundation Scholarship is awarded annually to the student judged to have the outstanding project in Microbiology & Immunology Honors Specialization program (483 E project).
## Enrolment and Mean Grades in Microbiology and Immunology Courses

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### Appendix F.1 (b)

**Undergraduate Course Evaluations**

Overall Effectiveness (maximum score: 7.0)

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Appendix F.1(c)

Honors Specialization in Microbiology and Immunology

Enrolment in this module is limited. Meeting the minimum requirements does not guarantee that students wishing to enter or progress in this module will be offered enrolment.

Admission Requirements

Completion of first-year requirements with no failures. Students must have an average of at least 70% in the following 3.0 principal courses, with no mark in these principal courses below 65%.
1.0 course from Biology 022, 023
1.0 course from Chemistry 020, 023
1.0 course from: Calculus 050a/b, 051a/b, 081a/b, 091a/b, Linear Algebra 040a/b, Statistical Sciences 024a/b, Applied Mathematics 026, Mathematics 028a/b, 030.
1.0 course from: Physics 020, 024, 028a/b and 029a/b, or the former Physics 022 or 025, must be completed by the end of second year, with a minimum mark of 65%.

Module
9.5 courses:
1.0 course: Chemistry 213a/b, 223b
0.5 course: Biochemistry 280a
1.5 courses: Biology 281b, Biology 282b, 290F/G
0.5 course: Microbiology and Immunology 220a
0.5 course from: Biology 244a/b, Statistical Sciences 222a/b
0.5 course: Biochemistry 381a
1.5 courses: Microbiology and Immunology 357a, 360b, 361G
1.5 course: Microbiology and Immunology 483E (Research Project = 1.5 courses)
2.0 courses: Microbiology and Immunology 461b, 465a, 467b, 473a

Notes:
1. This module requires a minimum mark of 70% in each of Microbiology and Immunology 220a, 357a, 360b and 361G, and in Biochemistry 381a.
2. Enrolment in Biochemistry 381a requires a minimum mark of 65% in Biochemistry 280a; and a minimum average of 65% in Chemistry 213a/b and 223b.

Honors Specialization In Biochemistry Of Infection And Immunity

Enrolment in this module is limited. Meeting the minimum requirements does not guarantee that students wishing to enter or progress in this module will be offered enrolment.

Admission Requirements

Completion of first-year requirements with no failures. Students must have an average of at least 70% in the following 3.0 principal courses with no mark in these principal courses below 65%.

1.0 course from: Biology 022 or 023
1.0 course from: Chemistry 020 or 023
1.0 course from: Applied Mathematics 026, Calculus 050a/b, 051a/b, 081a/b, 091a/b, Linear Algebra 040a/b, Mathematics 028a/b, 030, Statistical Sciences 024a/b
1.0 course from: Physics 020, 024, 028a/b and 029a/b, or the former Physics 022 or 025, must be completed by the end of second year, with a minimum mark of 65%.

Module
10.0 courses:
1.0 course from: Chemistry 213a/b and 223b, or Chemistry 273a and 283G
0.5 course: Biochemistry 280a
1.5 courses: Biology 281b, 282b, 290F/G
0.5 course from: Biology 244a/b or Statistical Sciences 222a/b
1.5 courses: Microbiology and Immunology 220a, 357a, 360b
1.0 course: Biochemistry 381a, 382b
0.5 course from: Biochemistry 380G or Microbiology and Immunology 361G
1.0 course from: Microbiology and Immunology 461b, 465a, 467b, 473a
1.0 course: Biochemistry 410a, 420b
1.5 courses from: Biochemistry 483E (Research Project = 1.5 courses) or Microbiology and Immunology 483E (Research Project = 1.5 courses)

Notes:
1. Enrolment in Biochemistry 381a requires a minimum mark of 65% in Biochemistry 280a; and a minimum average of 65% in Chemistry 213a/b and 223b, or a minimum mark of 60% in each of Chemistry 273a and 283G or the former Chemistry 253.
2. A minimum mark of 70% is required in each of Microbiology and Immunology 220a, 357a and 360b.
3. Enrolment in Biochemistry 483E requires a minimum mark of 70% in each of Biochemistry 381a, 382b, and either Biochemistry 380G or Microbiology and Immunology 361G.

Specialization in Microbiology and Immunology

Admission Requirements
Completion of first-year requirements including the following 3.0 courses with a minimum mark of 60% in each:
1.0 course from Biology 022, 023
1.0 course from Chemistry 020, 023
1.0 course from: Calculus 050a/b, 051a/b, 081a/b, 091a/b, Linear Algebra 040a/b, Statistical Sciences 024a/b, Applied Mathematics 026, Mathematics 028a/b, 030.

1.0 course from: Physics 020, 024, 028a/b and 029a/b, or the former Physics 022 or 025, must be completed by the end of second year, with a minimum mark of 60%.

Module
9.0 courses:
1.0 course: Chemistry 213a/b, 223b
0.5 course: Biochemistry 280a
1.5 courses: Biology 281b, 282b, 290F/G
0.5 course: Microbiology and Immunology 220a
0.5 course from: Biology 244a/b, Statistical Sciences 222a/b
0.5 course: Biochemistry 381a
1.5 courses: Microbiology and Immunology 357a, 360b, 361G
2.0 courses: Microbiology and Immunology 461b, 465a, 467b, 473a
1.0 course from Biology or Basic Medical Sciences Disciplines at the 200 or 300 level
Notes:
Enrolment in Biochemistry 381a requires a minimum mark of 65% in Biochemistry 280a; and a minimum average of 65% in Chemistry 213a/b and 223b, or a minimum mark of 60% in each of Chemistry 273a and 283G or the former Chemistry 253.

Major In Microbiology and Immunology

Admission Requirements
Completion of first-year requirements, including the following 3.0 courses with a minimum mark of 60% in each:
1.0 course from: Biology 022, 023
1.0 course from: Chemistry 020, 023
1.0 course from: Applied Mathematics 026, Calculus 050a/b, 051a/b, 081a/b, 091a/b, Linear Algebra 040a/b, Mathematics 028a/b, 030, Statistical Sciences 024a/b
1.0 course from: Physics 020, 024, 028a/b and 029a/b, or the former Physics 022 or 025, must be completed by the end of second year, with a minimum mark of 60%.

Module
6.0 courses:
0.5 course: Biochemistry 280a
1.0 course: Chemistry 213a/b, 223b
1.0 course: Biology 281b, 282b
0.5 course: Microbiology and Immunology 220a
0.5 course: Biochemistry 381a
1.5 courses: Microbiology and Immunology 357a, 360b, 361G
1.0 course from: Microbiology and Immunology 461b, 465a, 467b, 473a

Notes:
1. Enrolment in Biochemistry 381a requires a minimum mark of 65% in Biochemistry 280a; and a minimum average of 65% in Chemistry 213a/b and 223b.
2. Biology 290F/G and either Biology 244a/b or Statistical Sciences 222a/b are recommended option courses.

Minor In Microbiology And Immunology

Admission Requirements
Completion of first-year requirements, including Biology 022 or 023 and Chemistry 020 or 023, each with a mark of at least 60%.

Module
4.0 courses:
0.5 course: Chemistry 213a/b
0.5 course: Biochemistry 280a
1.0 course: Biology 281b, 282b
2.0 courses: Microbiology and Immunology 220a, 221b, 357a, 360b
G. GRADUATE PROGRAMS

G.1. Degree Programs
G.2. Enrolment
G.3. Program Regulations, Requirements, Course Work, Thesis Information and Supervision Structures
G.4. Courses
G.5. Financial Support and Program Awards
G.6. Ontario Council on Graduate Studies (OCGS) Appraisals
G. GRADUATE PROGRAMS

G.1. Degree Programs

Our graduate program training leads to M.Sc. and Ph.D. degrees in Microbiology & Immunology. The main objectives of our program are to provide training in the areas of the cellular and molecular biology of microorganisms, viruses, and the immune system for a variety of careers including: research, teaching, entry into professional schools, or employment in industry, government or research institutes.

These objectives are achieved through an independent research project, course work and research seminars. Ph.D. students are also required to complete a qualifying examination that consists of a written proposal followed by an oral defense.

G.2. Enrolment

Enrolment of graduate students in 2000, 2004 and 2007 were 40, 66, and 56, respectively. (Appendix G.2(a)). It should be noted that our graduate enrolment between 2000 and 2004 increased by 60%.

A 5-year listing of graduate student theses, supervisors and post-graduate positions is attached (Appendix G.2(b) and Appendix G.2(c)).

G.3. Program Regulations, Requirements, Course Work, Thesis Information, Supervision Structures

Information can be found in the Graduate Student handbook (Appendix G.3(a)) and in (Appendices G.3(b) and G.3(c)).

G.4. Courses

We currently offer 5 graduate courses; most of these courses are offered on an annual basis and they are described in Appendix G.4(a) and in the Graduate Student Handbook (Appendix G3(a)).

These courses are evaluated regularly and the evaluations can be found in Appendix G.4(b).

G.5. Financial Support and Program Awards

Graduate Student Financial Support

It is the policy of the Department of Microbiology and Immunology that all graduate students receive a stipend no less than that recommended by the CIHR for students paid from a research grant (M.Sc. currently $18,000/year, Ph.D. currently $20,000 for the 2007-08 academic year). This stipend can be a composite of external awards, funds from the supervisor's research grant, and Faculty of Graduate Studies Scholarship funding (e.g. Western Graduate Research Scholarship [WGRS] funding).

For students holding recognized external awards, these funds are included as part of the students’ stipends and revised stipend amounts (program policy increases based on award held) are calculated in recognition of the award. This is to provide an incentive to enter the program and a reward for success in scholarship funding competitions.
Eligible International students who are awarded Western Graduate Research Scholarship (WGRS) funding receive this funding as a means to bring international tuition rates close to or level with Domestic tuition rates.

A limited number of Teaching Assistantship positions (covered by the Collective Agreement between UWO and PSAC Local 00610) become available each year and information regarding these positions is communicated during the Summer term each year.

University Scholarships/Awards: Students may be eligible for awards provided by the Schulich School of Medicine & Dentistry and/or the Faculty of Graduate Studies (e.g. Schulich Graduate Scholarship, Western Graduate Research Scholarship).

External Scholarships/Awards: Students are encouraged to apply to all available external agencies for support (e.g. Ontario Graduate Scholarship [OGS], Canadian Institutes of Health Research [CIHR] Awards program, and the Natural Science and Engineering Research Council [NSERC] Awards programs).

Program Awards

In addition to other awards offered by the Schulich School of Medicine and Dentistry, the Faculty of Science and the School of Graduate Studies, our department has a number of awards at all levels in the program. The list of Awards in our program is summarized below.

