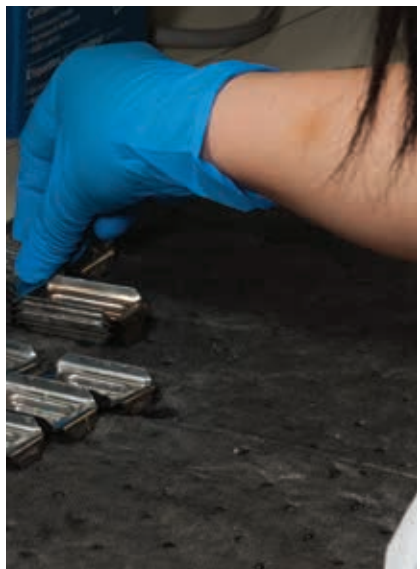
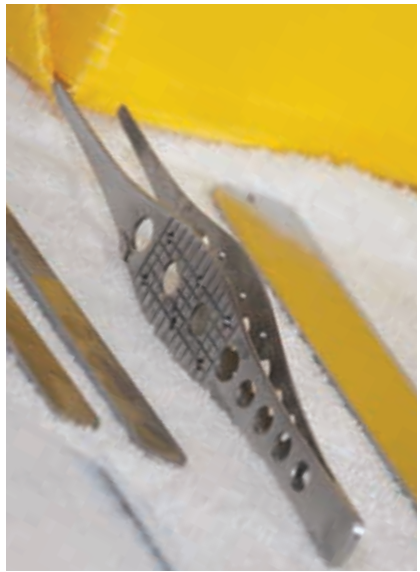


DEPARTMENT OF  
PATHOLOGY  
— & —

LABORATORY  
MEDICINE

# 2017 ANNUAL REPORT





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## Executive Summary

### Department Structure and Organization

The Department of Pathology and Laboratory Medicine (DPLM) comprises the medical and scientific staff for Calgary Laboratory Services (CLS). Throughout the calendar year of 2011, it was composed of 4 CLS Divisions (re-named Clinical Sections in early 2012) and had 68 primary clinical MD appointees and 13 clinical PhD scientists. There were 32 members with University of Calgary GFT academic appointments and 48 with Clinical or Adjunct academic appointments, as well as one part-time locum. The Medical/Scientific staff are located at all acute-care hospital sites, at CLS' central laboratory facility the Diagnostic and Scientific Centre, and at the University of Calgary Health Sciences Centre, Heritage Medical Research Building, and Health Research Innovation Centre.

### Accomplishments and Highlights

Faculty members with primary appointments in the DPLM are active in research. We held \$2.59 million in external grant funding as principle investigators and published 127 peer-reviewed papers as well as 10 book chapters in 2011. The mean Impact Factor of the journals we published in for the year 2011 was 3.66.

We also make very significant contributions in teaching. Our postgraduate clinical training programs (Anatomic Pathology and Neuropathology Residency training programs and Fellowship programs in a variety of areas) trained 17 Anatomic Pathology residents, 2 Neuropathology residents and 6 fellows in 2011. Our faculty contributed several thousand hours of post-graduate medical education and ~1200 hours of undergraduate medical education teaching.

Two faculty members were promoted this year. Three faculty members currently hold external salary awards to support their meritorious research. One faculty member was the recipient of the 2011 Canadian Association of Pathologists' Junior Scientist Award, another the International Society of Gynecological Pathologists' Robert Scully award, and yet another the Society for Pediatric Pathology's Presidential Award; faculty members were recipients of Faculty of Medicine Faculty-wide awards in 2011, including the Guenter Distinguished Achievement Award for International Health and the Faculty of Medicine "Social Accountability" Award.

We had another outstanding year for recruitment. A total of 5 new clinical and 2 new GFT faculty members were hired in 2011.

The DPLM and CLS held a two-day combined planning retreat on October 1 and 2, 2011 at Waterton Lakes National Park to discuss our vision for elevating research, education, and clinical service to new heights and to support the development of enhanced medical leadership skills. The latter has resulted in individualized programs for current leaders to enhance their leadership skills based upon 360 reviews.

A major accomplishment for this year was the relocation of all clinical testing from the Tom Baker Cancer Centre Pathology Laboratory (TBCC) to CLS. Although this move proved controversial, this change should both enhance the quality of these services and improve test turnaround time.

### Quality Programs

CLS has a comprehensive quality assurance program. Laboratory-wide performance indicators are reported monthly and there is a formal critical incident reporting and resolution process. We also monitor several indicators of customer satisfaction.

## Challenges

All across Canada, pathology and laboratory services have come under increasing scrutiny and repeatedly stories of “lab error” have been described in the press. Some of these errors have been egregious, were not dealt with appropriately by those who were aware of them, and, therefore, resulted in avoidable harm to additional patients; press coverage of these lab errors seems warranted and in the public interest. This has not happened in Calgary.

CLS performs more than 22 million laboratory tests per year, and our record, considering the volume of testing that we do is amongst the very best in North America. As the Head of the Department of Pathology & Laboratory Medicine in Calgary, I can assure you that we do not ignore and hide our errors but rather we disclose them to the affected patient, study them, and learn from them. One of the most difficult tasks performed by pathologists is interpreting microscope slides; this process is not an exact science as variation in the microscopic appearances of cancers is normal, even when viewing multiple slides of the same cancer from the same patient. The variation in the microscopic appearance of cancers is further compounded from patient-to-patient, even when viewing the same type of cancer. In other words, the work we do is not straightforward. Subtle variations in the microscopic appearance of a cancer can affect patient treatment and prognosis as can the results of a myriad of ancillary tests. Suffice it to say that, although variation in the skills and qualifications of pathologists may vary considerably from region to region across Canada, we try to set the bar very high when hiring pathologists to work at CLS and, to the extent that it is humanly possible, the medical leadership in the DPLM and CLS make certain that all of our pathologists have strong diagnostic skills that are appropriately matched to the work assigned to them. Speaking personally, I can honestly say that I do not believe that there is a single pathologist working at CLS whose diagnostic skills are suspect or are mismatched to their job descriptions. There is not a pathologist working at CLS who I would not trust to make a diagnosis on my wife or my daughter. Nevertheless, press coverage will likely continue to be a challenge.

Every year, we face the challenge of providing increased services without proportionate increases in funding. Therefore, especially when the system is short of money, one must look for inefficiencies and to consolidate duplicated services which allow for savings which can be reinvested to improve services. Although it is often difficult to gain 100% consensus on such changes, difficult decisions sometime need to be made as this is the only practical way to improve lab services when funding is tight.

Operationally, our biggest challenges relate to capital funding. Because of the large deficit within Alberta Health Services (AHS), purchasing necessary capital equipment, renovating old space, and developing new space continue to be problematic.

## Workforce Planning

Meeting increasing workload and handling increased workload complexity without a significant increase in medical/scientific staff workforce has been our major challenge throughout my first six years in this position. Because pathology and laboratory medicine are services, we have no ability to control our own workload, as this is determined by numbers of surgical procedures, orders for laboratory tests, etc. To further complicate workforce matters, laboratory physicians are not fee for service, and, thus, there is no simple mechanism to fund new positions based upon workload expansion. Over the past few years, CLS has authorized the creation of new positions when there was a documented need and sufficient funding. There are several possible options to address future workforce needs and create newly funded positions; these include CLS, AHS, Alberta Health and Wellness (AHW) (after movement of the laboratory physician funding envelope into the Master Agreement), or a proposed new University of Alberta/University of Calgary Province-wide Academic Alternate Relationship Plan (PAARP) and so we must work to facilitate any of these options. To complicate matters even more, the pathology and laboratory medicine workforce across Canada is ageing and there are

inadequate numbers of new graduates entering the workforce. Therefore, recruitment to replace retirements will also be further challenge.

Although historically a chronic problem, over the next year, funding for new positions appears to be readily available and our major issues will be finding sufficient highly qualified candidates as well as sufficient office space and microscopes for newly hired pathologists.

## Future Directions and Initiatives

The year 2012 will be an exciting one as many long-term projects need to come to completion in a time of fast and furious changes and great uncertainty.

The South Health Campus will open in 2012. The exact opening date is not certain but the laboratory will need to be ready before it can open. Recruitment began in 2011 for 8 new positions for the new hospital.

Also opening in 2012 will be the new FMC “regional” Autopsy Suite and Morgue, which will replace the current antiquated facility. Opening dates for several other large capital projects (the McCaig Tower at the Foothills Medical Centre and expansions of Rockyview and Peter Lougheed Hospitals) are uncertain and, thus, planning for laboratory needs and/or actualizing laboratory services related to these capital projects is problematic.

One mechanism employed in recent years in pathology departments across North America to deal with the shortage of pathologists has been to employ Pathologists’ Assistants. In most instances in Canada, these are individuals with on the job training who are taught to examine and describe the gross appearance of tissues and organs removed during surgery and then submit portions of these structures for histologic processing resulting in slides which can be examined by a licensed pathologist. Currently, there is only one National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) certified training program for Pathologists’ Assistants in Canada. The DPLM and CLS have developed a proposal for a M.Sc. PA Training Program and submitted it to the NAACLS for approval. If all goes well, our first students could start as soon as July 2012.

In 2012, we will open a new residency training program in General Pathology which we hope will meet the need for general pathologists in Alberta and across Canada.

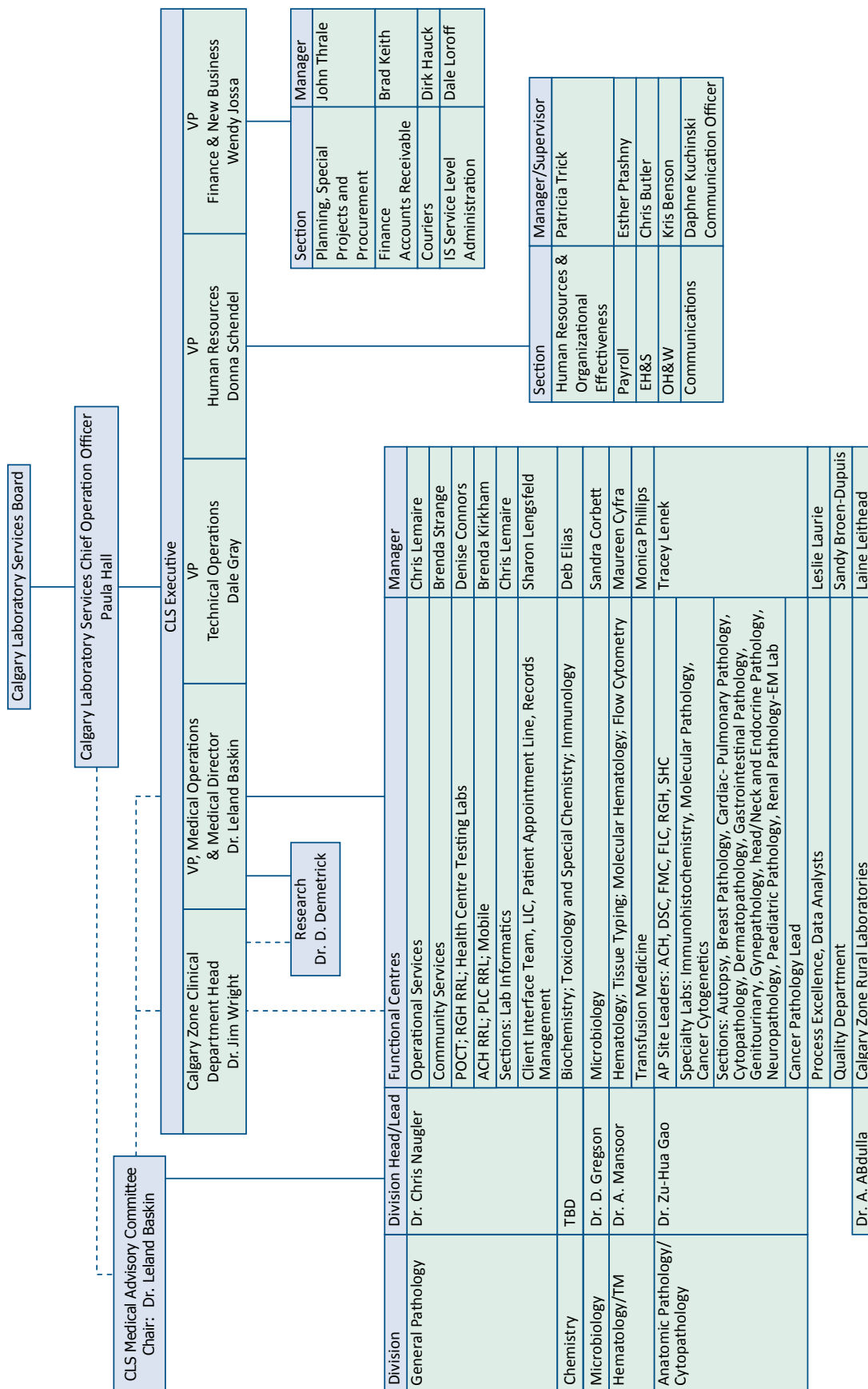
Regardless of change, uncertainty, and under-resourcing, the DPLM and CLS are leaders in laboratory service provision and innovation. Our regional integrated model for laboratory service provision is unique in Canada and we continue to be one of the top laboratories, not only in Canada but also North America. Through our Department’s partnership with CLS, which once again achieved Top 55 Employer status in Alberta for 2011, we are achieving our joint mission of improving health and well-being through laboratory diagnostic excellence, education and research and we continue to make strides towards our joint vision of being world leaders in laboratory medicine.

James R. Wright, Jr, MD, PhD

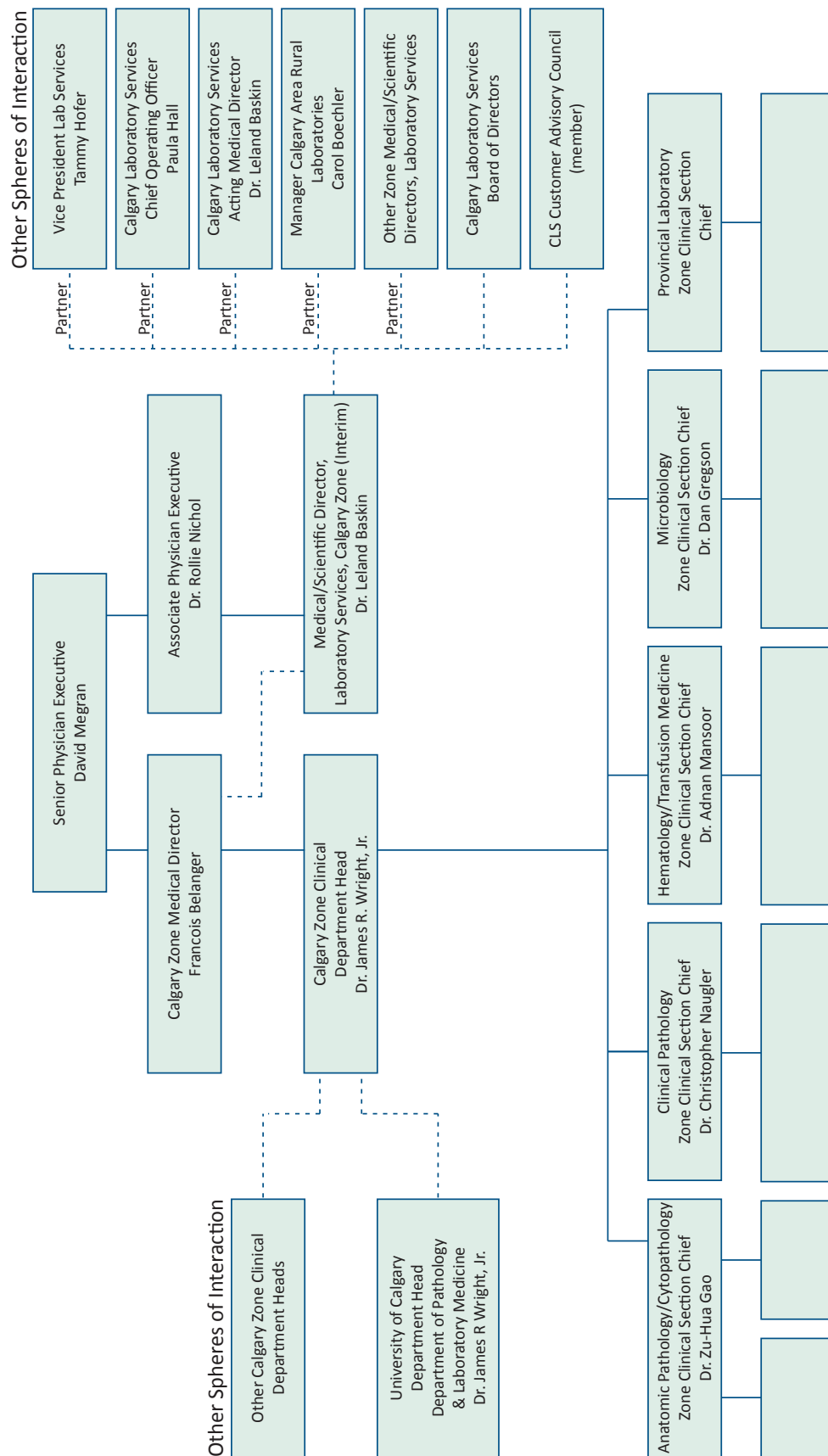


Head, Department of Pathology & Laboratory Medicine  
University of Calgary Faculty of Medicine/Alberta Health Services – Calgary Zone

## CLS GOVERNANCE AND REPORTING STRUCTURE



## AHS Calgary Zone Department of Pathology & Laboratory Medicine - Organizational Structure 2011



"Partners" refers to a model in which physician and operational leaders are complimentary partners in a respectful, inclusive and collaborative

## Accomplishments and Highlights

### Ongoing Education and Learning

#### Educational Programs Provided by the Department of Pathology & Laboratory Medicine

The medical and scientific staff of CLS are responsible for a wide array of educational activities that include: residency training programs in Anatomic Pathology and Neuropathology, mandatory rotations (e.g. hematopathology) for a number of other residency programs, lectures and small group sessions in a number of undergraduate courses, the Medical Sciences 515/Biology 515 Course, parts of the Bachelor of Health Sciences program, supervision of elective rotating residents from other programs and rotating clinical clerks, training of fellows and graduate students, and Continuing Medical Education events. We will also start a new General Pathology residency program and, hopefully, a new Pathologists' Assistant Master of Science training program in 2012.

#### Anatomic Pathology Residency Training Program (Program Director, Dr. Lisa DiFrancesco):

This is a five-year program leading to certification in Anatomic Pathology by the Royal College of Physicians and Surgeons of Canada. The Post Graduate Year (PGY)-1 year is designed to provide exposure to most of the medical and surgical services that rely heavily on the pathology laboratory and to prepare the resident for the Medical Council of Canada qualifying examination part II. The PGY-2 and PGY-3 years constitute the core training with integrated rotations of autopsy and surgical pathology. During the PGY-4 year, the resident embarks upon mandatory rotations (Pediatric Pathology, Forensic Pathology, Cytopathology, and Electron Microscopy) and elective rotations (Neuropathology, Dermatopathology, Hematopathology, Flow Cytometry, Molecular Pathology, research). The PGY-5 year may be spent in a variety of electives, which may include any one of the clinical laboratory subspecialties, a clinical rotation, a research rotation or one or more rotations in subspecialty pathology. Involvement in research activities is an integral part of the program and starting in the PGY-3 year, the residents are expected to present their research findings at the annual pathology residents' research day. Funding is available to present their work at North American meetings. The program is designed to give graded responsibility to the resident so that in the final year of training the resident will be expected to perform to the level of a junior faculty member, recognizing that faculty resident supervision is always occurring. In addition to one-on-one teaching, clinical pathological conferences and subspecialty rounds, there are co-ordinated didactic teaching sessions held in a weekly academic half-day (protected time). The residents write the yearly American Society of Clinical Pathology exam and participate in regular in-training evaluations that mimic the Royal College of Physicians and Surgeons of Canada exam. A philosophy of independent self-directed learning underlies the program.

Three excellent new trainees were accepted into the program beginning July 2011. Two residents graduated in 2011 and both passed the Royal College examination. One is working in Ontario and the other is pursuing additional training. There are currently 17 AP residents in the program.

The program was given full approval by the Royal College of Physicians and Surgeons of Canada in 2010.

