The Department of Pathology provides state-of-the-art diagnostic pathology services while achieving excellence in pathology research and education. Members of the Department of Pathology strive to provide a quality work environment that fosters unity, respect for diversity, teamwork and professional growth. We are committed to serve our: Patients, Students, Society, Scientific Research Community and Health Care.
04 Vision, Mission & Values

06 Leadership Messages
   Message from the Dean
   Message from the Chair/Chief

08 Staff
   Full-Time Faculty
   Professors Emeriti
   Cross Appointees
   Distributed Medical Education Program and Rural Region
   Western University Department of Pathology Staff
   Awards and Distinctions

12 Organizational Charts
   Department of Pathology
   Department of Pathology & Laboratory Medicine,
   London Health Sciences Centre and St. Joseph’s Health Care
   London

14 Education Reports
   Postgraduate Medical Education
   Graduate Education
   Undergraduate Education

28 Research Report
   Director of Research

32 Clinical Service Reports
   Laboratory Services
   Anatomical Pathology
   Clinical Laboratories
Vision, Mission & Values

The Department of Pathology fully supports the mission and values of the Schulich School of Medicine & Dentistry of Western University, London Health Sciences Centre and St. Joseph’s Health Care London.

VISION
Provide state-of-the-art diagnostic pathology services while achieving excellence in pathology research and education.

MISSION
Members of the Department of Pathology strive to provide a quality work environment that fosters unity, respect for diversity, teamwork and professional growth. We are committed to serve our:

PATIENTS, by providing efficient, comprehensive and high quality diagnostic services for optimal patient outcome and health. We are committed to strategies that result in continuous improvement of the quality of our services.

STUDENTS, by providing the best student experience through outstanding educational programs for undergraduate, graduate and postgraduate students, and other health care professionals within a clinical and research intensive environment. We integrate continuing medical education programs into the departmental activities.

SCIENTIFIC RESEARCH COMMUNITY AND HEALTH CARE PARTNERS, by sharing expertise, fostering interdisciplinary collaboration, and providing exemplary educational and scientific resources. We are a strong clinical and basic science department and our research endeavors include basic science, clinical and translational research.

We provide research leadership by identifying our strong research strengths and enhancing research productivity with selective allocation of resources. We guide and collaborate with our regional partners to improve the diagnostic pathology services throughout Southwestern Ontario.

SOCIETY, by actively applying the art and science of pathology in educating the community in matters of health and disease.

OUR CORE VALUES

TEAM WORK
We believe in a team-based problem identification and problem solving methodology. We believe in interdisciplinary networking.

INNOVATION
We are flexible and adaptable in order to meet the changing needs of society.

We strongly believe in continuous quality improvement to enhance clinical performance outcomes.

LEADERSHIP
We strongly encourage members to take leadership roles in education, research and management. We support the leaders who guide our mission.

“We must become the change we want to see”
Mahatma Gandhi (1869-1948)
The Department of Pathology has a longstanding history of being a key driver of the education and research mission of the Schulich School of Medicine & Dentistry, providing exceptional learning and education to its graduates. This rich history is being further guided by the development of a five year strategic plan by the department, which mirrors not only the aspirations of the department, but those of the Schulich School’s ten year strategic plan, “Optimizing Life Long Health”. Both of these documents provide an excellent framework to maintain our goals of excellence in research, education, and service.

The department has had a tremendously successful couple of years, achieving many of its goals. This includes a remarkable strengthening of collaborations across the city with the development of new education programs in ecosystem health/environmental pathology, the oral and maxillofacial surgery graduate program, and the establishment of the only accredited Masters of Clinical Science – Pathologists’ Assistants program in Canada. This program has rapidly become one of the “demand” programs of the University, with interest far outstripping the capacity.

This excellence also extends to the undergraduate program with the development of an undergraduate major in pathology within the BMSc program, an increase in the number of observership opportunities for both Meds 1 and Meds 2, and, working in collaboration with the department of surgery, introduction of new pathology educational opportunities during the clerkship period. The department welcomed Dr. Emily Filter, Canada’s first fellow for the new Royal College of Physicians and Surgeons of Canada (RCPSC) Area of Focused Competence (AFC) Program in Cytology. This is the first such program not only at Western, but in Canada.

The department has had a number of celebrations over the course of the last year. Amongst these was the celebration of the career of Dr. Jack Bend as he retired, recognizing his many contributions not only as a researcher, but as a key member of the faculty. The department welcomed Dr. Lisa Cameron to her new position in Ecosystem Health, and congratulated Dr. Candace Gibson as a winner of the Association of Faculties of Medicine 2013 Infoway, e-Health Award.

These are but a few of the major accomplishments within the department over the last several years. It is a mark of the tremendous strength of our faculty that such critical new programs are being developed, our investigators being recognized, and our research programs flourishing. As we enter into what will be undoubtedly one of the more difficult and challenging periods of research funding in Canadian history, the foundations upon which pathology have been built are solid and will serve us well. Congratulations to the department.

Dr. Michael J. Strong
Dean, Schulich School of Medicine & Dentistry
Interim Scientific Director, Robarts Research Institute
Our biggest strength continues to be our people. Our department moves forward due to a team effort.
Another successful year has come to an end in the Department of Pathology. Each year brings us new challenges, opportunities and successes. With our commitments to education, research and patient care, and a collaborative team approach, we are always able to overcome the most difficult challenges and explore new opportunities.

Members of the Department of Pathology and the Department of Physiology and Pharmacology gathered on June 10, 2013 at Michael’s Garden for a retirement reception to celebrate Dr. Jack Bend’s many contributions as a faculty member. Dr. Bend continues in the department in a post-retirement appointment. Dr. Zia Khan has taken over the role of Director of Research. We welcomed our new recruits Dr. Nikhil Sangle (Anatomic Pathologist), Dr. Ping Yang (Cytogeneticist) and Dr. Lisa Cameron (Scientist, to start April 1, 2014) to our family. We also welcomed several other new appointees to our department: Dr. Sunil Parapuram (Institute Scientist), Dr. Lloy Wylie (Assistant Professor, MPH ), Dr. Teresa Van Deven (Adjunct Research Professor), and Dr. Melanie Katsivo (Adjunct Research Professor).

Our clinical team has been very fortunate to be able to recruit Dr. Mike Kadour as Administrative Director of Laboratory Services. Working with Dr. Kadour, we have used a Doctor/Manager leadership model to redraw our organizational structure. Mr. Mike Graves, coordinator of the autopsy and gross room, retired following 32 years of service. In his place we are very happy to have been successful in recruiting Mr. Louis Litas from Los Angeles. Louis, we welcome you to London!

Our Masters of Clinical Science, Pathologists’ Assistant program has experienced significant changes this year. We have increased its capacity by expanding the practicum training in second year in collaboration with several Toronto hospitals. Our second year students will begin these rotations in the Spring. Congratulations to Dr. Nancy Chan, Program Chair, on this achievement.

Our Research Based Graduate program is on solid ground and continues to show growth. Undergraduate class offerings have undergone significant expansion. Our Anatomical Pathology and Neuropathology residency programs have continued to maintain 100 per cent success rate at the Royal College examinations. This year we initiated a new program in our department, another first in the country: We started a focused competency fellowship program in cytopathology and have received accreditation by Royal College of Physicians and Surgeons of Canada. Congratulations to Dr. Michele Weir for making this happen.

With the changing funding environment in CIHR, we are concerned about the future of research grant funding. Our researchers are accomplished leaders, and will be able to accept these challenges and will continue to explore new opportunities.

Over the years our efficiency in the laboratory has increased tremendously, however, budget challenges remain a concern. This is of further significance as we are facing an increase in our surgical pathology workload, largely due to gastrointestinal biopsy volume. We are involved internally with redesigning our processes and workflow. We are also heavily involved in the clinical strategic planning and Healthcare UnderGoing Optimization (HUGO) initiatives. We believe that these initiatives may lead to significant improvement in test utilization and quality.

Congratulations are in order to members, including but not limited to the following:

- Dr. Candace Gibson received the Association of Faculties of Medicine Canada, 2013 Infoway e-Health Award.
- She has been appointed Assistant Dean, Basic Medical Sciences Undergraduate Education (BMSUE), Schulich School of Medicine & Dentistry. In this role, Dr. Gibson will provide leadership in directing all aspects of the Basic Medical Sciences Undergraduate Education programs.

- Dr. Zia Khan, received the Dean’s Award of Excellence for Faculty.

Our biggest strength continues to be our people. Our department moves forward due to a team effort. I sincerely appreciate the commitment of all our leaders, academic and professional staff, technical and office personnel, and trainees. Congratulations to every member of our department on their achievement.

I look forward to the coming year with great enthusiasm. In the New Year, we will create our academic strategic plan, a blueprint for the next several years. Everybody in our department, both at the hospital and at the university are committed to move us forward with dedication to patient care, and knowledge creation and dissemination.

Dr. Subrata Chakrabarti
Staff
Department of Pathology at September 1, 2013

Full-Time Faculty
Dr. Lee Cyn Ang, Professor, MD
Dr. Christopher Armstrong, Associate Professor, MD
Dr. Ted Ball, Associate Professor, PhD
Dr. Subrata Chakrabarti, Professor, MD, PhD
Dr. Chandan Chakraborty, Associate Professor, PhD
Dr. Nancy Chan, Assistant Professor, MD
Dr. Thomas Daley, Professor, DDS, PhD
Dr. Mark Darling, Associate Professor, DDS
Dr. Johan Delport, Assistant Professor, MD
Dr. David Driman, Professor, MBChB
Dr. Martin Duennwald, Assistant Professor, PhD
Dr. Helen Ettler, Associate Professor, MBChB
Dr. Manal Gabril, Associate Professor, MD
Dr. Bertha Garcia, Professor, MD
Dr. Candace Gibson, Associate Professor, PhD
Dr. Jose Gomez Lemus, Associate Professor, MD
Dr. Aaron Haig, Assistant Professor, MD
Dr. Rob Hammond, Professor, MD
Dr. Chris Howlett, Assistant Professor, MD
Dr. Michael John, Professor, MD
Dr. Mariamma Joseph, Professor, MD
Dr. Zia A. Khan, Associate Professor, PhD
Dr. Joan Knoll, Professor, PhD

Dr. Keith Kwan, Associate Professor, MD
Dr. Rob Lannigan, Professor, MD
Dr. Meg McLachlin, Professor, MD
Dr. Carolyn McLean, Associate Professor, MD
Dr. Madeleine Moussa, Professor, MD
Dr. Jeremy Parfitt, Assistant Professor, MD
Dr. David Ramsay, Professor, MD
Dr. Kamila Rizkalla, Professor, MD
Dr. Nikhil Sangle, Assistant Professor, MD
Dr. Jessica Shepherd, Associate Professor, MD
Dr. Mike Shkum, Professor, MD
Dr. Alan Tuck, Professor, MD, PhD
Dr. Elena Tugaleva, Assistant Professor, MD
Dr. Ted Tweedie, Associate Professor, MD
Dr. Joanna Walsh, Assistant Professor, MD
Dr. Bret Wehli, Associate Professor, MD
Dr. Michele Weir, Professor, MD
Dr. George Zahariadis, Associate Professor, MD

Professors Emeriti
Dr. Jack Bend
Dr. George Cherian
Dr. John. V. Frei
Dr. Joe Gilbert
Dr. Robert A. Goyer
Dr. Collette M. Guiraudon

Dr. M. Daria Haust
Dr. Zafar Hussain
Dr. Mary Ellen Kirk
Dr. D. Ian Turnbull
Dr. George Wysocki

