DEPARTMENT OF PATHOLOGY & LABORATORY MEDICINE

Annual Report







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Submissions from: Division/Section Heads Managers Supervisors

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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 2012, it was composed of 5 CLS Clinical Sections and had 71 primary clinical MD appointees and 13 clinical PhD scientists. There were 27 members with University of Calgary GFT and 57 with Clinical Faculty appointments, as well as one part-time locum. The Medical/ Scientific staff are located at all 5 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

Our major clinical accomplishments this year included the recruitment of many new clinical faculty members (including 12 with start dates in 2012 and many others for 2013 or 2014), opening and gaining CPSA accreditation for the South Health Campus rapid response laboratory, implementation of a management agreement for the Calgary Zone rural laboratories, and providing continuous laboratory services during the Shaw Court outage. We opened a new 2 year M.Sc. training program for Pathologist's Assistants. Our postgraduate clinical training programs (Anatomic Pathology, General Pathology, and Neuropathology Residency training programs and Fellowship programs in a variety of areas) trained 15 AP, 2 GP, and 3 NP residents as well as 8 fellows in 2012. Our faculty contributed several thousand hours of post-graduate medical education and ~1200 hours of undergraduate medical education teaching. We held \$1.83 M in external grant funding as principle investigators, published 118 peer-reviewed papers as well as 11 book chapters, and 1 book in 2012. The mean Impact Factor of the journals we published in for the year 2012 was 4.01. Five faculty members were promoted this year.

Challenges

CLS performs more than 22 million laboratory tests per year. Every year, we face the challenge of providing increased services without proportionate increases in funding. For the next two years, it will be even tougher as CLS will be expected to cut its spending by about \$4,000,000 per year. Therefore, we must look for inefficiencies and, where possible, consolidate duplicated services allowing for savings which can be reinvested to improve services. Operationally, our biggest challenge is capital funding.

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 8+ 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. Although historically a chronic problem, AHS has put very substantial new funding into creating new laboratory physician and scientist positions and we have done much hiring of highly qualified personnel in the past year. This will continue throughout this year.

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 indicators of customer satisfaction. This year we will implement a new Province-wide AP QA plan, redefine our Subspecialty Groups, and implement recommendations from the HQCA review.

Future Directions and Initiatives

The year 2013 will be an exciting one with many short and long-term projects on the go and continued expansion of our Medical & Scientific Staff. Through a new Provincial "Hub & Spoke" Model, it is anticipated that we will provide some additional laboratory services in the Southern Zone.

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. It has been gratifying to see how competitive we are when trying to recruit the best and brightest laboratory physicians and scientists. Through our Department's partnership with CLS, which once again achieved Top Employer status in Alberta for 2012, 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