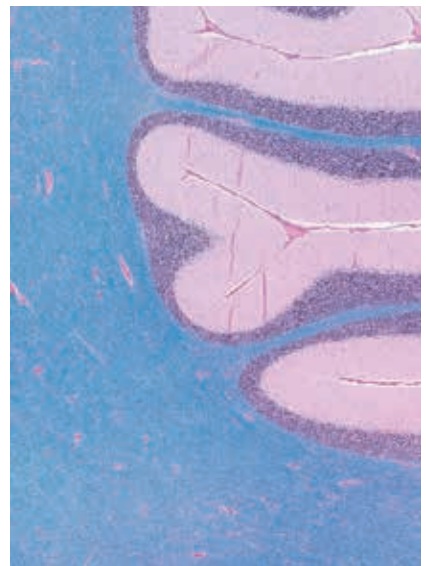
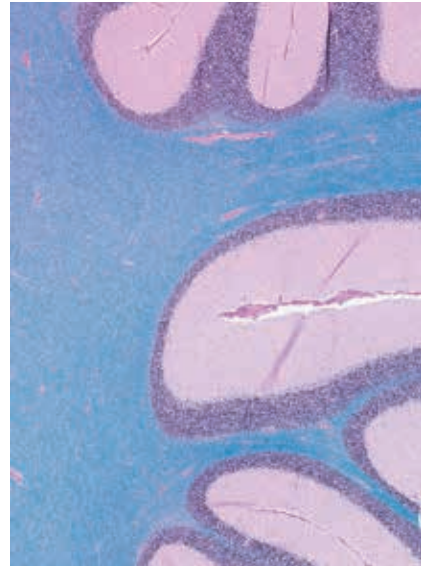
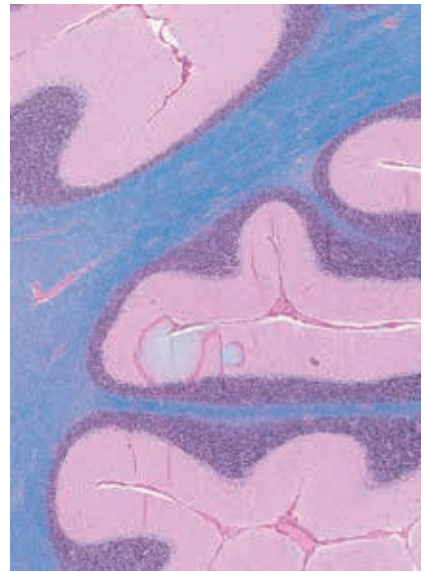
#### Neuropathology Residency Training Program (Program Director, Drs. Jeffrey Joseph/Lothar Resch):

This is a five-year program leading to certification in Neuropathology by the Royal College of Physicians and Surgeons of Canada. The University of Calgary program includes one year of clinical medicine, one year of anatomic pathology and three years of neuropathology training, including two core years with graded responsibility in the reporting of surgical and autopsy cases, nerve, muscle and eye material. The fifth year is an elective year and may be spent in service or clinical rotations but participation in research activities

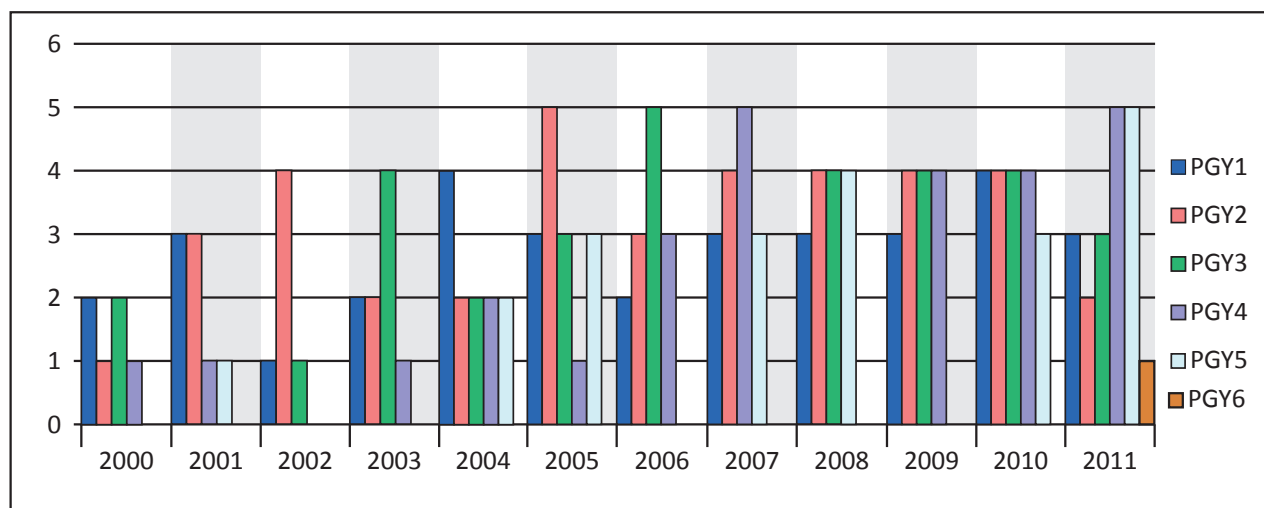
ongoing within the department is encouraged. These include research into neuro-degenerative disorders, neuro-regeneration, cerebral ischemia, neuro-oncology and developmental disorders. Trainees gain experience in applications of new technologies in the study of pathogenesis of disease including immuno-pathology, molecular pathology, electron microscopy, flow cytometry and image analysis. Medical-legal and diagnostic consultations are an integral component of this program as is participation in under-graduate and postgraduate teaching programs. The Neuropathology training program was reviewed in 2007 and received an accreditation category of "Provisional Approval with Internal Review" from the Royal College of Physicians and Surgeons of Canada. The program will be reviewed again in 2012. There are currently three residents in the program, although one is currently on a leave of absence completing a PhD in Germany. This number of residents makes us one of the largest and most active Neuropathology residency training programs in Canada. Dr. Jeff Joseph was the program director during the first half of the year and Dr. Lothar Resch, recruited in June of 2011, became the new program director and led the program for the second half of 2011. The Department would like to thank Dr. Joseph for making many positive changes and greatly strengthening the program.

#### General Pathology Residency Training Program (Program Director "in waiting", Dr. Christopher Naugler)

General Pathology is a laboratory medicine specialty incorporating training in anatomic pathology, forensic pathology, pediatric pathology, clinical chemistry, hematopathology, transfusion medicine and medical microbiology. General pathologists fill a variety of roles in Canadian hospitals including a vital role in community and rural hospitals where they often provide multi-disciplinary service in all areas of laboratory medicine. Training includes a significant emphasis on quality assurance and laboratory management, and provides the necessary skills to function as a laboratory medical director. The Calgary Laboratory Services/University of Calgary training program will offer particular strengths in informatics and laboratory management. We anticipate approval of the program by the Royal College of Physicians and Surgeons of Canada in early 2012 with the first residents starting in the summer of 2012.



## Resident History/Growth



### Medical Sciences 515/Biology 515 Course (Course Director: Dr. Guangming Han)

The Department is responsible for the development and teaching of this course and it continues to be very well received by students. This year's enrollment was 22 students. The basis of the course is the cellular and molecular mechanisms underlying basic human disease processes and how these can be influenced by lifestyle and environmental factors and the ways in which this knowledge can be used in the laboratory diagnosis of disease. Our faculty provided 42 hours of lectures in this course.

### Undergraduate Medical Education (Department Representative: Vacant)

The University of Calgary undergraduate teaching program for medical students follows an integrated approach in accordance with the requirements of the Medical Council of Canada. Pathology is part of the basic sciences component of the curriculum and is taught as part of each integrated course. Small group teaching, as an essential part of pathology teaching, requires an increased teacher-student ratio. The increasing size of the medical student classes has resulted in a significant increased demand for teaching time.

Department members are involved in teaching (lectures and small group sessions) for a number of courses including but not limited to: Cardiovascular, Respiratory System, Applied Evidence Based Medicine, Trial Advocate Course, Renal, Neurosciences, Blood, Molecular Biology of Cancer, Cancer Biology, Pathobiology, Directed Path Research Projects, Integrative Course, Pathology of Neoplasia, Pathology of Hepatobiliary Diseases, Endocrine, Gastrointestinal, Introduction to Medicine, Reproduction, Gynecological Pathology, Environmental Pathology, Upper Respiratory Tract Infections, Pneumonia and Pulmonary Infections, Human Genetics and Musculoskeletal/Skin.

In a typical year, the Department of Pathology & Laboratory Medicine faculty members provide about 1,200 hours of undergraduate medical education teaching.

This position was vacant in 2011 but Dr. Amy Bromley has been hired to fill this position starting in July 2012.

### Postgraduate Clinical Trainees

Geographic Full Time (GFT) faculty members provide greater than 2,000 hours of teaching per year to support postgraduate clinical trainees, including department residency training programs, rotating residents and

fellows. Clinical faculty members also make very extensive contributions to teaching residents and fellows; although this time has not been quantified, it is likely similar or greater in magnitude.

## Fellows

The DPLM/CLS Fellowship Committee selects qualified applicants for internally and externally funded Fellowship positions. For the past 6+ years, CLS has funded two positions per year and these are open to either MD or PhD applicants, depending upon the field of study. We currently offer fellowships in Cytogenetics, Cytopathology, Surgical Pathology, Histocompatibility, Hematopathology, Renal/Transplant Pathology, Uropathology, and Pediatric Pathology. The Histocompatibility Fellowship is accredited by the American Society of Histocompatibility and Immunogenetics (ASHI) as a Director Training Program. The Cytogenetics Fellowship is accredited by the Canadian College of Medical Geneticists.

Late in 2011, 4 additional newly funded positions were created by CLS based upon funding received for additional workload in Anatomic Pathology; these newly funded positions will begin in July 2012 and are meant to fund board-certified (or board-eligible) Anatomic Pathology Fellows wanting to develop subspecialty skills in an area of Anatomic Pathology.

Also in 2011, CLS established hard-funding for a two year Clinical Biochemistry fellowship with one entry position each year; applicants for this program must hold a PhD in chemistry or a related biomedical field. Our plan is to develop the program so that graduates will be able to write both the Canadian and American board certification examinations [currently, there is only one program in Canada with dual Commission on Accreditation in Clinical Chemistry (COMACC) and American Board of Clinical Chemistry (ABCC) certification]. It is anticipated that the first Clinical Chemistry Fellow will be accepted into the program in late 2012 with a July 2013 start date.

The year 2011 has been a banner year for the Fellowship program. At the beginning of 2011, CLS hard-funded two positions per year and by the end of 2011, CLS has committed to eight hard-funded positions per year. It should also be noted that, in most years, we train one or more externally funded Fellows.

Dr. A. Keith Brownell assumed the Chairmanship of this Committee in 2011 and revamped the Committee membership and made improvements to the selection process.

During 2011 the following clinical Fellows were trained at CLS:

Fellow	Specialty Area	Supervisor	Funding Source	Year
Sar, Aylin	Molecular Pathology	D. Demetrick	Other	2010 - 2012
Liacini, Abdelhamid	Histocompatibility	N. Berka	CLS	2010 - 2011
Wang, Chang	Cytopathology/Urological Path	M. Duggan A. Yilmaz	CLS External	2010 - 2012
Lamont, Ryan	Cytogenetics	J. Van Den Berghe	CLS	2011 - 2012
Pisooksantivatana, Karan	Hematopathology	I. Auer	External	2011 - 2012
Al Bashir, Samir	Gastrointestinal Path/Urological Path Cytopathology (2012 - 2013)	S. Urbanski A. Yilmaz	External	2011 - 2013

## Graduate Students

There is no Pathology program in the Faculty of Graduate Studies, however, graduate students are supervised by members of the Department.

Faculty	Graduate Students	
	Supervisor	Committee Member
Bismar, Tarek	A. Al-Mami (MSc) L-H. Teng (PhD) A. Bakar (PhD) L. Peterson (PhD)	S. Liu (PhD)
Chan, Jennifer	X.Y. Lim (MSc) C. Perotti (PhD)	J. Kelly (PhD) M. Blough (PhD) M. Mobahat (MSc) S. Li (MSc)
Demetrick, Doug	S.M. Kim (Postdoctorate)	S. Gao (PhD)
Green, Francis	P. Choudhart (MSc)	D. Polley (MSc) C. Fahey (MSc)
Gregson, Dan		T. Lye (PhD) K. Wilkinson (MSc)
Kelly, Margaret	A. Alansaru (MSc)	C. Downey (PhD)
Pitout, Johann	G. Peirano (PhD)	
Zhang, Kunyan	K. Wu (PhD) L. Bahafzallah (MSc) D. Tambalo (Post-doc) A. Khateb (MSc)	J. Kim (MSc) S. Abaco (MSc)

## Pathologists' Assistant M.Sc. (Program Director "in waiting", Dr. Jim Wright)

Pathologists' Assistants (PAs) are "physician extenders" for anatomic pathologists. PAs perform delegated medical tasks under the supervision of a medically qualified pathologist. They perform initial examination, dissection, and gross description of surgically removed tissues, assist in dissection of bodies during autopsies, and perform intraoperative frozen sections. They possess highly standardized skills related to each of these procedures which allow pathologists to spend more of their time looking at slides.

In 2011, we submitted applications to start a Pathologists' Assistant M.Sc. training program at University of Calgary as a specialization within the Medical Sciences Graduate Program. The proposed program will be accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), an American agency that accredits training programs of allied health professionals who work in anatomic pathology or clinical pathology laboratories. Accredited North American PA training programs are normally two year M.Sc. degrees, which may be thesis-based, course-based, or some training programs offer both options. There is currently only one accredited training program in Canada and it offers both options.

We have applied to initiate the University of Calgary PA M.Sc. training program as a thesis-based specialization within the Medical Sciences Graduate Program with CLS as the clinical affiliate providing the practicum training. Although PAs with research-intensive M.Sc. training are highly desirable to facilitate clinical research within academic pathology departments based at medical schools, we also recognize that PA employers in community or rural hospitals do not need PAs with research training. Therefore, once the thesis-based program is active, we will initiate the application process for Provincial approval of a parallel course-based Pathologists' Assistant M.Sc. program. Ultimately, we intend to offer both options.

All paperwork (Dean's letter, Application for Initial Accreditation form, Program Official Approval form for the Program Director, and Preliminary Report Application) and application fees necessary for preliminary accreditation have now been submitted to NAACLS and we would like to admit 3 students with a start date of July 1, 2012. Once graduate students are in the second year of the training program, we will need to submit a Self Study document to NAACLS and then NAACLS will perform an accreditation site visit. All students in any program progressing through



the NAACLS accreditation process are eligible to sit the American Society for Clinical Pathology (ASCP) Pathologists' Assistant board-certification examination. The job market for PAs trained in NAACLS-accredited M.Sc. training programs is excellent; there are jobs available in Calgary, elsewhere in Alberta, and throughout North America.

Dr. Wright's office has handled the voluminous paperwork for submissions to 8 different U of C Committees, each of which much approve this proposal on the University side, as well as the multiple forms and applications submitted to NAACLS. The NAACLS application process was completed in December of 2011 and we are now awaiting their response. If approved, Dr. Wright will step down as program director and Dr. Amy Bromley will become the new program director, with Dr. Wright transitioning to the program's medical director position in mid 2012.

### Continuing Medical Education

Department members participate in Continuing Medical Education (CME) events at many levels: (1) Accredited weekly CME rounds that are video-conferenced to each of the hospital sites and host local and visiting speakers (accredited with the Royal College of Physicians and Surgeons of Canada); (2) Pediatric GI Pathology rounds (RCPSC accredited), Renal/Neuro rounds, Pediatric Grand Rounds (RCPSC accredited), Pediatric Pathology Review Sessions (RCPSC accredited), and Liver rounds (RCPSC accredited) are held monthly; (3) bi-weekly Sarcoma Tumor Group Rounds; (4) weekly rounds for Pediatric Gross Neuropathology, Neuro (slide session), cytopathology, gross pathology, renal biopsy (RCPSC accredited), lymphoma (not accredited, but documented), gynecology/oncology, CPC, Breast Tumor Group (RCPSC accredited), Interstitial Lung Disease rounds (RCPSC accredited), Pediatric Oncology Tumour Boards (RCPSC accredited), and autopsy (RCPS accredited); (5) Friday morning Surgery Pathology rounds (RCPSC accredited); (6) California Tumor Registry slide set (ACCME accredited); (7) Quarterly Combined Surgery -Pathology Rounds (RCPSC accredited); (8) College of American Pathologists - Pathology In Practice Program; and (9) Society for Pediatric Pathology Slide Survey (AMA Category 1 accredited); (10) the Banff Pathology Update Course (RCPSC and ACCME accredited).

We have several named CME Lectureships attracting world-renowned external speakers. This year's Ben Ruether lecturer was Dr. Jonathan Said from UCLA Medical Center; the Paul Kneafsey lecturer was Dr. Mark E. Sherman from National Cancer Institute, Bethesda.

**The Banff Pathology Update Course** is an annual three-day course held in Banff that provides an in depth and comprehensive review of an important topic in Anatomic Pathology each year. Since the year 2000, it has been a joint effort between the Department of Pathology & Laboratory Medicine, University of Calgary and the Department of Laboratory Medicine & Pathology, University of Alberta. The 2011 course was hosted by the University of Alberta, the topic was Gynecological Pathology, and was once again a very successful event, with an excellent program and over 100 registrants. The Program is shown as Appendix 1.3

## Research (CLS and Externally Funded)

The GFT and Clinical Faculty members within the Department of Pathology & Laboratory Medicine perform research at both CLS and the University of Calgary; however, CLS is a clinical laboratory and, thus, primarily supports research by providing protected time to its academic medical and scientific staff. CLS does not have a mandate to provide dedicated research equipment and laboratory facilities; this is the role of the University of Calgary, Faculty of Medicine. Much of the research within the Faculty of Medicine is organized into research institutes and these institutes control most of the Faculty's research infrastructure and laboratory space. Therefore, integration of Departmental faculty into the Faculty of Medicine's Institute model is critical for research success but it has also proven to be a major challenge, as many of our current faculty member's research interests fall outside of scope of the strategic research priorities of one of the Institutes. These mis-alignments are not only a problem for our Department and CLS but also for the Faculty of Medicine as a whole. Pathology and Laboratory Medicine sit squarely at the crossroads between clinical practice and basic sciences; therefore, pathology departments should enable human research. When a pathology department fails in this, it adversely affects the whole medical school and exciting collaborative opportunities are lost. One of our major overall goals over the past few years has been to work very closely with Institute Directors to be certain that new academic recruits to our Department are a "good fit" and welcomed with open arms into a research institute and then are supported and mentored within.

In 2011, eight Department members (Drs. Bismar, Chan, Demetrick, Green, Kelly, Khan, Wright, Zhang) have research laboratories within the Faculty of Medicine Health Sciences Centre, Heritage Medical Research Building, or the Tom Baker Cancer Centre; these laboratories are associated with Faculty of Medicine Research Institutes or groups, including Hotchkiss Brain Institute; Southern Alberta Cancer Research Institute; Alberta Children's Hospital Institute of Maternal & Child Health; Institute of Infection, Immunity and Inflammation; Immunology Research Group; Respiratory Research Group; and Julia MacFarlane Diabetes Research Centre. Using laboratory space provided by Calgary Laboratory Services and epidemiological data, the Division of Microbiology has a strong research presence within the Infectious Disease Research Group and the Division of Clinical Pathology has developed new expertise in Lab Informatics and utilization.

CLS recognizes that research is an integral part of quality patient care, and that academic laboratory medicine plays a crucial role in developing new knowledge and clinical applications. Therefore, many of its GFT and Clinical Faculty perform clinical research related to the practice of pathology and laboratory medicine. CLS has a contractual commitment to support research, through its Affiliation Agreement with the University of Calgary and the Alberta Health Services – Calgary Zone. Clinical research programs are coordinated in partnership with research groups and with CLS. The CLS Research Department provides services for and supports the following types of research: (1) Industry-sponsored clinical trials, (2) Internal research conducted by CLS staff and funded by CLS, (3) Health foundation grant-based research, (4) CLS research competition, and (5) External requests for epidemiology-based research. On an annual basis CLS supports ~800 studies including clinical trials and grant-funded research.

In March of 2011, Dr. Doug Demetrick was appointed CLS Program Leader, Research and Development; this position is responsible for the coordination, facilitation, reporting and communication of research and development activities and outcomes at Calgary Laboratory Services (CLS).

## CLS Research Department

The CLS Research Department, reporting to the Medical Director, supports over 680 ethically approved Clinical Trials and grant based research projects conducted by researchers in the Calgary region. CLS research support for Clinical Trials ranges from specimen collection, processing, storing, and shipping samples to lab testing and data release. By supporting Research and Clinical Trials, which is an integral part of the CLS infrastructure, CLS has an opportunity to provide the best possible evolving patient care and to expand its reputation for innovative and advanced diagnostics.

Research Department staff located at the Special Services Building, Foothills Medical Centre, including 3 Medical Laboratory Technologist II's, and 2 Medical Laboratory Assistants I's provide laboratory and customer service support for research activity in the Calgary area. Rhonda L. Jackson is the research supervisor and is located at the DSC.

The Research eProcurement Coordinator, Chung-Sze Seck assists researchers by ordering scientific supplies and equipment in PeopleSoft to support research activities of CLS/U of C GFT medical and scientific staff.

Dr. Douglas Demetrick, a physician and Director of the Molecular Pathology Laboratory of CLS as well as an experienced cancer research scientist at the University of Calgary is the CLS Research and Development Program Leader.

Mr. Zane Ramdas, who's extensive background includes both pharmaceutical research and clinical trials management with large Pharmaceutical companies is the CLS Research and Development Coordinator.

## Province Wide Laboratory List of Tests and Services for Clinical Trials and Research Studies

The laboratories of Alberta: Alberta Health Services, Calgary Laboratory Services, DynaLifeDx, Covenant Health Edmonton Acute and Medicine Hat Diagnostic Laboratory collaborated to provide a single province-wide research cost list at the request of Alberta Health Services (AHS) in 2011. The template is effective across the province and will allow investigators to plan budgets for research projects.

## AP Research Lab (APRL)

The laboratory which is situated at the Foothills Medical Complex, offers the following tests and services: routine immunohistochemistry (IHC) staining: (single and double stains), IHC method development for new or untested antibodies, H & E stain, tissue sectioning: paraffin embedded, frozen tissues, Tissue Micro Array blocks, and tissue microarray and core punch construction.

The APRL obtained a new Leica antibody stainer: (BondMax) to assist with the increased workload at the laboratory and further enhance the service quality of the APRL.

APRL Workload has increased significantly from 2008 to 2011. IHC staining has increased from a total number of 48 stained slides in 2008 to 1953 stained slides in 2011. New antibody development has also increased from 12 assays in 2008 to 82 assays in 2011.

## 2011 CLS Research Competition

The CLS Research Department announced award results for the fourteenth annual CLS Health Services Research Funding Competition. A total of \$64,101.00 was awarded by CLS to researchers this year.

One hundred two projects have received funding through the Research competition since it began in 1998. Seventy two projects are complete. An additional \$8,102,406.00 has been obtained from external research granting agencies based on results of projects funded through this competition.

Since 1998, 45 publications and 70 abstracts/ presentations have resulted from funded projects. For a list of 2011 CLS Research Funded projects please see Appendix 1.4

### Outcomes resulting from previously funded CLS Research Competition projects:

- **Effect of killer cell immunoglobulin like receptor (KIR) and human leukocyte antigen (HLA) ligand incompatibility on human renal transplantation.** Dr. Faisal Khan, S. Yilmaz, N. Berka, A. Sar. Establishment of KIR (killer immunoglobulin like receptor's) genotyping assay. Data derived from the project allowed validation of the KIR-HLA ligand incompatibility influences graft outcome of renal transplantation. The results of the study improved understanding about the role of NK cells and their immunoregulation by KIR's in allo-immune responses following renal transplantation.
- **The roles of PTEN, TMPSSR2-ERG fusion and SPINK 1 in metastatic prostate cancer and their role in prostate cancer heterogeneity.** Dr. Tarek Bismar, S. Liu, L. Peterson, M. Phillips. Carried out FISH and IHC for ERG, PTEN, SPINK 1 and correlated the findings in cohorts. The results confirmed significant interplay between all those markers, which point to early suggestion into the ability of characterizing molecular subtypes of prostate cancer based on the interaction of those markers.
- **Molecular Detection of Human Polyomavirus Infection in Renal Transplant Tissue.** Dr. Douglas Demetrick, H. Benediktsson. The investigators have developed an oligonucleotide in situ hybridization assay for mRNAs of two BK virus genes (Agno and VPI genes) which may yield an improved test for identifying BK nephropathy in renal transplant patients. This would potentially allow earlier and more accurate treatment, resulting in saved kidney transplant grafts.
- **Development of a Conception Cohort to Study the Utilization of Prenatal Screening.** Dr. Andrew Lyon/Suzanne Tough J. Johnson, F Bernier, MS Rose. Research indicated that only approximately 92% of pregnant women obtain a PNRC test from CLS during the course of their pregnancy. Analysis is still ongoing regarding the utilization of laboratory services in pregnancy and how these are influenced by patient and provider characteristics.
- **The Role of PTCH1 and GLI1 in breast cancer.** Dr. Patricia Tang M. Webster, D. Heng, T. Magliocco. Developed the methodology to assess Gli1 and Gli2 protein expression in breast cancer cells using quantitative immunohistochemistry. This methodology can be used in the future as an exploratory biomarker for clinical hedgehog signalling pathway inhibitors. Created a Tissue Microarray of ER negative, PR negative breast cancer patients.
- **Detection of non classical HLA antibody to MICA in patients with renal rejection in the Southern Alberta Renal Transplant program.** Dr. Nouredine Berka Dr. W. Wang, Z. Gao, S. Yilmaz Validated an assay using the LABScreen® MICA Single Antigen technology to detect antibodies against a panel of 28 MICA antigens. The study lead to identification of a potential biomarker (presence of antibodies against MICA antigens) for the prediction of chronic and/or acute antibody mediated kidney allograft rejection.
- **Screening for Lung Cancer with Sputum: Optimization of Sputum Preparation.** Dr. M. Kelly, M. Khalil, V. Falck. Sputum samples with histologically proven lung cancer and control subjects were randomly divided into equal portions, one of which was processed by the standard CLS method (thinprep, TP) and one by the experimental method (preservative preparation, PP). The research suggested that the preservative method can be applied in rural areas that do not have access to a highly technical laboratory. The sputum specimen can be preserved and sent to a central laboratory for processing by this method or processed using low-tech equipment and later sent to a cytopathology department. This method could allow for wider use of sputum to screen for lung cancer.