Pathology Faculty, Staff and Residents

Dr. Subrata Chakrabarti and Dr. Jack Bend
Cross Appointees
* Basic Scientists with Basic Science home in Pathology
** Institute Scientists with Basic Science home in Pathology
Dr. Paul Adams
Professor, Department of Medicine
Dr. Ann Chambers
Professor, Department of Oncology
Dr. Regina Darnell
Professor, Department of Anthropology
Dr. Sameer Elsayed
Associate Professor, Department of Medicine
Dr. Guido Filler
Professor, Department of Pediatrics
Dr. Carol Herbert
Professor, Department of Family Medicine
Dr. Cindy Hutnick
Associate Professor, Department of Ophthalmology
Dr. Jonathan Izawa
Associate Professor, Department of Surgery
Dr. Tisha Joy
Assistant Professor, Department of Medicine
Dr. Jim Koropatnick
Professor, Department of Oncology
Dr. Weiping Min **
Professor, Department of Surgery, Lawson Health Research Institute
Dr. Sunil Parapuram **
Assistant Professor, Department of Ophthalmology, Lawson Research Institute
Dr. Tianqing Peng **
Associate Professor, Department of Medicine, Lawson Health Research Institute
Dr. Michael Strong
Professor, Department of CNS
Dr. Lloy Wylie *
Assistant Professor, Department of Psychiatry, Masters of Public Health Program
Dr. Zhu-Xu Zhang **
Associate Professor, Department of Medicine, Lawson Health Research Institute

In Memoriam

Kaufmann, John Cassidy Ewart, Professor Emeritus, Department of Pathology, Western University

It is with great sadness that we announced the passing of Dr. John Kaufmann on February 2, 2013 at University Hospital, London, Ontario. Dr. Kaufmann was born in Umtata, South Africa in 1924 and graduated from the University of Cape Town where he studied medicine and specialized in Neuropathology. He immigrated to Canada in the early 1970's when he joined the neuroscience medical team at the University of Western Ontario. Dr. Kaufmann retired in 1989. Dr. Kaufmann will be deeply missed by his colleagues in the Department of Pathology.
Awards & Distinctions

Faculty

Western University Students’ Council Teaching Honour Roll: Award of Excellence (Dentistry) - Dr. Tom Daley

Western University Students’ Council Teaching Honour Roll: Award of Excellence (Dentistry) - Dr. Mark Darling

Association of Faculties of Medicine Canada, 2013 Infoway e-Health Award – Dr. Candace Gibson

Dean’s Award of Excellence for Faculty – Dr. Zia Khan

Western University Students’ Council Teaching Honour Roll: Award of Excellence (Pathology) - Dr. Zia Khan

Western University Students’ Council Teaching Honour Roll: Award of Excellence (Dentistry) - Dr. Bret Wehrli

Western University Students’ Council Teaching Honour Roll: Award of Excellence (Pathology) - Dr. Bret Wehrli

Western University Students’ Council Teaching Honour Roll: Award of Excellence (Undergraduate Medical Education) - Dr. Bret Wehrli

Schulich School of Medicine & Dentistry Hippocratic Council, Basic Science Teaching Award – Dr. Michele Weir

Meds Year 2 Reproduction course received the HUMEC Award for the Year 2 Curriculum for the 2012-2013 Academic Year. HUMEC is a student run committee organized through the Hippocratic council. This award was made as a way of honouring those courses and course chairs that have excelled in areas of: 1) Innovation in teaching and evaluation, 2) Commitment to improvement, and 3) Student-centeredness. Dr. Michele Weir, Course Co-Chair.

Graduate Students

Ontario Graduate Scholarships (OGS): Kara McArthur (PA Program), Phaedra Henley, PhD Candidate (Research Program), Wahab Khan, PhD Candidate (Research Program), Michael Ruiz, MSc Candidate (Research Program)

Graduate Thesis Research Award (GTRA): Wahab Khan, PhD Candidate, Nathan Johnston, MSc Candidate

2012 3rd Annual Diabetes Research Day: Emily Keats, PhD Candidate and Michael Ruiz, MSc Candidate. First Prize for Best Poster/ Best Poster Presentation.

Queen Elizabeth II Graduate Scholarships in Science and Technology 2012-2013 - Emily Keats (PhD candidate)

London Laboratory Service Group – Profession Development Awards: Audrey Blanchard, MSc Candidate.

2012 Diane Y. Stewart Endowed Scholarship Award: Audrey Blanchard, MSc Candidate.

2013 Till & McCulloch Meeting: Emily Keats, PhD Candidate, abstract selected as one of the top entries in this year’s Trainee Abstract Competition.

2013 Canada Society of Transplantation Annual Meeting: Arthur Lau, PhD Candidate, Basic Science Trainee Award.

2013 Department of Medicine Research Day: Rui Ni, PhD Candidate. Best Poster

London Health Research Day 2013: Matthew Riopel, PhD Candidate. 2nd Place, Platform Competition, March 2013.

Undergraduate Students

Western Gold Medal for Honours Specialization in Pathology and Toxicology (for the BMSc, Pathology/Toxicology student with the highest grade) - Brendan Caraher

Western Gold Medal for Scholar’s Electives Program (the Scholar’s Electives program is designed for high-achieving, self-directed students interested in pursuing an interdisciplinary academic experience) - Michael Salna

Department of Pathology Awards

Faculty

Dr. M. E. Kirk Annual Teaching Award for Excellence in Resident Teaching – Dr. Michael Shkrum
Annual Pathology Research Day Awards

Chair’s Award for the Best Clinical Science Presentation -
Dr. Murad Alturkustani

Best Clinical Science Poster Presentation -
Dr. Cady Pocrnich

Best Basic Science Poster Presentation Award -
Di Chen (supervisor Wei-Ping Min)

Dr. M. Daria Haust Award for Best Presentation by a Graduate Student -
Emily Keats (supervisor Zia Khan)

Best Undergraduate Basic Science Poster Presentation Award -
Jina Kum (supervisor Zia Khan)

Best Basic/Clinical Science Collaborative Poster Presentation Award -
Alex Pavlosky (supervisors Anthony Jevnikar, Zhuxu Zhang)

Pathology Graduate Student Awards
Dr. Cameron Wallace Graduate Student Award In Pathology - Matthew Riopel (PhD Candidate)

Dutkevich Travel Award: Matthew Riopel, PhD Candidate, Emily Keats, PhD Candidate, Michael Ruiz, MSc Candidate, Rokhsana Mortuza, PhD Candidate.

Pathology Undergraduate Student Awards
Professor Colin Anderson Award (for the student with the highest mark in Pathology 3245B) -
Dov Kagan

2013 Frederick N. Lewis Memorial Prize
(for the student with the highest mark in the course, Pathology 3240A) -
Inhae Park

Mark Trinder
Organizational Charts
Department of Pathology, Schulich School of Medicine & Dentistry, Western University
Department of Pathology & Laboratory Medicine, London Health Science Centre and St. Joseph’s Health Care London

Please see http://www.lhsc.on.ca/lab/org_chart.htm for the full organization charts for Pathology & Laboratory Medicine
The Department of Pathology offers intensive, integrated training programs in Anatomical Pathology and Neuropathology. These programs fulfill the requirements of the Royal College and are fully accredited. The training programs may be used to embark on a career in either an academic or community hospital setting. The Medical Microbiology program is currently inactive.

The Department is a combined clinical and basic science department. As such, our training programs offer a range of clinical experiences and opportunities for research. Programs approved by the Royal College of Physicians and Surgeons are currently offered in:

1. Anatomical Pathology (Program Director, Jessica Shepherd)
2. Neuropathology (Program Director, Lee Cyn Ang)

Graduating Trainees 2012 – 13
Dr. Fahd AlSufiani – Neuropathology
Dr. Mara Caragea – Anatomical Pathology
Dr. Emily Filter – Anatomical Pathology
Dr. Iram Siddiqui – Anatomical Pathology
Dr. Sami Siddiqui – Anatomical Pathology

Dr. J. Shepherd, Anatomical Pathology Resident Training Program - Report of the Program Director

There were 12 residents in Anatomical Pathology (AP) in 2012-13. The residents (PGY2-5) are primarily located at one site, the Department of Pathology and Laboratory Medicine at University Hospital at the London Health Sciences Centre, and only go off-site for frozen section coverage or to attend academic events or rounds. They have the benefit of the Regional Forensic Unit also being on-site, as well as a parallel Neuropathology Program, so there is much beneficial sharing of facilities and educational interaction, as well as the formal rotations offered in these areas.

Twenty nine full-time faculty anatomical pathologists participated in teaching and mentoring our residents. All pathologists cover one or more subspecialty areas, as members of subspecialty teams. On any given day, most pathologists are on site and interact with one another in the handling of service and consult work. This results in a comprehensive and cohesive learning experience for the residents, with broad practical exposure and opportunity for role-modeling. In addition to pathology residents, there was a steady stream of off-service residents and medical students doing electives, as well as observers, such that the working space in the residents’ rooms was almost always filled to the seams.

There were many educational rounds, including almost daily Gross Room rounds, weekly Forensic and Surgical Pathology rounds, at least fortnightly Subspecialty Microscopy rounds, monthly Journal Club, Grand Rounds and ICU rounds, as well as many on-site and off-site Interdisciplinary rounds and Tumour Boards. Residents were heavily involved in teaching medical students in small group sessions, as well as each other, through oral presentations in rounds and as minor components of their weekly Academic Half Days. Residents, with the exemption of the PGY5s, presented their research at the Annual Research Day in April, along with the graduate students from the Pathology department.

This year the program’s biggest challenge was the Royal College Accreditation in October 2012. Although the program was commended for its’ strengths, there was cited need for improvement. The Residency Program Committee has worked very hard to address all issues. A follow-up Internal Review is due by January 31, 2015.

In the CaRMS match, both of our PGY1 positions were matched in the first iteration. The program had two PGY1 residents, two PGY2 residents, one PGY3 resident, three PGY4 residents and four PGY5
residents. In the Spring of 2013, all PGY5 residents passed the Royal College specialty examinations, and three were accepted into subspecialty fellowship training, at the University of Toronto, the University of Texas MD Anderson Cancer Clinic and here at UH–LHSC in Cytopathology. The latter resident has joined us as a fellow in Cytopathology, the first fellow undertaking a diploma program (Area of Focused Competence), recently approved by the Royal College.

Dr. L.C. Ang, Neuropathology Resident Training Program – Report of the Program Director

The challenge this year was the Royal College Accreditation in October 2012. The program was successfully accredited.

The residents not only actively participate in service but are excellent teachers to other residents rotating through the program. An Inter-University Agreement has been signed with the University of British Columbia which enables our residents to do rotations for pediatric neuropathology in Vancouver in order to augment the training in this area. The small number of teachers has also made organization of formal teaching difficult and time consuming, but this has been overcome by organizing our journal club, teaching sessions and self-assessment assignments along the format of a curriculum so that all the relevant topics can be covered. As there are very few positions available for neuropathologists in Canada, career planning for current residents can be difficult and recruitment of future residents, quite challenging.

This program had 3 residents, one in PGY5 (Fahd Al-Sufiani), one PGY4 (Sumit Das), and one in PGY2 (Maher Kurdi). Throughout the year, a number of AP residents, Neurology residents and Neurosurgery residents completed their electives in our program. One of our neuropathology residents spent 2 months in a rotation for pediatric Neuropathology with the University of British Columbia.

The 3 full-time faculty members in Neuropathology (Drs. Ramsay, Hammond and Ang) are involved in the training of the residents in Neuropathology as a specialty (approximately 3 years), and more than 26 anatomical pathologists are involved in the training of these residents in their one year compulsory rotation in the specialty of Anatomical Pathology. The program administration has been provided by Ms. Susan Stewart at Western University.

Almost all clinical teaching is concentrated at University Hospital. In addition to teaching during brain cutting and microscopic sign-out sessions, there is a weekly unknown slide session as well as Teaching Seminar for NP residents. For Anatomical Pathology teaching, residents are required to attend the Wednesday noon rounds with the Anatomical Pathology residents where surgical biopsies are presented and the Forensic Pathology Rounds teaching where general forensic pathology is being taught. Pathology Grand Rounds and the Robert Zhong Research Seminars are held every month. For teaching in Clinical Neurosciences, there are the Grand Neuroscience Rounds every Tuesday morning for neurosurgery and neurology cases, the epilepsy rounds and neuroradiology rounds weekly, and neuromuscular rounds monthly, all of which residents are to attend. A monthly Neuropathology Slide Teaching Session on the CNS Academic Half-day is being held for all Neuropathology, Neurology and Neurosurgery residents.