Our graduate program benefits from a $1.25M endowment for Graduate Education. The annual dollars available are used to support the RGE Murray Annual Lectureship series, the Infection & Immunity Research Forum (organized and run by graduate students), and also:

1) Microbiology & Immunology Graduate Entrance Award
Criteria: Awarded to new, full-time Masters or Doctoral students who are registered in the School of Graduate Studies and enrolled for their first year of studies in the Microbiology & Immunology graduate program, based on academic achievement (minimum 80% academic average). Recipients will be selected annually by the Graduate Committee of the Department of Microbiology & Immunology. Annually the department offers 4 awards (currently at $5,000 each); they are offered to attract high caliber students to the program.

2) Travel grants
Criteria: Awarded to full-time Master or Doctoral students who are registered in the School of Graduate Studies and have been enrolled in the Microbiology & Immunology graduate program for a minimum of two terms. Awards will be based on academic achievement (minimum 80% academic average) to enable the graduate students to attend scholarly conferences or meetings to present their research findings to national and international audiences. Recipients will be selected by the Graduate Committee of the Department of Microbiology & Immunology. Value: Up to $1,000 per student/year, maximum 15 students per year.

3) Roche Diagnostics Award of Excellence
Criteria: Annual award given to the student judged to have given the best seminar in the 541Y/540Y student seminar series. The student seminars are judged via a peer-review system. The seminars given by the students in the Microbiology & Immunology graduate student seminar program are judged by the rest of the students enrolled in the course. Value: $500. Also, a plaque with the name of the awardee and year of the award will be displayed in the Departmental office.
4) The John A. Thomas Award
Criteria: The award is intended for a Ph.D. student during the last stages of the program in the areas of Bacteriology, Virology, Immunology, and Genetics. Applicants should have completed all course requirements and should have passed the Comprehensive Exam with distinction or the Ph.D. Candidacy exam with a distinguished performance. Value: The Award consists of $1,500.00 (supported by an endowed fund from the Thomas family) and a plaque, which is presented by a member of John Thomas' family, and is followed by a seminar presentation by the awardee. Also, a plaque with the name of the awardee and year of the award will be displayed in the Departmental office.

5) The Stephen D. Poland Award
Criteria: The award is presented to an outstanding graduating Microbiology & Immunology Doctoral student in any given academic year. The criteria for the award will include: academic performance in graduate courses taken during the program, scholarly accomplishments including published articles, conference presentations, awards received, and evaluations of the doctoral thesis and its defence as assessed by members of the Thesis Examining Board. Value: $1200 (supported by an endowed fund from family and friends of Stephen D. Poland) and a plaque. Also, a plaque with the name of the awardee and year of the award will be displayed in the Departmental office.

G.6. **Ontario Council on Graduate Studies (OCGS) Appraisals**

Our graduate program was assessed by OCGS in June 2003. The OCGS Appraisal of the Microbiology & Immunology Graduate Program was conducted by Dr. Michael Ratcliffe (Professor and Chair, Department of Immunology, University of Toronto) and Dr. Stanley Maloy (Director, Center for Microbial Sciences, San Diego State University). The Graduate Program was assessed by OCGS as of “good quality” (Appendix G.6).

The following is a summary of their conclusions:

**The Faculty:** Overall, the faculty are well qualified to deliver a strong graduate program in Microbiology & Immunology. The quality of the faculty is well above the national average and several of the laboratories are world class.

**Student Research:** The quality of student research is excellent. Approximately two-thirds of Master's graduates and all PhD graduates had at least one publication emanating directly from graduate research.

**Admission standards and procedures:** The graduate committee maintains a high standard of students admitted to the program, as evidenced by the high success rate of students passing through the program, the very low dropout rate, and the publication record of graduating students.

**Progression of students through the program:** Since the last OCGS review, the M&I program has reduced times to completion of Master's students from nearly 3 years in 1997 to 2.5 years in 2003 and for PhD students from 6.6 years to 5.4 years in that same period. The Department has established excellent tracking of graduate students based on formal recording of twice yearly advisory committee meetings.
Appendix G.2(a)

University of Western Ontario
Department of Microbiology & Immunology
Enrolment Figures - 2000 – 2007

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As at: 1 October 2007

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## Appendix G.2(b)
### Ph.D. Student Graduates - 2003-2007

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<td>Ainslie (Cameron), Cheryl</td>
<td>McFadden, D.G.</td>
<td>Identification and characterization of novel immunomodulatory virulence factors of myxoma virus</td>
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<td>Avvakumov, Nikita</td>
<td>Mymryk, J</td>
<td>Analysis of Cellular Functions of the Viral Oncoproteins E1A and E7</td>
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<td>Beaurepaire, Cecile</td>
<td>Chaconas, G./Heinrichs</td>
<td>Replication Requirements and DNA Topology-Dependent Transcription on Plasmids of the Lyme Disease Sprochete</td>
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<td>Bosingier, Steven</td>
<td>Kelvin, D.</td>
<td>Modeling of Host Immune Responses to HIV and SIV Using Functional Genomics Reveals a Disruption of Innate Immunity</td>
<td>PDF, University of Toronto</td>
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<td>Cadieux, Peter</td>
<td>Reid, G.</td>
<td>Analysis of the Vaginal Microbiota and the Influence of Lactobacillus on Uropathogenic Escheria Coli</td>
<td>Assistant Professor, Department of Surgery, UWO</td>
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<td>Chadwick, Kristin</td>
<td>Bhatia, M.; Dekaban, G.</td>
<td>Role of SMAD7 in Primitive Human Hematopoietic and Embryonic Stem Cell Regulation</td>
<td>Manager, FACS Core, Robarts Research Institute</td>
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<td>Dale, Suzanne</td>
<td>Heinrichs, D.</td>
<td>Genetic Characterization of Siderophore Biosynthesis and Transport in Staphylococcus aureus</td>
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<td>Dept. of U. Kansas, Lab, Scraps</td>
<td>Characterization of the Strategy Used by Burkholderia Cepacia to Survive Within Phagocytic Cells</td>
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<td>Identification of Genes Regulated for Survival of Burkholderia Signature-Tagged Mutagenesis</td>
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<td>Differentiation of Xenotransplantation Rejection by IL-12</td>
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<td>Distribution of NMDA Receptor splice variants</td>
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<td>Distribution of NMDA Receptor splice variants</td>
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<td>Deksbar, C.</td>
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<td>Investigating the Role of C-terminal domains in the Subcellular Assembly of Pathogens</td>
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<td>PDf, D. Martis, Lab, Harvard</td>
<td>The Role of the MHC Class II Shared Epitope in Rheumatoid Arthritis</td>
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<td>Lefebre, Matthew</td>
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<td>Marleau, Annette</td>
<td>Singh, B.</td>
<td>Analysis of Dendritic Cell Subsets in Non-Obese Diabetic Mice</td>
<td>PDF, Scripps Research Institute, La Jolla, CA, USA.</td>
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<td>McArthur, Fiona</td>
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<td>Delovitch, T.</td>
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<td>Kang, C.Y.</td>
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|表面表征的决定因素
Characterization of the Staphylococcus aureus iron-regulated proteins
| Heinitz, D.           | Vermont, Chicheste             |
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| Thwbridge, J.         |                                |
| Boston, MA, USA       |                                |
| PDF: Dana-Farber Cancer Institute, Boston, MA, USA |
| Wnt and Hedgehog in Hematopoietic Stem Cell Regulation
Substrates and Proteins in an Unusual Biophysical Process
Splicing: Discovering the Complexity Relationships Between Telomere Resolution in Borrelia burgdorferi, the Lyme Disease Causative Agent
Chow, C.               | Chaconas, C.                   |
| PDF: University of Texas, University of Toronto, N/A |
| H. pylori Helicobacter pylori and Campylobacter jejuni
Structure/Function Characterization of Amidotransferases from Campylobacter jejuni
| Schuster, M.          |                                |
| University of Toronto, University of Toronto, N/A |
| Analysis of Adenosine E1A Function in Saccharomyces
Cerevisiae and Macchamellon Cells
| Moya, J.              |                                |
| PDF: Dr. C. Armstrong's Lab, N/A |
| Identification and Characterization of Molecular Regulators of Human Hematopoietic Stem Progenitor Cells
| Bahia, M.             |                                |
| College Inspector, Kelowna, B.C. |
| Iron (III)−Hydroxamate Transport in Staphylococcus aureus
Characterization of CXCR4 and SDF-1 in Hematopoietic Stem and Progenitor Cell Function
| Bethune, M.           |                                |
| Rose-Movies, Michael, N/A |

Ph.D. Student Graduates - 2003-2007
Appendix G.2(b)
# Appendix G.2(c)
## M.Sc. Students - Graduates
### 2003 - 2007