AHS Calgary Zone Department of Pathology & Lab Medicine

Calgary © Laboratory Services

> Alberta Health Services



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		CLS Board CLS Board Chris Mazurkey	vich	Calgary	Laboratory Service Paula I	is Chief Oper Hall*	ation Officer			
CLS Medical Advisory (AHS Calgary Zone	Committee]			
Executive Comn	nitte	CLS Executive				CLS Execu	tive			
Lo-Chairs: Dr. Leland Bas Dr. James R. Wrig	skin Jht, Jr.	Calgary Zone Clinical Department Head	VP, Me Mec	edical Oper dical Direct	ations or* T	echnical Ope	rations	VP Corporate Services		
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		RGH RRL; Health Cente	r Testing Labs, SH	U			Denise Connors	Accounts F	Receivable	
		POCT					Monica Phillips	Logistics	-	Dirk Hauc
		ACH RRL; PLC RRL; Mc	bile; CL Education				3renda Kirkham	Administra	Level ation	Dale Loroi
		Specialty Group: Lab Ir	nformatics				Chris Lemaire			
		Client Interface Team,	LIC, Patient Appoi	intment Lin	ie, Records Manag	ment	Deb Ellas			
		Calgary Zone Rural Lat	oratories			_	aine Leithead.	Functional Centre	Manager	
		Process Excellence, Da	ta Analysts				eslie Laurie	Human Resources	Sumana [asgupta
Clinical Biochemistry	Dr. Hossein Sadrza	adeh Biochemistry; Analytic	al Toxicology, Imm	unochemis	stry		sharon Lengsfeld	and Legal Attairs Total Rewards	Kric Banci	5
Microbiology	Dr. D. Gregson	Bacteriology, Mycolog	y, Parasitology, Mu	olecular Bio	ology, Infection Su	rveillance	andra Corbett	FH&S	Chris Butl	er
Hematology/TM	Dr. Adnan Mansoc	Dr Hematology; Tissue Ty	ping; Molecular He	ematology;	Flow Cytometry	_	Maureen Cyfra	Communications		;
		Transfusion Medicine,	Cellular Therapy L	aboratory		_	Monica Phillips	Organizational		
Anatomic Pathology/	Dr. Ranjit Waghra	y AP Site Leaders: ACH, I	DSC, FMC, FLC, RG	H, SHC		-	racey Lenek	Development		
Cytopathology		Specialty Labs: Immun Cancer Cytogenetics	ohistochemistry, N	Molecular F	athology,					
		Subspecilaty Groups: <i>A</i> Dermatopathology, Ga Gynepathology, Head/ Paediatric Pathology, F	Autopsy, Breast Pa Istrointestinal Path Neck and Endocrir Vulmonary Patholo	thology, Cy hology, Ger ne Patholo 3gy, Renal I	rtopathology, nitourinary Patholo gy, Neuropatholog ⁹ athology-EM Lab	ogy, sy,				
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Dirk Hauck Dale Loroff

Brad Keith

John Thrale

Changes in Organizational Structure: In 2012, CLS Divisions were re-named Clinical Sections, the Clinical Section of Clinical Pathology split to Clinical Sections of General Pathology and Clinical Biochemistry, the former Sections (re: subdivisions of the former Divisions) were expanded and renamed to sub-specialty groups and specialty labs. It should be noted that Divisions and Division Heads still exist in the UofC organizational structure.

January 21, 2013

Departmental Committees

CLS Medical Advisory Committee/AHS Calgary Zone Medical Executive Committee

Dr. Leland Baskin, Medical Director & VP of Medical Operations, CLS, Co-Chair Dr. Jim Wright, Zone Clinical Department Head (ZCDH), DPLM, Co-Chair Dr. Ranjit Waghray, Clinical Section Chief, Anatomic Pathology/Cytopathology Ms. Paula Hall, Chief Operating Officer, CLS Dr. Hossein Sadrzadeh, Clinical Section Chief, Clinical Biochemistry Dr. Christopher Naugler, Clinical Section Chief, General Pathology Dr. Adnan Mansoor, Clinical Section Chief, Hematology/Transfusion Medicine Dr. Dan Gregson, Clinical Section Chief, Microbiology Dr. Travis Ogilvie, AP Site Leader, FMC Dr. Shaun Medlicott, AP Site Leader, PLC Dr. Erik Larsen, AP Site Leader, RGH Dr. Cynthia Trevenen, AP Site Leader, ACH Dr. Steve Gorombey, AP Site Leader, DSC Dr. Karl Anders, AP Site Leader, SHC 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, CLS Dr. Leland Baskin, Medical Director & VP of Medical Operations, CLS (Chair Alternate) Dr. Jim Wright, ZCDH, DPLM/ CLS Ms. Paula Hall, Chief Operating Officer, CLS Mr. Dale Gray, AP Technical Operations, CLS Dr. Amid Abdullah, Consultant Pathologist, Calgary Zone Rural Laboratories Sandy Broen-Dupuis, Manager, Quality Department, CLS Carol Boechler, Director, Laboratory Integration and Standards, Alberta Health Services Laine Leithead, CLS Manager, Calgary Zone Rural Laboratories Patricia Boutilier, Clinical Safety Advisor, CLS