Dr. Al-Sufian has been successful in passing the RCPSC specialty examination for Neuropathology in May 2013. Dr. Saeed Asiry will join the program as PGY1 as of July 1st, 2013.

Dr. G. Zaharadis, Medical Microbiology Resident Training Program – Report of the Program Director

The program in medical microbiology is currently inactive and is not accepting applicants.

Trainees at July 1st 2013

Anatomical Pathology
Emily Goebel PGY1
Matthew Kubica PGY1
David Garcia Marquez PGY2
William Stecho PGY2
Brian Schick PGY3
Qi Zhang PGY3
Fahd Al-Sufi PGY4
Allison Osmond PGY4
Murad Alturkustani PGY5
Mara Caragea PGY5
Rebekah Jacques PGY5
Cady Pocrnich PGY5
Emily Filter CF
Derek Kohler CF

Neuropathology
Maher Kurdi PGY2
Das Sumit PGY4

Awards

This year’s Dr. M.E. Kirk Teaching Award was presented to Dr. Michael Shkrum. This annual teaching award is for excellence in resident education and is given by the residents to an individual who best exemplifies the following qualities with respect to resident education: dedication, enthusiasm, excellence, availability, approachability, knowledge and mentorship.

Murad Alturkustani was the Annual Pathology Research Day winner of the Chair’s Award for Best Clinical Presentation Award.

Cady Pocrnich was the Annual Pathology Research Day winner of the Best Clinical Science Poster Presentation Award and was also the winner of the Hugh Curry Award for the best poster related to the field of Cytopathology at the CAP-ACP Annual Meeting in Quebec City in June.
Resident Publications & Presentations


Presentations


Enrollment in Graduate Programs in Pathology at Western University has been increasing steadily since 2008. This has been possible for the following reasons: i) Several clinician scientists and basic scientists from clinical departments have sought graduate faculty membership in the Pathology graduate program and have been active as graduate student supervisors. ii) A collaborative graduate program between the environmental pathology program and the ecosystem health program was introduced. iii) A course based Pathologists’ Assistant (PA) graduate program was launched. iv) A part-time graduate program at both the MSc and PhD levels was introduced. Thus the program has been experiencing continuous growth during the last several years. The Department of Pathology is committed to graduate education, though and further growth in our graduate program may soon be possible with the recent recruitment of two Basic Scientists.

1) Research Based Graduate Program - Dr. Chandan Chakraborty, Report of the Graduate Chair

Research training is provided both at the MSc and at the PhD levels. This is an integrated research program and investigation occurs at the molecular, cellular, tissue, whole organism, and clinical levels. Students carry out supervised research in various thematic areas, including cancer, diabetes, transplantation, stem cell biology, neurodegenerative diseases, cardiovascular diseases, developmental defects, molecular genetics and toxicology. The goal of our graduate program is to create tomorrow’s researchers; scientists who will make significant original contributions to the global understanding of disease diagnosis and mechanisms. Graduates from our program are qualified for a diverse set of careers including academia, government, and the pharmaceutical industry and have been successful in each of these sectors. To further address the specific need for tomorrow’s scientists and to train clinician-researchers, an under-resourced profession in Canada, we have initiated a successful part-time research based graduate program.

Graduate Student Enrollment:
In the past several years, we have experienced an unparalleled growth in our pathology graduate education program. For example, from a total of 14 MSc and six PhD students in September of 2005, enrollment increased to 36 MSc and 11 PhD students in September of 2010 [Table 1]. The apparent reduction in number of full time MSc students from 2010 to 2012 in Table 1 is due to the separation of the graduate programs into two streams: research-based and course-based PA programs. Our achievements fulfill the mandate of our university to increase graduate student enrollment. Our faculty members are very successful in recruiting high quality research students into their research laboratories.
** Table 1: Enrollment in Pathology Graduate Program **

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>MSc FT</th>
<th>MSc PA PT</th>
<th>MSc PT **</th>
<th>PhD FT</th>
<th>PhD PT</th>
<th>PhD Total</th>
<th>Total FT</th>
<th>Total PT</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-2006</td>
<td>11</td>
<td>0</td>
<td>3</td>
<td>14</td>
<td>5</td>
<td>1</td>
<td>6</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>2006-2007</td>
<td>9</td>
<td>0</td>
<td>4</td>
<td>13</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>2007-2008</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>18</td>
<td>5</td>
<td>1</td>
<td>6</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>2008-2009</td>
<td>9</td>
<td>8</td>
<td>3</td>
<td>20</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>21</td>
<td>26</td>
</tr>
<tr>
<td>2009-2010</td>
<td>15</td>
<td>8</td>
<td>6</td>
<td>29</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>28</td>
<td>36</td>
</tr>
<tr>
<td>2010-2011</td>
<td>18</td>
<td>8</td>
<td>10</td>
<td>36</td>
<td>9</td>
<td>2</td>
<td>11</td>
<td>35</td>
<td>47</td>
</tr>
<tr>
<td>2011-2012</td>
<td>13</td>
<td>8</td>
<td>7</td>
<td>28</td>
<td>12</td>
<td>2</td>
<td>14</td>
<td>28</td>
<td>42</td>
</tr>
<tr>
<td>2012-2013</td>
<td>10</td>
<td>3</td>
<td>10</td>
<td>23</td>
<td>10</td>
<td>1</td>
<td>11</td>
<td>23</td>
<td>41</td>
</tr>
</tbody>
</table>

** MSc PT – 3 Oral Maxillofacial Students have been counted even though they are not counted until the 4th year of their degree. **

---

** Department of Pathology Research Graduate Education Committee **

- Dr. Chandan Chakraborty, Graduate Chair
- Dr. Nancy Chan, Program Director – PA Program
- Dr. Zia Khan
- Dr. Mark Darling
- Mr. Matthew Riopel (Student Representative)
- Dr. Subrata Chakrabarti (Chair/Chief, Department of Pathology)
- Ms. Tracey Koning (Ex-Officio Graduate Program Administrator)
- Ms. Mair Hughes (Ex-Officio Administrative Officer)

---

** Faculty supervisors and research areas **

The Pathology Department currently has 46 Pathology faculty members approved for graduate student supervision, some of whom are heavily involved in the PA training program. Several of these individuals are also members of interdisciplinary graduate programs. Table 3 below lists our graduate faculty members.
### Table 3: Graduate Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Rank</th>
<th>Home Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul C. Adams</td>
<td>Professor</td>
<td>Medicine</td>
</tr>
<tr>
<td>Lee-Cyn Ang</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Edith Arany</td>
<td>Assistant Professor</td>
<td>Medicine</td>
</tr>
<tr>
<td>John R. Bend</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Jorge G. Burneo</td>
<td>Associate Professor</td>
<td>Clinical Neurological Science</td>
</tr>
<tr>
<td>Subrata Chakrabarti</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Chandan Chakraborty</td>
<td>Associate Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Ann F. Chanbers</td>
<td>Professor</td>
<td>Oncology</td>
</tr>
<tr>
<td>Nancy Chan</td>
<td>Assistant Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Thomas D. Daley</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Mark R. Darling</td>
<td>Associate Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Johannes A. Delpont</td>
<td>Assistant Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Savita Dhavantari</td>
<td>Assistant Professor</td>
<td>Medical Biophysics</td>
</tr>
<tr>
<td>Martin Duennewald</td>
<td>Assistant Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Bertha Garcia</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Candace Joyce Gibson</td>
<td>Associate Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Robert Ralph Hammond</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Carol P. Herbert</td>
<td>Professor</td>
<td>Family Medicine</td>
</tr>
<tr>
<td>Christopher Jon Howlett</td>
<td>Assistant Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Cindy Mary-Lynn Hutnik</td>
<td>Associate Professor</td>
<td>Ophthalmology</td>
</tr>
<tr>
<td>Anthony M. Jevnikar</td>
<td>Professor</td>
<td>Medicine</td>
</tr>
<tr>
<td>Tisha Rosalin Joy</td>
<td>Assistant Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Stephen Karlik</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Zia Ali Khan</td>
<td>Associate Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Joan Helen Mary Knoll</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Gideon Koren</td>
<td>Professor</td>
<td>Pediatrics</td>
</tr>
<tr>
<td>D. James Koropatnick</td>
<td>Professor</td>
<td>Oncology</td>
</tr>
<tr>
<td>Robert Lannigan</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Patrick P.W. Luke</td>
<td>Professor</td>
<td>Surgery</td>
</tr>
<tr>
<td>Joseph Frank Megyesi</td>
<td>Associate Professor</td>
<td>Clinical Neurological Sciences</td>
</tr>
<tr>
<td>Wei-Ping Min</td>
<td>Professor</td>
<td>Surgery</td>
</tr>
<tr>
<td>Madeleine Moussa</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Anthony C. Nichols</td>
<td>Assistant Professor</td>
<td>Otolaryngology</td>
</tr>
<tr>
<td>Sunil K. Parapurnam</td>
<td>Assistant Professor</td>
<td>Ophthalmology</td>
</tr>
<tr>
<td>Tianqing Peng</td>
<td>Associate Professor</td>
<td>Medicine</td>
</tr>
<tr>
<td>Michael J. Rieder</td>
<td>Professor</td>
<td>Pediatrics</td>
</tr>
<tr>
<td>Michael J. Shkrum</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Michael Joseph Strong</td>
<td>Professor</td>
<td>Clinical Neurological Science</td>
</tr>
<tr>
<td>Amardeep Thind</td>
<td>Associate Professor</td>
<td>Epidemiology &amp; Biostatistics</td>
</tr>
<tr>
<td>Charles G. Trick</td>
<td>Professor</td>
<td>Biology</td>
</tr>
<tr>
<td>Alan Bradley Tuck</td>
<td>Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Elena Tugaleva</td>
<td>Assistant Professor</td>
<td>Pathology</td>
</tr>
<tr>
<td>Rennian Wang</td>
<td>Associate Professor</td>
<td>Physiology &amp; Pharmacology</td>
</tr>
<tr>
<td>David J. White</td>
<td>Professor</td>
<td>Surgery</td>
</tr>
<tr>
<td>Zhu-Xu Zhang</td>
<td>Assistant Professor</td>
<td>Medicine</td>
</tr>
<tr>
<td>Xiu Fen Zheng</td>
<td>Ints Scientist</td>
<td>Medicine</td>
</tr>
</tbody>
</table>

### Graduate Student Awards:
- **Ontario Graduate Scholarships (OGS):** Kara McArthur (PA Program), Phaedra Henley, PhD Candidate (Research Program), Wahab Khan, PhD Candidate (Research Program), Michael Ruiz, MSc Candidate (Research)
- **QEII Graduate Scholarship in Science and Technology (QEII GSST):** Emily Keats, PhD Candidate
- **Dutkevich Travel Award:** Matthew Riopel, PhD Candidate, Emily Keats, PhD Candidate, Michael Ruiz, MSc Candidate, Rokhsana Mortuza, PhD Candidate
- **2013 Annual Pathology Research Day:** Emily Keats, PhD Candidate Received the Dr. M. Daria Haust Award for the Best Basic Science Presentation; Di Chen, PhD Candidate received the Best Basic Science Poster Presentation Award; Alex Pavlosky, MSc Candidate received the Best Basic/ Clinical Science Collaborative Poster Presentation Award
- **The Cameron Wallace Graduate Student Award:** Matthew Riopel, PhD Candidate
- **Graduate Thesis Research Award (GTRA):** Wahab Khan, PhD Candidate, Nathan Johnston, MSc Candidate
- **3rd Annual Diabetes Research Day:** Emily Keats, PhD Candidate and Michael Ruiz, MSc Candidate were awarded First Prize for Best Poster—Best Poster Presentation, November 13, 2012
- **London Health Research day 2013:** Matthew Riopel, PhD Candidate was awarded 2nd Place in the Platform Competition, March 19, 2013
- **London Laboratory Service Group – Profession Development Awards:** The recipient for 2013 is Audrey Blanchard, MSc Candidate
- **2012 Diane Y. Stewart Endowed Scholarship Award:** Audrey Blanchard, MSc Candidate was a recipient of this Award
- **Canada Society of Transplantation Annual Meeting:** Arthur Lau, PhD Candidate was awarded the Basic Science Trainee Award, March 13-16, 2013
- **2013 Till & McCulloch Meeting:** Emily Keats, PhD Candidate, abstract was selected as one of the top entries in this year’s Trainee Abstract Competition
- **Department of Medicine Research Day:** Rui Ni, PhD Candidate was awarded the Best Poster Presentation, May 30, 2013
Pathology Graduate Student Publications and Presentations – July 1, 2012 to June 30, 2013

Journal Articles:


Presentations:


Keats EC and Khan ZA. High levels of glucose cause cell cycle arrest and modify Wnt signalling to skew the differentiation of mesenchymal progenitor cells. Presented at the 15th CSEM/CDA professional conference and annual meeting. October 10-13, 2012 in Vancouver, BC.