<table>
<thead>
<tr>
<th>Name</th>
<th>Supervisor</th>
<th>Thesis Title</th>
<th>1st Post-graduate Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ablack, Jailal</td>
<td>Kang, C.Y.</td>
<td>Construction of a replication competent assembly defective vesiculoz stomatitis virus based vector</td>
<td>PhD Candidate, Mymryk Lab, UWO</td>
</tr>
<tr>
<td>Arulsundaram, Vishnuka</td>
<td>Mymryk, J.</td>
<td>Alteration of Human Thyroid Hormone Receptor Beta 1 Isoform Dependent Transcription by the Human Adenovirus Type 2 Early Region 1A 55 Residue Protein</td>
<td>Nursing Program, University of Toronto</td>
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<tr>
<td>DeLima, Rachel</td>
<td>Singh, B.</td>
<td>Characterization of CD4+ Cell-Inducing Epitopes of Islet-Specific Glucose-6-Phosphate Catalytic Subunit-Related Protein (lGRP) that Prevent Autoimmunity</td>
<td>TD Bank Financial Group</td>
</tr>
<tr>
<td>Dixon, Jennifer</td>
<td>McCormick, J./Heinrichs, D.</td>
<td>Development of a Novel Tumor-Targeting Immunotoxin by Fusion of a Superantigen with a Single-Chain Variable Fragment Specific for the Oncofetal Antigen 5T4</td>
<td>Viron Therapeutics</td>
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<tr>
<td>Elwood, Chelsea</td>
<td>Jass, J./Reid, G.</td>
<td>Intracellular Communication in Uropathogenic E.coli and Lactobacillus reuteri RC14</td>
<td>Medical School, University of British Columbia</td>
</tr>
<tr>
<td>Flannagan, Ron</td>
<td>Valvano, M (MSc &amp; PhD)/Koval, S. (MSc)</td>
<td>The Identification and Characterization of Chemotaxis and Motility Genes in Bdelloccibrio bacteriovorus 109J</td>
<td>PhD Candidate, Valvano Lab, UWO</td>
</tr>
<tr>
<td>Gagliardi, Jason</td>
<td>Tini, M.</td>
<td>Molecular Analysis of SUMO Dependent Regulation of Thymine DNA Glycosylase</td>
<td>Research Assistant, Tini Lab; School of Dentistry</td>
</tr>
<tr>
<td>Gonzalez, Tamara</td>
<td>Jevnikar, A.</td>
<td>Extracorporeal Photopheresis (ECP) Immunosuppression to Prolong Murine Allograft Survival</td>
<td>N/A</td>
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<tr>
<td>Hales, Brigette</td>
<td>Heinrichs, D.</td>
<td>Identification and Characterization of Siderophore Biosynthetic Genes in Staphylococcus aureus</td>
<td>Research Associate, Childrens Hospital of Western Ontario</td>
</tr>
<tr>
<td>Herbert, Jonathan</td>
<td>McCormick, J.</td>
<td>Investigation into the Lytic Cycle of the Streptococcal Phage 370.1 and Expression of its Virulence Factors</td>
<td>Research Assistant, Creuzenet Lab, UWO</td>
</tr>
<tr>
<td>Ho, Nathan</td>
<td>Creuzenet, C.</td>
<td>6-deoxy-heptoses: Biosynthesis and Role in Virulence</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Project Title</td>
<td>Supervisor</td>
<td>Institution</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>N/A</td>
<td>Combined sRNA Taingel Bro-Z Analogsites sRNA Agmeet TS</td>
<td>Koropicki, D'A.</td>
<td>McComber, Catherine</td>
</tr>
<tr>
<td>PhD Candidate, University</td>
<td>Cell Death in response to Inflammation</td>
<td>Jestler, A.</td>
<td>McComber, Catherine</td>
</tr>
<tr>
<td>Toronto</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.D Program, University of</td>
<td>EGF-R1 Transgenic Mouse</td>
<td>Dekaban, G.</td>
<td>Lamler, Jason</td>
</tr>
<tr>
<td>M.D Program, University of</td>
<td>Expression of HOI Structural Proteins Using a Minigene</td>
<td>Lister, Erin</td>
<td>Valvano, M.</td>
</tr>
<tr>
<td>Toronto</td>
<td>Directed Spliphyscozuus Lagumg</td>
<td>N/A</td>
<td>Valvano, M.</td>
</tr>
<tr>
<td>PhD Candidate, Biology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toronto</td>
<td>Topological Mapping of the E. coli WecA Protein by Site-</td>
<td>N/A</td>
<td>Valvano, M.</td>
</tr>
<tr>
<td>M.D Program, University of</td>
<td>Characterization of Cell-Cell Communication between Lactobacilus</td>
<td>Helvichs, D.</td>
<td>Lamler, Jason</td>
</tr>
<tr>
<td>Toronto</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PhD Candidate, Biology</td>
<td></td>
<td>D.McComber, M.</td>
<td>Lamler, Jason</td>
</tr>
<tr>
<td>Toronto</td>
<td>Lipopolysaccharide- O-Antigen Biosynthesis in E. coli K1-</td>
<td>Lahi, P.</td>
<td>Valvano, M.</td>
</tr>
<tr>
<td>PhD Candidate, McComber</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Technician, Dr.</td>
<td>Affinity MHC Class II Binding Interfaces</td>
<td>Kaspar, Katharine</td>
<td>McComber, J. (MSC)</td>
</tr>
<tr>
<td>Lab, UWO</td>
<td>Visualization of Xenotransplanted Carcinomas Py. Westcarota</td>
<td>Javers-Metcalf, Amber</td>
<td>Coupless, D.</td>
</tr>
<tr>
<td>Name</td>
<td>Last Name, First Initial</td>
<td>Title</td>
<td>Research Position/Job Status</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
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<tr>
<td>Richardson, Jakob</td>
<td>Lucas, A.</td>
<td>Elucidation of the Anti-Inflammatory Viral Serpin serp-1's Cellular Association and Modulation of Monocyte Adhesion Through Differential Expression of the Actin Binding Protein Filament-B</td>
<td>Research Position, Toronto</td>
</tr>
<tr>
<td>Shaban, Mae</td>
<td>McFadden, D.G.</td>
<td>Myxoma Virus Oncolytic Activity in a Murine Melanoma Model</td>
<td>N/A</td>
</tr>
<tr>
<td>Speziali, Craig</td>
<td>Heinrichs, D.</td>
<td>Analysis of the Ferric Hydroxamate Uptake System in S. aureus</td>
<td>N/A</td>
</tr>
<tr>
<td>Sypula, Joanna</td>
<td>McFadden, D.G.</td>
<td>Myxoma Virus Topism in Human Tumor Cells</td>
<td>Research Assistant, NY, USA</td>
</tr>
<tr>
<td>Vigeant, Karen</td>
<td>Valvano, M.</td>
<td>Kinetic Analysis of the Escheria coli WecA Protein</td>
<td>Laboratory Operations Coordinator, Bioniche Inc., Bellville, Ontario</td>
</tr>
<tr>
<td>Wagner, Melany</td>
<td>Delovitch/Dekaban</td>
<td>The iNKT Cell Deficiency in Embryonic NOD: A Possible Role For the North Ligand, Delta-1</td>
<td>PhD Program, University of Alberta</td>
</tr>
<tr>
<td>Watson, Alanna</td>
<td>Chan, B./Morris, V.</td>
<td>Regulation of growth factor-stimulated chemotaxis and chemokinesis of primary keratinocytes</td>
<td>Australia, Job search for Position as Research Technician</td>
</tr>
<tr>
<td>Wu, Sally Kunyu</td>
<td>Kang, C.Y.</td>
<td>Expression and Procession of HIV-1 gp 160 with Homologous and Heterologous Signal Sequences Using A VSV Vector System</td>
<td>Research Assistant, Kang Lab, UWO</td>
</tr>
<tr>
<td>Yousef, Ahmed</td>
<td>Mymryk, J.</td>
<td>p53 Dependent Transcriptional Activation in Saccharomyces Cerevisae</td>
<td>PhD Program, Mymryk Lab, UWO</td>
</tr>
</tbody>
</table>
Graduate Program

Students may request information about our program from any member of the Graduate Committee:

Current Microbiology & Immunology Graduate Committee
Dr. Heinrichs (Chair) - deh@uwo.ca
Dr. Myrmyk (Co-Chair) - jmyrmyk@uwo.ca
Dr. Dekab - dekab@roberts.ca
Dr. Creuzen - ccreuzen@uwo.ca
Dr. Madenas - madenas@roberts.ca
Dr. Valvano - (ex-officio) - mvalvano@uwo.ca
(Student Rep)

What's being done to expand graduate enrolment?

Graduate Handbook

- The University of Western Ontario
- Brief Introduction to the Department of Microbiology and Immunology
- General Description of the Graduate Program
- Application for Admission to the Graduate Program
- Course Requirements
- Financial Support
- Awards - FGS, External and Internal
- Advisory Committee
- Departmental Graduate Program Thesis Deadlines
- Doctor of Philosophy (Ph.D.) in Microbiology and Immunology
- Ph.D. Candidacy Evaluation (including transfer from M.Sc. to Ph.D.)
- Ph.D. Thesis Submission
- Master of Science (M.Sc.) in Microbiology and Immunology
- M.Sc. Thesis Submission
- Exit from the Program
- Appeals process
- Student Housing Information

Appendix G.3 (a)
The University of Western Ontario

The University of Western Ontario is scenically situated on a large rolling 375 acre campus (Click here to see a map) which lies on the outskirts of the residential area of London, Ontario (population approximately 330,000). The University, which received its charter in 1878 has grown from a small parochial university to one of Canada's largest and well-established centres of higher education.

There are approximately 25,000 students enrolled in the 12 faculties of Western. Of these, 2,700 are studying in the Faculty of Graduate Studies and over 50 of these graduate students are in the Department of Microbiology and Immunology. The Department has a core of 16 full-time professors, but cross-appointments with other departments and research institutes provide a total of 56 faculty members. The total number of faculty members in the University is approximately 1,200.

The University Community Centre serves as a focal point for recreation, commerce and social activity for students, staff, alumni and faculty. This facility is complemented by Alumni Hall, which caters to the cultural pace of both the University campus and the community at large.

Brief Introduction to the Department of Microbiology and Immunology

The Department of Bacteriology and Immunology, the forerunner of the present Department, was created in 1939 in the Faculty of Medicine, which remains its formal "home". Up to that time bacteriology had been taught in Medicine by members of the Department of Pathology.

In 1965 the Department moved from its quarters in Victoria Hospital to the new Faculty of Medicine Building, increased its staff, initiated courses in Science and developed an honors program in the component disciplines. Graduate studies have been an important part of the life of the Department since 1948. From 1949 onwards, a particularly strong research program on the structure of microbes developed.

Virological studies were initiated in a hospital context in 1960 and in the University in 1965, expanding enormously since 1976 to provide a major component of the research effort. Immunology, although taught, was not a significant area of research in the Department until 1967 when a series of appointments gave rise to the strong group of today. New areas of academic/clinical contact have been developed, especially in immunology, the transplantation services and in neurological science. The development of University Hospital (1972) has led to a great strengthening of expertise in clinical microbiology. The Department also took part in the development of the Faculty of Dentistry (1967) and in the initiation of bioengineering and environmental engineering studies (1968). The Chair of the Department is Dr. M.A. Valvano.

The current name, Department of Microbiology and Immunology, was adopted in 1978 and reflects the broad interests of the faculty and its students. The Department offers programs leading to the M.Sc. and Ph.D. degrees in research of modern
General Description of the Graduate Program

The Graduate Program of the Department of Microbiology and Immunology revolves around two major fields of scientific endeavor:

- The molecular and cellular biology of microorganisms, and
- The molecular and cellular biology of the immune system.

These fields involve studies on bacteria, virus, parasites, cancer cells, and immune cells with an emphasis on molecular biology, biochemistry, and pathogenesis.

The Department is primarily committed to the training of Ph.D. students but also offers programs leading to a M.Sc. degree. M.D. and M.Sc. degrees are offered through the Faculty of Graduate Studies and thus their calendar should be consulted for general and specific information pertaining to residency requirements, deadlines, thesis requirements, and other pertinent information.

Application for Admission to the Graduate Program

Applications for Graduate Studies may be obtained from:

Graduate Secretary
Department of Microbiology and Immunology
Chulich School of Medicine
University of Western Ontario
London, Ontario N6A 5C1
Canada

The online application or application form (pdf) is available from the Faculty of Graduate Studies. The Letter of Recommendation form may also be obtained electronically (You will need to have Adobe Acrobat Reader installed on your computer. Click here to download a free copy of Acrobat Reader).

Eligibility

Applicants for entry into the graduate program must have an Honors Bachelor degree, or equivalent, in Microbiology, Immunology or in some other biological sciences program. At least a high B average is required. Holders of MD, DDS, or DVM degrees are also eligible to apply. All applicants must be approved by the Department and by the Faculty of Graduate Studies before being permitted to register.

Before action can be taken on a candidate's application the following information must be supplied:

1. A completed application form.
2. A 1-2 page letter (Statement of Interest/Letter of Intent describing your academic and scientific background, your research interests and motivations to pursue graduate studies in Microbiology and Immunology) and a resume or C.V.
3. Official transcripts of all previous university work.
4. Two letters of recommendation from faculty members familiar with your scientific activities and/or course work.
5. In addition, prospective candidates are encouraged to correspond with Faculty members whose work is of interest and to visit the Department for interviews.