CLS Department of Pathology & Laboratory Medicine Business Meeting

This is a quarterly meeting of all laboratory medicine medical and scientific staff in the Region. Cochaired 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. Margaret Kelly Dr. Hallgrimur Benediktsson Dr. Duane Barber Dr. Vincent Falck Dr. Elizabeth Brooks-Lim Dr. Duane Barber Dr. Andrew Kulaga Dr. Tarek Bismar Dr. Chad Luedtke Dr. Lothar Resch Chief Resident (rotates) 7

Junior Resident (rotates) Dr. Jim Wright (Ex-officio)

General Pathology Residency Training Committee

Dr. Christopher Naugler Dr. Amid Abdullah Dr. Julie Carson Dr. Iwona Auer Dr. Lisa DiFrancesco Dr. Jim Wright (Ex-officio) Dr. Elizabeth Brooks-Lim Dr. Angela Thompson Dr. Davinder Sidhu Dr. Alex Chin

Neuropathology Residency Training Committee

Dr. Lothar Resch, Chair Dr. Jeffrey Joseph Dr. David George Dr. Jennifer Chan Dr. Jim Wright (ex-officio) Chief Resident (residents' representative)

Fellowship Committee

Dr. Joanne Todesco (Chair) Dr. Lisa DiFrancesco Dr. Christopher Naugler Dr. Alex Chin Dr. Walid Mourad Dr. Jim Wright (ex-officio)

Divisions, Sections and/or Programs

Alberta Health Services Clinical Sections/University of Calgary, Faculty of Medicine Divisions:

- Clinical Section/Division, Anatomic Pathology/Cytopathology Clinical Section Chief/Division Head, Dr. Ranjit Waghray
- Clinical Section/Division, Clinical Biochemistry Clinical Section Chief/Division Head, Dr. Hossein Sadrzadeh

Clinical Section/Division, General Pathology

Clinical Section Chief/Division Head, Dr. Christopher Naugler

Clinical Section/Division, Hematology/Transfusion Medicine, Clinical Section Chief/Division Head, Dr.

Adnan Mansoor

Clinical Section/Division, Microbiology Clinical Section Chief/Division Head, Dr. Daniel Gregson

Membership (Appendix 1.1)

Accomplishments and Highlights

Clinical Service (by Section)

Anatomical Pathology/Cytopathology Section

Workload

	2012 Specimens	% change (vs. 2011)
Anatomic Pathology	442,873 (blocks)	+3.1%
Pap Smears	209,727	-2.5%
Non-Gyne Cytology	10,108	+0.1%

Optimization of Anatomical Pathology (AP) services

Considerable effort was made to ensure proper functionality of the AP services that had been experiencing some challenges following centralization. Widespread staff consultations and electronic surveys were held with help from an external Consultant. A report was generated with a plan to optimize the system in two phases. Staff sub-committees were setup to address various issues: 1) Refine centralization; 2) Support the front line; and, 3) Medical/Scientific staff engagement. All are functional and some have made significant progress to date.

South Health Campus

The hospital was formally open in September 2012. The laboratory was completely functional by this time and was successfully College of Physicians and Surgeons of Alberta accredited. Dr. K. Anders is the appointed site-leader for AP. The AP laboratory had been processing work from other CLS locations as in-hospital work slowly increases and as more clinical services become active.

Colon Cancer Screening Centre (CCSC)

The AP Clinical Section Chief and Dr. XS Gui, Subspecialty Group Lead for Gastrointestinal Pathology, met with the medical lead and physicians of CCSC to discuss quality of service and set goals for the future.

Path Techs & Path Scientists

CLS approved positions to hire more Path Techs and Path Scientists (i.e. Pathologists Assistants) to cope with the ongoing and increasing workload.

Rockyview General Hospital(RGH)

The AP lab space, as well as pathologists' office space, had been completely lacking upgrade and enhancement to accommodate the increased workload. In particular, poor ventilation system prevented installation of a much needed "grossing station" to facilitate handling of routine specimens. The much awaited addition to the

hospital and move of the lab into new lab space has not occurred yet. CLS started working with its staff within AP and Rapid Response Labs (RRL) areas as well as with RGH administration

to find additional available space to de-compress the working environment. After months of deliberations one pathologist's office space was procured outside the laboratory.