Mortuza R, Feng B, Chakrabarti S. miR-195 regulate accelerated endothelial aging in diabetes through SIRT1. oral presentation at the 73rd ADA meeting, June 21-25, 2013, Chicago, IL.


1) Masters of Clinical Science, Pathologist Assistant Program

Program Overview

Our Masters of Clinical Science, Pathologists’ Assistant program is the largest such program in Canada and the only one accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). In their first year, students complete courses in general/systemic pathology, anatomy and embryology, histology, infectious diseases and pathology, forensic pathology, and environmental pathology. In their second year, students complete rotations in autopsy and surgical pathology, a research project, and 2 months of a community hospital rotation. Upon graduation, the students are highly skilled professionals in hospital pathology laboratories, assuming significant responsibility for the initial examination and dissection of all surgically removed tissues and to a variable extent, for the dissection during postmortem examinations. In September 2012, our program became a stand-alone professional program, whereby students graduate with a Master of Clinical Sciences (M.Cl.Sc.) – Pathologists’ Assistant program degree.

PA Program Enrollment

This is a highly competitive program in which we have received up to 40 applications each year, of which only four are usually accepted. This year’s first year class (2012-2013) includes 4 students, of which one is an international student from the USA. The reputation of the program as Canada’s only program accredited by NAACLS is increasing, as we are seeing more applicants from American students as well as job postings forwarded to our office from the USA.

PA Program Graduate Research Projects:

<table>
<thead>
<tr>
<th>Name</th>
<th>Supervisor(s)</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacqueline Hunter</td>
<td>Drs. Zia Khan and Nancy Chan</td>
<td>A comparative in vitro Study of Epithelial Cells Derived from Normal Mammary Glands and Breast Adenocarcinoma</td>
</tr>
<tr>
<td>Kathryn Logan</td>
<td>Dr. Zia Khan</td>
<td>Metabolic Memory in Vascular Endothelial Cells</td>
</tr>
<tr>
<td>Kara McArthur</td>
<td>Drs. Zia Khan and Mark Darling</td>
<td>Characterization of Salivary Gland-derived Epithelial Cells</td>
</tr>
</tbody>
</table>

These projects were all presented as poster presentations at the Department of Pathology, Western University Annual Research Day in April 2013. In addition, Kara McArthur presented her work at the American Association of Pathologists’ Association (AAPA)’s annual meeting in Portland, Oregon in September 2013.

PA Program Graduates – Career Opportunities

There is a well-documented need for well-trained PAs in Canada. There are approximately 225 community laboratories in Ontario and the vast majority of them do not have a PA, largely due to the demand exceeding the supply of trained professionals. We expect that if well trained PAs are available, each of these labs will hire at least one.

Additional career possibilities are available in other provinces as well as in forensic centres. It is also expected that over the next several years, this need will continue to increase because of the severe shortage of practicing pathologists and pathologists-in-training, required to meet escalating clinical demands.

As of June 30, 2013, our program has graduated 20 students. Three graduates went on to medical school after graduation. All of the remaining students found jobs working as pathologists’ assistants either in Ontario, in other provinces, and in the USA.

MCIsC PA Program Graduate Education Committee

Dr. Nancy Chan (Program Director; new)  
Dr. Elena Tugaleva (Medical Director)  
Dr. Subrata Chakrabarti (Chair/Chief, Department of Pathology)  
Dr. Chandan Chakraborty (Chair-Research Based Graduate Program)  
Dr. Madeleine Moussa  
Mr. Mike Graves (Clinical Coordinator)  
Dr. Rick Mann, Regional Supervising Coroner (Community Member)  
Mr. Thom Burberry and Ms. Rebekah Carter (Clinical preceptors)  
Ms. Kara McArthur (student representative)  
Ms. Tracey Koning (Ex-Officio Graduate Program Administrator)  
Ms. Mair Hughes (Ex-Officio Administrative Officer)

Future Directions

This is an innovative program with room to grow. We have been limited to accepting only 4 students per year, based on the capacity of our facility for training students during their practicum year, and to ensure quality, hands-on experiences. During the 2012/2013 academic year, talks between our department and pathologists in Toronto have been successful in establishing a partnership. In May 2013, we accepted 6 students in a new expanded class to commence September 2013. The students’ second year practicum rotation will take place in London and in Toronto; students will graduate with a Western University degree. We are excited about the growth of our program and its leadership role of this emerging profession in Canada.
Undergraduate Education

1) Undergraduate Medicine - Dr. Mariamma Joseph, Undergraduate Pathology Medicine Chair

Meds I and Meds II

During the past year, our faculty members were actively involved in various Meds I and Meds II courses which run simultaneously from London and Windsor sites. In each course, there are Pathology lectures, PCCIA as well as lectures in various other subject areas as appropriate to that system. Four members played strong and effective leadership roles in their courses by serving as course chairs/coordinators. Our faculty and residents in collaboration with Windsor Pathologists delivered a wide variety of Pathology Small Group Discussions which are highly regarded by medical students.

During the past year, we continued our efforts to increase the number of Observership Program opportunities offered to the Meds I and Meds II medical students. Our mandate is to elevate the visibility of Pathology to medical students early on and enhance student consideration of Pathology as a career choice. In addition to one-on-one observerships, we delivered a large group Pathology Interest Group session on “Introduction to the Multifaceted Field of Pathology”, which was very well received by students. We also offered to students an interactive small group observship session “Multi-head Microscope Teaching: An Undergraduate Pathology Observership” in which students in small groups learned some basic skills in the work up of real case scenarios and observed the life of a pathologist in an academic hospital.

Meds III and Meds IV

Last year, we (Drs. Joseph/Driman) developed a comprehensive “Pathology Exit Competency” document customized for our Meds III & IV students. In collaboration with the Department of Surgery (Dr. B. Taylor and Terri MacDougall) and a medical student (Matt Cecchin), we established a series of mandatory pathology seminars for Meds III students called "Pathology Case Conferences". We are developing 10 learning modules on a variety of clinically relevant practical pathology practice topics which will be threaded into the clerkship curriculum through lectures or self-directed learning. Our first Pathology Case Conference was held on September 30, 2013. We are quite pleased with the progress we have made with this educational activity.

We are also redesigning and reorganizing “Meds III - Clinical Clerkship Pathology Selective” by linking this educational activity with the Department of Surgery. This will be implemented next year.

Last year we continued to offer the Meds III – Clinical Clerkship Pathology Electives and Meds IV – Clinical Electives to a number of undergraduate medicine students. We also offered our Meds IV Integration, Consolidation & Enrichment (ICE) courses “Primary Care Pathology Course” and “Forensic Medicine Course.

Administrative Roles at Schulpich School of Medicine

One faculty member (Dr. Garcia) serves as the Vice Dean of Education. In addition many faculty members participate in a variety of Undergraduate Medicine Committees at Schulpich.

We had a rewarding experience with undergraduate medicine students last year and we will continue our efforts to enhance our visibility among the medical students at Western through teaching, mentoring and collaborating in various educational and clinical research projects. We will work closely with members of undergraduate medicine office and other departments and explore innovative and collaborative opportunities related to pathology education.

Information about specific courses can be found under Education, Undergraduate Medical Education on the Schulich School of Medicine and Dentistry web site.

2) Undergraduate BScN / BMSc - Dr. Candace Gibson, Undergraduate Chair

The department also offers undergraduate courses to nursing students, and undergraduate students in the Bachelor of Science (BSc) and Bachelor of Medical Sciences (BMSc) and Neuroscience (BSc) programs offered jointly by the Faculty of Science and the Schulich School of Medicine & Dentistry. In addition a pathology course is offered in the Magnetic Resonance Imaging Program at Fanshawe College by Dr. Gabril.

Bachelor of Science in Nursing Degree (BScN)

The Department of Pathology offers a key course (Pathology 2420A – Pathology for Nursing Students) in general and systemic pathology to nursing students in two BScN programs at Western University: the Western-Fanshawe Collaborative BScN Program and the Compressed Time Frame BScN Program. The course is offered online with a face-to-face tutorial component on each of the campuses. Course numbers are now close to 300 total students and assistance is offered through a full-time graduate teaching assistant.

Bachelor of Medical Sciences (BMSc) Program in Pathology & Toxicology

Interest in our Honors Specialization in Pathology & Toxicology is high and we still have academically very strong students coming into the 4th year to undertake research projects with faculty members in the department. We have been able to accommodate 15 students in the past two to three years. Additional resources (faculty and space) are needed to increase intake beyond this number. The program attracts outstanding students and the honors specialization in Pathology & Toxicology has the distinction of having the highest entrance average among the BMSc modules.
New Courses and Modules offered

Pathology 4200A – Current Concepts in the Pathogenesis of Human Diseases (NEW course offered in 2013-2014)

This course will cover current concepts in the molecular and cellular pathogenesis of selected human diseases. These will include endocrine, metabolic, neuropsychiatric, renal, cardiac and neoplastic diseases, with emphasis on defects in genes and/or the levels of hormones or growth factor receptors, cellular organelles, intracellular signaling pathways, and cellular metabolism.

Major in Pathology

To increase the number of students who have access to our pathology courses, we have introduced a Major in Pathology that will commence in Fall 2013. This major can only be taken in conjunction with another Major in the basic medical sciences degree program to obtain an honors undergraduate degree. Introduction of the Major may increase demand for our 4000 level Pathology courses, in particular for the Pathology 4500B course (Introduction to Forensic Sciences).

Interfaculty/Collaborative Courses

A new BSc honors specialization in Medical Health Informatics was introduced in 2012 and is jointly administered between the Department of Pathology (SSMD) and the Department of Computer Science (Faculty of Science). Students are required to take courses from the basic medical sciences including the Pathology survey courses (Pathology 3240A and Pathology 3245B), biochemistry, physiology and pharmacology plus the courses in health informatics and health information management that are taught by Dr. Gibson

Undergraduate Course Enrolment Data

Enrolment in the Pathology courses has been steady and increasing in recent years due to the increased intake of medical science students. Interest in these courses, particularly in the third year introductory survey courses, is high and we expect it to increase in the next year. Intake was increased in Pathology 3240A this past year to accommodate demand.