Other requirements: Appendix G.3 (a)

http://www.uwo.ca/msi/MSc/grad.htm (3 of 10)| 03/03/2007 3:47:49 PM
Applicants must meet all general requirements for admission as stipulated by the Faculty of Graduate Studies, and in addition, they must also have a minimum average of 75 in the last 10 courses.

To be considered for admission, applicants graduated from schools outside of North America must demonstrate the following three English proficiency test scores:

1. TOEFL score minimum of 600 (or computer based minimum score of 250)
   TOEFL Link: <http://www.ets.org/toefl/>

2. GRE General Test scores with a minimum of 80 percentile in each of the areas (Verbal, Quantitative, Analytical) of the General Test:
   GRE General Test Link: <http://www.gre.org/ttindex.html>

3. GRE Subject Test scores with a minimum of 60 percentile in one Subject Test (one of either "Biology" or "Biochemistry, Cell and Molecular Biology").
   GRE Biology Link: <http://www.gre.org/subdesc.html#biology>
   GRE Biochemistry Link: <http://www.gre.org/subdesc.html#biochem>

Applicants are responsible to ensuring that a complete application package is submitted. Incomplete applications will not be assessed by the Graduate Committee. The Graduate Committee will review applications and the Graduate Chair will inform them in writing regarding their admissibility. Final admission depends on identifying a faculty member willing to supervise and financially support the candidate for a minimum of two years and approval by the Faculty of Graduate Studies. Such faculty member shall notify in writing the Graduate Chair on her/his disposition to take a student.

Candidates should write, telephone (519)661-3427 or contact the Graduate Secretary for further information.

Course Requirements

A) Courses of Instruction

All candidates must complete the program of courses as indicated below. In order to serve individual students' needs, specific courses will be determined by the direct supervisor in consultation with the Thesis Advisory Committee and the Graduate Committee.

Ph.D. Students

In addition to research, thesis, and seminar courses (see below), Ph.D. students may be required to take additional courses before taking the oral comprehensive examination during the second year in the program.

M.Sc. Students

In addition to research, thesis, and seminar courses (see below), all M.Sc. students are required to take a minimum of two half courses.

It is strongly recommended that all M.Sc. students take both Microbiology and Immunology 511a and 512b during their first year in the graduate program. However, under special circumstances one of these courses may be substituted by another course at the graduate level with the approval of the student's Advisory Committee.

Appendix G.3 (a)
The University of Western Ontario

Microbiology & Immunology 511a (Current Concepts in Microbiology) and Microbiology & Immunology 512b (Current Concepts in Immunology) cover modern topics and involve a combination of traditional lectures, student presentations, and a write-up of a final exam (open book style involving the write-up of a mini grant proposal, or equivalent). The final mark will be a combination of the evaluation of students' performance during presentations and the evaluation of the final exam.

Seminar Courses

The following seminar courses require mandatory attendance by students and faculty: Microbiology & Immunology 540y, Microbiology & Immunology 541y, and Microbiology & Immunology 585y (Journal Club on Current Topics).

M & I 540y involves two oral presentations, one in the first year and another in the second year in the program. The first presentation shall involve a comprehensive discussion on the background and objectives of the research project. The second presentation will involve a progress report on the research project. Both presentations will be evaluated by the course Coordinator, peer-students, and two other faculty members assigned as discussants by the Course Coordinator. The final mark will result from the average of the marks obtained in the two presentations. This course will apply to all M.Sc. students and to students entering directly in the Ph.D. program.

M & I 541y consists of annual presentations of the research progress as long as the student remains registered in the program. This is a pass/fail course and runs concurrently with M & I 540. This course will be for Ph.D. students only.

M & I 585y is a bi-monthly journal club on current topics in Microbiology and Immunology. Only students in the first year and those writing their theses can be exempted from presenting an article. Topics will be decided by the course Coordinator(s) in consultation with the Graduate Committee and the Department Chair. This is a pass/fail course.

Training Courses

All new graduate students must take the required training courses offered by the Department of Occupational Health and Safety or its equivalent at any of the affiliated institutes. These courses should be taken during the first year in the graduate program. In addition, students working with animals must take the corresponding training courses offered by the Department of Animal Care and Veterinary Services or its equivalent at any of the affiliated institutes. Supervisors are responsible for ensuring training courses are taken. Certificates of attendance to the courses will be kept with the students' records.

SUMMARY OF MICROBIOLOGY AND IMMUNOLOGY GRADUATE COURSES

511a Current Concepts in Microbiology
512b Current Concepts in Immunology
540y Graduate Seminar Course
541y Departmental Seminar Course
585y Contemporary Issues in Microbiology and Immunology (Journal Club)

Note: Audits are not permitted in any Microbiology and Immunology Graduate Courses

Financial Support

Financial Support

It is the policy of the Department of Microbiology and Immunology that all graduate students receive a stipend no less than that recommended by the CIHR for students paid from a research grant (M.Sc. currently $18,000/year, Ph.D. currently $20,000 for the 2007-08 academic year). This stipend can be a composite of external awards, funds from the supervisor's research grant, and Faculty of Graduate Studies Scholarship funding (eg. Western Graduate Research Scholarship funding).

For students holding recognized external awards and eligible International students who are awarded Western Graduate Research Scholarship (WGRS) funding, these funds should be in addition to the minimum or the current level of funding for the student if it is higher than the minimum. This is to provide an incentive to enter program and a reward for success in

scholarship funding competitions.

A limited number of Teaching Assistantship positions (covered by the Collective Agreement between UWO and PSAC Local 00610) become available each year and information regarding these positions is communicated during the Summer term each year.

**Awards**

Faculty of Graduate Studies: Students may be eligible for awards provided by the Faculty of Graduate Studies. For more information, please consult the Scholarships and Awards Program of the Faculty.

External: Students are encouraged to apply to all available external agencies for support. Information on the Ontario Graduate Scholarship (OGS), Canadian Institutes of Health Research (CIHR) Awards program, and the Natural Science and Engineering Research Council (NSERC) Awards programs will be made available when the program receives the appropriate information.

**Program:**

Department of Microbiology and Immunology Entrance Scholarships
Criteria: Awarded to new, full-time Master or Doctoral students who are registered in the Faculty of Graduate Studies and enrolled for their first year of studies in the Microbiology & Immunology graduate program, based on academic achievement (minimum 80% academic average). Recipients will be selected annually by the Graduate Committee of the Department of Microbiology & Immunology. Value: Up to 4 @ $5,000, payable over the first two terms.

Department of Microbiology and Immunology Travel Awards
Criteria: Awarded to full-time Master or Doctoral students who are registered in the Faculty of Graduate Studies and have been enrolled in the Microbiology & Immunology graduate program for a minimum of two terms. Awards will be based on academic achievement (minimum 80% academic average) to enable the graduate students to attend scholarly conferences or meetings to present their research. Recipients will be selected by the Graduate Committee of the Department of Microbiology & Immunology. Value: Up to $1,000 each (travel award).

Roche Award
Criteria: Annual award given to the student judged to have given the best seminar in the 541Y/540Y student seminar series. The student seminars be judged via a peer-review system. The seminars given by the students in the Microbiology & Immunology graduate student seminar program will be judged by the rest of the students enrolled in the course. Value: $500. Also, a plaque with the name of the awardee and year of the award will be displayed in the Departmental office.

J.A. Thomas Award
Criteria: The award is intended for a Ph.D. student during the last stages of the program in the areas of Bacteriology, Virology, Immunology, and Genetics. Applicants should have completed all course requirements and should have passed the Comprehensive Exam with distinction or the Ph.D. Candidacy exam with a distinguished performance. Value: The Award consists of $1,500.00 and a plaque, and it will be presented by a member of John Thomas’ family, and followed by a seminar presentation by the awardee. Also, a plaque with the name of the awardee and year of the award will be displayed in the Departmental office.

Poland Award
Criteria: The award will be presented to the outstanding graduating Microbiology & Immunology Doctoral student in any given academic year. The criteria for the award will include academic performance on graduate courses taken during the program, scholarly accomplishments including published articles, conference presentations, awards received, and evaluations of the doctoral thesis and its defence as assessed by members of the Thesis Examining Board. Value: $1200 and a plaque. Also, a plaque with the name of the awardee and year of the award will be displayed in the Departmental office.

**Advisory Committee**

Appendix G.3 (a)
It is the policy not only of the Department of Microbiology and Immunology but also the Faculty of Graduate Studies that all full-time graduate students have an Advisory Committee composed of at least two faculty members in addition to their supervisor. Advisory committee members may be from another Department.

The committee must have formal meetings at least twice each academic year (September 1 - August 31). We suggest that it most efficient in terms of effort and time for both the students and the advisory committee members that one of these meetings immediately follow the student's 540y or 541y seminar. The advisory committee members should obviously attend the student's seminar.

These committee meetings are for the benefit of the student. They provide a forum for the student not only to present completed experiments but more importantly to seek advice about technical problems, what directions might be most promising to pursue, etc. Although two meetings per year are the minimum requirement, the student, supervisor or members of the Advisory Committee may suggest additional meetings (formal or informal) as deemed necessary.

The Advisory Committee meetings must be documented by filling out a form that can be obtained from the Graduate Studies Secretary. The completed form should be returned to the Graduate Secretary after the meeting to be kept into the student's graduate file and provide a useful source of specific information for monitoring the student's progress and for future recommendations.

Students not complying with the minimum requirement of meetings will not be eligible for internal awards and funding support.

Doctor of Philosophy (Ph.D.) in Microbiology and Immunology

SUMMARY OF PROGRAM

The Ph.D. degree involves course work (see requirements), a Ph.D. oral comprehensive in modern areas of microbiology and immunology, and a thesis. The research work reported in the thesis must represent the results of original scientific work.

Duration: Approximately 3-5 years.

Courses:

540y (only to students entering the Graduate Program with a M.Sc. degree from another program) 541y 585y. Additional courses may be required

THESIS PREPARATION AND THESIS DEFENSE

Guidelines for the preparation of theses and details of the thesis defense are found in the calendar of the Faculty of Graduate Studies. Consult this calendar for important deadline dates.

THESIS PREPARATION AND THESIS DEFENSE

Guidelines for the preparation of theses and details of the thesis defense are found in the calendar of the Faculty of Graduate Studies. Consult this calendar for important deadline dates.

Link to Faculty of Graduate Studies Thesis & Completion of Degree Requirements Deadlines

Two to three months before the student intends to submit the thesis for examination, please consult the Graduate Chair such that the process of setting up an examination committee can be initiated.

Prior to submission, the thesis must be read and approved to proceed to examination by the supervisor and at least one member of the advisory committee. The appropriate form is available in the departmental office.

The Ph.D. examination is arranged by the Faculty of Graduate Studies and normally occurs 6 weeks after the date of submission to the Faculty.