Anal Dysplasia Clinic

Cytopathology continued to have serious dialogue with the STI Clinic at the Sheldon Chumir Centre to facilitate screening Pap testing for patients. Laboratory Information System (LIS) build was accomplished with plans to start testing in March 2013.

Clinical Biochemistry Section

A new Clinical Biochemistry Section was established in December, 2012. The Clinical Biochemistry Section covers the chemistry laboratories at Alberta Children Hospital (ACH), Foothills Medical Center (FMC), Rockyview Hospital (RGH), and Peter Lougheed Medical Center (PLC). Currently, there are seven Clinical Biochemists who work at ACH, FMC, different areas of the main lab at DSC, and oversee the chemistry lab at Rockyview Hospital (RGH) and point of care section. In addition, six clinical pathologists are also involved in clinical biochemistry sections at different medical center labs.

Two new clinical biochemists were recruited, Dr. Lawrence de Koning graduated from Boston Children's Hospital and Harvard Medical School (July, 2012), and Dr. Isolde Seiden Long from DynaLife Lab in Canada. Dr. de Koning has an excellent background in epidemiology and nutrition and plans to devote part of his time to active basic research. Dr. Long is an established clinical biochemist who received her training at University of Toronto and worked at DynaLife for the past eight years.

Clinical Biochemistry is the largest section of the Department Pathology and Laboratory Medicine (DPLM). In 2012 the chemistry section performed over 20 million tests (20,096,702), which was approximately 8% (7.96%) more than the number of tests done in the last fiscal year (18,614,308). Improving service/ indirect patient care has been one of the major goals of the Clinical Biochemistry Section. The following represents examples of the completed continuous service improvement initiatives in the section:

- Implemented Provincial wide initiatives for standardizing glucose reference range and critical value ranges. Also, the Calgary Rural Lab critical values and reference ranges were aligned with the CLS critical values and reference ranges.
- Increased the number of testing sites performing CRP and Cortisol testing, resulting in a decreased TAT for acute care patients.
- Implemented NT-pro BNP measurement at all the hospital labs (except ACH), health centres, as well as the surrounding rural area laboratories.
- Implementing high-sensitivity troponin T in the Calgary zone adult hospitals and community. This assay is approximately fifteen fold more sensitive than the previous troponin T assay.
- Implemented changes to ordering practises for reducing substances.
- Implemented electronic rapid HIV ordering (the clinician uses SCM to order the test). This resulted in eliminating a manual requisition and clinician time for filling out the requisition form.
- Transferred lipid testing from Didsbury, Strathmore and High River to DSC Chemistry.
- Received accreditation for South Health Campus lab and started running patient tests.

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• Improving reporting the results of unconfirmed urine drugs of abuse (Presumptive Positive instead of Positive). That can significantly improve patient care and prevent unnecessary management.

Evidence Based/Utilization Initiatives

One of the major goals of the section in 2012 has been the implementation of evidence based approach for the use of clinical laboratory tests. Physician education is an important factor to successfully promote appropriate test utitilization. In order to initiate successful physician education, we have started regular quarterly meetings between the biochemists and clinical endocrinologists and cardiologists to meet and openly discuss and educate one another for better patient care. We plan to establish similar meetings with other medical specialists who use clinical biochemistry on a regular basis. So far, the following practices have been approved and established:

- Educating physicians about the proper use of vitamin D testing [i.e. 25 (OH) vitamin D, to assess body's vitamin D status instead of using 1, 25 (OH)2 vitamin D]. Limiting vitamin D ordering to 90 day intervals.
- Established ordering guideline and testing algorithms for A1AT phenotyping.
- Implemented changes to ordering practises for IgE-specific allergen. That has reduced utilization by 43%, so far.
- Discontinued thyroglobulin confirmation testing, resulting in a projected reagent cost savings of \$5,000 annually.
- Removed Adult Triglycerides from the stat test menu to promote effective use of resources.
- Discontinued CSF pH testing, due to lack of evidence for clinical usefulness.
- Discontinued CK-MB Stat testing and limiting the CK-MB ordering to Cardiologists (this practice started in February 2013 and we anticipate significant reduction in number of CK-MB).
- Discontinuation of Stat urine drug screen. This project has the support of clinical toxicologists from PADIS who accepted to act as the "gate keepers" whenever such a test is ordered by ED physicians. We anticipate that this project will also result in significant cost savings.

New Instrumentation

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Several new instruments have been installed in the labs within the Biochemistry Section. The new instruments are state-of-the art that not only will improve the quality of our testing, but also improve our capacity for running more tests and coping with our normal growth, without the need for more FTEs. The following represents the new instruments that have been installed in the labs, so far:

- Immunosuppressant back-up instrumentation that eliminated the need to use Edmonton as our immunosuppressant back-up. This initiative reduced TAT for results when our instrument is non-operational and a cost-savings of \$6,000 annually.
- New instrumentation in the Immunochemistry area to increase workflow efficiencies and increased instrument capacity.
- Ketone meters with improved sensitivity and specificity for ketone analysis.
- Auto Delfia in the Immunospecial chemistry lab to provide increased capacity for maternal screen assays.
- Architect instrumentation in the Immunospecial chemistry leb, which resulted in decreasing analysis time.
- Implemented automated urinalysis instruments at RGH and PLC which resulted in automation as a solution to deal with the high testing volumes to achieve greater efficiencies and improved laboratory workflow.
- Started transition to Cobas 8000 in DSC Chemistry to increase capacity and allow further centralization of CRL immunoassay.
 - Roche E601 (new improved line) replaced Elecsys 2010.
 - Liaison XL replaced Liaison in DSC.
 - Start vion assay at ACH to support STAT overdose cases.

Lean project

The drug screen tests per month have consistently increased from an average of 600 to 900 specimens per month. Also, there has been significant fluctuations in workload volumes (daily volumes can be 20 or >90 specimens per day). Due to the latter issues, it had become increasingly challenging to schedule staff to manage the daily workload. Thus, we decided to do a new lean project to streamline the testing and improve productivity in the analytical toxicology lab. The last Lean event occurred in 2007.

The objective of this Lean event is to optimize the use of the instrumentation and staff in the lab to accommodate the variable volumes of work. To accomplish the goals, changes in the management of the two gas chromatography mass spectrometer instruments were investigated, and the bench duties of the department staff were revised. We hope to see improved productivity by mid 2013.

General Pathology Section

Alberta Children's Hospital:

- Took on stool reducing substances testing for selected inpatients at ACH on Feb 1. This test is not offered anywhere else, and us offering it alleviates turn around time issues we would have with alternatives.
- Increased workload and complexity of testing required the hiring of a Technologist II for ACH Transfusion Medicine.
- Continued to support ECMO program by adapting processes as required.
- A new ACL Top coagulation analyzer was validated/ implemented.
- Modified verification process for Stat CBCs from Pediatric Oncology Clinic to decrease turn around times.
- Installed software upgrade on DxHs which has decreased the amount of maintenance required.
- Training on Hematology Cellavision instrument was completed and system is now in use for scanning peripheral blood smears.
- New Advantus urinalysis analyzer validated/ implemented (replaced Clinitek 500).
- Addition of on-site stat iron and CRP testing.
- Validated/ implemented ketone meter.
- Movement of Methotrexate testing from FMC to ACH.
- Competency assessments completed in all three areas.