<table>
<thead>
<tr>
<th>Course</th>
<th>2008-09</th>
<th>2009-10</th>
<th>2010-11</th>
<th>2012-13</th>
<th>2012-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path 3240A</td>
<td>148</td>
<td>159</td>
<td>154</td>
<td>183</td>
<td>248</td>
</tr>
<tr>
<td></td>
<td>+ 12 grads</td>
<td>+ 15 grads</td>
<td>+ 16 grads</td>
<td>+ 7 grads</td>
<td>+ 10 grads</td>
</tr>
<tr>
<td>Path 2420A</td>
<td>279</td>
<td>283</td>
<td>289</td>
<td>299</td>
<td>282</td>
</tr>
<tr>
<td></td>
<td>+ 11 grads</td>
<td>+ 5 grads</td>
<td>+ 5 grads</td>
<td></td>
<td>+ 3 grads</td>
</tr>
<tr>
<td>Path 3245B</td>
<td>80</td>
<td>91</td>
<td>100</td>
<td>129</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>+ 4 grads</td>
<td>+ 4 grads</td>
<td>+ 4 grads</td>
<td>+ 4 grads</td>
<td>+ 5 grads</td>
</tr>
<tr>
<td>Path 4100F</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Path 4110G</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>3</td>
<td>Name change (MHI)</td>
</tr>
<tr>
<td>MHI 4100F</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>3</td>
<td>+ 4 grads</td>
</tr>
<tr>
<td>MHI 4110G</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>3</td>
<td>+ 4 grads</td>
</tr>
<tr>
<td>Path 4400B</td>
<td>32</td>
<td>39</td>
<td>40</td>
<td>51</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>+ 3 grads</td>
<td>+ 3 grads</td>
<td>+ 4 grads</td>
<td>+ 3 grads</td>
<td>+ 4 grads</td>
</tr>
<tr>
<td>Path 4500B</td>
<td>27</td>
<td>22</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>+ 3 grads</td>
<td>+ 3 grads</td>
<td>+ 4 grads</td>
<td></td>
<td>+ 5 grads</td>
</tr>
<tr>
<td>PathTox 4980E</td>
<td>9</td>
<td>5</td>
<td>14</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>MRIP6004/6005</td>
<td>...</td>
<td>...</td>
<td>10</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

Priorities/Considerations for the Future

1. Review current courses and offerings to identify areas where we can develop and offer new courses. A new course, Pathology 4200A (Current Concepts in the Pathogenesis of Human Diseases), is being offered in 2013-2014. This course fills the gap in introducing current biochemical concepts in the pathogenesis of selected human diseases.

2. Monitor the upcoming changes in Toxicology that will occur in the Department of Physiology & Pharmacology with retirements and other changes. We will explore the possibility of offering a molecular toxicology course through Pathology.

3. Explore avenues to increase intake of 4th year Honors Specialization Program students. Current enrolment in the 4th year thesis course is capped at 15, which is the maximum number of students who can be reasonably accommodated with current resources and faculty members.

4. Explore the possibility of increasing the class size for Pathology 3240A. Note: we did increase the class size for 2013-14 in Pathology 3240A to 300 and early enrolment data indicates that the class filled to capacity instantly upon lifting of constraints (priority registration
### Pathology & Toxicology Honors Specialization Program - 2012-2013 Students

<table>
<thead>
<tr>
<th>Student</th>
<th>Supervisor</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammaar Ahmad</td>
<td>Dr. Tom Drysdale</td>
<td>Determining the Role of Fibroblast Growth Factor Signalling in the Developing Thyroid</td>
</tr>
<tr>
<td>Brendan Caraher*</td>
<td>Dr. John Trevithick</td>
<td>Pilot study of North American ginseng-supplemented water treatment of diabetes</td>
</tr>
<tr>
<td>Gregory Douglas</td>
<td>Dr. Savita Dhanvantari</td>
<td>Expression of the Growth Hormone Secretagogue Receptor in the Myocardium of Diabetic Mice</td>
</tr>
<tr>
<td>Kuk Kang</td>
<td>Dr. Weiping Min Dr. Xiufen Zheng</td>
<td>Effects of indoleamine 2, 3-dioxygenase 2 in tumour development: A possible target for cancer therapy</td>
</tr>
<tr>
<td>Jina Kum</td>
<td>Dr. Zia Khan</td>
<td>Propranolol inhibits growth but does not cause apoptosis in hemangiomat stem cells: possible mechanism of regrowth</td>
</tr>
<tr>
<td>Young J. Lee</td>
<td>Dr. Cindy Hutnik</td>
<td>Selective Laser Trabeculoplasty: Induction of Matrix Metalloproteinase III Secretion Upon Selective Photothermolysis of Pigmented Trabecular Meshwork Cells</td>
</tr>
<tr>
<td>Stephanie Mok</td>
<td>Dr. Christopher Howlett</td>
<td>Determining Global Cytogenomic Changes in Classical Hodgkin Lymphoma</td>
</tr>
<tr>
<td>Stephanie Nantes</td>
<td>Dr. Madeleine Moussa</td>
<td>Localization of PLA2R antibody in membranous nephropathy and clinical correlation</td>
</tr>
<tr>
<td>Mathew Nicholas</td>
<td>Dr. Andy Watson</td>
<td>Reactive Oxygen Species (ROS) and Development of Mouse Preimplantation Embryos in Vitro</td>
</tr>
<tr>
<td>Jan J. Piskorz</td>
<td>Dr. Edith Arany</td>
<td>Characterization of Peroxisome proliferator-activated receptors and their coactivators in the diabetic placenta</td>
</tr>
<tr>
<td>Michael Salna**</td>
<td>Dr. Patrick Luke</td>
<td>The effects of Carbon Monoxide Releasing Molecules in Renal Transplantation and Ischemia Reperfusion Injury</td>
</tr>
<tr>
<td>Sydney Todorovich</td>
<td>Dr. Zia A. Khan</td>
<td>Expression and Function of T-box 2 in Infantile Hemangioma</td>
</tr>
<tr>
<td>Tianzhu Zhang</td>
<td>Dr. Subrata Chakrabarti</td>
<td>The Role of miR-146a on Extracellular Matrix Protein in Diabetic Nephropathy</td>
</tr>
<tr>
<td>Liangyi Zhou</td>
<td>Dr. Weiping Min Dr. Xiufen Zheng</td>
<td>MicroRNA and Ischemia Reperfusion Injury in Heart Transplantation</td>
</tr>
</tbody>
</table>

*Gold Medal Winner in Path/Tox  
**Scholars’ Elective Gold Medal Winner (Path/Tox HSP)

### Graduating Class at June 30, 2013

<table>
<thead>
<tr>
<th>Student</th>
<th>Where are they now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammaar Ahmad</td>
<td>re-applying to MD programs</td>
</tr>
<tr>
<td>Brendan A. Caraher</td>
<td>MD program at Western University</td>
</tr>
<tr>
<td>Gregory A.F. Douglas</td>
<td>MD program at University of Ottawa</td>
</tr>
<tr>
<td>Kuk T. Kang</td>
<td>re-applying to MD programs</td>
</tr>
<tr>
<td>Jina Kum</td>
<td>MSc program in Pathology at Western University</td>
</tr>
<tr>
<td>Young J. Lee</td>
<td>MD program at University of Ottawa</td>
</tr>
<tr>
<td>Stephanie Mok</td>
<td>MSc program in Pathology at Western University</td>
</tr>
<tr>
<td>Stephanie G. Nantes</td>
<td>MD program at University of Toronto</td>
</tr>
<tr>
<td>Mathew Nicholas</td>
<td>MD program at University of Toronto</td>
</tr>
<tr>
<td>Jan J. Piskorz</td>
<td>re-applying to MD programs</td>
</tr>
<tr>
<td>Michael Salna</td>
<td>MD program at Columbia University</td>
</tr>
<tr>
<td>Sydney M. Todorovich</td>
<td>Master of Public Health program at Western University</td>
</tr>
<tr>
<td>Tianzhu Zhang</td>
<td>Master of Clinical Science program (PA) in Pathology at Western University</td>
</tr>
<tr>
<td>Liangyi Zhou</td>
<td>MSc program in Pathology at Western University</td>
</tr>
</tbody>
</table>
3) Undergraduate Dentistry – Dr. Mark Darling, Dentistry Education Chair

Within the Schulich Dentistry curriculum, instruction in general and systemic pathology is introduced in the first year. A number of courses in pathology and oral pathology are also offered to undergraduate and postgraduate dental students.

Dentistry – Year 1

Two pathology courses are taught to Dents 1: Dentistry 5162 - Systemic Pathology directed by Dr. Jose Gomez and Dentistry 5170 - Oral Diseases I directed by Drs. Mark Darling and Tom Daley.

Dentistry 5162 - Systemic Pathology is a component of the General Medicine Unit and is a systems-based course which runs sequentially with Human Physiology, Pharmacology, Systemic Anatomy and Medicine. It examines specific aspects (etiology, clinical presentation, macroscopic and microscopic features, and pathogenesis) of common human diseases relevant to the practice of dentistry.

Dentistry 5170 - Oral Diseases I is an integrated course covering the common diseases of the teeth, periodontal and periapical tissues; specifically caries, gingivitis, periodontitis, pulp disease, periapical inflammation, regressive dental conditions and dental anomalies. It is designed to introduce the student to common dental pathologies early in their dental school careers. Faculty engage the students in one small group discussion introducing them to the concepts of histopathology of common oral diseases.

Dentistry – Year 2

In year 2, the theme of introducing students early to common oral diseases is continued in Dentistry 5235 (Oral Diseases II) also directed by Drs. M. Darling and T. Daley. This is a continuation of Oral Diseases I and is an integrated course combining oral medicine, oral pathology and oral radiology to cover a variety of diseases that affect the hard and soft tissues of the mouth, head and neck. Several faculty members engage the students in 6 small group sessions, encouraging discussion in the clinical and histopathological aspects of oral conditions.

Dentistry – Year 3

In year 3, Dentistry 5335 (Oral Diseases III) was also directed by Drs. M. Darling and T. Daley. This course is a continuation of Oral Diseases II, but focussed now on the less common oral diseases, that might be more infrequently seen by dentists. This included broader aspects of odontogenic, salivary, mucocutaneous and connective tissue diseases. Again, several faculty members engage the students in 7 small group sessions, encouraging discussion in the clinical and histopathological aspects of oral conditions.

Internationally trained Dental Students – Year 1

The Dentistry 5304 (Oral Pathology (ITD1 only) is directed by Dr. T. Daley. It is a comprehensive review of the more common diseases affecting the orofacial region and jaws, excluding periodontal diseases; and is intended to be a comprehensive Oral Pathology “refresher” for these students who already have significant experience in treating oral and dental diseases.
Dr. Jack Bend, Director of Research

Overview

The Department has continued to enhance its research capacity and impact. Even with a relatively small core faculty complement, the Department has developed a significantly larger and more comprehensive graduate program over the years. The key to our growth has been the productivity of our research faculty and cross-appointees in both basic science and clinical departments at the Schulich School of Medicine & Dentistry, and in the Faculties of Science and Social Science. Our researchers have continued to maintain their respective research programs, which are in perfect alignment with Schulich Medicine & Dentistry key areas of research strengths. These areas of research include cancer biology, cardiovascular science, biomedical imaging, infection and immunity, and global health.

Scope of our research

Our faculty has played and continues to play leading roles in some of the research areas of recognized excellence at Western, and a collaborative role in others.

Our members collaborate with investigators from Robarts Research Institute, Lawson Health Research Institute, and London Regional Cancer Institute within Schulich Medicine & Dentistry and with other Faculties at Western. Highlighted below are a few specific research programs in which the Department of Pathology plays a major role.

1. Cancer biology

Cancer research is one of the strengths of the Department of Pathology. The key researchers in this area are Drs. Joan Knoll, Chandan Chakraborty, Alan Tuck and Ann Chambers (cross-appointee from Oncology) (breast cancer); Madeleine Moussa and Jose Gomez (prostate cancer); Christopher Howlett and Kamila Rizkalla (hematologic malignancies); David Driman and Jeremy Parfitt (gastrointestinal and hepatobiliary cancer); Mariamma Joseph (skin and pulmonary cancers); Meg McLachlan and Michele Weir (gynecological cancers); Bret Wehrli (soft tissue tumors); Lee Cyn Ang and Robert Hammond (neurological cancer); and Thomas Daley and Mark Darling (oral cancers).

Researchers in the cancer biology group have received funding from Canadian Institutes of Health Research (CIHR), Canadian Breast Cancer Foundation (CBCF), Ontario Research Fund (ORF) and other national and international organizations. Department members continue to produce high quality publications in basic, clinical and translational aspects of cancer research.