Ph.D CANDIDACY EVALUATION

Current guidelines in pdf format available here.

Master of Science (M.Sc.) in Microbiology and Immunology

Appendix G.3 (a)
SUMMARY OF THE PROGRAM

The Master's degree involves course work (see requirements) as well as a thesis. The master's degree should be considered as certification of two attributes; familiarity with a body of knowledge in a specified number of fields and acquaintance with the methods of research which will permit at least a beginning of systematic and independent inquiry. For the M.Sc. thesis, a completed project of original research is highly desirable, but not an absolute requirement. However, it should be a competent report of the student's mastery of certain relevant techniques and their application to a specific problem.

Duration: maximum recommended of 2 years (No stipend and additional support will be guaranteed beyond two years).

Courses:
511a, 512b. (One of these courses may be substituted by another graduate course) 540y 585y.

THESIS PREPARATION AND THESIS DEFENSE

In the thesis the student should:

- Demonstrate familiarity with the current knowledge of the field.
- Provide an acceptable rationale for the research problem, as a coherent project (i.e., not a series of exercises).
- Demonstrate that a reasonable amount of experimental work has been expended on the problem, beyond the mastery of analytical or technical skills.

Naturally, the thesis must conform to the rules provided in the most recent U.W.O. Guide for the Preparation of Theses.

The M.Sc. examination is arranged by the Department and normally occurs 4 weeks after the date of submission to the Graduate Chair. In each term, the departmental deadline for M.Sc. thesis submission for examination is 1 month prior to the Faculty of Graduate Studies deadline for oral examinations. Faculty calendar should be consulted for deadlines.

Link to Faculty of Graduate Studies Thesis & Completion of Degree Requirements Deadlines for M.Sc. Students

Master's Thesis Submission

Prior to the submission for examination, the thesis must be read and considered ready for examination by the Chief Advisor and one member of the Advisory Committee. This is indicated by the signatures on the "Master's Thesis Submission Form" available from the Graduate Secretary.

During the final stages of the thesis preparation, the Chief Advisor in consultation with the Advisory Committee and the student, prepares a list of proposed examiners; a minimum of four from the program and two University examiners. The Chief Advisor, NOT THE STUDENT, may wish to informally contact the suggested examiners as to their willingness to serve. These proposed examiners are included on the thesis submission form as well as, if appropriate, a list of individuals not to be considered as examiners. The Graduate Committee will make every effort to accommodate these suggestions, however, the final recommended composition of the examining board lies with the Graduate Committee. The proposed examination board must be approved by the Faculty of Graduate Studies before the thesis evaluation process can begin.

A suggested date for the examination can also be included on the Thesis Submission Form.

The Departmental deadline for submission of the thesis for examination is one week prior to the Faculty of Graduate Studies deadline for submission of Examining Boards. This deadline changes on a term basis and students are instructed to consult the Faculty of Graduate Studies as well as the Microbiology and Immunology homepages on the web to determine the actual date.

Submission: The thesis (the original plus 3 copies), the Master's Thesis Submission Form, and an electronic copy of the thesis abstract are submitted to the Graduate Secretary.

Examination: The oral examination normally occurs four weeks after submission of the thesis for examination. Under no circumstances will an oral examination be scheduled in less than 15 working days after the thesis submission. Details of the examination and defense processes can be found on the homepage of the Faculty of Graduate Studies.
Departmental Deadlines for Summer Term, 2007 (May - August)

- Ph.D. Thesis Submission: Friday, October 19, 2007
- M.Sc. Thesis Submission: Friday, November 2, 2007
- Ph.D. Candidacy Evaluation*: Friday, October 12, 2007

* Students are reminded that two advisory committee meetings are required per year.
1st: between July 1 - December 31, 2007
2nd: between January 1 - June 30, 2008

Exit from the Program

At the completion of the program, the student should provide the Graduate Secretary with the following information:

- A copy of your curriculum vitae
- A forwarding address
- Future position

Graduate students who perform below expectations may be requested to withdraw from the Program by the Chair of the Graduate Committee.

Students may choose to withdraw and this must be done in writing to the Graduate Chair explaining the reasons for the withdrawal. The content of the letter will remain confidential.

Under special circumstances (and only according to the regulations of the Faculty of Graduate Studies), students may be granted a leave of absence.

Appeals process

A committee of two faculty and one graduate student will hear appeals. Members of this committee will be elected by the faculty every year, and must not have conflicts of interest. In case of a conflict of interest the Chair of the Graduate Studies Committee (or the Department Chair, as appropriate) will appoint ad hoc members.

Proceedings of the committee will be confidential.

Grades or matters related to graduate courses must first be appealed to the course coordinator. Matters related to the PhD Candidacy Evaluation must be appealed to the Chair of the Graduate Studies Committee.

Students must submit their appeal in writing within 6 weeks of the event under appeal to the chair of the Graduate Studies Committee (or, if that person is involved in the event, to the Chair of the Department). This letter should explain the basis for the appeal and include any supporting documentation.

The chair will inform the Appeals Committee, and provide it with all documentation received. The committee will hold a meeting to discuss the case. It may decide to request further documentation or meetings with the principals as deemed fit.

The appellant must be notified of, and given a chance to rebut, any documentation that mitigates against him/her.

If the committee decides that a formal hearing is warranted, procedures laid out by the Faculty of Graduate Studies will be followed.

followed.

Legal counsel is not permitted, but a colleague who is a graduate student of the same division may accompany the student. After reaching a decision, the committee chair must provide a written report including reasons for the decision. This will be provided to the principals and to the chair of Graduate Studies and the Department within 6 weeks of receiving the written appeal.

Only two levels of appeal are available within the Department. Further appeals must be to the Faculty of Graduate Studies. More information regarding appeals is available from the FGS website.

**Student Housing Information**

The University provides accommodations for approximately 33 per cent of the non-London student enrollment through its residences for single and married students. Although there is no "Traditional Style" graduate students residence as such, graduate are accommodated in the various University residences for single students as well as University apartments.

For further information write directly to:

Residence Admissions Manager
Room 150, Lambton Hall
University of Western Ontario
1421 Western Road
London, Ontario N6A 4W4

The University has recently established married student accommodation in its modern Platts Lane Estates. Application forms and further information on this housing may be obtained from:

The Manager
Platts Lane Estate Inc.
536 Platts Lane
London, Ontario
N6G 3A8

For more information visit the Division of Housing and Food Services Home Page.

1151 Richmond Street, Suite 2, London, Ontario, Canada, N6A 5B8 • Tel: (519) 661-2111
Updated September 27, 2007 by [your contact info]
See our policies on Privacy, and Web Standards
Appendix G.3(b)

Requirements for Graduate Program in Microbiology & Immunology
Department of Microbiology & Immunology

Applicants for entry into the graduate program must have an Honors Bachelor degree, or equivalent, in Microbiology, Immunology or in some other biological sciences program. At least a high B average is required. Holders of MD, DDS, or DVM degrees are also eligible to apply. All applicants must be approved by the Department and by the School of Graduate Studies before being permitted to register. Before action can be taken on a candidate's application the following information must be supplied:

1) A completed application form.

2) A 1-2 page letter (Statement of Interest/Letter of Intent describing your academic and scientific background, your research interests and motivation to pursue graduate studies in Microbiology and Immunology) and a resume or C.V.

3) Official transcripts of all previous university work.

4) Two letters of recommendation from faculty members familiar with your scientific activities and/or course work.

5) In addition, prospective candidates are encouraged to correspond with Faculty members whose work is of interest to them and to visit the Department for interviews.

Other requirements:

Applicants must meet all general requirements for admission as stipulated by the School of Graduate Studies, and in addition, they must also have a minimum average of 75 in the last 10 courses.

To be considered for admission, applicants graduated from schools outside of North America must demonstrate the following three English proficiency test scores:

1. TOEFL score minimum of 600 (or computer based minimum score of 250)

TOEFL Link: <http://www.ets.org/toefl/>

2. GRE General Test scores with a minimum of 80 percentile in each of the areas (Verbal, Quantitative, and Analytical) of the General Test:

GRE General Test Link: <http://www.gre.org/ttindex.html>

3. GRE Subject Test scores with a minimum of 60 percentile in one Subject Test (one of either "Biology" or "Biochemistry, Cell and Molecular Biology.")

GRE Biology Link: <http://www.gre.org/subdesc.html.biology>

GRE Biochemistry Link: <http://www.gre.org/subdesc.html.biochem>

Applicants are responsible for ensuring that a complete application package is submitted. Incomplete applications will not be assessed by the Graduate Committee. The Graduate Committee will review applications and the Graduate Chair will inform them in writing regarding their admissibility. Final admission depends on identifying a faculty member willing to supervise and financially support the candidate for a minimum of two years and approval by the School of Graduate Studies. Such faculty member shall notify in writing the Graduate Chair on her/his disposition to take a student.
APPENDIX G.3 (c)

2002-2003
GRADUATE PROGRAM IN MICROBIOLOGY AND IMMUNOLOGY

Ph.D. Candidacy Evaluation

Objectives

1. To assess the candidate's potential to conduct independent research leading to a Ph.D. thesis.

2. To assess the candidate's ability to defend the proposed research in terms of experimental design according to standard scientific methodology.

3. To evaluate the candidate's intellectual capabilities, commitment, and perseverance, as well as the candidate's general knowledge in relation to the area of research.

Process

M.Sc. Students

Students enrolled in the M.Sc. program "who have demonstrated outstanding academic qualities" (quotation from the Faculty of Graduate Studies) may be permitted to enter the Ph.D. program prior to completion of the M.Sc. degree, providing they successfully pass the Ph.D. Candidacy Evaluation.

1) Students must have a performance in each of M&I 511a and M&I 512b (or their equivalents) equal to or greater than 78%.

2) The Evaluation must occur prior to the end of the 5th term after enrollment. (See Important Considerations below for additional details on the timing of the evaluation process).

3) The student will prepare a written Ph.D. research proposal of up to 8-10 typewritten pages, in the format of a Canadian Institute of Health Research (CIHR) grant proposal, excluding literature references, tables and figures, for discussion and approval by the Advisory Committee (See Important Considerations below for a list of responsibilities of the Advisory Committee).

4) The proposal should include background information, a summary of progress to date, as well as an outline, significance, rationale for the proposed Ph.D. research work, references, figures and tables (For additional information on format see Important Considerations below).

5) The Advisory Committee must first approve the proposal before being considered by the Graduate Program. A complete submission form with the required signatures must be provided to the Graduate Secretary.

6) The Chief Advisor and the Advisory Committee in consultation with the student is requested to
provide a list of four individuals who might serve as evaluators. Also, if appropriate, a list of individuals not to be considered as evaluators can be indicated.

**Ph.D. Students**

1) Students enrolled in the Ph.D. program must take the Candidacy Evaluation prior to the end of the 3rd term after enrollment. (See Important Considerations below for additional details on the timing of the evaluation process).