Patient Service Centres:

Community Services

- Through LA II Development series and training. Staff attended Fierce Conversation, understanding yourself as a leader, speed of trust workshops. Commencing January 2013 LA II Meetings will be full day meetings quarterly throughout the year which will increase the ability to hold education sessions. (i.e. Dr. Nanji ECG interpretations, Chris Butler defibrillation instruction).
- New Telemed Paperless ECG System implemented. Developed priority ECG emergency escalation based on ECG interpretation process at all sites to improve patient care and safety.
- New glucose meter implementation and training for all sites, in alignment with Edmonton and can do remote QCs with new system in place.
- Mosaic Medical worked closely with Mosaic point of care network and AHS translation department in a trial to help address language barriers experienced by patients, physicians and clinics in the North East area of the city.
- Volunteer program for the PSCs continues work with AHS.
- Hired five students from Careers Next Generation to work throughout summer of 2012 as patient liaisons and providing appointment line information.
- Worked collaboratively with patient appointment line to improve patient access for booking appointments. Trial commencing at Avenida early 2013.

- Worked closely with PE to sustain current processes and development and implementation of new Specimen Transfer process which improve efficiencies within the PSC sites as well as accessioning and testing departments.
- One Flow Process working well at three sites. Beddington, McKnight and Sunridge.
- Maintain inventory management. Control the minimum and maximum inventory through templates that staff use for purchase orders.
- Revenue sharing work with Research on various studies. We have also participated in the Nano Speed Vitamin D clinical trial.
- HUTV announcements displayed on sites with TV's on regular basis. CLS information being kept current and up to date through meeting with HUTV reps and communications department.
- Green Belt Projects Evaluate productivity metrics and STL.
- Standing order office database working with AHS IT and CLS PE to better support patient care and simplify staff workflow. We streamlined standing order database to the millennium database system. Should be fully implemented by April 2013.
- The sites participated in Helping Hands Project and the Penny Drive, Backpacks for Mustard Seed, helped build morale through site competitions throughout the year i.e. Stampede Decorating, Bowling, Karaoke, Christmas Decorating.
- PSCs will lead the steering committee towards plans for the MLA getaway in 2013.
- CLS Imagery working alongside communications department to enhance CLS website towards a humanistic side of laboratory services.

Health Centre Testing Labs:

- Acquired, through capital acquisition, a replacement Hematek slide stainer for Airdrie Community Health Centre(ACHC) Testing Laboratory.
- Yearly workload increases ranged from 7 % for South Calgary Health Centre (SCHC) Testing up to 45 % for the Cochrane Community Health Centre(CCHC) Testing Lab. Staffing levels are in the process of being augmented as a result of workload increases and inadequate staffing coverage approved as part the initial commissioning of the individual Health Centre Testing Labs.
- Participated in the COR audit.
- Based on a request from the Medical Lead at the CCHC Urgent Care Centre, protocols are being developed to set up and report Lactate and Albumins on the Vitros 350 Chemistry Analyzers at all Health Centre Testing Labs.
- Work was done in conjunction with "rural" in an effort to standardize SOP's in Hematology and Biochemistry.
- Extensive effort was made by the HCTL leadership to "engage" staff. Based on the staff survey completed in the fall of 2012, employee engagement increased by 24 % over last year.
- Weekly staff newsletter developed by the HCTL Supervisor and OLC provides an excellent forum to keep all HCTL's informed of updates, procedural changes etc.

South Health Campus:

- Hiring:
 - Worked with Human Resources, HSAA to determine hiring strategy.
- Training/Orientation:
 - Developed on site and an offsite MLT I training schedule.
 - Cross trained all RRL MLT I staff before go live on December 3, 2012.
 - Onsite laboratory orientation provided to all RRL staff.
- Alberta Infrastructure/Commissioning/Accreditation:
 - Reviewed RRL Laboratory Casework requirements.
 - Confirmed RRL computer accessory requirements /locations as well as telephone requirements.
 - Pre-Occupancy walkthrough completed in June 2012. Deficiencies are currently being resolved.
 - Developed Gantt charts and contingency plans as part of changing opening timelines.