2. Cardiovascular science and vascular biology research

Vascular biology researchers have focused their attention on: a) chronic complications of diabetes (Drs. Subrata Chakrabarti, Zia A. Khan), b) cardiovascular disease (Dr. Tianqing Peng; Lawson Scientist/cross-appointee), c) vascular stem cell research (Dr. Zia A. Khan), d) mechanisms of islet development in the pancreas (Dr. Edith Arany; Lawson Scientist/cross-appointee), and e) imaging modalities for pancreatic islets and cardiomyopathy (Dr. Savita Dhanvantari; Lawson Scientist/cross-appointee). This research group has continued to receive funding from CIHR, Canadian Diabetes Association (CDA), and the Heart and Stroke Foundation of Ontario (HSFO).

3. Environmental pathology research

The Department of Pathology has a large number of researchers who are involved in environmental pathology research and has established a graduate program in ecosystem health. This group has members from several departments including the Departments of Clinical Neurological Sciences (Jorge Burneo); Family Medicine (Carol Herbert, Amardeep Thind); Pediatrics (Michael Rieder, Gideon Koren [Ivey Chair in Molecular Toxicology], and the Faculties of Science (Irena Creed, Biology; Charlie Trick, Biology [Ivey Chair in Ecosystem Health]) and Social Science (Bradley Corbett, Sociology [Statistics Canada]; Regina Darnell, Anthropology). These new additions to the Pathology Graduate Program complement existing research expertise in the Department (Jack Bend, Chandan Chakraborty). The research efforts have received funding from Assembly of First Nations-Health Canada Environmental Contaminants Program, the Association of Universities and Colleges of Canada, UWO international curriculum funds and the IDRC.


Research in transplantation (clinical and experimental) is one of our Department’s focus areas, and has demonstrated strong growth during the last year. The backbone of the xenotransplant program is the expertise of people such as Drs. Bertha Garcia, Aaron Haig, David White and Weiping Min (cross appointees from Surgery), and Zhu-Xu Zhang (cross appointee from Medicine). This group of researchers is funded from CIHR, HSFO, MOTP, National Institutes of Health (NIH), and other national and international organizations. Research in this field has been very productive with a large number of publications in high impact journals.

5. Neuropathology

Key researchers in neuropathology research group include Drs Lee Cyn Ang and Robert Hammond (neurological cancer), and Michael Strong and Martin Duennwald (amyotrophic lateral sclerosis). A new collaborative research program was recently established with Drs Martin Duennwald (recruited 2012) and Dr Michael Strong, who are investigating RNA metabolism as a major contributor to both familial and spontaneous amyotrophic lateral sclerosis (ALS). They will be investigating the role of the RNA binding protein, RGNEF (Rho guanine nucleotide exchange factor) in ALS. This innovative program was recently awarded Bernice Ramsay Innovation Grant and Dr Duennwald has accepted a MSc level student to work on the project.

Summary of Publication Data (July 1, 2012 to June 30, 2013)

<table>
<thead>
<tr>
<th></th>
<th>Journal articles</th>
<th>Books &amp; Book Chapters</th>
<th>Published Abstracts</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD/CTA</td>
<td>48</td>
<td>3</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>PhD/Scientists</td>
<td>15</td>
<td>6</td>
<td>7</td>
<td>28</td>
</tr>
<tr>
<td>Cross Appointees</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>69</strong></td>
<td><strong>10</strong></td>
<td><strong>11</strong></td>
<td><strong>90</strong></td>
</tr>
</tbody>
</table>

Summary of Invited Scientific Lectures and Presentations
(July 1, 2012 to June 30, 2013)

<table>
<thead>
<tr>
<th></th>
<th>International</th>
<th>National</th>
<th>Provincial</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD/CTA</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>PhD/Scientists</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>7</strong></td>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

Summary of Grant Funding Data (July 1, 2012 to June 30, 2013)

<table>
<thead>
<tr>
<th></th>
<th>Total Awards</th>
<th>Award Value</th>
<th>2012-13 Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Externally Funded (PI)</td>
<td>18</td>
<td>$4,051,719</td>
<td>$1,084,950</td>
</tr>
<tr>
<td>Externally Funded (co-PI/co-investigator)</td>
<td>10</td>
<td>$7,535,188</td>
<td>$1,645,210</td>
</tr>
<tr>
<td>Internally Funded (PI)</td>
<td>17</td>
<td>$144,621</td>
<td>$118,811</td>
</tr>
<tr>
<td>Internally Funded (co-PI/co-investigator)</td>
<td>2</td>
<td>$150,669</td>
<td>$115,335</td>
</tr>
<tr>
<td><strong>Total Grant Funding:</strong></td>
<td><strong>47</strong></td>
<td><strong>$11,882,197</strong></td>
<td><strong>$2,964,306</strong></td>
</tr>
</tbody>
</table>

Building of research infrastructure

The Pathology Department continues to provide a significant amount of research infrastructure, which is organized as core facilities at London Health Sciences Centre (LHSC) or Western to facilitate research of investigators in London. It is our goal to support as many researchers as possible with this infrastructure.

- Tissue preparation facility
- Transplant histology laboratory services
- Archival tissues
- Ontario Institute for Cancer Research (OICR) tissue collection
- Morphometry core
- Real-time PCR core
- Palm Laser Dissection
- Shared MultimediA Resource and Teaching Centre (SMART) Centre

Postdoctoral Fellows, Postdoctoral Associates, Visiting Scientists

Dr. Yanan Cao, Mujianjiang Medical University (Chakrabarti Lab), Visiting Research Scientist – Diabetic Complications
Dr. Prasanth Puthanveetil (Chakrabarti Lab), Postdoctoral Fellow

**Dr. Robert Zhong Seminar Series**

In 2006, the Department of Pathology Research Committee initiated a monthly research seminar, named after Dr Robert (Zheng) Zhong, with the purpose of capturing the research interests of our department and the wider university and hospital community. The objectives are to enhance our departmental basic and clinical science
research, and to improve communication within the department and between departmental members and other researchers in the city. The seminars are accredited by the Royal College, Maintenance of Certification program.

2012-2013 Dr Zhong Research Seminars - Speakers

<table>
<thead>
<tr>
<th>Date</th>
<th>Speaker</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-06-13</td>
<td>Dr. Robert Bartha</td>
<td>Monitoring Cellular Metabolism and pH in the Brain with High-Field MRI</td>
</tr>
<tr>
<td>2013-06-04</td>
<td>Presentation cancelled</td>
<td></td>
</tr>
<tr>
<td>2012-04-02</td>
<td>Dr. Lorelei Lingard</td>
<td>The Field, the Centre, and Your Research Pathway</td>
</tr>
<tr>
<td>2012-01-31</td>
<td>Dr. Adrian M. Owen</td>
<td>Disorders of Consciousness</td>
</tr>
</tbody>
</table>

2013 Annual Pathology Research Day
Dr. Zia A. Khan, Chair Annual Pathology Research Day Committee

Research Day was held on February 26, 2013. Our guest speaker was Dr. Michael Ohh of the Department of Laboratory Medicine and Pathobiology, University of Toronto. His presentation was titled “Modern lessons from a 100 year-old VHL cancer syndrome”.

Pathology Research Day is accredited by the Royal College, Maintenance of Certification program.

2013 Research Day Awards

Chair’s Award for Best Presentation by a Resident
Dr. Murad Alturkustani

Dr. M. Daria Haust Award for Best Presentation by a Graduate Student
Emily C. Keats (PhD candidate, Z.A. Khan Supervisor)

Best Clinical Science Poster Presentation Award
Dr. Cady Pocrnich

Best Basic Science Poster Presentation Award
Di Chen (PhD Candidate, W. Min Supervisor)

Best Basic/Clinical Science Collaborative Poster Presentation Award
Alex Pavlosky (MSc Candidate, A. Jevnikar Supervisor)

Best Undergraduate Basic Science Poster Presentation Award
Jina Kum (BMSc student, Z.A. Khan Supervisor)

Challenges Ahead and Opportunities

Pathology has continued to make progress in research during the last year. We are marking the highest numbers of MSc to PhD transfers, successful graduate scholarships, and high impact publications. However, our growth is limited by the shortage of high quality wet laboratory research space, adequate space for core facilities, and faculty resource. Another challenge for all investigators is the decrease in available research funds that has also impacted negatively on our research endeavors. In spite of these limitations, we continue to review our stance and take measures to enhance our research capacity and impact. The Department of Pathology Research Committee is in the process of creating a blueprint for continued success in research. These initiatives will be made available in the next installment of our Annual Report.
Clinical Services Report
Dr. Mike Kadour, Report from Director

Pathology and Laboratory Medicine at London Health Sciences Centre and St. Joseph’s Health Care London, provides a wide range of routine and specialized laboratory testing and clinical consultation to support the diagnosis and treatment of patients within Southwestern Ontario as well as nationally and internationally. Enhancing care for our patients through high quality diagnostic services and collaborating with other clinical teams, enabling academic priorities, and supporting innovation.

The following are some highlights from Pathology and Laboratory Medicine over the past twelve months:

Recognitions
On July 21, 2012, Mike Graves (now retired); Coordinator for Autopsy Services received the Lloyd A. Kennedy Pathologists’ Assistant Award at the Pathologists’ Assistants Conference held during the 63rd Annual Scientific Meeting of the Canadian Association of Pathologists in Calgary. The award recognizes a Pathologists’ Assistant in good standing who has made outstanding contributions to continuing professional development in the area of medical laboratory practice. Mike’s knowledgeable and caring interaction with staff and students has certainly fostered a learning environment in pathology.

On November 3, 2012, the Blood Transfusion Laboratory presented their annual symposium at the Four Points Sheraton. This year’s topic was “It’s More Than ABO and RH: The complexities of a BTL Technologist”. There were 86 participants in attendance from throughout southwestern Ontario. The symposium was sponsored by LLSG, Orbcon and Canadian Blood Services.

On November 8, 2012, Dr. Norman Smith, Section Head for Toxicology & Therapeutic Drug Monitoring labs in the discipline of Immunology and Biochemistry at VH received the “Lifetime Achievement Award” presented by the Ontario Society of Clinical Chemists (OSCC) at their annual scientific meeting held in Niagara Falls. Dr. Smith has been with our laboratories for the past 30 years.

Dr. Liju Yang, Section Head for Clinical Immunology and Trace Elements Laboratories was invited by the Toronto group of Hospitals (Dr. K. Adel) to give presentations on trace element analysis and its clinical applications. The presentations were well received. Toronto trainees will be seeking for rotation in London Hospital Laboratories pursuant to this desirable exposure.

Leadership Changes
Over the last 12 months we experienced an influx of leadership change through retirements and organizational changes. The following leaders were successful:

- Dr. Robert Lannigan for Program Head for Laboratory Medicine
- Dr. Mike Kadour for Director for Pathology and Laboratory Medicine
- Sue Milburn for Manager for Pathology
- Jennifer Bell for Coordinator for Core Laboratory and Transplant Immunology at UH
- Vily Choperena for Coordinator for Specialty Chemistry at VH
- Kathy Demopoulos for Coordinator for Core Laboratory at VH
- Mary Emanuel for Coordinator for Molecular Diagnostics Laboratories
- Kim Spearin for Coordinator for Laboratory Client Support
- Renee Dickey for Support Coordinator for Specimen Receiving
- Dr. Sameer Elsayed for half time Medical Microbiologist at VH
- Dr. George Zahariadis for Section Head in Virology at VH
- Dr. Angela Rutledge for Section Head for Endocrinology and Maternal Serum Screening
- Dr. SueAnn Berend accepted a temporary locum Cytogeneticist position to cover during recruitment for a Cytogeneticist.

David Schaus, acting Coordinator for Microbiology, received a certificate for his nomination to the Gayle Talaskavich Memorial Award and was recognized for his leadership to improve staff health and safety at the 2013 Employee Health and Safety Awards presentation May 23, 2013.

This year’s Diane Y. Stewart Endowed Scholarship Award was awarded to two of our staff members: Jennifer Kelly (Medical Laboratory Technologist, Molecular Diagnostics) and Kattie Eagleden (Medical Laboratory Technologist, Pathology). Congratulations to both of them for their commitment to personal growth and development.
Pathology and Laboratory Medicine has ~462 clerical, technical, scientific and medical staff.