- **The application of conventional and novel human hematopoietic progenitor cell functional assays as predictors of engraftment. Dr. Nicole Prokopishyn, J. Luider.** The research resulted in a better understanding and appreciation of the role of post-thaw CD34 enumeration (post-thaw CD34 counts are valuable markers of engraftment), in the laboratory and how this can be used to improve the quality of results generated for assistance with clinical treatment. The ALDH and CFU assays are very do-able and can be utilized but do not provide any additional information and it is therefore not fiscally sound to use them as predictors of engraftment in Autologous transplant products. There may be a role of these functional assays in other Cellular Therapy Products (CTPs) such as Cord Blood in which the CD34 enumeration is not as accurate at assessing engraftment potential.
- **An “observer-independent” and fully quantitative Tissue Microarray (TMA) based classification is predictive of survival among Multiple Myeloma (MM) patients. Dr. Adnan Mansoor/ Nizar Bahlis, D. Stewart, A. Magliocco** This research evaluated the application of routine Laboratory technique ( IHC) on BM biopsies of multiple myeloma patients and correlated the predictive value of these markers in a clinical laboratory setting. These markers were identified by a discovery platform through experimental methodology like Gene expression profile. This will enable the use these markers for routine clinical management in the future. The research evaluated the observer dependent evaluation of staining pattern with automated platform like HisotRX.

### Summer Studentships

The Research Department offers two summer student award programs: Master of Biomedical Technology Program and the CLS Undergraduate Competition.

### Master of Biomedical Technology Competition 2011

Supervisor	Student	Project
Dr. Adnan Mansoor	Rabeya Zarrin	Predicting clinical outcome among Mantle cell lymphoma patients following high dose chemotherapy and bone marrow stem cell implant (BMT)
Dr. Deirdre Church	Golsa Razian	Development of a multiplex RT-PCR Assay for Detection of Genital Mycoplasmas in Urogenital Specimens from High-Risk patients attending the Calgary Provincial STD Clinic: A Pilot Project

### Calgary Laboratory Services Undergraduate Competition 2011

Supervisor	Student	Project
Dr. Sean Gui	Samuel Jensen	Novel Immunohistochemical Markers for Detecting Colitis- Associated Colorectal Dysplasia
Dr. Adnan Mansoor	Sarah-Joy Haggstrom	Identification of gene signatures for extra medullary plasmacytoma compared to Multiple Myeloma
Dr. Nouredine Berka	Christina Gaspar	Effect of Killer cell immunoglobulin like receptor (KIR) gene profile of the renal transplant recipients on the outcomes human renal transplantation
Dr. Tarek Bismar	Michael Dolph	Characterizing Novel Biomarkers in Prostate Cancer Progression

## External Research Funding

Department members with a primary appointment in the DPLM and whose primary remuneration is derived from either CLS or U of C DPLM (i.e., list excludes cross-appointments) held \$2.59 million in competitive grant funding as principle investigators (PI) in 2011; total PI grant funding and PI grant funding/GFT faculty member are the metrics that we use for comparing grant funding from year to year.

### Total “calendar year-adjusted” P.I. grant funding for faculty member with primary appointments in the DPLM (2005 - 2011)

Year	Total Annual PI Funding	#GFT Faculty	\$/GFT
2005	\$1.3 M	30	\$43,333
2006	\$1.56 M	31	\$50,323
2007	\$1.94 M	33	\$58,788
2008	\$2.54 M	34	\$74,706
2009	\$2.44 M	31	\$78,710
2010	\$1.64 M	33	\$49,697
2011	\$2.59 M	32	\$80,938

For a complete list of Departmental research grant holdings, both as principle investigator and as co-investigator, please refer to Appendix 1.4

## Publications

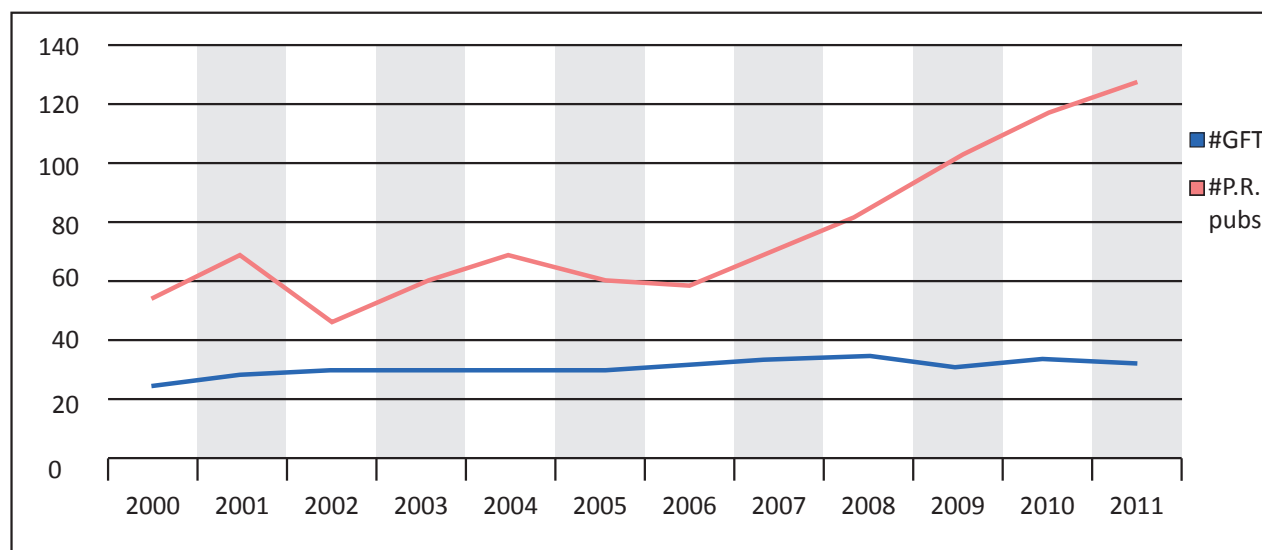
Department members with a primary appointment in the DPLM and whose primary remuneration is derived from either CLS or U of C DPLM (i.e., list excludes cross-appointments) published 127 peer-reviewed papers in 2011 (Appendix 1.5). Total number of publications in peer-reviewed journals, the mean Impact Factors of the journals we published in during each calendar year and the number of papers in high impact journals are the metrics that we use for comparing publication productivity from year to year.

### Number of papers in peer-reviewed journals published by faculty members with primary appointments in the DPLM (2005 - 2011)

Year	Total Papers	Sum of Journal IFs	Mean IF/Paper	IF >10	IF >30
2005	60	172.380	2.87	0	0
2006	59	236.660	4.01	1	1
2007	71	237.693	3.35	1	0
2008	83	390.837	4.71	4	2
2009	102	469.815	4.61	5	1
2010	117	546.823	4.67	10	1
2011	127	464.280	3.66	6	1

It should also be noted that the DPLM is a purely clinical department; all primary faculty members have clinical roles to fulfill and no one in the Department is a fulltime basic scientist. Our overall percentage of academic protected time was estimated to be 21% in 2010 (for comparison purposes, clinical departments with Academic Alternate Relationship Plans had 34-46% academic protected time in 2010). The following figure shows the trend over a longer period of time and that our increased publication output cannot be simply attributed to increased numbers of GFT faculty members.

## DPLM: GFTS & Peer reviewed Publications (2000- 2011)



While peer-reviewed publications, in general, represent the generation of new knowledge, the publication of book chapters, which are almost always by invitation, is usually considered more of a measure of stature of faculty members. Department members with a primary appointment in the DPLM and whose primary remuneration is derived from either CLS or U of C DPLM (i.e., list excludes cross-appointments) published 10 book chapters in 2011 (Appendix 1.5).

Members of the DPLM also presented many scientific papers at prestigious national or international meetings in 2011. While such presentations generally represent the generation of new knowledge, these are not listed here as the assumption is that the important presentations will be turned into peer-reviewed publications and will appear in a subsequent DPLM Annual Report.

### Promotions

Dr. Kiril Trpkov was promoted to Full Professor and Dr. Asli Yilmaz was promoted to Associate Professor. The Department congratulates Drs. Trpkov and Yilmaz and thanks them for their academic contributions.

### Awards

Many Faculty members in the DPLM received honors and awards in 2011. Congratulations to all!

Dr. Hallgrimur Benediktsson

- Faculty of Medicine Guenter Distinguished Achievement Award for International Health.

Dr. Tarek Bismar

- 2011 Canadian Association of Pathologists' Junior Scientist Award. Presented at the 2011 CAP meeting in Vancouver.

Dr. Arthur W. Clark

- Faculty of Medicine "Social Accountability" Award.

Dr. Máire Duggan

- Distinction Ambassador international co-workers “Ambassador” for the United States and Canadian Academy of Pathology. March 2001-March 2013

Dr. Marc Dupre

- University of Calgary, DPLM Teacher of the Year (2010-2011)

Dr. Martin Koebel

- Young investigator award ‘Robert Scully award’ of the International Society of Gynecological Pathologists. Presented at the 2011 USCAP meeting in San Antonio, Texas.

Dr. Martha Lyon

- Annual Meeting Best Abstract Award; AACC Critical and Point of Care testing 23rd International Symposium, Boston , MA, Sept 2010

Dr. Cynthia Trevenen

- Alberta Medical Association - Long Term Service Award

Dr. Kiril Trpkov

- Physician Recognition Award, Medical Staff Association, Rockyview General Hospital

Dr. Jim Wright

- Presidential Award, Society for Pediatric Pathology - Scroll of appreciation for outstanding planning and execution of the SPP 2010 Fall Meeting, Banff, AB. Presented at 2011 Spring Meeting, San Antonio, TX. This is the only such award ever given by the Society.

Dr. Kunyan Zhang

- Mentoring award - Canadian College of Microbiologists (CCM) Environmental Microbiology Award (Mentoring)

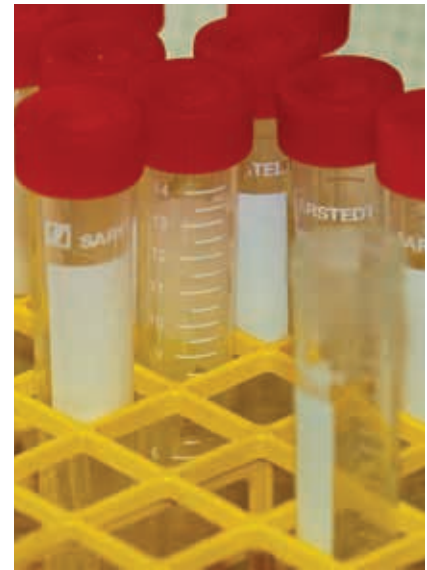
## Challenges

All across Canada, pathology and laboratory services have come under increasing scrutiny and repeatedly stories of “lab error” have been described in the press. Some of these errors have been egregious, were not dealt with appropriately by those who were aware of them, and, therefore, resulted in avoidable harm to additional patients; press coverage of these lab errors seems warranted and in the public interest. This has not happened in Calgary.

CLS performs more than 22 million laboratory tests per year, and our record, considering the volume of testing that we do is amongst the very best in North America. As the Head of the Department of Pathology & Laboratory Medicine in Calgary, I can assure you that we do not ignore and hide our errors but rather we disclose them to the affected patient, study them, and learn from them. One of the most difficult tasks performed by pathologists is interpreting microscope slides; this process is not an exact science as variation in the microscopic appearances of cancers is normal, even when viewing multiple slides of the same cancer from the same patient. The variation in the microscopic appearance of cancers is further compounded from patient-to-patient, even when viewing the same type of cancer. In other words, the work we do is not straightforward. Subtle variations in the microscopic appearance of a cancer can affect patient treatment and prognosis as can the results of a myriad of ancillary tests. Suffice it to say that, although variation in the skills and qualifications of pathologists may vary considerably from region to region across Canada, we try to set the bar very high when hiring pathologists to work at CLS and, to the extent that it is humanly possible, the medical leadership in the DPLM and CLS make certain that all of our pathologists have strong diagnostic skills that are appropriately matched to the work assigned to them. Speaking personally, I can honestly say that I do not believe that there is a single pathologist working at CLS whose diagnostic skills are suspect or are mismatched to their job descriptions. There is not a pathologist working at CLS who I would not trust to make a diagnosis on my

wife or my daughter. Nevertheless, press coverage will likely continue to be a challenge.

Every year, we face the challenge of providing increased services without proportionate increases in funding. Therefore, especially when the system is short of money, one must look for inefficiencies and to consolidate duplicated services which allow for savings which can be reinvested to improve services. Although it is often difficult to gain 100% consensus on such changes, difficult decisions sometime need to be made as this is the only practical way to improve lab services when funding is tight.



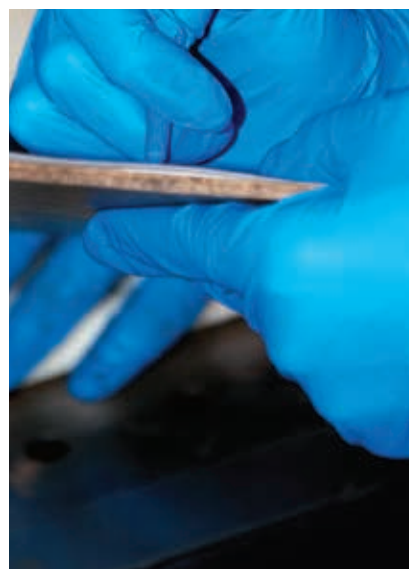
CLS became a wholly owned subsidiary of Alberta Health Services effective April 1, 2009 and, over the past several years, there have been occasional instances where, because of the complex relationship between CLS, AHS (our owner), AHS Calgary Zone (our primary customer), and AHS Lab Services, it has become clear that CLS does not possess a complete understanding of the will of the owner and the desires of the customer. Nevertheless, CLS is accustomed to transformational challenges – from its formation in 1996 from a complicated mixture of hospital – community and public – private laboratories into an integrated Public Private Partnership to becoming a wholly-owned subsidiary of the Calgary Health Region in 2006 – the robustness and professionalism of the CLS staff met the challenges and succeeded. Although the learning curve has been longer than hoped, this will happen again with AHS as our owner.

CLS views the prospect of a single-province wide system as an opportunity to improve, grow, and rationalize service. An excellent example of this during the past year was the closure of the TBCC Cancer Pathology Laboratory and the transition of all clinical testing (except for busulphan pharmacokinetic testing) to CLS. This gave CLS an opportunity to improve testing quality and turn-around times, and the decision was supported by almost all pathologists providing cancer diagnostic services in the city of Calgary. The transition was complicated and oncologists were consulted at several steps along the way to make certain that the new processes would meet or exceed their needs. For much of the last three months of 2011, testing was simultaneously performed in the TBCC Cancer Pathology Laboratory (and remotely interpreted by the former Director of this Laboratory) and at CLS and then the results were compared. In many instances, testing was also performed at either Cross Cancer Institute (Edmonton) or Mt Sinai Laboratory (University of Toronto) and these results were compared as well. For each test that was being transferred, CLS was required to demonstrate to AHS' satisfaction that the quality of the testing we would be providing met or exceeded that being provided by the TBCC Laboratory. The following molecular tests (KRAS, EGFR, MSI, MGMT) and immunohistochemistry tests (HER2, HER2 SISH, MMR) were validated and then transferred to CLS. Likely, AHS may involve CLS in additional rationalization projects directed at improving the quality and cost-effectiveness of laboratory testing within the Province over the next few years. If so, we will be ready.

A related challenge is for us to understand the changing horizon related to decision-making as to when CLS and its medical and scientific staff are allowed to make internal business decisions related to implementing new testing for clinicians in the AHS Calgary Zone vs. when we need to seek approval to do this through AHS Laboratory Services and its new Laboratory Networks.

As a laboratory system that performs >22,000,000 tests per year, CLS does have challenges including:

- Providing excellent laboratory service with accurate and timely results to our patients and their physicians.
- Ensuring that CLS operates as efficiently and economically as possible.
- Training, recruiting and retaining enough competent and qualified medical/scientific, technical and support staff.
- Making efficiencies, gains and savings, through process excellence, especially lean sigma, durable and transformative.
- Planning, funding, staffing and actualizing laboratory service at CLS' new facilities, including the South Health Campus, the McCaig Tower at the Foothills Medical Centre, and expansions of the Rockyview and Peter Lougheed Hospitals.
- Replacing aging analyzers and other laboratory equipment along with deployment of new technologies when capital funds are scarce.
- Identifying capital funding to buy microscopes and to create office space for new pathologists.
- Making continued improvements to the Cerner Millennium Laboratory Information System.
- Discerning, meeting and exceeding the needs for quality and value of our owner, and by far our biggest customer, AHS.
- Exploring possibilities to expand our business.



## Workforce

### CLS Medical Laboratory Technologists (MLT)/Medical Laboratory Assistants (MLA) Education Program (Submitted by Ingrid Buchholz, Supervisor Clinical Education)

CLS ensures workforce needs by partnering with the educational institutes of Southern Alberta Institute of Technology (SAIT) and Alberta Business and Education Services (ABES). CLS provides practicum placements for up to 100 Medical Laboratory Assistant (MLA) students annually. CLS also supports the placement of SAIT Medical Laboratory Technology (MLT) students. For the upcoming 2012 practicum year, up to 45 students have been scheduled at CLS.

Five MLT head preceptors representing each technical division collaborate throughout the practicum year with SAIT instructors to ensure that CLS delivers a standardized teaching program. To help accommodate the teaching of MLT students, 4 small simulated labs are utilized. They are located at the Diagnostic Scientific Center (DSC) in the Divisions of Hematology and Microbiology and at the Alberta Children's Hospital (ACH) in the Divisions of Transfusion Medicine and Urinalysis. Under the guidance of designated preceptors, students are able to actively practice MLT skills in a stable environment while still being close in proximity to the hub of activity in a medical diagnostic laboratory. Two of the simulated labs utilize state-of-the-art audiovisual equipment; digital camera, microscope and network connection to LCD screen to enhance student teaching. It has also been beneficial for CLS staff to utilize these simulated lab rooms for reviewing teleconferences and presenting clinical education sessions.

In 2010, CLS began partnering with SAIT to achieve accredited status by the Canadian Medical Association (CMA) Conjoint Accreditation Services for the current Medical Laboratory Assistant Program. An onsite inspection by the CMA Committee is scheduled for May 2012.

CLS supports preceptor education throughout the organization. This is achieved by in-house educational workshops and learning events. SAIT also offers an on-line MLT preceptor development course for CLS employees desiring to broaden their knowledge of competency based learning. This course is recognized by the Alberta College of Medical Laboratory Technologists (ACMLT) for use in the continuing competence program mandated by the Health Professions Act (HPA).

CLS has facilitated the installation of the Millennium TRAIN environment at both ABES and SAIT schools. Instructors and students have the ability to incorporate this LIS system in the classroom setting which has facilitated just-in-time training before practicum commences.

In 2011, DPLM and the University of Calgary plan to file paperwork to initiate a National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) M.Sc. degree for Pathology Assistants, in which CLS would be the clinical training site. This would meet a critical clinical need for CLS, the Province of Alberta, and nationally.

### Medical and Scientific Staff

In the 2005 to 2010 versions of the DPLM Annual report, each year I have chronologically outlined, starting with the 2004-5 Social Sector Metrics workforce planning exercise, the evidence supporting the need for additional FTEs and the various measures which we have attempted to use to generate additional funding for FTEs. I will not repeat this here.

Suffice it to say, because pathology and laboratory medicine are services, we have little ability to control workload as this is determined by numbers of surgical procedures, orders for laboratory tests, etc. To further complicate workforce matters, laboratory physicians are not fee for service and are funded via the AHS budget, and, thus, there is no simple mechanism to fund new positions based upon workload expansion. Nevertheless, the work simply gets done by increasingly over-worked laboratory physicians and scientists and there are no waitlists. This chronic trend increases the risk for “lab error”. That being said, this risk has been largely mitigated over the past few years through the diligence, dedication, and hard work of our highly skilled medical and scientific staff.

Fortunately, there appears to be a significant influx of funding for new FTEs on the near horizon and AHS has already been able to commit to funding for some new positions, including an additional 8 FTE to staff the South Health Campus. Furthermore, in the near future, it appears likely that pathologist remuneration will move from being the responsibility of AHS to that of AHW, as negotiations are underway for the funding of the clinical portions of all pathologists’ salaries to move into the Trilateral Master Agreement (TMA). Currently, it appears as if the funding covering the protected time of academic pathologists will remain outside of the TMA. Likely, the most contentious hurdle to overcome will be the development of a governance structure to allocate newly created positions to the various AHS Zones.

The new, but welcome, “emerging” issue will be our ability to identify sufficient highly qualified medical and scientific staff, as the pathology and laboratory medicine workforce across Canada is aging and there are inadequate numbers of new graduates entering the workforce. Therefore, recruitment will be a major challenge and we will need to increase the number of residents and fellows that we train; this latter initiative will further increase our short-term workload but is a welcome addition.

Ironically, one of the ways we have dealt with the increased clinical workload over the past 5-6 years has been to switch GFT positions to Clinical Faculty positions or to decrease the percentage of academic protected time

for some GFT positions. Six years ago, the DPLM was 46% GFT faculty members, one of the highest percentages of any clinical department at U of C. In some instances, it appeared as if the academic protected time associated with some of these GFT positions was not being optimally utilized and so, each year, we have tried to hold faculty members increasingly accountable for their protected time. Furthermore, we have tried to set the bar very high for hiring new GFTs and now preferentially hire clinical faculty members. Since 2005, >75% of our new hires have been Clinical faculty. Slowly replacing GFT faculty members, who have contractually protected time for academic pursuits with Clinical Faculty who do not, has helped us meet our increasing clinical workload requirements but this change will not help us train the next generation of laboratory physicians and scientists. Thus far, this has been offset by raising the bar higher when hiring Clinical Faculty members. All of our new hires want to teach and many want to do clinical research; therefore, our academic output has continuously improved. However, this approach is probably not sustainable as eventually academics will suffer. Here, the long-term hope is the Province-wide University of Alberta/University of Calgary Academic Alternate Relationship Plan, which is currently being negotiated.