2) The student will prepare a written Ph.D. research proposal of up to 8-10 typewritten pages, in the format of a Canadian Institute of Health Research (CIHR) grant proposal, excluding literature references, tables and figures for discussion and approval by the Advisory Committee. (See Important Considerations below for a list of responsibilities of the Advisory Committee).

3) The proposal should include background information, a summary of progress to date, as well as an outline, significance, rationale for the proposed Ph.D. research work, references, figures and tables. (For additional information on format see Important Considerations below).

4) The Advisory Committee must first approve the proposal before being considered by the Graduate Program. A complete submission form with the required signatures must be provided to the Graduate Secretary.

5) The Chief Advisor and the Advisory Committee in consultation with the student is requested to provide a list of four individuals who might serve as evaluators. Also, if appropriate, a list of individuals not to be considered as evaluators can be indicated.

**Submission and Deadline**

1) The student submits the Ph.D. Candidacy Evaluation form and six copies of the Proposal to the Graduate Secretary.

2) The deadline for receipt of the proposal is ten weeks prior to the end of the term.

**Evaluation**

1) Upon receipt of the proposal and Ph.D. Candidacy form (but not sooner than two weeks after receipt of proposal) a meeting will be held, chaired by the Co-Chair of the Graduate Studies Committee or designate, with the student, the Chief Advisor, and 4 Evaluators, at least one of whom is a member of the Graduate Studies Committee. The evaluators will be appointed in consultation with the supervisor and the candidate (the evaluators cannot have a current conflict of interest with the student or the Chief Advisor). (For alternatives in case of conflicts see Important Considerations below).
2) The graduate student representative on the Graduate Committee will not be part of this process.

3) The candidate will give a 15 minute oral presentation on the research project.

4) The Ph.D. Evaluation Committee will assess the student on the research to date, the proposed research and its defense, his/her intellectual capabilities and perseverance, and background knowledge in relation to the general field of research. This generally will entail 2 rounds of questions.

5) After the candidate has withdrawn from the meeting, the Chief Advisor will be invited to make comments as needed, but he/she will not participate in the decision. The Chair of the Evaluation Committee will then invite each evaluator to make comments on the candidate’s performance during the evaluation. The evaluators will then give their rating of the candidate’s performance. Three out of four evaluators must agree upon a ‘satisfactory’ rating for the candidate to pass the evaluation. The Chair of the Evaluation Committee does not take part in the rating of the candidate.

6) The Evaluation will be assessed as "distinguished performance", "satisfactory performance", or "unsatisfactory performance". "Distinguished performance" will only be applied to those students who have shown an outstanding defense of the project based on the assessment of the written proposal, the oral presentation, and the response to questions both on specific research aspects as well as on general background knowledge. "Satisfactory performance" will denote an adequate defence of their proposal. "Unsatisfactory performance" will denote an inadequate defence of their proposal as related to the nature of the project (i.e. descriptive versus hypothesis-based), and/or inadequate response to questions by the Evaluation Committee members.

7) The student will be invited back and informed of the decision.

8) The Co-Chair of the Graduate Studies Committee will convey the decision to the student in writing.

9) Candidates receiving an unsatisfactory performance evaluation will be offered a second chance as deemed appropriate after discussion with the members of the Evaluation Committee. Students may be allowed to retake the Evaluation after a suitable period of time (no less than a month) to consider the recommendations of the Evaluation Committee. After a second evaluation the decision of the Committee will be final.

**Successful outcome**

M.Sc. students successfully completing the Ph.D. candidacy process will be transferred directly to the Ph.D. program in the next academic term.

Ph.D. students successfully completing the Ph.D. candidacy Evaluation will be allowed to remain in the program until completion of all additional requirements for the Ph.D. degree according to the guidelines of the Faculty of Graduate Studies and the program's specific requirements.
Unsuccessful outcome after second Evaluation

M.Sc. students who demonstrate unsatisfactory performance after the second round of evaluation (or those who choose not to take a second evaluation) will be allowed to complete the M.Sc. degree. They may re-apply for admission to the Ph.D. program upon completion of the M.Sc. degree. If accepted by the program, these students will be assessed as regular Ph.D. students.

Ph.D. students who demonstrate unsatisfactory performance after the second round of evaluation will be required to withdraw from the Graduate Program. The acceptance letter by the Graduate Chair to all students entering directly in the Ph.D. program (at the time of admission into the program) should state the need for passing the Candidacy Evaluation before being allowed to continue in the program.

Important Considerations

Style and Format of the Research Proposal

The proposal must be written in single space, 12-point font and 1 inch margins. Proposals not conforming to these guidelines will be returned to the student. The proposal should contain the following: Introduction, Background, Rationale and Significance, Hypothesis, Objectives, Work accomplished to date, Proposed experiments, Expected/anticipated results, References, and an Appendix with Tables and Figures.

In general the proposal should clearly summarize the background, data and progress to date. In addition it should outline the proposed research. The hypothesis to be tested should be clearly stated as well as a logical rationale for the project, the proposed methodology to attack the problem, and the relevance of the work to the general discipline. Such a clear description of the project will facilitate the committee's decision.

Timing

The first round of the evaluation process must be completed at least one month prior to the end of the term. This is especially important for M.Sc. students who, according to regulations by the Faculty of Graduate Studies must be transferred to the doctoral program by the beginning of the sixth term of graduate enrollment.

Students are responsible for careful planning regarding the timing of the Ph.D. Evaluation process. In practical terms, this means that (i) the Advisory Thesis Committee should have a substantial input in the preparation of the research proposal; (ii) the Ph.D. Evaluation Committee will require a minimum of 2 weeks prior to the evaluation; and (iii) the first round of evaluation should take place at least one month before the end of the term. The Graduate Committee is not responsible for poor student's planning or the lack of availability of the student's Chief Advisor and/or members of the Advisory Committee during the process of preparation of the proposal (see below).
Role of the Thesis Advisory Committee

It should be noted that this evaluation process requires a strong participation of the members of the Thesis Advisory Committee (including the student's Chief Advisor). The following responsibilities rest within this committee: (a) Making an honest assessment of the student's abilities to progress into the Ph.D. and to convey this information to the student; (b) Providing feedback to the student during the process of preparation of the proposal; (c) Agreeing in writing that the proposal is ready, both in form and content, for evaluation by the Ph.D. Evaluating Committee.

Conflict of Interest

Faculty members in direct conflict of interest with the student's research project must not take part in the Ph.D. Evaluating Committee. Direct conflict includes (i) Supervision (or co-supervision) and/or membership on the Advisory Committee of the student under evaluation, and (ii) Joint publications with the student.

Ph.D. Candidacy Evaluation Guidelines

GETTING READY FOR THE EVALUATION

1. The candidate will be invited by the Chair to leave the room so that the Evaluation Committee may discuss evaluation procedures. The following points shall be decided: the order in which evaluators are to question the candidate, the number of rounds of questioning desired (usually one or two), and the length of time to be allotted to questioners for each round of questioning.

2. Each evaluator will receive a "Ph.D. Candidacy Evaluation" form, which will be distributed by the Chair.

3. The candidate will be invited back into the room.

DURING THE EVALUATION

4. The candidate will be asked to give a brief overview of the proposal, of no more than 15 minutes.

5. The evaluators will be invited to question the candidate, in the order previously determined, on the proposal and related areas.

6. When the period of questioning is over the candidate will be asked to leave the room until invited to return.

AFTER THE EVALUATION

7. The Chair will invite the candidate's Chief Advisor to make any comments as deemed necessary.
8. Evaluators will be invited by the Chair to discuss on the quality of the candidate’s performance at the evaluation. Only the evaluators will discuss the candidate’s performance. The evaluators will be asked to fill the confidential "Ph.D. Candidacy Evaluation" forms.

9. The evaluation forms will be collected by the Chair who will announce the decision of the evaluation committee.

OUTCOMES

The Ph.D. Evaluation Committee will make a decision to determine the outcome of the evaluation.

The Evaluation will be assessed as "distinguished performance", "satisfactory performance", or "unsatisfactory performance".

"Distinguished performance" will only be applied to those students who have shown an outstanding defense of the project based on the assessment of the written proposal, the oral presentation, and the response to questions both on specific research aspects as well as on general background knowledge.

"Satisfactory performance" will denote an adequate defense of their proposal.

"Unsatisfactory performance" will denote an inadequate defense of their proposal as related to the nature of the project (i.e. descriptive versus hypothesis-based), and/or inadequate response to questions by the Evaluation Committee members.

The student will be invited back and informed of the decision.

The Chair of the Graduate Studies Committee will convey the decision to the student in writing.

Candidates receiving an unsatisfactory performance evaluation will be offered a second chance as deemed appropriate after discussion with the members of the Evaluation Committee. Students may be allowed to retake the Evaluation after a suitable period of time (no less than a month) to consider the recommendations of the Evaluation Committee. After a second evaluation the decision of the Committee will be final.

Successful outcome

M.Sc. students successfully completing the Ph.D. candidacy process will be transferred directly to the Ph.D. program in the next academic term.

Ph.D. students successfully completing the Ph.D. candidacy Evaluation will be allowed to remain in the program until completion of all additional requirements for the Ph.D. degree according to the guidelines of the Faculty of Graduate Studies and the program’s specific requirements.

Unsuccessful outcome after second Evaluation

2007 Department of Microbiology & Immunology Self-Study Appendix G.3 (c)
M.Sc. students who demonstrate unsatisfactory performance after the second round of evaluation (or those who choose not to take a second evaluation) will be allowed to complete the M.Sc. degree. They may re-apply for admission to the Ph.D. program upon completion of the M.Sc. degree. If accepted by the program, these students will be re-assessed as regular Ph.D. students.

Ph.D. students who demonstrate unsatisfactory performance after the second round of evaluation will be required to withdraw. The acceptance letter by the Graduate Chair to all students entering directly in the Ph.D. program (at the time of admission into the program) should state the need for passing the Candidacy Evaluation before being allowed to continue in the program.