Laboratories on the Move

In January 2013, the South Street Annex Lab Test Centre and Pulmonary Function Lab moved to Victoria Hospital, Zone E, 4th floor. These moves went smoothly without any interruption in service for patient treatment.

In April 2013, the Pathology and Laboratory Medicine Administrative Team moved to Victoria Hospital, Zone E, 3rd floor. These moves were welcomed by the entire team.

Also, in April 2013, the Biochemical Genetics Laboratory located at the CPRI moved to Victoria Hospital, Zone E, 3rd floor. This move was a huge undertaking for the lab staff and they have settled into their new home.

In June 2013, the Hematology clinics and offices moved to a newly renovated area in Zone E, 5th and 6th floors. Staff and patients are now enjoying the new surroundings.

Accomplishments

On July 5, 2012, the Laboratory Services Partnership Project Steering Committee met to debrief and create a close-out report. An overview of the project resulted in committee praise for the successful implementation. Ongoing joint management reviews will continue in order to identify opportunities and initiate further improvements. London Laboratory Services Group (LLSG), a joint venture of London Health Sciences Centre and St. Joseph’s Health Care London and Middlesex Hospitals Alliance (MHA), an alliance of Strathroy Middlesex General Hospital and Four Counties Health Services partnered to look for options to sustain pathology and laboratory services upon retirement of the MHA laboratory physician at the end of 2011. MHA recognized that the environment for pathology services is changing rapidly with increased patient expectations around cancer diagnosis and emerging digital picture technology and therefore initiated a partnership with the local academic health services centre. A purchased services agreement was signed December 2011 whereby LLSG provides MHA with laboratory physician diagnostics and professional administration to satisfy the operating requirements of the Ontario Laboratory
Enabled by the existing integrated laboratory information system, the LLSG/MHA partnership has had a positive beginning and momentum. This initiative is the beginning of centrally coordinated pathology service which provides standardized care for patients and overcomes the community hospital challenges of both recruiting pathologists and maintaining quality standards. It has the potential to grow as other community hospitals find that they do not have the critical mass or volume of work to support core pathology services. The Ontario Southwest LHIN supports amalgamation of services that result in accessible health care for all patients who reside throughout the geographic area. On May 22, 2013, representatives from Pathology and Laboratory Medicine (PaLM) and Middlesex Health Alliance (MHA) met for the annual management review of 2011 service agreement between these two sites which has PaLM managing the MHA laboratory licence and related lab operations - quality and financial efficiencies were noted as well as a strong working relationship.

The Trace Elements Laboratory had a successful vendor inspection on December 13, 2012. Mary Major Sr. Manager, Clinical Field Operations and Emily Haglund Clinical Quality Assurance Auditor from Wright Medical Technology Inc., located in Arlington Tennessee, inspected the lab for the day. The audit focused on the Quality Management System, Laboratory Policies and Procedures as well as on-site laboratory inspection. The assessors were very impressed with our level of accreditation, lab procedures and the 10th floor facilities. External clients based in the U.S. do have F.D.A. requirements to assure their lab service providers meet standards.

2012 was a record kidney transplant year with 100 kidneys being transplanted into 95 recipients with diagnostic testing done by the Transplant Immunology Laboratory. Kudos to our lab staff!

In January 2013, we initiated a major program culture change to improve Identity and Information. This effort will address (i) strengthening branding, Doctor-Manager partnerships, roles and responsibility and decision-making, (ii) clarifying strategic and cultural direction, and (iii) building performance awareness and simplifying underlying data.

In January 2013, the Blood Transfusion Laboratory in collaboration with St. Joseph’s Health Care London (St. Joseph’s) Surgical Program has implemented a BloodTrack HemoNine refrigerator on the sixth floor of St. Joseph’s that securely dispenses blood for patient transfusions. The HemoNine allows the centralized LHSC laboratory which is located across the city to safely issue blood products. The locking refrigerator drawers utilize barcode technology and hospital electronic information systems to ensure compliance with industry regulations for controlled access, positive identification, product labeling, traceability, and record retention. Installation of the HemoNine is an innovative improvement that can reduce delivery times for patient ABO compatible cross-matched blood since the blood is stored at the point of care.

The Molecular Diagnostics Laboratories in collaboration with Dr. Richard Kim are working with SickKids in Toronto on a Pharmacogenetics proposal for establishing an Ontario approach to mainstream Pharmacogenetics services (genetics-guided drug decisions to minimize Adverse Drug Reactions). The proposal has been submitted to the Ontario Ministry of Health.

The Molecular Diagnostic Laboratories team submitted an expression of interest package to the Ministry of Health Long-Term Care in order to repatriate Genetic testing back to Ontario. The MoHLTC received an abundance of applications (>100) and will formerly announce their decisions later this year.

The Helix Millenium Module of Cerner is currently being built for reporting of patient results within the Molecular Genetics Section within the Molecular Diagnostics Group. This build should be completed in early 2014.

Ontario Laboratory Information System (OLIS) project - March 26, 2013 marked the first day that laboratory information began transmitting to the provincial repository as planned within the project timelines. Test results were released in stages and validation of the accuracy of the orders completed at each step by the LHSC project team and various user groups across the region. Necessary interfaces for information sharing between our Cerner database and the provincial repository continue. A memorandum of understanding was signed between laboratory administration and senior executives of the regional hospitals in November for signatures to indicate each hospital’s decisions about participation in sending laboratory test results to the OLIS provincial repository and viewing OLIS stored data.

Canadian Blood Services implemented the Canadian Transplant Registry (CTR) for Highly Sensitized Patients (HSP) in May 2013. Transplant donor results entered into the CTR after analysis by the Transplant Immunology laboratory staff will be used for organ offers and acceptance/decline of offers between participating hospital programs throughout Canada. Inter-provincial sharing of HSP kidneys will also begin at the same time as part of the Trillium Gift of Life “receive one, give one” kidney transplant program.

In June 2013 we had a very successful OLA/QMP-LS mid-cycle surveillance assessment for VH and UH licenses - compliance is over 99%. Self-assessment for the other 4 yielded excellent results. Our internal audit processes produced lots of learning for our staff to prepare for the full peer assessment in 2015.

The HUGO project has been at the forefront this year for the labs. We have reviewed approximately 150 ordersets, many are written correctly after following the mandate that the order set capture practices that are done at least 80% of the time. Unfortunately some services have not followed this build mandate and have included numerous routine and specially tests which if selected will significantly increase testing. Continued communications with the HUGO team is on-going to insist that the laboratories review comments are integrated into the final draft versions. Lab resources on this phase are extremely high, engaging LIS staff, Managers and Medical/Scientific leaders.
A highly successful RFP was completed for glucose meters across the city resulting in savings for the organization of $250,000 over 5 years. This was a complex and very well managed exercise led by our POCT Coordinator Wendy Stratton and Sue Vollbrecht Manager for Laboratory Medicine. This large scale project involved nurses throughout the city participating in HMMS product selection. Collaborative efforts by laboratory point-of-care, information technology, HMMS suppliers, the vendor, and clinical educators/ coordinators resulted in successful replacement of 350 meters for approximately 3,500 users. Planned in in conjunction with the HUGO project, these meters will transfer test results wirelessly to PowerChart electronic patient record, utilizing armband barcodes for improved patient identification safety and access to test information. Training took place in stages at the various sites and the go live was the end of June 2013.

An accreditation inspection of the Transplant Immunology lab by the American Society of Histocompatibility and Immunogenetics (ASHI) was on June 3, 2013. Facilities and Planning worked with laboratory leaders to finalize a renovation plan that will meet industry standards for DNA replication processes that have been sited at previous inspections. This is an important step as closure of the lab is a major risk to the operation of the hospital Transplant program. Transplant Immunology laboratory achieved a recommendation to award accreditation on June 3, 2013 after the American Society for Histocompatibility and Immunogenetics (ASHI) inspection. Written commitment from LHSC senior administration to fund improvements and facilities redesign for the laboratory was noted favorably by the assessor to meet legislated requirements.
Anatomical Pathology – Reports from Medical Leaders
Dr. Helen Ettler, Surgical Pathology

Surgical Pathology is staffed by 28 pathologists, three of which are dedicated neuropathologists. There are also two oral pathologists within the Western University Pathology Department. The sections heads are: electron microscopy (Dr. M. Moussa), histology, gross room, specimen receiving (Dr. K. Kwan) and immunohistochemistry (Dr. B. Wehrli). One new pathologist, Dr. Joanna Walsh, began work in September 2012. A second new pathologist, Dr. Nikhil Sangle, commenced work in August 2013. He brings expertise in hematopathology, gastrointestinal and soft tissue pathology. We currently have a full complement of staff.

Surgical Pathology is actively involved in service, education, quality and research with individuals contributing their time to each area in differing amounts. Two pathologists have significant protected time in research, while two others spend significant time with university administrative duties. Our subspecialty teams are fully developed with pathologists with expertise and interest each dedicated to several teams. This has improved consistency and quality in reporting and has been well received by our clinical colleagues. This has also allowed for our active involvement in many multidisciplinary Tumor Boards.

Specimen volumes, particularly gastrointestinal (GI) biopsies, continue to increase. There were 52,739 surgical specimens in 2012 (48,600 in 2011). The increasing volumes have placed pressures on all areas of the laboratory, with a resultant increase in reporting times. All teams are facing increasingly lengthy and complex reporting requirements. We have more than 70 synoptic reports, with updated versions being introduced recently (2013).

The length of the Cancer Care Ontario (CCO) mandated synoptics, as well as the not always user friendly Cerner computer system, has been a source of frustration. A recent Cerner upgrade alerting us to incomplete synoptic report data should lead to a reduction in incomplete reports.

The consultation service also faces increasing demand from pathologists in our Local Health Integration Networks (LHINs) and beyond. The number of pathologists across Ontario providing this type of consultation service seems to be decreasing, making our consultation service highly sought after. In 2012 we received 2,259 surgical pathology consult cases. These consults add increased pressure to our busy internal case load.

Surgical Pathology continues to have a strong quality assurance program, “PIQM”. Most activities are in line with those outlined in the Standards 2Quality guidelines. This program is currently lead by Dr. Helen Ettler. Protected time is provided to ensure this program continues to grow and improve. Other pathologists from Ontario have used our program as a model for their own departments.

Surgical Pathology does face several challenges and opportunities. The complexity of surgical pathology material will likely increase further, with clinicians requesting more complex immunohistochemistry and molecular testing to help manage patients. While our department has molecular expertise, this will place a strain on resources and pathologist time. Regional initiatives and increasing workload are additional challenges.
Dr. Mike Shkrum, Autopsy Service

The Autopsy Service continued its commitment to high quality service, teaching and research in 2012-13.

The autopsy service case volume increased overall in 2012. Compared to 2011, there was a 9% increase in the number of autopsies (from 507 to 556). The main factor was the increased number of coroners’ cases (from 370 to 439) due to closure of hospital autopsy services in Stratford and Chatham.

Dr. E. Tweedie became the coordinator of the forensic course offered to the fourth year BMSc and medical students.

Drs. Tugaleva and Shkrum continued as co-supervisors of a MSc candidate - Audrey Blanchard, a Pathologists’ Assistant at LHSC. She is doing a study of infant organ weights.

Dr. Shkrum, the Director of the Motor Vehicle Safety Research Team at Western, is a CoPi on an AUTO 21 grant which is funding a MSc student (Shayan Shekari). His study on cervical spine injuries is part of study of fatal child injuries in motor vehicle collisions. Dr. Shkrum became a Co-Investigator in a study funded by the Academic Medical Organization of Southwestern Ontario (AMOSO) focusing on “A Multidisciplinary Team Approach to Prevent Motor Vehicle Crash-related Injuries in Southwestern Ontario”.