## Workforce Planning

### Summary of Recruitment in 2011

The year 2011 was a big year for recruitment and the year 2012 will be even bigger. In 2011 we made the following recruitments.

The biggest winner was the Microbiology Division which increased its staffing by 50% with the hiring of two new medical microbiologists. Dr. Wilson Chan, a new graduate of the University of Alberta Medical Microbiology training program, was hired as a Clinical Assistant Professor and Dr. Dylan Pillai, a faculty member at the University of Toronto, was hired as an Associate Professor. Dr. Pillai is the first new GFT faculty member hired in this Division in about 10 years and thus a new GFT position was long overdue; he has 50% protected time for academics. Funding for both new positions were created internally by CLS and Paula Hall's strong leadership in this matter, addressing both clinical and academic needs, is greatly appreciated!

The second biggest winner was the Hematology & Transfusion Medicine Division, which had experienced huge increases in workload and workload complexity. Dr. Jay Patel, a pathologist with AP/CP training at the University of Utah and Hemepath training at Stanford, was recruited from Stanford and is a Clinical Assistant Professor. Once again, I would like to thank Paula Hall, CLS COO, for creating the funding for this position, which increased our hematopathology staffing by 20%.

The Clinical Pathology Division hired Dr. Paul Klonowski, a pathologist with AP/CP training from Washington University in St Louis and a Surgical Pathology Fellowship at University of Washington. Dr. Klonowski has expertise in both breast pathology and informatics, an unusual but very welcome combination.

All of the remaining recruitments were in the Anatomic Pathology/Cytopathology Division. Dr. Lothar Resch, a highly experienced neuropathologist, was hired at the Associate Professor rank from the U of A; he has 25% protected time and will dedicate most of this to running the Neuropathology Residency Training program. In addition, we recruited several new clinical faculty members including Dr. Chad Luedtke, a Clinical Assistant Professor who completed his Anatomical Pathology training at University of Western Ontario and a breast pathology fellowship at Memorial Sloan-Kettering Cancer Center, New York in 2011, as well as Fariborz Kolvar, a clinical Assistant Professor cytogeneticist trained in Calgary. Finally, Dr. Evan Matshes was opportunistically recruited as a locum autopsy pathologist; funding for this locum position will disappear when Dr. Amy Bromley starts in July 2012.

For a complete list of Departmental recruitments and departures, see Appendix 1.6

## Current Needs

The year 2012 will likely be our biggest single year for recruitment in at least the past decade. First of all, we will need to staff the South Health Campus which will open sometime in 2012. We have been allocated funding through the SHC budget for a total of 8 FTE (4 surgical pathologists, 1 general pathologist, 1 hematopathologist, 1 medical microbiologist, and 1 clinical biochemist) spread out over two years. Hiring for these positions is well underway. It is also anticipated that one or more current CLS pathologists may desire to relocate from their current CLS sites to SHC, and if so, we will attempt to accommodate these request(s), resulting in the need to backfill their current positions.

The closure of the TBCC Cancer Pathology Laboratory and the departure of the single pathologist in the Department of Oncology, who was formerly funded through the Alberta Cancer Board (0.8 FTE) and CLS (0.2 FTE), has created a new 1.0 FTE Pathologist Clinician-Scientist position based in the DPLM. The successful candidate will have a cross-appointment in Oncology and will be jointly recruited by DPLM, Oncology, and SACRI. This individual's research operations will be based in the TBCC Translational Research Laboratory to promote collaboration with oncologists.

Two surgical pathologists resigned in the latter half of 2011 and these vacancies, one at FMC and the other at RGH, must be filled. We also have a net new surgical pathology FTE based upon increased workload related to colon cancer screening. Two of our dermatopathologists switched to part-time in 2011; this along with increasing workload results in the need for an additional dermatopathologist. We also anticipate that we will need to recruit an additional pediatric pathologist, a neuropathologist, a clinical chemist and an additional renal pathologist in the near future.

Discussions between AHS and the ASLP related to moving pathologist remuneration into the Master Agreement on a Province-wide basis have resulted in a desire to harmonize the benefit packages in pathologists' contracts to a new Provincial standard requiring that all pathologists have 30 days of vacation and 10 CME days per year. If this happens, AHS will need to fund at least 3 new FTE for CLS and these individuals will need to be recruited.

Aggressive hiring of anatomic pathologists with cytopathology skills in 2010 has resulted in sufficient staffing in this arena and so, for the first time in memory, this is not an area of subspecialty expertise in which we need to recruit in the near future.

## Appendices

### 1.1 Departmental Committees

#### CLS Medical Advisory Committee

Dr. Leland Baskin, Medical Director, Calgary Laboratory Services  
Dr. Zu-hua Gao, Division Chief, Anatomic Pathology/Cytopathology  
Ms. Paula Hall, Chief Operating Officer, Calgary Laboratory Services  
Dr. James R. Wright, Jr., ZCDH, Department of Pathology & Laboratory Medicine  
Dr. Richard Krause, Section Head, Biochemistry  
Dr. Christopher Naugler, Division Chief, Clinical Pathology  
Dr. Adnan Mansoor, Division Chief, Hematology/Transfusion Medicine  
Dr. Dan Gregson, Division Chief, Microbiology  
Dr. Travis Ogilvie, Site Leader, FMC  
Dr. Shaun Medlicott, Site Leader, PLC  
Dr. Erik Larsen, Site Leader, RGH  
Dr. Cynthia Trevenen, Site Leader, ACH  
Dr. Martin Trotter, Site Leader, DSC  
Mr. Dale Gray, VP Technical Operations  
Ms. Sandy Broen-Dupuis, Quality Manager

#### Department of Pathology & Laboratory Medicine Clinical Safety Committee

Dr. Anna Sienko, Chair, Lead Cancer Pathologist Calgary Zone, Staff Pathologist Calgary Laboratory Services  
Dr. Leland Baskin, Medical Director, Calgary Laboratory Services (Chair Alternate)  
Dr. James Wright, Calgary Zone Clinical Department Head, Department of Pathology and Laboratory Medicine, CLS  
Ms. Paula Hall, Chief Operating Officer, Calgary Laboratory Services  
Mr. Dale Gray, AP Technical Operations, Calgary Laboratory Services  
Dr. Amid Abdullah, Consultant Pathologist, Calgary Zone Rural Laboratories  
Sandy Broen-Dupuis, Manager, Quality Department, Calgary Laboratory Services  
Carol Boechler, Director, Laboratory Integration and Standards, Alberta Health Services  
Laine Leithead, CLS Manager, Calgary Zone Rural Laboratories  
Madeleine Hammermeister, Clinical Safety Advisor, Calgary Laboratory Services

#### CLS Department of Pathology & Laboratory Medicine Business Meeting

This is a quarterly meeting of all laboratory medicine medical and scientific staff in the Region. Co-chaired by the Department Head and CLS VP Medical Operations

#### Anatomic Pathology Residency Training Committee

Dr. Lisa DiFrancesco, Chair  
Dr. Travis Ogilvie  
Dr. Iwona Auer-Grzesiak  
Dr. Anna Sienko  
Dr. Hallgrimur Benediktsson  
Dr. Marc Dupre  
Dr. Vincent Falck

Dr. Elizabeth Brooks-Lim  
Dr. Duane Barber  
Dr. Andrew Kulaga  
Dr. Tarek Bismar  
Dr. Martin Trotter  
Dr. Martin Koebel  
Chief Resident (rotates)  
Junior Resident (rotates)  
Dr. Jim Wright (Ex-officio)

### Neuropathology Residency Training Committee

Dr. Lothar Resch, Chair  
Dr. Jeffrey Joseph  
Dr. Arthur Clark  
Dr. David George  
Dr. Evan Matshes  
Dr. Jennifer Chan  
Dr. Jim Wright (ex-officio)

### Fellowship Committee

Dr. A. Keith W. Brownell (Chair)  
Dr. Lisa DiFrancesco  
Dr. Christopher Naugler  
Dr. Marie Dvorakova  
Dr. Steve Gorombey  
Dr. Jim Wright (ex-officio)

## 1.2 Division Sections/Programs and Membership

### 1.2.1 Division of Anatomic Pathology/Cytopathology

Division Head: Dr. Zu-hua Gao

#### Committees:

Anatomic Pathology & Cytopathology Planning & Operations Committee, Chair, Dr. Zu-hua Gao  
Autopsy Group Meeting, Chair – Dr. Martin Koebel  
Anatomic Pathology Quality Assurance Committee, Chair – Dr. Zu-hua Gao  
Division of Anatomic Pathology & Cytopathology Business Meeting, Chair – Dr. Zu-hua Gao  
Cytopathology Medical Staff Meeting, Chair – Dr. Ranjit Waghrey  
Cytopathology Quality Assurance Committee, Chair – Dr. Zu-hua Gao  
Colposcopy, STD, Family Planning User Group, Chair – Dr. Zu-hua Gao

## Division Members (as at December 31, 2011)

Medical Staff	GFT/Clinical	Rank	Site	Special Expertise
Barber, Duane	Clinical	Assoc. Professor	DSC	Dermatopathology
Benediktsson, Hallgrimur	GFT	Professor	FMC	Renal Pathology, Transplantation
Bismar, Tarek	GFT	Assoc. Professor	RGH	Genitourinary Pathology, Anatomic Pathology
Brown, Holly	Clinical	Asst. Professor	DSC	Dermatopathology
Bruecks, Andrea	Clinical	Assoc. Professor	DSC	Dermatopathology
Chan, Jennifer	GFT	Asst. Professor	FMC	Neuropathology
Chebib, Ivan	Clinical	Asst. Professor	FMC	Surgical Pathology, Cytopathology
Clark, Arthur	GFT	Professor	FMC	Neuropathology
Demetrick, Douglas	GFT	Assoc. Professor	HSC	Molecular Pathology
DiFrancesco, Lisa	GFT	Asst. Professor	FMC	Endocrine, Lymphoma, Soft Tissue & Bone Pathology
Duggan, Máire	GFT	Professor	FMC	Cytopathology, Gynecological Pathology
Dupre, Marc	Clinical	Asst. Professor	PLC	Gastrointestinal Pathology, Surgical Pathology
Dvorakova, Marie	Clinical	Asst. Professor	DSC	Cytopathology
Eidus, Leslie	Clinical	Assoc. Professor	RGH	Gastrointestinal Pathology
Falck, Vincent	GFT	Assoc. Professor	FMC	Gastrointestinal Pathology, Surgical Pathology
Fontaine, Daniel	Clinical	Assoc. Professor	DSC	Cytopathology
Gao, Zu-hua	GFT	Assoc. Professor	FMC	Gastrointestinal Pathology, Hepatopathology
George, David	Clinical	Assoc. Professor	FMC	Neuropathology, Renal Pathology
Gorecki, Margaret	Clinical	Asst. Professor	DSC	Surgical Pathology, Cytopathology
Gough, James	Clinical	Professor	FMC	Renal Pathology, Cytopathology, Surgical Pathology
Green, Francis	GFT	Professor	FMC	Pulmonary Pathology, Autopsy
Guggisberg, Kelly	Clinical		DSC	Anatomic Pathology, Dermatopathology
Gui, Xianyong (Sean)	Clinical	Asst. Professor	FMC	Gastrointestinal Pathology, Surgical Pathology
Han, Guangming	Clinical	Asst. Professor	FMC	Gynecological Pathology
Joseph, Jeffrey	GFT	Professor	FMC	Neuropathology
Kelly, Margaret	GFT	Asst. Professor	FMC	Surgical Pathology, Pulmonary Pathology
Khalil, Moosa	Clinical	Assoc. Professor	FMC	Cytopathology, Surgical Pathology
Klonowski, Paul	Clinical	Asst. Professor	DSC	Surgical Pathology, Lab Informatics
Koebel, Martin	GFT	Asst. Professor	FMC	Gynecological Pathology, Autopsy Pathology

Medical Staff	GFT/Clinical	Rank	Site	Special Expertise
Kolvear, Fariborz	Clinical	Asst. Professor	DSC	Cytogenetics
Kulaga, Andrew	Clinical	Asst. Professor	RGH	Genitourinary Pathology, Surgical Pathology
Luedtke, Chad	Clinical	Asst. Professor	PLC	Breast Pathology
Matshes, Evan	Clinical	Assoc. Professor	FMC	Autopsy Pathology (locum)
Medlicott, Shaun	Clinical	Assoc. Professor	PLC	Gastrointestinal Pathology
Meier, Lucja	Clinical	Asst. Professor	DSC	Cytopathology, Surgical Pathology
Ogilvie, Travis	GFT	Asst. Professor	FMC	Breast Pathology, Gynecological Pathology, Molecular Pathology
Oryschak, Allan	Clinical	Assoc. Professor	RGH	Breast Pathology, Genitourinary Pathology, Ophthalmic Pathology
Paslowski, Doreen	Clinical	Asst. Professor	RGH	Breast Pathology, Genitourinary Pathology, Surgical Pathology
Pinto-Rojas, Alfredo	GFT	Assoc. Professor	ACH	Pediatric Pathology, Pediatric Hematology
Resch, Lothar	GFT	Assoc. Professor	FMC	Neuropathology
Sienko, Anna	Clinical	Professor	PLC	Surgical Pathology, Cytopathology
Trevenen, Cynthia	Clinical	Professor	ACH	Pediatric Pathology
Trotter, Martin	GFT	Assoc. Professor	DSC	Dermatopathology
Trpkov, Kiril	GFT	Assoc. Professor	RGH	Genitourinary Pathology, Lymphoma, Soft Tissue & Bone Pathology
Urbanski, Stefan	GFT	Professor	FMC	Gastrointestinal Pathology, Hepatopathology, Pulmonary Neoplasia
van den Berghe, Janette	Clinical	Asst. Professor	DSC	Cytogenetics
Waghray, Ranjit	Clinical	Assoc. Professor	PLC	Surgical Pathology, Cytopathology
Wang, Yinong	GFT	Asst. Professor	DSC	Cytopathology, Cardiac Pathology
Wright, James	GFT	Professor	DSC	Pediatric and Perinatal Pathology
Yang, Hua	Clinical	Asst. Professor	FMC	Breast Pathology
Yilmaz, Asli	GFT	Assoc. Professor	RGH	Urological Pathology, Surgical Pathology, Ultra-structural Pathology
Yu, Weiming	Clinical	Assoc. Professor	ACH	Pediatric Pathology, cardiac pathology

## Workload

	2011 Specimens	% change (vs. 2010)
Anatomic Pathology	429,601 (blocks)	+7.1%
Pap Smears	215,554	+4.9%
Non-Gyne Cytology	10,341	+2.3%

## Accomplishments

### Divisional Level

- TBCC transition: As of December 1, 2011
  - All TBCC IHC marker testing has been transferred to CLS IHC lab, including HER-2, HER-2 by SISH and MSI.
  - All TBCC molecular testing has been transferred to CLS molecular lab, including K-ras, MGMT, EGFR, etc.
  - ER/PR, HER-2 and HER-2 SISH are interpreted by the breast group.
  - MSI markers are interpreted by Dr. Trotter/Dr. Dupre.
  - TBCC consult requests and TBCC tumor boards are handled by FMC consult desk.
  - All research projects that involve pathology will need to have a CLS pathologist as the collaborator.
  - Tumor bank: Work in progress. Partnership approach.
- Complete gap analysis and initiate implementation of provincial quality assurance plan.
- Created internal locum positions to deal with increased oncology surgery and colon cancer screening workload.
- Completed reappointment of site leaders.
- Development of a plan for complete restructuring of sections to become Specialty Groups to meet the demands of quality.
- Completed planning for new south hospital and two pathologists were recruited to the site.
- Autopsy has moved to the new morgue facility
- Innovation award recipient: Evelyn Fong

Evelyn was able to institute portering runs which alleviated the pressure on staff to pick up specimens. This is far more efficient for gross room staff and far more cost effective with staffing. Not to mention less stressful for all staff involved.

- Collegiality award recipient: Cheryl Ziebart

Although the workload of the consult desk increased dramatically after the TBCC-CLS transition, Cheryl always handles consult requests from all sources timely, orderly, and pleasantly. Many of the frontline pathologists feel that the consultation



*Innovation award recipient Evelyn Fong and Dr. Gao*



*Collegiality award recipient Cheryl Ziebart and Dr. Gao*

process is much smoother and more pleasant now than before. As the result, our patients are receiving better services and care.

#### Autopsy service

- Maintained number of adult autopsies numbers (198 cases for 2011).
- Majority of cases presented at CPC and M&M rounds.
- Covered autopsy service from Lethbridge and Medicine Hat for more than 4 weeks for each site.

#### Cytopathology

- HPV testing started
- Fine needle aspiration clinic started.

#### Anatomical Pathology Residency Training Program

- **February:** Capital Equipment expansion included the purchase of new microscopes for the FMC (1) and PLC (1), plus a digital camera for the PLC. A teaching head was also installed on the cytopathology microscope at the DSC.
- **March:** Six residents (Drs. Bures, Hamilton, Ng, Zhao, Salina, and Husain) attended the USCAP meeting in San Antonio, TX, and four posters were presented.
- Our program was successful in matching 2/2 of our CaRMs PGY1 positions for July 2011.
- **April:** The updated Residency Training Manual was completed, and was made available on line.
- **May:** Resident Research Day took place on May 27th, 2011. There were a record number of poster (6) and platform (17) presentations this year, all of very high quality. The 10th Anniversary of the Paul Kneafsey Memorial Lecture was held on May 26th. Paul's sister, Dr. Michele O'Sullivan, attended the lecture and gave a brief address to the audience. The Guest Speaker and Head Adjudicator was Dr. Mark Sherman (NCI).
- Both of our two PGY5 residents (Drs. Hamilton and Li), were successful in passing the Royal College Board Examinations. Dr. Hamilton will be continuing her training as a Neuropathology resident (2 years), and Dr. Li will be working as a Staff Pathologist in Ontario.
- Dr. Denise Ng (PGY3) was awarded a Fellowship position in Neuropathology at UCLA (2013).
- Dr. Nicole Bures (PGY4) was awarded a Cytopathology Fellowship in Pittsburgh (2013).
- June: A record nine residents attended the CAP Meeting in Vancouver, BC (Drs. Husain, Bures, Hamilton, Naert, Ng, Salina, Sandra Lee, Lik Hang Lee and Zhao), with 9 posters and one platform presentation.
- Dr. Davide Salina (PGY4) was awarded the Dr. Donald W. Penner Award for the resident presenting the best paper or poster at the Annual Meeting of the Association. Dr. Salina's topic was entitled "Neutrophil DNA NET formation in appendicitis and other acute inflammatory disorders".
- Dr. Liena Zhao (PGY2) was awarded the Canadian Chairs of Pathology Award at the CAP meeting for her paper: "ICILIN attenuates tri-nitro-benzene sulphonic acid-induced colitis in mice".
- Dr. Adrian Box (PGY 1) won the Award for Top PGY1 Resident in Obstetrics and Gynecology.
- Dr. Karen Naert (PGY3) was nominated as the College of American Pathologists Resident's Representative for Alberta.
- **July:** Three new residents (Drs. Jacqueline Macmillan, Kuo-Cheng Huang, and Hanan Armanious) joined the Anatomical Pathology Training Program as PGY1s, bringing the total number of AP residents to a record number of 17. The Welcome BBQ on July 16th was well attended by Residents, Fellows, Staff, and their families (95 in attendance).
- Dr. Amy Bromley (PGY5) accepted a position as Staff/Section Head of Autopsy: Calgary Laboratory Services (July, 2012).
- AIMG funds were utilized to purchase a new SPOT camera for FMC, and additional teaching heads for the Hematopathology multi-headed microscope.
- **August:** All residents attended the Banff Conference on Gynecological Pathology.

- Dr. Liena Zhao (PGY2) was awarded a CLS grant: “Development of an assay which qualifies proteinase-activated receptor activation as a diagnostic marker of organ-specific inflammation”. PI: Dr. Alex Chin (\$35,000).
- **September:** The International Conference on Residency Education (Quebec City) was attended by Dr. Amy Bromley (PGY5), where she presented a poster.
- College of American Pathologists Meeting (Galveston, TX) was attended by Dr. Karen Naert (PGY4), who represented the Pathology Residents of Alberta.
- Dr. Karen Naert gave a platform presentation at the Canadian Association of Neuropathology Meeting (Vancouver).
- **October:** Dr. Karen Naert presented a poster at the American Society of Dermatopathology Annual Meeting (Seattle, WA).
- **December:** In total, thirteen peer-reviewed manuscripts were published by our residents group in 2011.

#### Pediatric Pathology

- Dr. Alfredo Pinto, at the request of Pediatric Hematology/Oncology, developed objectives for a 4 week rotation in Pediatric Pathology-Oncology for clinical Fellows in the Pediatric Hematology/Oncology Program. The Pediatric Hematology/Oncology Program is approved by the Royal College of Physicians and Surgeons. The 4 week course included one week in general anatomic pathology, one week on small round cell tumours of childhood, one week on spindle cell tumours and one week on other tumours (brain, kidney, bone, etc). The first two Fellows participated in this course in 2011.
- Dr. Pinto is the preceptor for the rotation and other collaborators have included Dr. J. Joseph and Dr. L. Resch (brain tumours), Dr. W. Yu (kidney and bone tumours) and Dr. M. Lyon (clinical laboratory).
- Dr. Weiming Yu is a co-investigator with Dr. H. Sarnat and Dr. A. Pinto in a research study entitled “Neuronal Maturation in Enteric Plexi of Fetuses and Infants in Relation to Dysmotility Syndrome”. This research is funded by Calgary Lab Services. Preliminary results have been presented to the Pediatric Gastroenterologists at their monthly pathology review sessions.

#### Technical Accomplishments

##### Equipment:

- Two new rapid tissue processors were acquired to improve efficiency and quality of tissue preservation.
  - Automated immunostaining platform change occurred in May to improve quality of patient results, efficiency and consistency.
  - Acquisition of an automated stainer/coverslipper to improve efficiency and reduce staff exposure to chemical fumes.

##### Staffing:

- Pathology Technician Supervisor hired April; responsible for the Pathology technician staff.
  - AP sponsored two Grade 11 students for a summer lab internship for the Career Next Generation program for the third consecutive year.
  - MLT I hired for both Immunopathology and Molecular Pathology to accommodate the increase in workload from TBCC.

##### Service:

- Oncology surgery at both FMC and RGH increased.
- Colon Cancer Screening Center cases increased in September 2011 at FMC with an additional anticipated increase in workload of approximately 40 cases/day.
- HPV testing in Cytology became available December 5.
- FNA clinic at PLC opened October 14.
- South Health Center planning ongoing.
- FMC Morgue planning ongoing.
- Repatriation of prostate needle biopsies to RGH occurred in January to improve quality and turnaround time.

- TBCC transfer of clinical testing to Molecular Pathology and Immunopathology effective December 1st including Her2Neu, MMR, EGFR, KRAS, MGMT and MSI.