October, 2002
## Appendix G.4(a)
### Graduate Courses
#### 2003 - 2007

<table>
<thead>
<tr>
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<tr>
<td>512b &quot;Current Concepts in Immunology&quot;</td>
<td>Dr. E. Cairns (Coord 2004 - 2007) Dr. T. Delovitch Dr. R. Zhong Dr. M. Bhatia Dr. S. Kim Dr. P. O'Connell</td>
<td>13</td>
<td>16</td>
<td>10</td>
<td>7</td>
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<td>540y &quot;Graduate Student Seminar&quot;</td>
<td>Dr. C. Creuzenet Dr. L. Hertel</td>
<td>30</td>
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<td>31</td>
<td>22</td>
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<tr>
<td>541y &quot;Graduate Student Seminar&quot;</td>
<td>Dr. C. Creuzenet Dr. L. Hertel</td>
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<td>585y &quot;Contemporary Issues in M&amp;I - Journal Club&quot;</td>
<td>Dr. Heinrichs, Dr. Valvano, Dr. McCormick, Dr. Creuzenet, Dr. Madrenas, Dr. Mymryk, Dr. Koropatnick</td>
<td>57</td>
<td>61</td>
<td>59</td>
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### Appendix G.4(b)
Department of Microbiology Immunology
Graduate Course/Instructor Evaluation Summary - 2003-2007

<table>
<thead>
<tr>
<th>Course/Instructor</th>
<th>Year</th>
<th>Evaluation Summary</th>
<th>Overall Effective Ranking (out of 5)</th>
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<tr>
<td><strong>MICROIMM 511a (4 Instructors/year)</strong></td>
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<td></td>
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<tr>
<td>Dr. D.G. McFadden (Coord 2003, 2005)</td>
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<td>n/a*</td>
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</tr>
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<td>Dr. W. Flintoff (Coord 2004, 2007)</td>
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<td>4.6</td>
<td>n/a*</td>
</tr>
<tr>
<td>Dr. M. Valvano (Coord 2006)</td>
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<td>n/a*</td>
<td>n/a*</td>
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<tr>
<td>Dr. Heinrichs</td>
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<td>3.8</td>
<td>n/a*</td>
</tr>
<tr>
<td>Dr. M. Gijzen</td>
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<tr>
<td>Dr. Dekaban</td>
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<tr>
<td>Dr. McCormick</td>
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<tr>
<td>Dr. Creuzenet</td>
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<td>Dr. Hertel</td>
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<tr>
<td><strong>MICROIMM 512b (4 Instructors/year)</strong></td>
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<tr>
<td>Dr. E. Cairns (Coord 2004 - 2007)</td>
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<tr>
<td>Dr. T. DeLavitch</td>
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<td>Dr. S. Kim</td>
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<td>n/a*</td>
<td>3.4</td>
</tr>
<tr>
<td>Dr. P. O'Connell</td>
<td>n/a*</td>
<td>n/a*</td>
<td>n/a*</td>
</tr>
</tbody>
</table>

*Note: n/a* = Not Applicable *only 4 instructors per year*
April 26, 2005

Dr. Martin Kreiswirth, Dean
Faculty of Graduate Studies
University of Western Ontario
Room 130 Stevenson Lawson Bldg
London Ontario
N6A 5B8

Dear Dr. Kreiswirth:

At its meeting of April 25, 2005, the Appraisal Committee (Section I) decided to recommend that the MSc/PhD program in Microbiology and Immunology at the University of Western Ontario be classified as of GOOD QUALITY.

Periodic appraisals lead to a classification of Good Quality if: the program’s objectives are appropriate and are being met; the core faculty provide intellectual leadership in the disciplinary area(s) of the program through active engagement in research and scholarship; the faculty complement is appropriate for the level and scope of the program and its identified fields, and there are appropriate provisions and/or plans for its continued vitality; the curriculum design is appropriate; the resources, such as laboratories, libraries, computer facilities and research support, are appropriate; enrolments are commensurate with the resources available; students complete the program in a timely fashion; there is evidence of appropriate financial support for students; and there is demonstration of the quality of the educational experience of students, including intellectual development and the acquisition of relevant skills.

The following fields have been identified and approved:

- Cellular and Molecular Biology of Microorganisms
- Cellular and Molecular Biology of the Immune System

In keeping with the OCGS By-Laws and Procedures Governing Appraisals, these are the only areas of strength within the program which may be advertised, apart from the program as a whole.

Among the issues to be addressed in the next periodic appraisal will be:

- Maintenance of research strength in basic immunology
- Effectiveness of measures to foster and maintain intellectual community among all students and faculty, especially regarding facilitation of travel and involvement of off-site faculty and students in the on-campus program
This recommendation is not effective until it has been accepted by OCGS, and the information in this letter should not be widely circulated until it is so accepted. In the interim can you please confirm the identification of fields in the program. Please advise the Committee of any discrepancies you feel may exist, or of your acceptance no later than May 10, 2005.

Sincerely yours,

[Signature]

David Leyton-Brown
Executive Director, OCGS

DLB/pm
H. SWOT ANALYSIS (January 2004 – October 2007)
H.1. **Strengths**

**Recruitment**

Faculty Recruitment (Kim, Hertel, Haeryfar, McCormick, Mele, and Summers) and Retention (Cairns, Trick).

Taking effective advantage of the UPIF competitions to creatively develop new positions that enhance the research and training of graduate students (areas of UPIF Awards: Molecular Virology [Hertel], Functional Genomics [McCormick], Clinician Scientist in Transplant Immunology [with Surgery; Mele], and Clinician Scientist in Inflammation [with Medicine; currently under search]).

Successful allocation of a CRC tier I in Viral Pathogenesis to the SSMD and the department, which was used to fill the vacancy left by the departure of G. McFadden (currently under search).

Successful replacement of the vacancy left by the departure of M.W. Clarke (Immunoregulation; M. Haeryfar).

Developing a faculty position to fill the vacancy left after the upcoming retirement of W. Flintoff (Immunobiologist; currently seeking formal approval from UWO; expected search in the spring 2008).

Continuing efforts towards maintaining a gender balance in departmental faculty. Despite that Microbiology & Immunology does not have any female faculty at the Full Professor rank, 3 female faculty are Associate Professors (Cairns, Creuzenet, Koval), 2 are Assistant Professors (Hertel, Mele), plus one more at the Assistant Professor level who is a Lawson Health Research Institute scientist (Summers). Efforts are made to recruit outstanding female faculty at the professorial level, using the Tier I CRC in Viral Pathogenesis as an instrument. Females and males are given equal consideration in all the other positions to be filled.

**Research Excellence**

Researchers from the department collectively attracted ~ $5 M annually in external funding from Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council, and other agencies, without counting research contracts. This translates to a rough average of $250,000 per faculty member/per annum.

All current faculty members with primary appointments (non-clinical) are funded by at least one external grant in the period 2006-2007.

Half of the departmental faculty members with primary appointments have most or all of their salary defrayed by External Awards.

At least half of the departmental members are recognized as national and international leaders in their disciplines and they provide external service in grant review panels, organization of scientific conferences, and editorial boards.

Successful seminar program series, as attested by both the quality and quantity of invited speakers.
Scientific publications from primary (non-clinical) faculty members on high impact factor journal (e.g. average impact factor for 2006 was 7.8).

Research space and infrastructure

Laboratory and office space was redeveloped in the 5th floor Dental Sciences Building to accommodate Drs. Cairns, Haeryfar, and Mele. Most of the costs came from departmental sources.

Development of additional laboratory space and Tissue Culture Facility for Dr. Hertel in the Health Sciences Addition. This was done with funds recovered from carry forward dollars returned from the Dean's Office.

Development of a Common Biohazard Level II laboratory Facility in the 3rd floor Dental Sciences Building. All costs came from departmental sources.

Development of a lounge/meeting room in the 3rd floor Dental Sciences Building for departmental faculty and student meetings. Costs came from SSMD as part of the start up package for Dr. Valvano as new Department Chair.

Development of a Small Molecule purification suite in the 3rd Floor Dental Sciences Building and office space for trainees of Dr. Creuzenet. Costs paid from departmental resources.

Redesign of the Transmission Electron Microscopy Facility in partnership with the Department of Pathology. A new TEM was relocated into the 3rd floor Dental Sciences Building. Costs covered by a combination of sources from Pathology, Microbiology & Immunology and SSMD.

Teaching

$1.25 M endowment from an anonymous benefactor dedicated to the enhancement of the Graduate Program. Monies used for entrance scholarships to outstanding new graduate students and travel awards for graduate students enabling them to attend research meetings and conferences.

Strong teaching evaluations (departmental average for overall teaching effectiveness in undergraduate courses is 5 in last three years).

Student recognition and teaching award winners (Colby, Madrenas).

Ongoing curriculum development as evidenced by annual teaching retreats.

Collaboration with other departments in the BMSc Program (e.g. contribution to MedSci400E, joint Honors with Biochemistry).
Administrative leadership

Associate Dean, Basic Medical Sciences Undergraduate Education (BMSUE) (Flintoff).

Faculty members on major university committees (e.g. Dr. Koval was chair of the Animal Use Subcommittee for the past 3 years).

Faculty members serving on national and international committees.

Directorship of the Infection and Immunity Institute of the Canadian Institutes of Health Research (Singh).

Faculty members elected to the Canadian Royal Society (Singh, Kang, McFadden, Murray).

H2. Weaknesses and Threats

Faculty Renewal

The department has been rejuvenated with the new recruitments. However, recruitment is an ongoing task. Several retirements will be potentially available in the next few years. A major perceived weakness is in the area of Immunology. The passing of R. Zhong, the restructuring of the Multiple Organ Transplant Program, and the restructuring of the Robarts Research Institute have resulted in a leadership vacuum in what traditionally has been a very active research area and hallmark for London as a Transplant Immunology Center. Unfortunately, and for unclear reasons, M&I was unsuccessful at the last round of UPIF competition where the department put forth a proposal to recruit an Immunobiologist.

Clinical Microbiology and Infectious Diseases is a health science discipline that has been notoriously affected by the restructuring of the London Health Science Centre. This area requires an infusion of quality research, and most of the activities in the clinical arena are currently focused on health care delivery. While certainly an attainable and laudable goal, LHSC is mostly a training centre, and training requires research. Efforts are ongoing in partnership with the Department of Medicine to rebuild on this area, but so far to no avail.

The Robarts Research Institute

Since 1992 onwards, RRI, showed leadership in the area of immunology. Two excellent research groups were formed: Tolerance and Diabetes, and Transplantation. However, the commitment by RRI to continue building a strong and visible immunology program has eroded over the years. Currently, only three RRI scientists are bona fide immunologists (Delovitch, Madrenas, and Singh). Two of them (Delovitch and Singh) are senior researchers. Microbiology & Immunology took the leadership to build immunology (recruitments of Haeryfar, Kim, Mele, and retention of Cairns) but additional recruitments are required to reach a healthy critical mass and also to contribute to the retention of outstanding faculty members at the Robarts Research Institute (e.g. Madrenas) who are currently scientifically isolated.

University and SSMD budget reductions

The departmental budget has suffered ongoing budget reductions in the operating component, plus a tax imposed by the former Dean of Medicine, that continued until last year on the
budget carry forward. There is little doubt by all objective parameters that M&I has been a model of administrative excellence, in addition to its other accomplishments and recognitions at scientific and scholarly levels.

This success is not something that the current Chair takes credit for, but rather the consequence of an excellent leadership legacy of past chairs that has continued over the years. An example of the current situation is that over a 4-year period, the Department has contributed with more than $1.2 M from the departmental budget into costs associated with new recruitments in terms of salary, start-up funds, and space renovations (See Appendix H.2). These contributions took place despite the continuing 3% cuts on the base budget annually, and the 10% taxation of the carry forward by the Dean’s Office. A similar trend has occurred for at least a period of 10 years or more. This has not been officially recognized in any significant way.