**Weaknesses**

- Increasing volume and complexity of surgical/cytology cases has meant increased pressures on pathologists on the Autopsy Team

**Opportunities**

- Increased service demands has meant enhanced teaching for residents and other trainees and research possibilities

**Threats**

- Collapse of community hospital autopsy services has led to an increased number of coroners’ cases from outside of London referred to LHSC. Also an increased demand for private autopsies without formal agreements with community hospitals

**Staff**

- Three certified forensic pathologists
- Seven other pathologists with interest in doing autopsies (“Autopsy Team”)
- Three neuropathologists, one of whom specializes in forensic neuropathology
- Very experienced Technical specialist
- Eight highly competent Pathologists’ Assistants

**Facilities:** Autopsy Suite – University Hospital

**Hours of Operation:** (effective Jan.1/12): Monday to Saturday 8 am to 4 pm (Sunday service in exceptional cases)

**Scope of Practice:** The autopsy service at LHSC, in addition to conducting postmortem examinations for the clinical services on behalf of families, is a regional forensic pathology unit not only performing autopsies for local coroners but also assisting in medical legal investigations of complex deaths (e.g. homicides, pediatric deaths) in southwestern Ontario. In 2012, there were 556 autopsies done at LHSC. Of these, 439 were coroners’ cases and 117 were hospital-consent cases (down from 137 in 2011). There was an overall case increase of 9% from 2011 (from 507 to 556 cases) due to the increased number of coroners’ cases (370 to 439). The number of cases referred outside of London rose from 132 to 178 cases.
The Cytology laboratory is run by a team consisting of the Division Leader, Coordinator (D. Murphy), 9 cytotechnologists, 1.5 lab assistants and 12 pathologists of which 4 are cytopathologists. We provide a wide range of diagnostic services to our physicians and deliver expert cytology consultation service to our regional pathologists. For the year 2012-2013, we processed 26,581 samples in the lab. Our cytotechnologists continue to provide an efficient and highly valued Rapid Onsite Evaluation (ROSE) FNA service to clinicians (1117 cases, 3 locations) and this volume is steadily increasing. The strength of our lab lies in its continued efficiency in providing test results with Turn Around Time in lab target. Our team members strongly believe in a patient centered approach to cytology practice and we are passionate about education. We try to create an environment that drives continuous quality improvement and we have a robust ongoing technical and professional quality management program in place.

Education, a major thrust of our cytology division continues to thrive in our division. In the past year, our monthly “Medical Leader’s Multi head Microscope Rounds” for cytotechnologists created a stimulating educational environment which we believe enhances team relationships. Our team members and residents actively participated in our “Monthly Cytology Rounds” and we included current topics, cytology E conferences and journal clubs in an attempt to improve communication and interaction. Our team members were involved in the ongoing teaching of Pathology residents and cytology fellows. In addition several of our cytotechnologists served as Clinical Educators with the Michener Institute of Health Sciences.

On April 6, 2013, our cytology team offered a successful CME event “Practice of Cytopathology: Recent Advances” at the University Hospital designed for community pathologists and cytotechnologists which was very well received. This symposium was jointly organized by the Department of Pathology, Western University and the London Laboratory Service Group, LHSC.

In the past year, our professional team members made a number of major contributions in the cytology field, at the provincial and national levels. Dr. Weir served as the chair of the QMPLS Scientific Committee for Cytology and chaired the Area of Focused Competence (Diploma) Program Committee for Cytopathology, RCPSC. The latter role led to the establishment of a Royal College accredited fellowship training in Cytopathology in our department, a first in Canada (Dr. Emily Filter, Fellow). Dr. Weir co-authored two important peer reviewed cytopathology guidelines for the cytology community 1) Standards 2 Quality – Guidelines for Quality Management in Pathology Professional Practices, Cytopathology and 2) Canadian Society of Cytopathology Guidelines for Practice & Quality Assurance in Cytopathology. In addition, past year, our team members and residents published a number of peer reviewed publications related to cytology and presented many abstracts.

Our future goal is to maintain excellence in cytopathology education and service. We strive to sustain a supportive environment for medical and technical staff to grow in their chosen fields. We believe the Laboratory’s success is linked to inter- professional team work. Overall we are very pleased with our progress and accomplishments during the past year.
This last year has seen continued challenges for the Division. We were able to complete our Medical Microbiologists recruiting process. The Infectious Diseases service is still actively recruiting but has not yet been able to fill the position for Infection Control which has left Dr. Michael John in this position and as such he has not been able to move more fully into the lab. We are also still working on filling the Technical Co-ordinator position but in the interim David Schaus has done a wonderful job in an acting capacity. Despite the unsettled situation we have been able to streamline work flow, using the new capital equipment and this year have been actively evaluating other new equipment in the hope of making further progress in improving workflow. A great deal of effort has been put in by Laboratory Medicine to address all aspects of the laboratory support for the Transplant program. These changes are coming into effect in the next year and should improve our capabilities. For the upcoming year, we will be looking to appoint a technical co-ordinator and hopefully the medical support of Infection Control will be settled. We will be continuing to evaluate equipment in order to improve workflow and introduce new tests and technologies in the coming year. The introduction of CPOE will be an interesting change and opportunities to develop a more comprehensive utilization management program is anticipated for all of the lab services as a result of this initiative. The OLIS program is also moving ahead and is providing its challenges, however progress is being made in this area as well. On the technical side in the microbiology lab we continue to struggle with 20% of the workforce on workplace accommodations and some more job sharing requests in the offing. In addition we have ongoing retirements. We are hoping to be able to continue replacing staff when vacancies arise but budget pressures may preclude this. Our major challenges in the upcoming year will be to continuing to support ongoing hospital initiatives under budgetary and staff constraints.

Staff: 4.5 Medical Microbiologists, 37 MLT’s 2 virology MLT’s, 8 Microbiology MLA’s. 1 Virology MLA., 2 secretarial support.

Facilities: The facilities are located on the 10th floor of B wing at LHSC Victoria campus. It is a city wide facility. The hours of operation are 0700-2300 7 days a week. We are a full service Microbiology Diagnostic laboratory service. We handle ~ 240,000 samples of varied types in a year.
Space:
- Final move of SSH/VH PFT lab into final resting place: VH E4 space.
- Excellent, efficient clinical testing rooms have appropriate space for patients in wheelchairs, and rarely in stretchers as well.
- A survey has been constructed and will begin initially at VH to assess our overall patient experience.

IS:
- Chuck is investigating the very important step of online / Cerner access of all PFT clinical data, including numerical data, graphs, and physician reports from the PFT-specific Breeze software.

Staffing Challenges:
- Based on current clinical testing volumes, how do we plan for # staff and distribution across UH vs VH for future attrition, based on impending retirements?
- How do HUGO orders impact our scheduling?

Financial issues:
- Loss of income / billing for no shows (both professional medical and hospital income); can we bill these patients?
- Can we improve attendance by providing reminders for appointments, either computer-driven or human staff-driven?

Workflow:
- Concerns for workflow balance / division between UH and VH for the 2 Pulmonary Functions Labs, given that the majority of Respirologists, and thus the majority of Respirology clinical work are at VH.
- Ideas / questions we are addressing:
  - How do we keep UH PFT lab functioning efficiently?
  - Possibility of routing more outside referral (eg. community specialists, FPs) testing at UH?
  - Foster more clinical research studies with greater focus of research studies at UH?
  - Advertise the availability of exercise studies (eg. cardiopulmonary treadmill or bicycle ergometry, 6-minute walk tests) to increase this volume?
Hematology & Blood Transfusion Laboratories support the core laboratory, investigational hematology, flow cytometry and blood transfusion. In addition, we support the Strathroy Middlesex General Hospital and Four Counties Hospital Laboratories. Medical support consists of 3 FTE staffed primarily by 5 hematologists. In addition hematopathology provides shared support for flow cytometry unit and coagulation and thrombosis is supported by hematologist Drs Kovacs and Minuk. 24/7 coverage for these laboratories is provided by group of 9 hematologists. As one of the largest Academic Health Sciences Laboratories in Ontario, we are actively seeking funding for additional FTE positions in the areas of Transfusion and Morphology to bring us to staffing levels of 5 or 6 FTE comparable with other centers.

Our laboratories continue to be provincial, national and international leaders in the areas of Flow Cytometry and Blood Transfusion. Our technical staff members, Kathy Eckert and Mike Keeney, have been recognized with national and international awards. We are actively involved in method development, quality assurance and both investigator driven research and industry research. These activities reflect culture of innovation and joint partnership between technical and medical staff over the years. For this culture to continue it is critical that the concentration of expertise by senior technologist be transferred to the next generation. To this end we have formally established monthly teaching rounds to facilitate technologist and medical staff learning in a collegial environment. We continue to support the Ilaine Matuscin award to promote CME among our staff in Blood Transfusion.

In the past year, Flow cytometry has developed and introduced new tests to meet the clinical demand such as testing for Minimal Residual Disease (MRD) in childhood leukemia and circulating tumor cells in patients with solid tumors. Blood transfusion has undertaken initiatives to standardize reporting of transfusion reactions and now remotely support transfusion at the St Joseph’s site through automated fridge dispenser after hours. HUGO order sets for transfusion developed in the past year will hopefully provide a greater accountability for transfusion utilization in the region. A new initiative undertaken with McMaster and Ottawa linking transfusion databases with clinical database now allows direct comparisons of blood utilization with other academic centers. We anticipate this data will provide a better understanding of blood utilization and quality control and be fruitful area for future researchers in transfusion.

Education in laboratory utilization and understanding basic hematology and transfusion testing is one of the primary objectives of our group. Residents in general medicine, hematology, pathology and anesthesia routinely rotate through our laboratories and rate the teaching as one the highlights of their rotation.

The current challenge remains to develop and support (FTE) medical and technical staff for careers in laboratory hematology. This has been identified as the primary goal for our group in the years to come and we are actively seeking support to continue our tradition of excellence.
The Professional and administrative staffing in Clinical Biochemistry and Immunology is stable. There is on-going restructuring of the Organizational Charts. The strength of the labs is their continued efficiency in (test) utilization. Increasing demands in test menu and volumes are being addressed within the current budget! The move to the 10th floor of the B wing of the Victoria Hospital of the Specialty Labs and the Biochemists has made operations much more efficient. We continue to enjoy a privileged position as a desirable referral lab for client institutions from all across Canada and even from some places in the U.S.A. e.g., to our Trace Elements Laboratory. The name of the Laboratories will now read Pathology and Laboratory Medicine instead of LLSG (London Laboratory Services Group).

**Strengths:** committed, experienced, professional, administrative and technical staff who value quality above all and are “utilization” conscious almost to a fault.

**Weakness:** Aging staff. We have recruited a new Clinical Chemist, a trainee from Hamilton.

**Threats:**
- The limited resources, including low volume of professional staff, implies just being able to get the clinical work done i.e., put out quality results. Academic activities therefore suffer, although valiant efforts are made by the Biochemists to keep an active teaching schedule going at Western’s Department of Biochemistry. The 3386b Course is the best rated course in all of Biochemistry, including the basic Biochemistry courses.
- Potential loss of aging staff and difficulty replacing them.

**Opportunities:** Fine tuning of our labs as a referral lab, making them profit centers e.g., TEL and Immunology. Also, to enhance partnerships, such as with Roche.

**Looking Ahead:** We are looking forward to continued gelling of the Professional and Administrative staff under the new Organizational Chart format.

**Staff:** 1 MD Biochemist, 4 PhD Biochemists, 1 office staff, 97 Technologists, 45 Technicians and 2 Clerks

**Facilities:** All of the Specialty Labs including Immunology are located on the 10th floor of the B wing of the Victoria Hospital. There are two large Core Labs, one at VH and the other at UH. There is also a modest sized Core Lab at SJHC.

**Hours of Operation:** The Core Labs operate 24/7 at UH and VH and from 7am to 11pm at SJHC; the Specialty Labs work 8 am to 4 pm during regular week days.

**Scope of Practice:** Full service Biochemistry and Immunology Labs, which are also referral Labs.
Department of Pathology
Schulich School of Medicine & Dentistry
Western University
Dental Sciences Building, Room 4044
London, Ontario, Canada N6A 5C1
Telephone: 519-661-2030
www.uwo.ca/pathology