### Continuing Education

One Cytogenetic tech attended the Association of Genetic Technologists Conference in Minneapolis (June).

- Two Cytotechnologists attended the American Society of Cytopathology conference in Baltimore (June).
- One Immunotech attended the Diagnostic Immunohistochemistry Conference in Vancouver (May).
- Two Path Techs attended the CAP conference in Vancouver (June).
- Marco Perizzolo – MP was asked to present his poster at the ASCP Annual Meeting in Las Vegas.
- One AP MLT attended the NSH Conference in Cincinnati (September)
- Twelve Cytotechnologists registered for a weekend Genetics course in preparation for HPV testing.
- Bill Gorday – AP was asked to present at the Region IX NSH Conference in Montreal.

### Molecular Pathology Laboratory (MPL)

#### Laboratory Testing

- New Tests
  - Epidermal Growth Factor Receptor Mutation assay (Qiagen).
  - Microsatellite Instability (Promega).
  - MGMT gene methylation (own assay).
  - N-RAS mutation assay (codons 12, 13 and 61)--own assay.
  - K-RAS mutation assay (codons 12, 13 and 61)—Qiagen.
- Improved Tests
  - Returned to our original BRAF mutation Lightcycler test after using the ABI test for 6 months.
  - Changed to Qiagen K-RAS codon 12/13 test from our previous ABI test.
  - Developed a novel SNaPshot assay for IDH1 and IDH2 mutations.
- Volume of Testing
  - Test requests continued their yearly trend of ~15% increase in volume in 2011, resulting in approximately 1500 tests performed for diagnostic purposes, and additional tests performed for research and contract testing.

#### Infrastructure

Pervasive resource shortages continued to plague Molecular Pathology in 2012, though a reagent contract negotiated with Qiagen resulted in the availability of a Qiagen Rotor Gene thermal cycler in the laboratory which can be used for EGFR and K-ras mutation testing.

- There is a growing need for automation of several procedures in the MPL, specifically, for automated DNA extraction and a robot for automated PCR setup.
- Lack of equipment to measure small nucleic acid concentrations has forced the MPL to continue borrow time on a University instrument (this has occurred for over 5 years)
- All but two thermocyclers situated in the MPL have failed this year. We received 5 ABI Veriti thermocyclers as replacements, however, at the end of the year, we had the same number of machines as we had in the lab on Jan 1, 2011 due to equipment failures from age and overuse.

#### Education

- Dr. Aylin Sar continues her Molecular Pathology fellowship in the MPL/Demetrick laboratory.
- Dr. Karen Naert completed a one-month rotation through the Molecular Pathology Laboratory.
- Dr. Zohreh Mohammad-Taheri completed a one-month rotation through the Molecular Pathology Laboratory.
- Dr. Fahrid Kosari, a diagnostic Laboratory Director from Tehran completed a three week Molecular Pathology observership.
- Several hematopathology/hematology trainees undertook short electives.

## Other

- The MPL took over testing for MSI, MGMT methylation, K-ras and EGFR mutation analyses from the TBCC Translational Laboratory.
- The MPL provided significant time to the Helix development team to assist with their continued development of a customized LIS for Molecular Pathology.
- A new, updated MPL test requisition form was developed and is in use.
- Bob Winkfein attended the Roche BRAF Advisory Board Meeting in Toronto
- The MPL hired a new, full time Tech I, Mary Lou Saratoga, although she did not begin working in the MPL until 2012.
- The MPL was awarded a contract to perform NRAS, KRAS and BRAF testing for a clinical trial examining a C-MEK inhibitor being developed by Novartis.

## Neuropathology

- Recruited and hired a new neuropathologist: Dr. Lothar Resch will work on the clinical service and is now Program Director of the Neuropathology Residency Program.
- Accepted Dr. Leslie Hamilton into neuropathology fellowship. Dr. Hamilton was trained in Calgary and is Royal College certified in Anatomic Pathology.
- Neuropathology maintained professional relationship with the Office of the Chief Medical Examiner. Dr. J. T. Joseph testified on behalf of the Crown in a child abuse case in Red Deer, stemming from an OCME case.
- Neuropathology worked closely with neurologists to develop a plan for improving the muscle pathology service in Calgary. This is an ongoing project.
- Neuropathology has actively participated in new Dementia Neuroimaging Rounds that were begun in 2011.
- Neuropathology continues to actively participate in other rounds:
  - TBCC brain tumour rounds
  - ACH brain tumour rounds
  - Clinical neuroscience Grand Rounds
  - Rheumatology rounds (once per year)
  - ACH Neurology Grand Rounds, including presentation on Pontocerebellar Hypoplasia
- In 2011, we had 15 different rotators, including medical students and residents in neurology, neurosurgery, pediatric neurology, and pathology.
- In 2011, neuropathology changed the time of its biweekly conference to accommodate neurosurgery residents. The change has resulted in much greater attendance at these rounds.
- Neuropathology has been working with Dr. Eric Smith to help create a brain bank for neurodegenerative diseases. This is an ongoing project.
- Neuropathology, especially Dr. Lothar Resch and Mr. Thomas Kryton, have been assisting the province on the Provincial Digital Pathology Initiative. Mr. Kryton has been especially key in this project, since he currently operates the only slide scanner for pathology in the province. This is an ongoing project.
- Neuropathology continues to be associated with the Creutzfeldt-Jakob Disease Surveillance System, including ethics approval, autopsies, and retention of tissues for research.
- The neuropathology service at Alberta Children's Hospital was restructured, so that all sign-out of cases is now done by certified pathologists or neuropathologists.
- At the 2011 meeting, it was decided that Calgary will host the 2014 Canadian Association of Neuropathologist meeting.
- Dr. Jeff Joseph is on a subcommittee of the CANP to develop national standards in neuropathology. His area is to develop standards for muscle pathology.
- Both Drs. Jeff Joseph and Lothar Resch provided lectures to medical students in the neuroscience section of Course V at the University of Calgary Medical School. Neuropathology continued to provide assistance for the laboratories in this course.
- Dr. Jeff Joseph participated in the BIOL/MDSC 515 course (Mechanism of Disease) to undergraduates.

## Cancer Cytogenetics

- There was an increase in the number of FISH testing performed on paraffin-embedded tissue, especially for brain tumors.
- The lab participated in an increased number of clinical trials.
- To match clinical advances, modifications were made in the FISH testing of high grade lymphomas and plasma cell neoplasm.
- The lab became the provincial referral centre for the cytogenetic testing of several neoplasms including ocular melanoma and plasma cell myeloma.
- FISH testing for ALK gene rearrangements increased, as this became a pre-requisite for the treatment of non-small cell lung adenocarcinoma with a new small molecule drug.
- Dr. van den Berghe continued as an examiner for the Canadian College of Medical Geneticists.



*Dr. Gao gives a pathology lecture at the National Meeting of Chinese Pathologists October, in HangZhou China*

## 1.2.2 Division of Hematology/Transfusion Medicine

Division Head: Dr. Adnan Mansoor

Division Members (as at December 31, 2011)

Medical Staff	GFT/Clinical	Rank	Site	Special Expertise
Auer-Grzesiak, Iwona	Clinical	Assoc. Professor	FMC	Flow Cytometry, Lymphoma
Berka, Nouredine	Adjunct	Asst. Professor	DSC	Tissue Typing
Fourie, Thomas	Clinical	Asst. Professor	FMC	Hematological Pathology, Flow Cytometry
Jiang, Xiu Yan (Sue)	Clinical	Asst. Professor	DSC	Hematopathology
Khan, Faisal	GFT	Asst. Professor	HSC	Pediatric Hematology
Mansoor, Adnan	GFT	Assoc. Professor	FMC	Hematopathology
Patel, Jay	Clinical	Asst. Professor	FMC	Hemtaopathology
Prokopishyn, Nicole	Clinical	Asst. Professor	FMC	Stem cell lab
Shabani-Rad, Meer-Taher	Clinical	Asst. Professor	FMC	Hematopathology
Sinclair, Gary D.	Adjunct	Assoc. Professor	DSC	Supervisor, Molecular Hematology

### Workload (Approximate):

Hematology Specimens	3,780,013
Transfusion Medicine Tests	239,303
Flow-Cytometry Tests	14,588
Tissue Typing Tests	19,925

### Accomplishments

#### Flow Cytometry

- Installed and validated 3 new instruments (Navios).
- Converted 50% of testing from 5 color to 10 color panels.
- Created independent R&D bench, includes: technologist, staining area and instrumentation.
- Developed and implemented Hereditary Spherocytosis assay to replace Osmotic Fragility testing previously done in Special Hematology.
- Completed research project for Dr. Rad (sorting MDS bone marrow samples for metabolomics testing).
- Collaborated with Dr. Julie Deans, University of Calgary, to characterize two novel antibodies on myeloid neoplasms.
- Implemented TCR vbeta repertoire testing for immunodeficient and post-transplant patients.
- Upgraded flow cytometry analysis software to FCS Express v4.0.
- Replaced cell sorter application software (Spigot) with new software (Sortware).
- Trained additional staff member on Cell Sorter.
- Trained 3 new technologists.
- Trained residents and 2 fellows.
- Collected data for CTLA-4 research project.
- Developed paperless antibody QC analysis and documentation.
- Completed study of CD20 expression on CLL's with Dr. Julie Deans. Publication submitted.

#### Hematology and Special Coagulation

- Implemented Coag competency for all staff – completed by all staff.
- Introduced fluid competency for FMC staff.
- Participated in SHC Planning.
- Worked on validation of Cellavision – Automated digital cell morphology.
- New RLS system of reporting introduced.
- New Urinalysis analyzers acquired, validated and implemented at DSC.
- New Hematology analyzers (DxH) acquired, validated and implemented at ACH.
- New Hematopathologist Dr. Jay Patel started in July 2011.
- Combined CE event with Clinical Chemistry held in October 2011.
- Discontinued manual ESR testing.
- FMC received DxH analyzer for fluid testing.
- Greenbelt project completed to standardize the reporting of hemolysis in Coag samples.
- Finalized INR reporting process.
- Introduction and training of TRACESS.
- PROservice introduced for all sites.
- Hematology technologists have attended the TBCC Hematology rounds.
- DSC Hematology technologists completed many hrs of continuing education through teleconferences, CAP slide reviews and presentations conducted by Hematopathologists.
- Special Hematology trained an additional staff member to perform Hgb. Electrophoresis.
- Osmotic Fragility testing discontinued and test transferred to Flow Cytometry.
- LAPS discontinued.

## Molecular Hematology

The Molecular Hematology Laboratory provides advanced molecular and biochemical testing in the areas of malignant and non-malignant hematology. The laboratory provides advanced molecular analysis for diagnosis and prognosis of patients with myeloproliferative neoplasms and leukemias, and for monitoring patients for treatment response after tyrosine kinase inhibitors or chemotherapy, and disease recurrence and graft survival after bone marrow/stem cell transplantation. As a regional centre for testing in hemostasis, the laboratory also offers DNA molecular diagnostics for inherited disorders such as hemophilia A and B, von Willebrand disease, and for inherited risk factors in thrombosis. The laboratory works closely with the Special Coagulation Laboratory at CLS to provide integrated reporting and interpretation of functional, antigenic, and molecular data.

- Participant in the North American, Ipsogen Inc, HarmonIS, International Standardization Project for quantitative BCR-ABL1 fusion gene analysis, the results of which were presented at the 2011 Association of Molecular Pathologists (AMP) meeting in Dallas Texas, USA.
- Collaboration with Transfusion Medicine in the development and validation of bead array-based DNA testing for red cell genotyping.
- Continued collaboration with Pediatric Stroke Program ACH, performing inherited risk factor for thrombosis testing for this patient cohort.
- Development of in-house methodology for detection of CEBP alpha mutations for prognosis in AML patients without NPM1 and FLT3 gene mutations.
- Validation of multiplex PCR assays for the detection of common alpha globin gene deletional variants associated with alpha thalassemia.
- Implementation of automated DNA extraction for multiple molecular tests using newly acquired robotic nucleic acid extractor.
- Trained all technologists on operation of ABI capillary analyzer and use for hematopoietic cell chimerism analysis.
- Continued the ongoing revision of molecular methods manual.
- Lead a LEAN Sigma process excellence implementation for Special Coagulation/Molecular Hematology laboratories.
- Laboratory participation in Association of Hemophilia Clinic Directors of Canada 2011 National Meeting including co-authorship of an oral presentation on immunologic basis of acquired vWD.
- Laboratory participation in 2011 combined Hematology/Chemistry CE event.
- Hematopathology resident/fellowship training program specialized laboratory coordinator and molecular hematology preceptor for one visiting scholar and trainees in the following disciplines: Adult and Pediatric Hematology, Bone Marrow Transplantation, and Molecular Genetics.
- Lecture series on Molecular Hematology Laboratory services for the MLT training program at CLS.

## Tissue Typing

- Passed 2011 onsiteASHI Laboratory Accreditation for period 9/1/2011-8/3/2013.
- Published 1 manuscript and 7 Abstractsin respected journals, such as Nature Genetics, Human Immunology, and American Journal of Transplantation.
- Continuing education through teleconferences, Bone Marrow, Renal Weekly Rounds, and Hematology Education Session.
- Trained 3new technologist on tissue typing benches.
- Trained Histocompatibility Fellow on serology, luminex, molecular typing benches.
- Trained three technologists in Flow Cell Crossmatch.
- Trained two technologists on sequence base typing.
- Rotated Fellows, Residents, and Nurses in tissue typing.
- Maintained ABHI technologist board certificate for seven technologists.
- Represented Calgary in HLA national committee for living donor exchange program and highly sensitized patients program.

- Represented Canadian HLA laboratories at the One Match National committee.
- Elected by ASHI Accreditation board as the first Canadian ASHI commissioner.
- Acquired grant funding for 2 research projects.
- Validated new 3500 XL Life Technologies DNA sequencing platform.
- SSO typing

### 1.2.3 Division of Clinical Pathology

Division Head: Dr. Christopher Naugler

The Divisions of General Laboratory and Clinical Biochemistry were combined into one Division and re-named to Clinical Pathology during 2010. Dr. Leland Baskin was the Division Head of both Divisions until Dr. Christopher Naugler joined the Department at which time he became Acting Division Head.

#### Committees:

- Chemistry Quality Utilization and Management Committee: Drs. Andrew Lyon, Richard Krause, Valerian Dias, Alex Chin, Christopher Naugler, Leland Baskin, Amid Abdullah, Martha Lyon, Lyle Redman
- Friday Update Meeting: Drs. Andrew Lyon, Richard Krause, Valerian Dias, Martha Lyon, Leland Baskin, Alex Chin, Christopher Naugler, Amid Abdullah, Steve Gorombey, Lyle Redman, Paul Klonowski
- First Trimester Testing Committee: Dr. Richard Krause
- First Trimester Testing Steering Committee: Dr. Richard Krause
- Quality and Utilization Process Excellence Committee: Drs. Richard Krause, Leland Baskin, Christopher Naugler, Amid Abdullah
- Medical Advisory Committee: Drs. Richard Krause, Leland Baskin, Christopher Naugler, Adnan Mansoor, Cynthia Trevenen, Dan Gregson, Erik Larsen, Jim Wright, Shaun Medlicott, Steve Gorombey, Travis Ogilvie, Zu-hua Gao
- CLS Leaders Meetings: Drs. Richard Krause, Leland Baskin, Christopher Naugler
- Point of Care Testing Network: Drs. Martha Lyon, Lyle Redman
- Alberta Toxicology Centre Steering Committee: Drs. Andrew Lyon, Valerian Dias, Leland Baskin
- General Laboratory Monthly Staff Meeting: Chair – Drs. Leland Baskin, Christopher Naugler, Adnan Mansoor, Alex Chin, Amid Abdullah, Andrew Lyon, Erik Larsen, Gary Sinclair, Jim Wright, Lyle Redman, Marie Dvorakova, Martha Lyon, Martin Trotter, Nouredine Berka, Paul Klonowski, Richard Krause, Steve Gorombey, Valerian Dias, Walid Mourad, Xiu Yan Jiang
- Department Clinical Safety Committee: Drs. Hua Yang, Chair, Anna Sienko, Amid Abdullah
- Electronic Health Record Laboratory Advisory Committee (ELDAC): Drs. Leland Baskin, Amid Abdullah, Christopher Naugler, Paul Klonowski
- AHS Chemistry Network BNP/NTproBNP subcommittee: Dr. Andrew Lyon
- Clinical & Operational Advisory Committee: Drs. Leland Baskin, Amid Abdullah, Christopher Naugler

Division Members (as at December 31, 2011)

Medical Staff	GFT/Clinical	Rank	Site	Special Expertise
Abdullah, Amid	Clinical	Asst. Professor	DSC	General Pathology
Baskin, Leland	Clinical	Assoc. Professor	DSC	Chemical Pathology, General Pathology
Chin, Alex	Clinical	Asst. Professor	DSC	Clinical Chemistry
Dias, Valerian	Adjunct	Assoc. Professor	DSC	Clinical Toxicology, Special Chemistry
Gorombey, Steve	Clinical	Asst. Professor	DSC	Cytopathology, General Pathology
Klonowski, Paul	Clinical	Asst. Professor	DSC	Surgical Pathology, Lab Informatics
Krause, Richard	Adjunct	Asst. Professor	DSC	Clinical Chemistry
Larsen, Erik	Clinical	Asst. Professor	RGH	General Pathology

Medical Staff	GFT/Clinical	Rank	Site	Special Expertise
Lyon, Andrew	GFT	Assoc. Professor	DSC	Clinical Chemistry
Lyon, Martha	GFT	Assoc. Professor	ACH	Pediatric and Neonatal Clinical Chemistry, Point of Care
Mourad, Walid	Clinical	Professor	DSC	General Pathology, Hematopathology, Cytopathology
Naugler, Christopher	GFT	Asst. Professor	DSC	Lab Informatics, General Pathology
Redman, Lyle	Clinical	Locum	DSC	Clinical Chemistry

## Accomplishments

### Professional Staff Changes

- Dr. Paul Klonowski joined the division as a clinical pathologist in August 2011.

### Education

- Another resident completed the Informatics clinical elective (4 weeks) in October 2011.
- The application for a new General Pathology Residency Training program was approved by Alberta Health Services. It is anticipated that full approval by the Royal College of Physicians and Surgeons of Canada will be granted in January 2012.
- A new monthly clinical pathology newsletter, LabLink, was started under the editorship of Dr. Alex Chin. This newsletter provides a venue for education to community physicians on topics related to test ordering and interpretation.
- Clinical Education once again chaired the organization of a very successful “MLA Getaway 2011” with the largest attendance to date with 182 attendees. The event included presentations from Dr. Chris Naugler “Possibilities”, Zane Ramas “Research in Perspective”, Dawn Peacock RD, “Nutrition for a Healthy Life”, Jacki McLenaghan, “Stress Relief in the Workplace” and Karen Matthews “Find Your Passion”.

### Specific accomplishments

#### Quality

- Many CLS staff participated as assessors in various CPSA accreditations.

### Alberta Children’s Hospital

- ACH RRL staff are now supporting the TM needs of the new ECLS Program introduced this last year to (need TM to provide further explanation).
- ACH RRL staff are also supporting the addition of on site NICU beds which has resulted in an increase in use of TM and TM product manipulation.
- Two new DxH Hematology analyzers were implemented after instrument validation and training of all ACH RRL staff.
- ACH RRL staff training and validation/implementation of two new Cobas analyzers was completed.
- Installation and training on Hematology Cellavision instrument.
- Implementation of auto verification of Chemistry results.
- Competency assessments completed in all three areas.
- Follow up re: “Voice of the Customer Survey” with Site Director.

### Peter Lougheed Hospital

- Addition of on-site Thyroid test and serum BHCG testing.
- Installation, validation and implementation of new Cobas Chemistry analyzers.

- Installation and training on Hematology Cellavision instrument.
- Installation of ergonomic benches to increase staff safety and comfort.
- Implementation of auto verification of Chemistry results.
- Competency assessments completed in all three areas.

### **Mobile Collection Services**

- Updated Mobile requisition now available on-line at [www.calgarylabservices.com](http://www.calgarylabservices.com).
- Continue to route Stat specimens to the closest acute care site/HCTL for testing to decrease TAT of patient results.
- Implementation of new automated messaging service that calls all mobile home patients with a consistent message regarding their collection and special instructions if applicable for the next day.
- Implementation of working alone solution for employees on evenings and weekends that checks-in with them throughout their shift to ensure their safety.
- Installation of winter tires on all CLS Mobile vehicles.
- Implementation of Bluetooth devices for all Mobile employees to ensure safe, undistracted driving.
- Installation of new ergonomic furniture for data entry clerks.
- Addition of new Mobile comment field in LIS Millennium to ensure the provision of the correct patient's address.
- Continue to roll out the Long Term Care Pre-entry of Requisition project to all LTC Centers in Calgary. This will result in decreased TAT for test results and less recollections due to collection errors.
- Implementation of new Mobile report (CCL) that will identify if home patient has been admitted to hospital and not available at home on their collection day. This process saves our collectors an average of 7 unnecessary trips/day. Cancellations are managed real-time (i.e. one day at a time) instead of cancelling the entire order and having the physician or family inform us when the patient has returned home and required resumption of service.
- Development and implementation of a new patient "welcome" package for all patients new to the Mobile Collection Service.
- Implementation of new Mobile report (CCL) that will inform the collector if patient is deceased so that we do not go to the patient's home upsetting family members at a very difficult time.

### **Health Centre Testing Labs**

- Performed a 5S at all of the HCTL's, eliminating waste, standardizing processes, labelling of binders etc facilitating the movement of staff amongst the 4 sites.
- Acquired, through capital acquisition, a Vitros 350 at SCHC and Clinitek Advantus' for SCHC and SMCHC HCTL's.
- Received approval for the hiring of a 0.5 Operational Leadership Coordinator person, located @ SMCHC, to assist the HCTL Supervisor with Administrative functions.
- Participated in development of "Code Orange" along with the clinical areas within the Cochrane Community Health Centre.
- Scheduled CCHC staff for equipment training in the USA.
- Participated in the COR audit.
- Provided in-service for HCTL staff on the Hematology Beckman Coulter Analyzers.
- Provided opportunities for 2 HCTL staff to participate in extended Vitros 350 training in order to enhance their job experience and ability to deal with instrument issues.

### **South Health Campus**

- Operations Project team was created to facilitate the commissioning of the SHC.
- Developed a Project Charter and Project Plan.
- Developed a detailed Gantt chart outlining commissioning tasks and timelines for completion.
- Met with SHC clinical areas to understand their needs and provide information on the lab service delivery model.
- Worked with CLS medical to define laboratory test menu.
- Worked with CPSM and Operations to determine capital and minor equipment requests, as well as define timelines for ordering and delivery of equipment.
- Working with IT to ensure that Millennium builds and equipment interfaces are complete for the proposed opening of the facility.
- Worked with AHS Project Team to define facility infrastructure needs.
- Developed a contingency plan in the event that the facility turnover does not occur as planned.
- Worked with lab Architect to reconfigure RRL space.
- Worked with AHS CPSM on many RFP's.
- Developed RRL budgetary requirements and coordinated the gathering of Budgetary info from other Operational areas.
- Developed, along with HR, an RRL staff hiring strategy.
- Coordinated the formation of a CLS SHC Steering Committee to provide direction and guidance to the project.
- Defined Project risks & issues as well as mitigation strategies.
- Developed staff training strategies.
- Worked with CLS Operations, defining roles and responsibilities as well as identifying key activities required for commissioning of their areas.