The termination of salary awards held by some of the junior faculty, together with the need to “absorb” the full salary of Dr. B. Chan, who was transferred from the RRI to the UWO, will put a significant amount of strain in the departmental budget in future years.

Departmental space

The faculty in the Department of Microbiology & Immunology are scattered. The major priority for the Chair is the location of the core faculty in close proximity to one another, as it happens with the majority of faculty members in the other Basic Medical Science Departments. This is critical to foster interactions among faculty members and to develop a strong, vibrant, integrated research and training program in Infection and Immunity.

Graduate enrollment

The Department of Microbiology & Immunology doubled the graduate enrollment well before the current impetus by Canadian universities to increase graduate enrollment in the next 10 years. This increase, which was associated with the excellence of our faculty members, has not been recognized by the SSMD and UWO. Also, this increase took place with far fewer resources than those currently applied to the graduate programs.

Core facilities

The Transmission Electron Microscope facility was not recognized as such by the Associate Dean of Research, and consequently did not receive funding support, while other facilities did. The decision to ignore the TEM facility has placed severe constraints on our ability to operate it, particularly taking into account that this facility is not only for research but also for medical education and training of residents, as it was established in partnership with the Department of Pathology and with investments from both departments and the SSMD.

H.3. Opportunities

Faculty Renewal

The Department of Microbiology & Immunology has three ongoing recruitments: a Virology position at the Assistant/Associate Professor Level, UPF CLINICIAN Scientist (with Medicine) in Inflammation, and Tier I CRC in Virology (centrally coordinated by SSMD).
In addition, plans are being developed for another junior position for an Immunobiologist to replace a faculty member who has opted for an early retirement in 2008.

Continuing recruitments is a crucial aspect of the department’s faculty renewal. The particular demographic characteristics of Microbiology & Immunology are such that five additional faculty may potentially retire in the period 2009-2013.

Research Space

The faculty in the Department of Microbiology & Immunology are scattered. A cost-saving opportunity that will make a very positive impact on the department is the relocation of the majority of the faculty members to the 1st and 2nd floors of the Siebens Drake Research Institute and the remainder of available space in the 3rd floor of the Dental Sciences Building and the 3rd floor of the Health Sciences Addition. Numerous advantages are perceived.

This is critical to foster interactions among faculty members and to develop a strong, integrated, research and training program in Infection and Immunity.

Research Focus

Integration of the departmental research focus into a single Research Program in Infection and Immunity.

Graduate enrolment

Graduate enrolment in Microbiology & Immunology has remained stable in the last few years. However, Microbiology & Immunology doubled the graduate enrolment before the current initiatives for increased enrolment were put in place. This has affected our program, as it gives the false impression that our enrolment has not gone up.

With the new opportunities for recruiting additional graduate students (from SSMD additional graduate scholarships), combined with the continuing efforts to recruit additional faculty members (more new supervisors to take graduate applicants), the opportunity for consolidating the departmental space to facilitate interactions, and the blending of the graduate and research programs under the general area of infection and immunity, will allow Microbiology & Immunology to increase graduate students numbers and as well as their quality.

Development of New Teaching Programs

The Department will continue to support its existing teaching initiatives (as described in section F of this report).

The Department will be exploring the following during the period of 2008-2013:

a) The development of new courses to be included in the BMSc program, with a particular focus on infection and inflammation and in reflection of the integration of these two areas.
b) The development of distant learning courses in Microbiology, Immunology, and Infectious Diseases. These courses will be primarily focused on undergraduates aspiring to professional degrees in Nursing, Medicine, Dentistry, and Health Sciences.

Core facilities and operations

Recognition of the TEM facility as a core component of the facilities within the SSMD is critical to provide adequate service.

The Departmental office is clearly understaffed and overworked. In the last four years there has been a tremendous amount of administrative downloading from central UWO in terms of finances, appointments, faculty relations, relationships with the various Bargaining Units, undergraduate teaching, and graduate studies. The Microbiology & Immunology office clearly requires another position to assist with many of these components, which currently fall for the most part on three individuals: the Administrative Officer, the Teaching/Research Coordinator, and the Graduate Secretary. The Assistant to the CRC Chair (held by Dr. Valvano) can only provide limited assistance and this position is contingent on the ability of Dr. Valvano to renew his CRC Chair and also to continue for another term as department chair.

The other critical position is that of a Dishwasher for the faculty housed at the Siebens Drake. This position is currently supported 50% from departmental resources and the rest by cost recoveries from PI's grants. A relocation of most of the faculty members in the Siebens Drake will cause a substantial increase in the workload of this individual.

H.4. Major Priorities and Challenges for period 2008-2013

Faculty renewal balanced with increasing budget reductions and the need to provide for those faculty members coming off salary awards (Kim, McCormick) or added to the complement because of a discontinuation of appointment with the Robarts Research Institute (Chan).

Continue to secure reasonable start-up packages to competitively attract excellent candidates.

Secure appropriate space for the department (See Appendix H.4.).

Develop and administer a Research Program in Infection and Immunity.

Increase graduate enrolment with major focus on the high quality of the applicants and the high quality of training. This cannot be done unless it is associated with the faculty renewal strategies. The best student experience for our graduates is the opportunity to be trained in cutting edge research under the supervision and mentoring of outstanding research faculty.

Increase staff by adding secretarial and dishwashing positions to the permanent complement of support staff.
Appendix H.2.

**MNI Dollars Contributions from Budget Dollars**

*Over a Four Year Period*

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**NEW RECRUITS (MNI Start up)**

- Sung Kim (Aug 04) 150,000.00
- Laura Hertel (Feb.05) 150,000.00
- Mansour Haeryfar (July 06) 150,000.00
- Clinician Scientist (Transplant/Surgery) 40,000.00
- Virology Position 150,000.00
- Virology CRC Tier I 200,000.00
- Clinician Scientist (Inflammation/Medicine) 50,000.00

**CONTRIBUTIONS TO SALARY/BENEFITS (MNI)**

- Peter Cadieux 3,500.00
- Kelly Summers 6,300.00 25,000.00 25,000.00 25,000.00
- E. Cairns (joint with Med) 16,887.00 20,000.00 20,000.00
- S. Gelsworthy (post retire LD) 20,000.00 20,000.00 20,000.00
- G. Strejan (post retire LD) 9,000.00 11,300.00 11,300.00

**MNI Funded Renovations**

- Haeryfar and Cairns labs (5th fl DSB) 25,000.00
- John McCormick 20,500.00

**Total $ funded from MNI Budget**

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**MNI Provided Space**

- E. Cairns (Lab space 6th Floor DSB)
- Clinician Scientist (Transplant/Surgery - lab space in progress)
- Clinician Scientist (Inflammation/Medicine proposed lab space)
Appendix H.4.

Draft Space plan to accommodate the newly created Infection and Immunity Research Program

December 2006; Submitted by M. A. Valvano, Department Chair
as requested by the Associate Dean of Research

NOTE: THIS IS ONLY A DRAFT PROPOSAL AND IS SUBJECT TO CHANGE AFTER DISCUSSION WITH THE DEPARTMENTAL SPACE RE-ALLOCATION TASK FORCE

PROPOSAL

1. To create a Research Program in Infection & Immunity that will replace the Department of Microbiology and Immunology, which will only continue to exist as a Teaching/Administrative Unit.

2. To relocate faculty members of the Research Program in Infection & Immunity, who are currently housed in the 5th floor of the Dental Sciences Building, and in the Robarts Research Institute to the 1st and 2nd floor of the Siebens-Drake Medical Research Building.

3. To consolidate the Proteomics and Genomics, Functional genomics and Cell signaling groups on the ground floor of SDRI.

4. To relocate the current M&I departmental office to the space currently occupied by SPARCS, which will become the administrative headquarters of the Infection & Immunity Research Program/Department of M&I.

RATIONALE

- Faculty in the department of Microbiology and Immunology are currently fragmented into 4 buildings (two floors in DSB, HSA, MSB, and SDRI), without counting additional faculty at RRI, LHRI, and LRCC.
- M&I is the only basic science department that has no newly renovated space, except for ca. 3,000 sq feet corresponding to 2 labs and offices and a common room in MSB.
- The Infectious Diseases Research Group (IDRG), a strong force in the department and the SSMD is also fragmented, with some of its members located at SDRI while the others are in DSB and Robarts.
- The IDRG came to existence to build around the CIHR Institute of Infection and Immunity (III), directed by Dr. Bhagi Singh.
- M&I is strongly aligned around the areas of infection and immunity, autoimmunity, and transplantation. In addition to the III, members of department provide national and international visibility as leaders in Microbiology (e.g. Valvano, Heinrichs) and Immunology (Madrenas).
- M&I would like to evolve towards a programmatic rather than a departmental structure, by developing the Infection and Immunity Research Program. This means that the research of departmental members will be closely integrated along programmatic and strategic planning. Steps have already been taken with the strategic recruitments of Drs. Creuzenet, Kim, Hertel, Haeryfar, and Mele. However, to develop a successful programmatic structure, physical proximity of the program's core members is a must.
STRENGTHS

Consolidating the faculty members of M&I into two floors of SDRI plus the 3rd floor of the Dental Sciences Building and the Health Sciences Addition will provide the following strengths:

- To provide SDRI with a visible focus and scientific leadership in the area of Infection and Immunity.
- To launch the Infection and Immunity Program as the legacy from the Institute of Infection and Immunity, after the Institute relocates outside London in 2008 (following Dr. Singh’s last term as Director).
- To provide a scientific focus that will facilitate contacts with the Siebens Foundation, the Drake family, and other potential donors to secure future support for the building’s core infrastructure (Proteomics & Genomics) and the research leaders housed in SDRI.
- To provide a direct linkage with Genomics & Proteomics and Cell signaling initiatives, as a major component of research on immunology and innate immunity involves the study of cell signaling.
- To free substantial (and usable) laboratory space in the 2nd and 5th floors of DSB, and the 3rd floor of MSB for other departments and initiatives as well as to accommodate those faculty members in SDRI directly affected by the relocation. Importantly, it will release newly renovated space in MSB next to the Department of Biochemistry, which could turn over to this department for re-allocation.

TIMETABLE

The estimated date to begin the relocation would be December 2007 aiming for completion within one year by no later than September 2008, depending on minor renovations required and the situation with SPARCS.

ASSUMPTIONS

SPARCS will relocate to the North Campus of LHSC and this space will be renovated to accommodate the Program’s offices.

The Office for the Neurosciences program will relocate elsewhere, possibly in proximity to the Research Office or to vacated space by M&I.

The office of Peter Flanagan will relocate to the Clinical Skills Building or any other suitable location outside SDRI.

Laboratories of Litchfield, Li, Walton, Dagnino, De Souza, Tini, and Bend will relocate elsewhere in the SDRI (ground floor), in space vacated by Microbiology and Immunology (5th floor and 2nd floor DSB, and 3rd floor MSB), or in any other space as appropriate.