### **Rocky View General Hospital Rapid Response Lab**

- Replacement of aging Chemistry analyzers with Roche COBAS 6000 analyzers which included interface and renovations to the space within the Lab. With COBAS implementation, new testing includes Beta HCG, AST and ammonias done on site.
- Improvements to lab with more efficient air balancing, air flow and ventilation to accommodate larger analyzers. Improved drainage from Hematology analyzers as a safety initiative.
- On site testing for PTH post op total thyroidectomy (previously not available at RGH and PLC). Testing was only available at the DSC.
- Fluid creatinines fro Urology implemented at RGH.
- Arrival of Cellavision, gathering of data, start of validation process, training still ongoing.
- Implementation of MAP tubes in Hematology for baby collections.
- Implemented Massive Transfusion Packs in Transfusion Medicine, improving accessibility to unmatched products in a critical situation.
- Completed a successful external Safety Core Audit.
- Continued ED nursing tours through lab.
- Transfer of .32 FTE to Accession from RGH RRL , removing technologists from morning collections. Improved efficient use of technical staff skillset, and ability to move staff to other shifts to accommodate increases in workload.

### **Patient Service Centres**

- PSC Restructuring/ new positions formed - OLCs in place to support Supervisors.
- One Flow Process implemented in 2010 and on going for further sites through 2011 and continuing roll out plan in 2012.
- Standing Order Greenbelt Project implemented.
- Implementation of ECG criteria for medical intervention.

### **Rural Laboratories**

- CLS took over operations for the Calgary Rural Laboratories in 2011. These sites include Claresholm, Vulcan, High River, Nanton (collections site only), Okotoks, Oilfields, Canmore, Strathmore and Didsbury.
- An extensive review was done to assess current operations and equipment.
- A CLS Quality Coordinator was hired to assist with accreditation readiness. She has been working with Dr. Richard Krause to add the rural labs to the Millennium QC database. The Quality Coordinator is also working with the on-site technologists to update operating procedures, as well as processes for proficiency reporting to align with CLS.
- While Dr. Abdullah continues to be the rural consult Pathologist, Pathology on call has been extended to the rural sites.
- The testing menu at the Okotoks Health and Wellness Centre has been expanded to match more closely with the menus available at Cochrane and Airdrie.
- A new general requisition is being reviewed and rural requisitions are now coming into CLS to be optically scanned and stored.
- In response to an AHS request in November, microbiology samples are now coming into CLS instead of being routed to High River.

### **Point Of Care Testing**

- Worked with AHS IT and Respiratory Therapy Department to install a middleware system between the blood gas analyzers and Cerner Millennium. This facilitates remote real time monitoring of blood gas analyzer performance and has also decreased manual result entry which in turn increases patient safety.
- Purchased and implemented an alternative meter for glucose testing on all neonates/newborns.
- Implemented a formal end user competency program for glucose testing in 19 long term care locations.
- Worked with Respiratory and Obstetrics to evaluate a POCT lactate testing application.
- Worked with Respiratory to identify expedited lab testing performed by Respiratory staff which adds significantly to their workload.
- Worked with the province to evaluate and select a new glucose meter for implementation across the province.
- Worked with the province to select a new urine pregnancy test kit for implementation across the province.
- Validated and implemented a new POC coagulation instrument. This replaces an older model and demonstrates better accuracy and precision.
- Staff worked on a number of research related projects.
- Staff attended numerous conferences and meetings, subsequently providing summaries to the team.
- Provided creativity sessions for staff as an aid to increasing productivity.
- Switched 3 Southern Alberta Dialysis Units from monthly postal transport of glucose meters to CLS courier resulting in cost savings.
- Negotiated a service contract for the transcutaneous bilirubin meters resulting in cost savings and expedited meter repairs.

### **Laboratory Information Centre**

- Microbiology notifiable results started coming to the LIC critical queue January 23, 2012.
- Phone requests for reports transferred to LIC from AP FMC & AP PLC.
- Taking requests for APHER2NEU reports.
- New critical exceptions form.
- LIC has aligned with AHS Laboratory for the management and documentation of critical results. Results now communicated at a maximum of 1 hour after which it will be referred to CLS Pathologist/Microbiologist on-call if ordering physician has not returned pages. Full name of the caller and receiver is now being documented in the LIS.

### **Patient Appointment Line**

- Bench marks in place for call centre agents.

- Added responsibility for booking appointments for the new Fine Needle Aspirate Clinic.
- Update CLS Website PAL bridge page to support patients access for on-line booking.
- Added a patient instruction manual for on-line booking.
- Added FAQs to bridge page.
- Customer Outreach Program implemented at PSC (monthly workshop at varying sites).

#### **Client Interface Team**

- Provided an educational in-service on phlebotomy collection and processing specimens for CUPS.
- Provided an educational in service for CDI College on complete lab requisitions, labeling specimens and GTS.
- Working on an in-service on report distribution, requisitions for outpatient clinics at SCH.
- DM & CIT now handle full patient overlay procedure for General Lab.
- Review of regional overlay procedure.

#### **Optical Scanning**

- PIA developed for the implementation of DocVue 9.0.
- Implementation of DocVue 9.0.
- CLS now optically scans Calgary Rural Lab requisitions to support remediation and investigation of problems. Requisitions are optically scanned and viewable in DocVue for 2 years and a hard copy is retained for one year.

#### **Medical Records**

- Identified undefined and permanent boxes stored at offsite storage.
- Work with divisions to determine returns/ destruction based on CLS retention guidelines.
- Worked with DSC departments to create a monthly destruction for in house records and report storage with a 2 year retention.

#### **Data Maintenance**

- Training/orientation manual developed for new staff.
- Annual competencies.
- Green Belt DMAIC “Misdirected Lab Reports.”
- Several new audits added to improve the integrity of LIS.
- Multiple initiatives undergone to clean up the LIS provider table.

### **1.2.4 Division of Microbiology**

Division Head: Dr. Dan Gregson

#### **Committees**

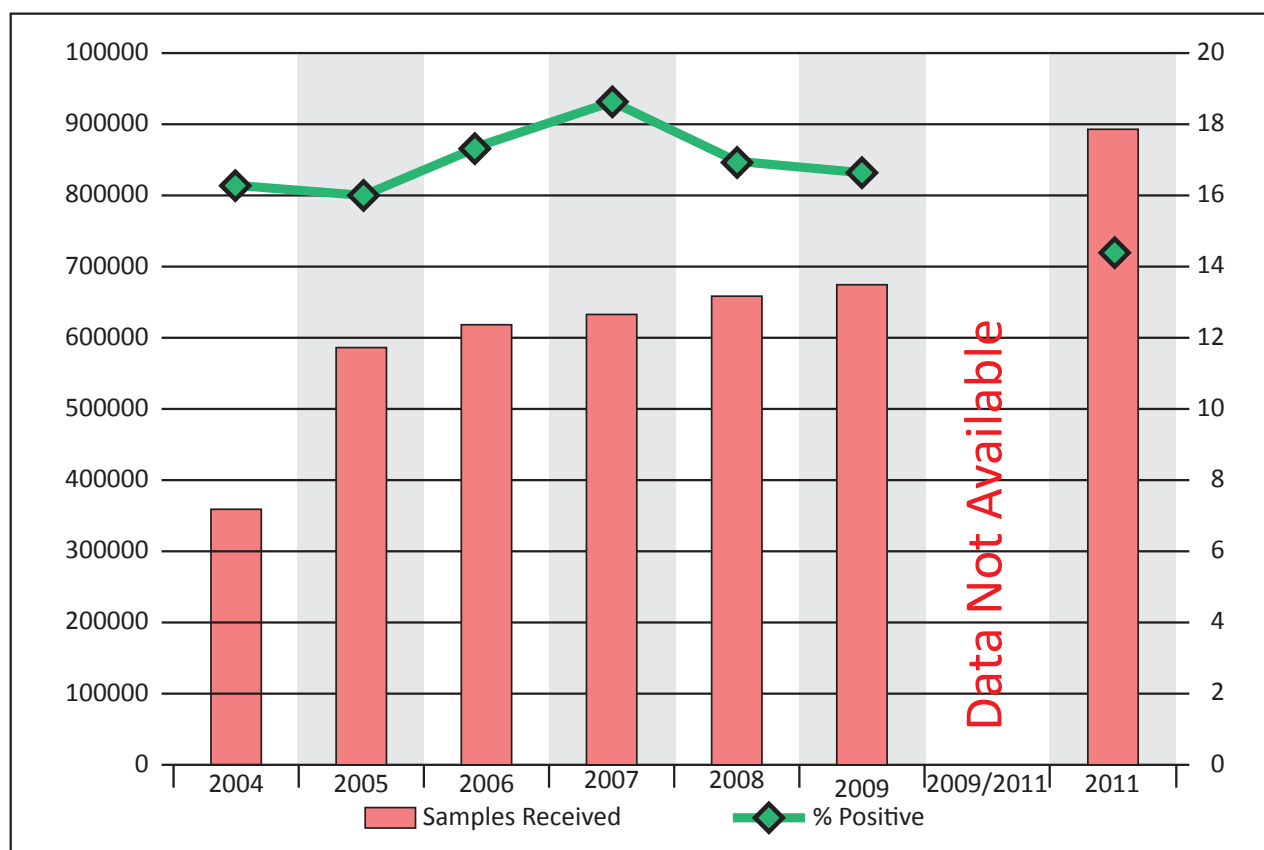
- AHS, Regional IP & C Committee – Dr. Dan Gregson
- CLS, Microbiologists Divisional Group – Chair, Dr. Dan Gregson
- CLS, Microbiology Medical/Technical/Quality – Chair, Dr. Dan Gregson
- Quality and Utilization Process Excellence Committee – Dr. Dan Gregson
- Provincial, Member, ID Division Committee – Dr. Dan Gregson
- Provincial, MicroNet Committee – Chair, Dr. Dan Gregson
- Provincial, Consultant, Microbiology Laboratory Proficiency Testing Program (LPTP), College of Physicians & Surgeons of Alberta – Dr. Deirdre Church
- Provincial, Member (GFT), AMA Representatives Forum – Dr. Deirdre Church
- Provincial, Member, CPSA Advisory Committee on Lab Medicine – Dr. Dan Gregson
- UofC, Infectious Disease Research Group – Dr. Dan Gregson, Dr. Deirdre Church, Dr. Johann Pitout
- UofC, Member, UofC Adult ID Residency Training Committee – Dr. Julie Carson
- UofC, Member, UofC Advisory Selection Committee – Dr. Julie Carson
- UofC, Member, UofC Pediatric ID Residency Training Committee – Dr. Julie Carson

#### Division Members (as of December 31, 2011)

Medical Staff	GFT/Clinical	Rank	Site	Special Expertise
Carson, Julie	Clinical	Asst. Professor	DSC	Mycology, Enterics, Wounds
Chan, Wilson	Clinical	Asst. Professor	DSC	Telediagnostics, Mycology, Parasitology
Church, Deirdre	GFT	Professor	DSC	Medical Microbiology, HIV Diagnostics, STDs, Anaerobes, Mycology
Gregson, Daniel	GFT	Assoc. Professor	DSC	IP&C Surveillance, Virology, Serology, Informatics, Sterile Fluids, Respiratory
Pillai, Dylan	GFT	Assoc. Professor	DSC	Molecular Diagnostics, Parasitology
Pitout, Johann	GFT	Professor	DSC	Antibiotic Susceptibility/ARO Bacteriology, Parasitology

Cross-appointment: Dr. Otto Vanderkooi, Asst Prof, 0.2 FTE, Pediatric Microbiology/Cystic Fibrosis, primary appointment in the Department of Pediatrics.

#### Workload



#### Accomplishments

- Implemented Fast PCR, for confirmation and speciation of vancomycin-resistant *Enterococcus* species resulting in reduced TATs and costs.

- CLS Microbiology implemented a new test to detect *Helicobacter pylori* antigen from stool samples for patients that cannot have the breath test done. Previously this test had been referred to a laboratory in the USA. Bringing this test in house, resulted in a reduction in costs and improved turn-around-times.
- Shiga toxin-producing *Escherichia coli* (STEC) can be a cause of bloody diarrhea in humans and in some cases, cause hemolytic uremic syndrome (HUS). It is transmitted through contaminated water, improperly cooked food or through human contact. Generally, only the *E.coli* O157:H7 serotype of STEC is routinely detected in the clinical microbiology laboratory. A new test to detect other serotypes of Shiga toxin-producing *Escherichia coli* (STEC) was implemented at CLS Microbiology in June 2011.
- An upgrade to the ABI Prism 3130xl sequencer was performed. Implementation of Fast 16s rDNA sequencing was also achieved, decreasing the time to perform sequencing, improving consistency of results and reduced costs.
- CLS Microbiology proposed a new protocol for the interpretation and reporting of vaginal smears for the diagnosis of bacterial vaginosis, candidiasis and *Trichomonas vaginalis* which was approved by the Micronet committee and LOSC as a provincial protocol. Implementation of the standardized protocol will improve the quality of testing and patient results.
- A new chromogenic media for the detection of vancomycin-resistant *Enterococcus* was implemented, reducing TATs and costs.
- Implemented of the cytospin procedure for gram stains on BAL specimens, improving observation and recovery of bacteria.
- To assist the High River Hospital laboratory with staffing shortages and decrease their workload, CLS Microbiology assumed the Microbiology testing for the Okotoks area upon the request of AHS.
- A thorough evaluation of two Maldi ToF Mass Spectrometry Systems was performed in 2011. The evaluation was performed to determine which instrument would best suit our needs to provide a faster and a less expensive method to identify bacteria.
- Microbiology completed the blood culture instrument RFP in 2011. Through the RFP process there was no change in vendor or instruments. A reduction in costs was achieved and we were able to obtain the Vitek MS (MALDI-TOF) in the new contract.
- The Abbott RT HIV-1 assay was interfaced with Cerner Millennium, reducing potential errors of manually transcribing results into the LIS.
- A second Gen-Probe Tigris instrument was implemented for the detection of *N.gonorrhoeae* and *Chlamydia trachomatis*, decreasing TATs and reducing down-time if one instrument is experiencing instrument failures.
- Implemented the NanoDrop 2000c Pedestal procedure for more accurately determining DNA concentration and decreasing TATs on the Fast Bacterial Sequencing procedure.

### 1.2.5 Division of Provincial Lab of Southern Alberta

#### Division Members

Medical Staff	GFT/Clinical	Rank	Site	Special Expertise
Louie, Marie	Cross-Appointed	Assoc. Professor	FMC	Microbiology
Tellier, Raymond	Cross-Appointed	Assoc. Professor	FMC	Microbiology

### 1.2.6 Division of Toxicology

#### Division Members

Medical Staff	GFT/Clinical	Rank	Site	Special Expertise
Vacant	Region, Cross-Appointed		HSC	Toxicology

## 1.3 2011 Banff Pathology Course - Gynecological Pathology

Time	Event
<b>Wednesday, August 24, 2011</b>	
5:00 - 6:30 pm	Registration
<b>Thursday, August 25, 2011</b>	
7:00 - 7:45 am	Registration & Continental Breakfast
7:45 - 8:00	Welcome
8:00 - 9:00	<b>Dr. Terry Colgan</b> - The Challenge of glandular Lesions of the Uterine Cervix
9:00 - 10:00	<b>Dr. Dean Daya</b> - Endometrial Hyperplasia - When Will We Get Our Act Together
10:00 - 10:15	Break
10:15 - 11:15	<b>Dr. Martin Koebel</b> - Ovarian Carcinomas: Part 1 - Types Are Different Diseases That Can Be Reproducibly Diagnosed In Practice
11:15 - 12:15 pm	<b>Dr. Blake Gilks</b> - Ovarian Carcinomas: Part 2 - Practical Considerations in Tyhpe Differential Diagnois
12:15 - 1:00	Lunch
1:00 - 2:00	<b>Dr. Máire Duggan</b> - The Role of Pap Tests and Endocervical Curettage at ColPoscopy in the Detection of CIN 2+
2:00 - 3:00	<b>Dr. Valerie Capstick</b> - Gynecologic Pathology Reporting - Implications for Clinical Mangement and Treatment
5:30 - 7:30	Wine & Cheese
<b>Friday, August 26, 2011</b>	
7:15 - 8:00 am	Registration & Continental Breakfast
8:00 - 9:00	<b>2011 Dr. Peter W. Davey Pathology Lectureship</b> <b>Dr. Blake Gilks</b> - Sex Cord-stromal Tumors of the Ovary: Recent Advances and an Algorithm for Diagnosis
9:00 - 10:00	<b>Dr. Marisa Nucci</b> - VIN and Vulvar Cancer: Diagnostic Issues and Practical Considerations.
10:00 - 10:15	Break
10:15 - 11:15	<b>Dr. Julie Irving</b> - Diagnostic Gynecological Pathology in 2011: A Case-based Presentation Integrating Practical Issues With New Ancillary Markers, Updated TNM Staging, and Current Surgical Trends
11:15 - 12:15 pm	<b>Dr. Terry Colgan</b> - New Wrinkles in (Hydatidiform) Moles/Trends in Canadian and Albertan Pathologist Supply
12:15 - 1:00	Lunch
1:00 - 3:00	<b>Dr. Máire Duggan</b> - Workshop - Gynecological Cytopathology: Pearls and Pitfalls
3:30 - 5:30	Annual General Meeting of the AMA Section of Laboratory Physicians (ASLP)
6:00 - 7:00	Cash Bar
7:00	Banquet
<b>Saturday, August 27, 2011</b>	
7:15 - 8:00 am	Registration & Continental Breakfast
8:00 - 9:00	<b>Dr. Marisa Nucci</b> - The Fallopian Tube as a Source of Pelvic Serous Carcinoma

Time	Event
9:00 - 10:00	<b>Dr. Dean Daya</b> - Challenges and Solutions for Filling out the CAP Synoptic Report for Endometrial Carcinoma
10:00 - 10:15	Break
10:15 - 11:15	<b>Dr. Marisa Nucci, Dr. Blake Gilks, Dr. Julie Irving</b> - Case Presentations
11:15 - 12:15 pm	<b>Dr. Marisa Nucci, Dr. Blake Gilks, Dr. Julie Irving</b> - Case Presentations
12:15	Closing Remarks

## 2012 Banff Pathology Course Speakers

### Craig Allred, MD

Barnes Hospital  
Professor, Pathology and Immunology  
Washington University School of Medicine  
St. Louis, MO

### Edi Brogi, MD, PHD

Memorial Sloan-Kettering Cancer Center  
Attending Pathologist  
New York, NY

### Susan C. Lester, MD, PHD

Brigham and Women's Hospital  
Assistant Professor, Pathology  
Harvard Medical School  
Boston, MA

### Stuart J. Schnitt, MD

Beth Israel Deaconess Medical Center  
Professor of Pathology  
Harvard Medical School  
Boston, MA

### Barbara Walley, MD

Assistant Professor  
Departments of Oncology/  
Medicine

### May Lynn Quan, MD

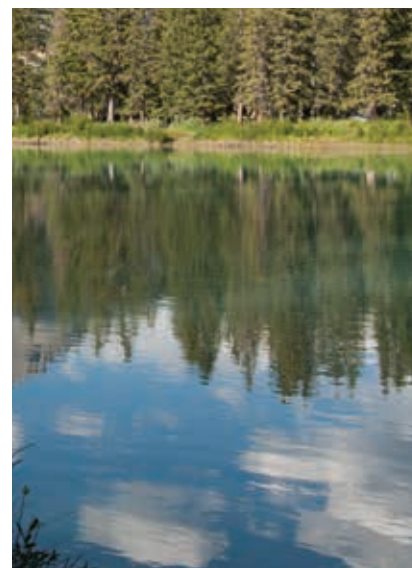
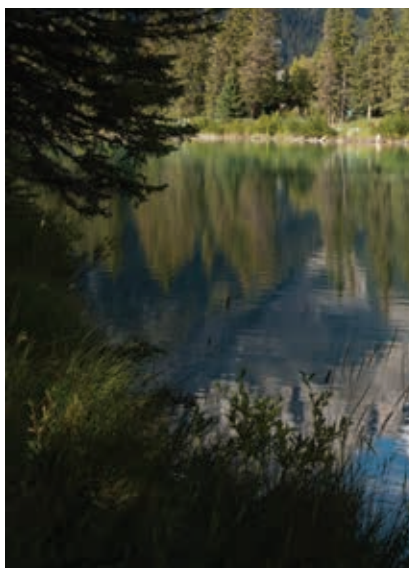
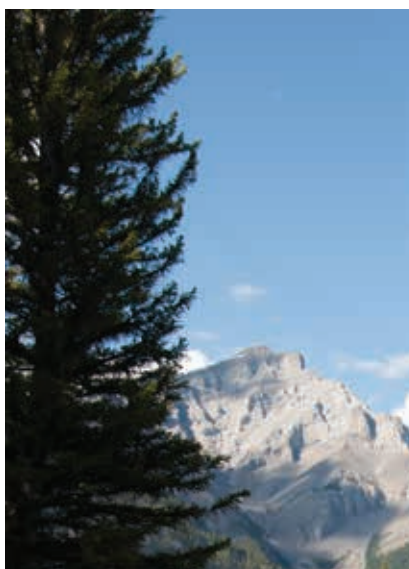
Assistant Professor  
Departments of Surgery/Oncology

### Bobbie-Jo L. Docktor, MD

Clinical Assistant Professor  
Department of Radiology

### Gilbert Bigras, MD

Associate Clinical Professor  
Cross Cancer Institute



## 1.4 Research Grants

### 2011 CLS Health Services Research Funding Competition Projects Awarded Funding

Principal Investigator/ Co-Investigators	Topic	Budget
<b>Dr. Francis Green,</b> Candice Bjornson	A serum DNA based diagnostic assay for occult infection in cystic fibrosis patients	\$9,850.00
<b>Dr. Christopher Naugler,</b> Brenda Hemmelgarn, Paul Woods, Dan Henne	Vitamin D utilization in Calgary: sociodemographic correlates and linkage to external databases.	\$9,350.00
<b>Dr. Guangming Han,</b> M. Duggan, D. Sidhu	Immunohistochemical Profiles of High-Grade Endometrial Carcinomas	\$9,901.00
<b>Dr. Alex Chin,</b> Morley D. Hollenberg, Rithwik Ramachandran, Liena Zhao	Development of an assay which quantifies proteinase-activated receptor activation as a diagnostic marker of organ-specific inflammation.	\$35,000.00
		\$64,101.00

The next table showcases external research grants held by Department of Pathology & Laboratory Medicine/ Calgary Laboratory Services researchers during 2011.

**External Research Grants and Awards** (includes multiple years and co-investigators) Does not include those of cross-appointments.

Medical Staff	Year	Funding Source	Total Award	*PI/Co-Inv
<b>Berka, Noureddine</b>				
"A prospective study of endothelial progenitor cells (EPCs) in pre-eclampsia and pregnant women who smoke"	2009-11	ACH Research Foundation	\$30,000	Co-Inv
<b>Bismar, Tarek</b>				
"Molecular signatures of TMPRSS2-ERG hormone refractor prostate cancer and the regulation of TMPRSS2-ERG in hormone"	2008-10	Prostate Cancer Institute	\$100,000	PI
"Molecular signatures platform to characterize aggressive and indolent prostate cancer"	2008-11	Canadian Foundation of Innovation	\$153,000	PI
"miRNA Predictors of Lethal Hormone Refractory Prostate Cancer"	2010-12	Prostate Cancer Canada	\$120,000	PI
"Combined role of TMPRSS2-ERG fusion gene and PTEN genomic deletions in prostate cancer development, progression and metastasis"	2008-11	Prostate Cancer Research Foundation USA	\$238,600	PI
<b>Chan, Jennifer</b>				
"MicroRNAs in Medulloblastoma"	2009-12	Kids Cancer Foundation of Alberta	\$300,000	PI
"MicroRNA functions in cerebellar development and disease"	2010-13	Alberta Heritage Foundation Establishment Grant	\$360,000	PI

Medical Staff	Year	Funding Source	Total Award	*PI/Co-Inv
“MicroRNA functions in cerebellar development and disease”	2010-17	Alberta Heritage Foundation Clinical Investigator Award	\$770,000	PI
<b>Church, Deirdre</b>				
“Antibiotic resistance organism research Fund”	2000-10	Calgary Health Trust	\$963,147	PI
“Infection of the Gut by HIV-1”	2008-11	CIHR	\$ 144,100	Co-Inv
<b>Demetrick, Douglas J.</b>				
“Angiogenesis Factor Polymorphisms: Role in the Development of Rapid Metastasis in Breast Cancer”	2007-10	Canadian Breast Cancer Research Initiative	\$429,000	PI
“Association of patient genotype with rapid skeletal metastasis in Breast Cancer”	2009-11	Alberta Breast Cancer Research Initiative	\$257,853	PI
“Characterization of Putative Hypoxia-regulated Cell Growth Regulatory Genes”	2010	AHFMR Summer Studentship	\$6,000	PI
<b>Duggan, Máire</b>				
“Polyps of the Vagina & Uterine Cervix: a clinico pathologic analysis.”	2007-10	CHR	\$3,947	PI
<b>Falck, Vincent</b>				
“Barrett’s esophagus: Incidence and Prevalence in Calgary and Southern Alberta”	2004-10	Bonnie Laing Fund and O’Brien Center	\$7,400	PI
“A Multi-Center, Single-Blind, Randomized Study Comparing Thymectomy to no Thymectomy in Non-Thymomatous Myasthenia Gravis (MG) Patients Receiving Prednisone”	2006-11	National Institute of Health	\$3,400 Per accrued patient	Co-Inv
<b>Green, Francis</b>				
“High resolution microscopy of human cancer”	2004-10	Anonymous Foundations	\$428,373	PI
“Treatment of acute asthma with perfluoro-carbon/carbon dioxide formulations”	2008-10	AHFMR ForeFront Program	\$109,000	PI
“Novel formulations for the treatment of acute asthma”	2009-10	AHFMR ForeFront Award Phase II	\$26,500	PI
“Novel formulations for the treatment of acute asthma”	2009-10	Southern AB Intellectual Property Network Grant Award	\$15,000	PI
“Treatment of acute asthma with perfluoro-carbon/carbon dioxide formulations”	2010-11	The Lung Association – AB & NWT	\$30,000	PI
<b>Kelly, Margaret</b>				
“The Innate Immune Response in the Pathogenesis of Hypersensitivity Pneumonitis.”	2009-16	AHFMR	\$1,170,000	PI

Medical Staff	Year	Funding Source	Total Award	*PI/Co-Inv
"The role of IL-17 and neutrophilic airway inflammation in airway remodeling in a mouse model of chronic allergen exposure"	2009-11	GlaxoSmithKline	\$60,000	PI
<b>Koebel, Martin</b>				
"A Pan-Canadian platform for the development of biomarker-driven subtype specific management of ovarian carcinoma"	2010-11	Terry Fox Research Institute	\$900,000	Co-Inv
<b>Lyon, Andrew</b>				
"Feasibility Study for Development of a Conception Cohort to Study Utilization of Prenatal Screening"	2009-11	CIHR	\$25,000	PI
"Preterm birth and healthy outcomes"	2008-13	AHFMR	\$5,000,000	Co-Inv
<b>Mansoor, Adnan</b>				
"Predicting benefit and improving outcomes of high dose therapy (HDT) and autologous stem cell transplantation (SCT) for Lymphoma (NHL) and Myeloma (MM) patients through tissue arrays based classification, sensitive detection of minimal residual disease (MRD) and reovirus purging"	2008-11	Terry Fox Research Institute	\$625,875	Co-PI
"Expression of CD-20-related genes in Lymphocytic Neoplasm."	2008-11	CIHR	\$152,875	Co-Inv
"Therapeutic targets and Prognostic markers for MCellL."	2008-11	CIHR	\$310,000	Co-Inv
<b>Pitout, Johann</b>				
"CTXM-M-15 producing Escherichia coli" in Canada	2008-10	Merck Frosst Canada Ltd.	\$27,500	PI
<b>Wright, Jr., James</b>				
"Protein characterization using advanced mass spectrometry: a core facility to advance medical research"	2007-12	Canadian Institutes for Health Research	\$327,450	Co-Inv
<b>Zhang, Kunyan</b>				
"MRSA Colonization in African American College Youth"	2009-10	National Institute of Health	\$30,000	Co-Inv
"Real-Time PCR for Rapid Detection of Antibiotic Resistant Organisms"	2009-10	Calgary Health Trust	\$60,000	Co-Inv
Molecular characterization of the Malaysian MRSA strains from animals and humans	2009-10	Universiti Putra Malaysia	\$2,500	PI
"Dissecting the mechanism of the tissue injury (abscess) caused by Staphylococcus aureus- Bacterial factors or host immune response?"	2010	AHFMR 2010 Summer Studentship Award	\$5,200	PI
Community-associated MRSA in Europe: Multi-resistance, Virulence and Patient Risk Profiles-A Collaborative Project	2010-11	EURO-ASPIRE	€100,00	Co-Inv

Medical Staff	Year	Funding Source	Total Award	*PI/Co-Inv
"Molecular assay development and their applications in Centre for Antimicrobial Resistance (CAR) Program"	2007-12	AHS CAR Program	\$300,000	PI
"The Alberta Sepsis Network."	2009-14	AHFMR	\$4,998,191	Co-Inv

## 1.5 Publications

### Peer-Reviewed Publications (does not include those of cross appointments)

1. Almekhlafi MA, **Clark AW**, Lucchinetti CF, Zhang Y, Power C, Bell RB. Neuromyelitis optica with extensive active brain involvement: an autopsy study. *Arch Neurol.* 68(4):508-12, 2011
2. Andrews CN, Mintchev P, Neshev E, Fraser HF, Storr M, Bathe OF, **Urbanski SJ**. Percutaneous endoscopically assisted transenteric full-thickness gastric biopsy: initial experience in humans. *Gastrointest Endosc.* 73(5):949-54, 2011
3. Anglesio MS, Carey MS, **Köbel M**, Mackay H, Huntsman DG. Vancouver Ovarian Clear Cell Symposium Speakers. Clear Cell Carcinoma of the Ovary: A report from the first Ovarian Clear Cell Symposium June 24th, 2010. *Gynecol Oncol.* 121(2):407-15, 2011
4. Arbefeveille SS, **Zhang K**, Kroeger JS, Howard WJ, Diekema DJ, Richter SS. Prevalence and Genetic Relatedness of Methicillin Susceptible Staphylococcus aureus Isolates Detected by the Xpert MRSA Nasal Assay. *J Clin Microbiol* 49(8):2996-9, 2011
5. Baker K, Lachapelle J, Zlobec I, **Bismar TA**, Terracciano L, Foulkes WD. Prognostic significance of CD8+ T lymphocytes in breast cancer depends upon both oestrogen receptor status and histological grade. *Histopathology.* 58(7):1107-16, 2011
6. **Benediktsson H**. Pathology against the odds. *Arch Pathol Lab Med.* 135(2):171-2, 2011
7. Berney DM, Wheeler TM, Grignon DJ et al. and The ISUP Prostate Cancer Group (**Trpkov K** – Member). International Society of Urological Pathology (ISUP) Consensus Conference on Handling and Staging of Radical Prostatectomy Specimens. Working group 4: seminal vesicles and lymph nodes. *Mod Path.* 24(1):39-47, 2011
8. **Bismar TA**, Yoshimoto M, Vollmer RT, Duan Q, Firszt M, Corcos, J, Squire JA. PTEN genomic deletion is an early event associated with ERG gene rearrangements in prostate cancer. *BJU Int.* 107(3):477-85, 2011
9. Borkar M, Ahmad F, **Khan FM**, Agrawal S. Paleolithic spread of Y-chromosomal lineage of tribes in eastern and northeastern India. *Ann Hum Biol.* 38(6):736-46, 2011
10. Bromley AB, **Trotter MJ**. Immunohistochemistry utilization in autopsy pathology: A Canadian experience. *Pathol Res Pract.* 207(4):241-6, 2011
11. **Chin AC**. Vitamin D – Analyte of the Millennium. *Journal of the International Federation of Clinical Chemistry and Laboratory Medicine.* 22(1), 2011
12. **Church D, Gregson D**, Lloyd T, Klein M, Beckthold B, Laupland K, Gill MJ. Comparison of the RealTime HIV-1, COBAS TaqMan 48 v1.0, Easy Qv1.2, and Versant v3.0 assays for determination of HIV-1 viral loads in a cohort of Canadian patients with diverse HIV sybtype infections. *J Clin Microbiol.* 49(1):118-24, 2011

13. **Church DL**, Baxter H, Lloyd T, Miller B, **Gregson DB**. Evaluation of Xpert® group B streptococcus real-time polymerase chain reaction assay compared to StrepB Carrot Broth™ for the rapid intrapartum detection of group B streptococcus colonization. *Diagn Microbiol Infect Dis*. 69(4):460-2, 2011
14. **Church DL**, Chow BL, Lloyd T, **Gregson DB**. Comparison of automated repetitive-sequence-based polymerase chain reaction and spa typing versus pulsed-field gel electrophoresis for molecular typing of methicillin-resistant *Staphylococcus aureus*. *Diagn Microbiol Infect Dis*. 69(1):30-7, 2011
15. **Church DL**, Chow BL, Lloyd T, **Gregson DB**. Evaluation of automated repetitive-sequence-based PCR (DiversiLab) compared to PCR ribotyping for rapid molecular typing of community- and nosocomial-acquired *Clostridium difficile*. *Diagn Microbiol Infect Dis*. 70(2):183-90, 2011
16. **Church DL**, Simmon KE, Sporina J, Lloyd T, **Gregson DB**. Identification by 16S rRNA gene sequencing of *Negativicoccus succinivorans* recovered from the blood of a patient with hemachromatosis and pancreatitis. *J Clin Microbiol*. 49(8):3082-4, 2011
17. Congly SE, **Gao ZH**, Storr M. Duodenal vascular Ectasia [DUVE] associated with hematopoietic stem cell transplant. *Endoscopy*. 43 Suppl 2:E197-8, 2011
18. Delair D, Oliva E, **Köbel M**, Macias A, Gilks CB, Soslow RA. Morphological spectrum of immunohistochemically characterized clear cell carcinomas of the ovary: a study of 155 cases. *Am J Surg Pathol*. 35(1):36-44, 2011
19. Doyle-Baker PK, Venner AA, **Lyon ME**, Fung T. Impact of a combined diet and progressive exercise intervention for overweight and obese children: the B.E. H.I.P. study. *Appl Physiol Nutr Metab*. 36(4):515-25, 2011
20. **Dupre MP**, Dixon E, Heitman SJ. Primary pancreatic lymphoma: a rare cause of massive upper gastrointestinal hemorrhage. *Can J Gastroenterol*. 25(10):532-3, 2011
21. El Mays T, Saifeddine M, Choudhury P, Hollenberg MD, **Green FH**. Carbon dioxide enhances substance P-induced epithelium-dependent bronchial smooth muscle relaxation in Sprague-Dawley rats. *Can J Physiol Pharmacol*. 89(7):513-20, 2011
22. Everett JB, **Falck VG**, Dort JC, Matthews TW. Mandibular pseudoepitheliomatous hyperplasia following treatment for oral squamous cell carcinoma. *J Otolaryngol Head Neck Surg*. 40(1):E1-4, 2011
23. Fauth C, Franko A, Duan Q, Wood S, **Duggan MA**. Clinicopathological determinants of vaginal and premalignant-malignant cervico-vaginal polyps of the lower female genital tract. *J Low Genit Tract Dis*. 15(3):210-8, 2011
24. Fenton TR, **Lyon AW**. Milk and acid-base balance: proposed hypothesis versus scientific evidence. *J Am Coll Nutr*. 30(5):471S-475S, 2011
25. Fenton TR, **Lyon AW**. Rose MS. Cord blood calcium, phosphate, magnesium, and alkaline phosphatase gestational age-specific reference intervals for preterm infants. *BMC Pediatr*. 11:76, 2011
26. Fenton TR, Tough SC, **Lyon AW**. Eliasziw M, Hanley DA. Causal assessment of dietary acid load and bone disease: A systematic review and meta-analysis applying Hill's epidemiologic criteria for causality. *Nutr J*. 10:41, 2011
27. Fleshner NE, Kapusta L, Donnelly B, Tanguay S, Chin J, Hersey K, Farley A, Jansz K, Siemens DR, **Trpkov K**, Lacombe L, Gleave M, Tu D, Parulekar WR. Progression from high-grade prostatic intraepithelial neoplasia to cancer: A randomized trial of combination vitamin-E, soy and selenium. *J Clin Oncol*. 29(17):2386-90, 2011

28. Gao JJ, **Gao ZH**, Zhao CR, Yuan Y, Cui SX, Zhang XF, Cheng YN, Xu WF, Tang W, Qu XJ, Qu LYP, a novel bestatin derivative, inhibits cell growth and suppresses APN/CD13 activity in human ovarian carcinoma cells more potently than bestatin. *Invest New Drugs*. 29(4):574–82, 2011
29. Gao S, Zeng J, ElSheikh AM, Naji G, Alhadj R, Rokne J, **Demetrick D**. A closer look at “social” boundary genes reveals knowledge to gene expression profiles. *Curr Protein Pept Sci*. 12(7):602-13, 2011
30. Gilks CB, Clarke BA, **Han G**, **Köbel M**, Longacre T, McCluggage WG, Seidman JD, Shaw P, Soslow RA. Letter to the editor regarding ‘Roh MH, Lassin Y, Miron A et al. High-grade fimbrial-ovarian carcinomas are unified by p53, PTEN and PAX2 expression’. *Mod Pathol*. 24(9):1281-2; author reply 1282-3, 2011
31. Goebel A, Ferrier RA, Ferreira P, **Pinto-Rojas A**, Matshes E, Choy YM. Gaucher disease with prenatal onset and perinatal death due to compound heterozygosity for the missense R131C and Null RecNci\GBA mutations. *Pediatr Dev Pathol*. 14(3):240-3, 2011
32. Goto J, Talos DM, Klein P, Qin W, Chekaluk YI, Anderl S, Malinowska IA, Di Nardo A, Bronson RT, **Chan JA**, Vinters HV, Kernie SG, Jensen F, Sahin M, Kwiatkowski DJ. Regulable neural progenitor-specific TSC1 loss yields giant cells with multi-organelle dysfunction in a mouse brain model of tuberous sclerosis complex. *Proc Natl Acad Sci USA*. 108(45):E1070-9, 2011
33. **Guggisberg K**, Okorie C, **Khalil M**. Cytopathology including fine-needle aspiration in sub-Saharan Africa: a Cameroon experience. *Arch Pathol Lab Med*. 135(2):200-6, 2011
34. **Gui X**, Qin L, **Gao ZH**, **Falck V**, Harpaz N. Goblet cell carcinoids at extraappendiceal locations of gastrointestinal tract: an underrecognized diagnostic pitfall. *J Surg Oncol*. 103(8):790-5, 2011
35. Hahn JN, **Falck VG**, Jirik FR. Smad4 deficiency in T cells leads to the Th17-associated development of premalignant gastroduodenal lesions in mice. *J Clin Invest*. 121(10):4030-42, 2011
36. Hamilton L, **Joseph JT**. Colloid cyst of the third ventricle and sudden unexpected death. *Acad Forensic Pathol*. 1:236-237, 2011
37. Hannam P, Khairnar K, Downey J, Powis J, Ralevski F, **Pillai DR**. Cutaneous myiasis in traveler returning from Ethiopia. *Emerg Infect Dis*. 17(12):2385-6, 2011
38. Hinnell C, Coulthart MB, Jansen GH, Cashman NR, Lauzon J, **Clark A**, Costello F, White C, Midha R, Wiebe S, Furtado S. Gerstmann-Straussler-Scheinker disease due to a novel prion protein gene mutation. *Neurology*. 76(5):485-7, 2011
39. Hrytsenko O, Rayat G, Xu B-Y, Pohajdak B, **Krause R**, Rajotte RV, **Wright JR Jr**. Lifelong stable human insulin expression in transgenic tilapia expressing a humanized tilapia insulin gene. *Transgenic Res*. 20:1397-98, 2011
40. Hunt KA, Smyth DJ, Balschun T, et al; Type 1 Diabetes Genetics Consortium (**N. Berka**). Rare and functional SIAE variants are not associated with autoimmune disease risk in up to 66,924 individuals of European ancestry. *Nat Genet*. 44(1):3-5, 2011
41. Iftinca MC, **Joseph JT**. Takayasu Arteritis. *Acad Forensic Pathol*. 1:234-235, 2011
42. Jensen US, Knudsen JD, Wehberg S, **Gregson DB**, Laupland KB. Risk factors for recurrence and death after bacteraemia: a population-based study. *Clin Microbiol Infect*. 17(8):1148-54, 2011
43. Kalloger SE, **Köbel M**, Leung S, Mehl E, Gao D, Marcon K, Chow C, Clarke B, Huntsman DG, Gilks CB. Calculator for ovarian carcinoma subtype prediction. *Mod Pathol*. 24(4):512-21, 2011

44. Kelemen L, **Köbel M**. Mucinous carcinomas of the ovary and colon: different organ, same dilemma. *Lancet Oncol.* 12(11):1071-80, 2011
45. Kim HS, Moreira DM, Jayachandran J, Gerber L, Bañez LL, Vollmer RT, Lark AL, Donovan MJ, Powell D, **Khan FM**, Freedland SJ. Prostate biopsies from black men express higher levels of aggressive disease biomarkers than prostate biopsies from white men. *Prostate Cancer Prostatic Dis.* 14(3):262-5, 2011
46. Kim J, **Gregson DB**, **Church DL**. A case of acute cholecystitis caused by methicillin-resistant *Staphylococcus aureus* (MRSA) in an immunocompromised patient. *Can J Infect Dis & Med Microbiol.* 22(1):e7-9, 2011
47. Kim M, Garant KA, zur Nieden NI, Alain T, Loken SD, **Urbanski SJ**, Forsyth PA, Rancourt DE, Lee PW, Johnston RN. Attenuated reovirus displays oncolysis with reduced host toxicity. *Br J Cancer.* 104(2):290-9, 2011
48. **Köbel M**, Löning T. Commentary on modified grading of endometrial carcinoma. *Geburtsh Frauenheilk.* 71:954-5, 2011
49. **Köbel M**, Turbin D, Kalloger SE, Gao D, Huntsman DG, Gilks CB. Biomarker expression in pelvic high-grade serous carcinomas: comparing ovarian and omental site. *Int J Gynecol Pathol.* 30(4):366-71, 2011
50. Laupland KB, Schonheyder HC, Ostergaard C, Knudsen JD, Valiquette L, Galbraith J, Kennedy KJ, Gradel KO: International Bacteremia Surveillance Collaborative (**D Church** – member). Epidemiology of *Haemophilus influenzae* bacteremia: a multi-national population-based assessment. *J Infect.* 62(2):142-8, 2011
51. Laupland KB, Svenson LW, **Gregson DB**, **Church DL**. Long-term mortality associated with community-onset bloodstream infection. *Infection.* 39(5):405-10, 2011
52. Lee A, Griffiths TA, Parab RS, King RK, Dubinsky MC, **Urbanski SJ**, Wrobel I, Rioux KP. Association of *Mycobacterium avium* subspecies paratuberculosis With Crohn Disease in pediatric patients. *J Pediatr Gastroenterol Nutr.* 52(2):170-4, 2011
53. Lesack K, **Naugler C**. An open source software program for performing Bonferroni and related corrections for multiple comparisons. *J Pathol Inform.* 2:52, 2011
54. Lewkonja P, **Medlicott SA**, Hildebrand KA. Intramuscular myxoid lipoma in the proximal forearm presenting as an olecranon mass with superficial radial nerve palsy: a case report. *J Med Case Reports.* 5(1):321, 2011
55. Li Y, Su J, Dingzhang X, Yoshimoto M, Liu S, Bijian K, Gupta A, Squire JA, Alaoui Jamali MA, **Bismar TA**. PTEN deletion and heme oxygenase-1 overexpression cooperate in prostate cancer progression and are associated with adverse clinical outcome. *J Pathol.* 224(1):90-100, 2011
56. Li Y, Yau A, Schaeffer D, Magliocco A, **Gui X**, **Urbanski S**, **Waghray R**, Owen D, **Gao ZH**. Colorectal glandular-neuroendocrine mixed tumor: pathologic spectrum and clinical implications. *Am J Surg Pathol.* 35(3):413-25, 2011
57. Liu HP, **Gao ZH**, Xue X, Hou CY, Jiang ZM, Yue P, Zhao CR, Tang W, Wang CB, Chen SG, Qu XJ. Haishengsu, a protein from shellfish *Tegillarca L. granosa*, inhibits the growth and the activity of matrix metalloproteinases-2 and -9 in human lung carcinoma. *Food Biophysics.* 6:390-396, 2011

58. Liu S, Yoshimoto M, Trpkov K, Duan Q, Firszt M, Corcos J, Squire JA, **Bismar TA**. Detection of ERG gene rearrangements and PTEN deletions in unsuspected prostate cancer of the transition zone. *Cancer Biol. Ther.* 11(6):562-6, 2011
59. Löning T, Riethdorf L, **Köbel M**. Diagnosis and differential diagnosis of cervical adenocarcinoma. *Pathologe.* 32(6):505-13, 2011
60. Luft L, Gill MJ, **Church DL**. HIV viral diversity and its implications for viral load testing: review of current platforms. *Int J Infect Dis.* 15(10):e661-70, 2011
61. **Lyon AW**. Could elevated potassium results be due to dehydration? (Letter) *Medical Laboratory Observer.* 43(7):34-35, 2011
62. **Lyon ME, Lyon AW**. Analysis of the performance of the CONTOUR® TS Blood Glucose Monitoring System: when regulatory performance criteria are met, should we have confidence to use a medical device with all patients? *J Diabetes Sci Technol.* 5(1):206-8, 2011
63. **Lyon ME, Lyon AW**. Patient acuity exacerbates discrepancy between whole blood and plasma methods through bias and variance in molality to molarity conversion: "Mind the gap!" *Clin Biochem.* 44(5-6):412-7, 2011
64. Magi-Galluzzi C, Evans AJ, Delahunt B et al. and The ISUP Prostate Cancer Group (**Trpkov K** – Member). International Society of Urological Pathology (ISUP) Consensus Conference on Handling and Staging of Radical Prostatectomy Specimens. Working group 3: extraprostatic extension, lympho-vascular invasion and locally advanced disease. *Mod Path.* 24(1):26-38, 2011
65. Maingat F, Halloran B, Acharjee S, van Marle G, **Church D**, Gill MJ, Uwiera RR, Cohen EA, Meddiings J, Madsen K, Power C. Inflammation and epithelial injury in AIDS enteropathy: involvement of endoplasmic reticulum stress. *FASEB J.* 25(7):2211-20, 2011
66. Mann J, **Urbanski S**, Lategan J, Swain MG. Chronic lymphocytic leukemia-associated cholangiopathy. *Can J Gastroenterol.* 25(7):356-7, 2011
67. **Mansoor A**, Pittaluga S, Beck PL, Wilson WH, Ferry JA, Jaffe ES. NK-cell enteropathy: a benign NK-cell lymphoproliferative disease mimicking intestinal lymphoma: clinicopathologic features and follow-up in a unique case series. *Blood.* 117(5):1447-52, 2011
68. Matshes EW, Evans RM, Pinckard K, **Joseph JT**, Lew EO. Shaken infants die of neck trauma, not of brain trauma. *Acad Forensic Pathol.* 1:82-91, 2011
69. Matshes EW, **Trevenen C**. Infant heart dissection in a forensic context: babies are not just small adults. *Acad Forensic Pathol.* 1:156-165, 2011
70. Mushtaq S, Irfan, S, Sarma J, Doumith M, Pike R, **Pitout JDD**. Livermore DM, Woodford N. Phylogenetic diversity of Escherichia coli strains producing NDM-1 carbapenemase. *J Antimicrob Chemother.* 66(9):2002-5, 2011
71. **Naugler C**. Human leukocyte antigen polymorphisms and leukemia susceptibility. *Leuk Res.* 35:1545-6, 2011
72. **Naugler C**. Immune recognition of transplacentally acquired lymphoid allografts selects for increased major histocompatibility polymorphism. *Med Hypotheses.* 77:323-5, 2011
73. Neri P, Ren L, Azab A, Brentnall M, Gratton K, Klimowicz A, Lin C, Duggan P, Tassone P, **Mansoor A**, Stewart D, Boise L, Ghobrial I, Bahlis N. Integrin B7-Mediated Regulation of Multiple Myeloma Cell Adhesion, Migration and Invasion. *Blood.* 117(23):6202-13, 2011

74. Neri P, Ren L, Gratton K, Stebner E, Johnson J, Klimowicz A, Duggan P, Tassone P, **Mansoor A**, Stewart DA, Lonial S, Boise LH, Bahlis NJ. Bortezomib-induced “BRCAness” sensitizes multiple myeloma cells to PARP inhibitors. *Blood*. 118(24):6368-79, 2011
75. Neri P, Ren L, Gratton K, Stebner E, Johnson J, Klimowicz A, Duggan P, Tassone P, **Mansoor A**, Stewart D, Lonial S, Boise L, Bahlis N, Nyante SJ, Black A, Kreimer AR, **Duggan MA**, Carreon JD, Kessel B, Buys SS, Ragard LR, Johnson KA, Dunn BK, Lamerato L, Commins JM, Berg CD, Sherman ME. Pathologic findings following false-positive screening tests for ovarian cancer in the Prostate, Lung, Colorectal and Ovarian (PLCO) cancer screening trial. *Gynecol Oncol*. 120(3):474-9, 2011
76. Patel, SN, McGeer A, Melaro R, Tyrell GJ, Green K, **Pillai DR**, Low DE, and the Canadian Bacterial Surveillance Network (**DL Church** – Member). Susceptibility of *Streptococcus pneumoniae* to fluoroquinolones in Canada. *Antimicrob Agents Chemother*. 55(8):3703-8, 2011
77. Paulin H, Geldenhuys L, **Naugler C**. Predictors of an unsatisfactory conventional cervical cytology smear. *J Obstet Gynecol Can*. 33:725-8, 2011
78. Peermohamed S, **Barber D**, Kurwa H. Diagnostic challenges of cutaneous draining sinus tracts of odontogenic origin: a case report. *Dermatol Surg*. 37(10):1525-7, 2011
79. Peirano G, Ahmed-Bently J, Woodford N, **Pitout JDD**. New Delhi Metallo- $\beta$ -lactamase from a Canadian traveller. *Emerg Infect Dis*. 17(2):242-4, 2011
80. Peirano G, Asensi MD, Pitondo-Silva A, **Pitout JDD**. Molecular Characteristics of extended-spectrum  $\beta$ -lactamase *Escherichia coli* from Rio de Janeiro, Brazil. *Clin Microbiol Infect*. 17(7):1039-43, 2011
81. Peirano G, **Gregson DB**, Laupland KB, **Pitout JDD**. Colonization of returning travellers with CTX-M-producing *Escherichia coli*. *J Travel Med*. 18(5):299-303, 2011
82. Peirano G, **Pillai DR**, Pitondo-Silva A, Richardson D, **Pitout JDD**. The characteristics of NDM-producing *Klebsiella pneumoniae* from Canada. *Diagn Microbiol Infect Dis*. 71(2):106-9, 2011
83. Peirano G, Schreckenberger PC, **Pitout JDD**. The characteristics of NDM-1-producing *Escherichia coli* that belong to the successful and virulent clone ST131. *Antimicrob Agents Chemother*. 55(6):2986-8, 2011
84. Peirano G, van Greune CHJ, **Pitout JDD**. Characteristics of infections caused by extended-spectrum  $\beta$ -lactamase-producing *Escherichia coli* from community hospitals in South Africa. *Diagn Microbiol Infect Dis*. 69(4):449-53, 2011
85. **Pinto A**, Dickman P, Parham D. Pathobiological markers of the Ewing sarcoma family of tumors: state of the art and prediction of behaviour. *Sarcoma* 856190, 2011
86. Peirano G, van Greune CHJ, **Pitout JDD**. Characteristics of infections caused by extended-spectrum  $\beta$ -lactamase-producing *Escherichia coli* from community hospitals in South Africa. *Diagn Microbiol Infect Dis*. 69(4):449-53, 2011
87. Pollak PT, Verjee ZH, **Lyon AW**. Risperidone-induced QT prolongation following overdose correlates with serum drug concentration and resolves rapidly with no evidence of altered pharmacokinetics. *J Clin Pharmacol*. 51(7):1112-5, 2011
88. Ratnam S, Coutlee F, **Fontaine D**, Bentley J, Escott N, Ghatage P, Gadag V, Holloway G, Bartellas E, Kum N, Giede C, Lear A. Aptima HPV E6/E7 mRNA test is as sensitive as Hybrid Capture 2 Assay but more specific at detecting cervical precancer and cancer. *J Clin Microbiol*. 49(2):557-64, 2011

89. Rempel G, **Pitout JDD**, Laupland KB. Antimicrobial resistance surveillance systems: are potential bias taken into accounts? *Can J Infect Dis Med Microbiol.* 22(4):24-28, 2011
90. Rodriguez FJ, Scheithauer BW, **George D**, Midha R, MacCollin M, Stemmer-Rachamimov AO. Superficial neurofibromas in the setting of schwannomatosis: nosologic implications. *Acta Neuropathol.* 121(5):663-8, 2011
91. Roldán G, **Chan J**, Eliasziw M, Cairncross JG, Forsyth PA. Leptomeningeal disease in oligodendroglial tumors: a population-based study. *J Neurooncol.* 104(3):811-5, 2011
92. Sabur N, **Kelly MM**, Gill MJ, Ainslie MD, Pendharkar SR. Granulomatous *Pneumocystis jiroveci* pneumonia associated with immune reconstituted HIV. *Can Respir J.* 18(6):e86-8, 2011
93. Samaratunga H, Montironi R, True L, Epstein JI, Griffiths DF, Humphrey PA, van der Kwast T, Wheeler TM, Srigley JR, Delahunt B, Egevad L; ISUP Prostate Cancer Group (**Trpkov K** – Member). International Society of Urological Pathology (ISUP) Consensus Conference on Handling and Staging of Radical Prostatectomy Specimens. Working group 1: specimen handling. *Mod Pathol.* 24(1):6-15, 2011
94. Sar A, Worawichawong S, **Benediktsson H**, Zhang J, Yilmaz S, **Trpkov K**. Interobserver agreement for Polyomavirus Nephropathy grading in renal allografts using the working proposal from the 10th Banff Conference on allograft pathology. *Hum Pathol.* 42(12):2018-24, 2011
95. Sarmaga D, Dubois JA, **Lyon ME**. Evaluation of different disinfectants on the performance of an on-meter dosed amperometric glucose-oxidase-based glucose meter. *J Diabetes Sci Technol.* 5(6):1449-52, 2011
96. Saxena RK, McClure ME, Hays MD, **Green FH**, Vallyathan V, Gilmour MI. Quantitative assessment of elemental carbon in the lungs of never smokers, cigarette smokers and coal miners. *J Toxicol Environ Health A.* 74(11):706-15, 2011
97. Shahinas D, Tamber GS, Arya G, Wong A, Lau R, Jamieson F, Ma JH, Alexander DC, Low DE, **Pillai DR**. Whole-genome sequence of *Streptococcus pseudopneumoniae* isolate IS7493. *J Bacteriol.* 193(21):6102-3, 2011
98. Shetty S, **Pinto A**, **Roland B**. Mesenchymal hamartoma of the liver with inversion of chromosome 19. *Pediatr Dev Pathol.* 14(5):407-10, 2011
99. Siemieniuk RA, **Gregson DB**, Gill MJ. The persisting burden of invasive pneumococcal disease in HIV patients: an observational cohort study. *BMC Infect Dis.* 11:314, 2011
100. Simner PJ, Zhanel GG, **Pitout JDD**, Tailor F, McCracken M, Mulvey MR, Lagacé-Wiens PR, Adam HJ, Hoban DJ; Canadian Antimicrobial Resistance Alliance (CARA). Prevalence and characterization of extended-spectrum  $\beta$ -lactamase- and AmpC  $\beta$ -lactamase-producing *Escherichia coli*: results of the CANWARD 2007-2009 study. *Diagn Microbiol Infect Dis.* 69(3):326-34, 2011
101. Singh JS, Costello F, Nadeau J, Witt S, **Trotter MJ**, Goyal M. Case 176: Neuro-Sweet syndrome. *Radiology.* 261(3):989-93, 2011
102. Soraisham AS, Kamaluddeen M, **Trevenen C**. Primary pulmonary lymphangiectasia in an infant with trisomy 21: Case Report. *J Neonatal Perinatal Medicine.* 4:383-5, 2011
103. Stewart M, Andrews CN, **Urbanski S**, Beck PL, Storr M. The association of coeliac disease and microscopic colitis: a large population-based study. *Aliment Pharmacol Ther.* 33(12):1340-9, 2011

104. Storek J, Vliagoftis H, Grizel A, **Lyon AW**, Daly A, **Khan F**, Bowen T, Game M, Larratt L, Turner R, Huebsch L. Allergy transfer with hematopoietic cell transplantation from an unrelated donor. *Bone Marrow Transplant.* 46(4):605-6, 2011
105. Straseski JA, **Lyon ME**, Clarke W, Dubois JA, Phelan LA, **Lyon AW**. Investigating Interferences of a Whole-Blood Point-of-Care Creatinine Analyzer: Comparison to Plasma Enzymatic and Definitive Creatinine Methods in an Acute-Care Setting. *Clin Chem.* 57:1566-73, 2011
106. Swenerton KD, Santos JL, Gilks CB, **Köbel M**, Hoskins P, Wong F, and Le ND. Histotype predicts the curative potential of radiotherapy: the example of ovarian cancers. *Ann Oncol.* 22(2):341-7, 2011
107. Tan PH, Cheng L, Srigley JR et al. **JI** and The ISUP Prostate Cancer Group (**Trpkov K** – Member). International Society of Urological Pathology (ISUP) Consensus Conference on Handling and Staging of Radical Prostatectomy Specimens. Working group 5: surgical margins. *Mod Path.* 24(1):48-5715, 2011
108. Tian Y, Rich BE, Vena N, Craig JM, Macconail LE, Rajaram V, Goldman S, Taha H, Mahmoud M, Ozek M, Sav A, Longtine JA, Lindeman NI, Garraway LA, Ligon AH, Stiles C, Santagata S, **Chan JA**, Kieran MW, Ligon KL. Detection of KIAA1549-BRAF fusion transcripts in formalin-fixed paraffin-embedded pediatric low-grade gliomas. *J Mol Diagn.* 13(6):669-77, 2011
109. Tremblay A, Stather D, **Kelly MM**. Effect of Repeated Administration of Low-Dose Silver Nitrate for Pleurodesis in a Rabbit Model. *Respirology.* 7:1070-5, 2011
110. **Trotter MJ**, Abi Daoud MS. Use of immunohistochemistry in routine dermatopathology. *Can J Pathol.* 3(2):31-42, 2011
111. **Trotter MJ**. Melanoma margin assessment. *Clin Lab Med.* 31(2):289-300, 2011
112. **Trpkov K**, Barr R, Kulaga A, Yilmaz A. Mesothelioma of tunica vaginalis of “uncertain malignant potential” – an evolving concept: case report and review of the literature. *Diagn Pathol.* 6:78, 2011
113. **Trpkov K**, Yilmaz A. Re: Rodolfo Montironi, Liang Cheng, Antonio Lopez-Beltran, et al. Original Gleason System Versus 2005 ISUP Modified Gleason System: The Importance of Indicating Which System Is Used in the Patient’s Pathology and Clinical Reports. (Letter) *Eur Urol.* 59(3):e5-6, 2011
114. Ueno-Yamanouchi A, **Khan FM**, Serushago B, Bowen T, Lu C, Luider J, Storek J. Allergen-specific T cell quantity in blood is higher in allergic compared to nonallergic individuals. *Allergy Asthma Clin Immunol.* 7(1):6, 2011
115. Ugarte-Torres A, Hoegh-Petersen M, Liu Y, Zhou F, Williamson TS, Quinlan D, Sy S, Roa L, **Khan FM**, Fonseca K, Russell JA, Storek J. Donor serostatus has an impact on cytomegalovirus-specific immunity, cytomegaloviral disease incidence, and survival in seropositive hematopoietic cell transplant recipients. *Biol Blood Marrow Transplant.* 17(4):574-85, 2011
116. Vallyathan V, Landsittel D, Petsonk E, Jeffery K, Parker J, Tofflemire Osioy K, **Green FH**. The influence of dust standards on the prevalence and severity of coal workers’ pneumoconiosis at autopsy in the United States of America. *Arch Pathol Lab Med.* 135(12):1550-6, 2011
117. van Der Bij AK, Mol M, van Westreenen M, Goessens WH, **Pitout JDD**. The laboratory diagnosis of *Pseudomonas aeruginosa* that produce metallo- $\beta$ -lactamases in a Dutch tertiary care centre. *Scand J Infect Dis.* 43(8):596-602, 2011

118. van der Bij AK, Peirano G, Goessens WH, van der Vorm ER, van Westreenen M, **Pitout JDD**. Clinical and Molecular Characteristics of Extended-spectrum  $\beta$ -lactamase-producing *Escherichia coli* causing bacteraemia in the Rotterdam area, the Netherlands. *Antimicrob Agents Chemother*. 55(7):576-8, 2011
119. Van der Bij AK, Van Mansfeld R, Peirano G, Goessens WH, Severin JA, **Pitout JDD**, Willems R, Van Westreenen M. First outbreak of VIM-2 metallo- $\beta$ -lactamase-producing *Pseudomonas aeruginosa* in The Netherlands: microbiology, epidemiology and clinical outcomes. *Int J Antimicrob Agents*. 37(6):513-8, 2011
120. van der Kwast TH, Amin MB, Billis A et al. and The ISUP Prostate Cancer Group (**Trpkov K** – Member). International Society of Urological Pathology (ISUP) Consensus Conference on Handling and Staging of Radical Prostatectomy Specimens. Working group 2: substaging and prostate cancer volume. *Mod Pathol*. 24(1):16-25, 2011
121. Wang C, Chu P, **Duggan MA**. Reactive tubal epithelium mimicking Mullerian serous carcinoma: pitfalls in the evaluation of pelvic wash specimens. *Cytopathology*. 1365-2303, 2011
122. Wang XD, **Gao ZH**, Xue X, Cheng YN, Yue P, Fang XW, Qu XJ. N1-acetyl substituted pyrrolidine derivative CIP-A5: a novel compound that could ameliorate liver cirrhosis through modulation of hepatic stellate cell activity. *Toxicol In Vitro*. 25:897-904, 2011
123. **Wang Y**, Goulart RA, Pantanowitz L. Oil red O staining in cytopathology. *Diagn Cytopathol*. 39(4):272-3, 2011
124. Worawichawong S, Girard L, **Trpkov K**, **Gough JC**, **Gregson DB**, **Benediktsson H**. Immunoglobulin A-dominant postinfectious glomerulonephritis: frequent occurrence in non-diabetic patients with *Staphylococcus aureus* infection. *Hum Pathol*. 42(2):279-84, 2011
125. **Wright JR Jr**, Shokeir MO, **Joseph JT**, **Gao ZH**. Late autopsy reports: The Calgary solution. *Can J Pathol*. 3(2):26-30, 2011
126. Yue P, **Gao ZH**, Xue X, Cui SX, Zhao CR, Yuan Y, Yin Z, Inagaki Y, Kokudo N, Tang W, Qu XJ. Des- $\beta$ -carboxyl prothrombin induces matrix metalloproteinase activity in hepatocellular carcinoma cells by involving the ERK1/2 MAPK signalling pathway. *Eur J Cancer*. 47(7):1115-24, 2011
127. Zhao L, **Gao ZH**. Involvement of cytosolic phospholipase A2 alpha signalling pathway in spontaneous and transforming growth factor-beta-induced activation of rat hepatic stellate cells. *Liver Int*. 31:1565-73, 2011

### Book Chapters

1. **Baskin LB**. Severe Crushing Headaches, Nausea, and Weakness in a 30-Year-Old Man. in Willis MS, Wians FH, ed. *ASCP CASESET*. Chicago, IL. American Society for Clinical Pathology Press, 28-31, 2011
2. Ghada N, Mohamad N, Abdallah M. ElSheikh, Shang Gao, Keivan Kianmehr, Tansel Özyer, Jon Rokne, **Demetrick D**, Mick Ridley, and Reda Alhajj. Effectiveness of Social Networks for Studying Biological Agents and Identifying Cancer Biomarkers. In: *Counterterrorism and Open Source Intelligence*. Wiil, U (Ed). UK. Springer, 285-308, 2011
3. **Lyon AW**, **Baskin LB**. Pseudohyponatremia in a Myeloma Patient: Direct Electrode Potentiometry is a Method Worth its Salt. in Willis MS, Wians FH, ed. *ASCP CASESET*. Chicago, IL. American Society for Clinical Pathology Press, 56-60, 2011
4. **Patel JL**. Platelets. In: Pereira I, Goerge TI, and Arber DA, eds. *Atlas of Peripheral Blood: The Primary Diagnostic Tool*. Philadelphia. Lippincott Williams & Wilkins, 168-172, 2011

5. Willis MS, Wians FH, **Baskin LB**. Abdominal Tenderness in a Male. in Willis MS, Wians FH, ed. ASCP CASESET. Chicago, IL. American Society for Clinical Pathology Press, 450-55, 2011
6. Willis MS, Wians FH, Kroft S, **Baskin LB**. Needle-Shaped Urine Crystals. in Willis MS, Wians FH, ed. ASCP CASESET. Chicago, IL. American Society for Clinical Pathology Press, 184-89, 2011
7. Wooten DC, Susa J, **Baskin LB**. Conflicting Blood and Urine Ethanol Results. in Willis MS, Wians FH, ed. ASCP CASESET. Chicago, IL. American Society for Clinical Pathology Press, 181-83, 2011
8. **Wright JR Jr**. Blood transfusion and blood banking. In: Era 8 (1900-1945): ABC-CLIO World History Encyclopedia, edited by A.J. Andrea and F. Nadis (Era 8 editor, M. Tarver), Santa Barbara, CA: ABC-CLIO, 711-713, 2011
9. **Wright JR Jr**. Karl Landsteiner. In: Era 8 (1900-1945): ABC-CLIO World History Encyclopedia, edited by A.J. Andrea and F. Nadis (Era 8 editor, M. Tarver), Santa Barbara, CA: ABC-CLIO, 712, 2011
10. **Wright JR Jr**. Sins of our fathers: Two of "The Four Doctors" and their roles in the development of techniques to permit covert autopsies. In: The Persisting Osler-IV. Selected Transactions of the American Osler Society, 1991-2000, edited by Charles Bryan and Jeremiah Barondess, Science History Publications, Sagamore Beach, MA (reprinted with permission from: Archives of Pathology & Laboratory Medicine), 261-271, 2011

## 1.6 Medical Staff

### Recruitment

Medical Staff	Start Date	GFT/Clinical	Primary Division
Resch, Lothar	2011 June	GFT	Anatomic Pathology/Cytopathology
Patel, Jay	2011 July	Clinical	Hematology/Transfusion Medicine
Luedtke, Chad	2011 July	Clinical	Anatomic Pathology/Cytopathology
Klonowski, Paul	2011 July	Clinical	Anatomic Pathology/Cytopathology/Clinical Pathology
Chan, Wilson	2011 August	Clinical	Microbiology
Matshes, Evan	2011 August Locum	Clinical	Anatomic Pathology/Cytopathology
Pillai, Dylan	2011 September	GFT	Microbiology
Kolvear, Fariborz	2011 November	Clinical	Anatomic Pathology/Cytopathology

### Departures

Medical Staff	End Date	GFT/Clinical	Primary Division
Dong, Wei-Feng	2011 August	Clinical	Anatomic Pathology/Cytopathology
Roland, Birgitte	2011 September	GFT	Anatomic Pathology/Cytopathology
Rasmussen, Steve	2011 December	Clinical	Anatomic Pathology/Cytopathology