- RRL Senior Staff completed equipment set up and validations in preparation for Accreditation. This included 20 Analyzers (NEOsx2, COBAS 6000 x2, Gem 4000's x 2,Osmometer x 2, Ketone Meter x 1, Triage Drugs of Abuse Meters x 2, IRIS Automated Urinalysis System x 1, Clinitek Advantus x 1, ACL TOPS x 2, DxH 800 x 2, DxH Slide Maker Stainer x 2, Cellavision, Excyte 20).
- Validated the Pneumatic Tube system for the transportation of Transfusion Medicine products. SHC is the first site to use the PTS for TM.
- Commissioning of the RRL began with laboratory occupancy on July 3, 2012 and was completed in 4 ½ months.
- CLS Mock Accreditation occurred on November 16, 2012.
- College of Physicians and Surgeons of Alberta (CPSA) accreditation was held on November 30, 2012, with interim accreditation provided. CPSA final assessment report issued on February 1, 2013.
- The RRL officially opened on December 3, 2012 with limited testing hours to support SHC outpatient clinics that were open.
- The RRL became 24x7 operational on January 14, 2013 with the opening of the SHC Emergency Department and Rapid Access Unit.
- Successful implementation of the SHC Venous Whole Blood Analysis Pilot Project in collaboration with SHC Respiratory. Provision of this service is for select PCU's (ED, RAU, ICU, OR and PACU) and Arterial Blood Gases (OR, PACU).
- Equipment:
 - 115 pieces of RRL equipment were ordered by AHS CPSM.
 - Coordinated equipment deliveries and installation timelines with the vendors.
 - SHC Project Team Equipment reconciled all equipment ordered/received.
- Other:
 - Provided two workstations for two AHS Workplace Safety and Health Officers until Phase II of South Health Campus is built.
 - Meetings held with SHC Clinical Areas to review laboratory support prior to their opening.
 - Dr. Flynn General Lab Medical Lead and Dr. Karl Anders Anatomic Pathology Site Lead on site full time as of January 7, 2013.
 - Outpatient Lab opened on Sept 10/2012 providing phlebotomy service to the on site Ambulatory care clinics.

Records Management:

- Medical Records
 - Follow up letters for return of research material for completed studies (Improve documentation for return of outstanding materials).
 - Mailroom
 - Requested route numbers be added to Cytology follow up letters to patients to improve sorting and TAT for letters.
- Data Maintenance
 - Change all Pathnet Classic Chart Print Distribution to print in DM at the DSC (Hospital staff not familiar with Classic Reports, reports being put in shredding instead of being delivered).
 - Supported SAIT Practicum for Health Information Management (HIM) student.
 - Worked with AHS IT to develop a CCL to capture Deleted Disease Alerts (Identifies patients where a level III or IV disease alert was deleted as a result of a manual or auto-reconcile combine. Reports the deleted level III/IV disease alert code along with the order note that describes the details of the disease alert).
- Optical Scanning
 - Implemented upgrade for Doc Vue optical scanning system from 8.0 to 9.0.

Client Services:

- Client Interface Team (CIT)
 - Added physician package to CLS website (Includes contact information, requisition completion aides, supply forms and health care provider form).
 - Supported South Health Campus out patient's clinics by attending meetings and providing the information required to ensure correct report distributions for each area.
- Patient Appointment Line (PAL)
 - Education sessions for patients to learn how to register and how to book an appointment on-line were held at all eighteen Patient Service Centres. Sessions took place over a 6 month period.
- Lab Information Centre (LIC)
 - Supported SAIT Practicum for health information office assistant student.
 - Added a one day orientation in LIC for MLTs student's practicum.

Rockyview General Hospital, Rapid Response Lab:

- Have absorbed constant increase in testing areas by 5-10 % without increases in staffing levels. Have
 absorbed opening of additional beds and overcapacity beds within RGH, trained students in both
 Chemistry and Hematology total of 10 MLT RRL positions vacated 10 new MLT positions hired
 and trained to fill vacancies.
- Installation, validation and training for the new IRIS IQ2000 Urinalysis analyzer.
- Increased menu of immunochemistry test on COBAS analyzers.
- Implementation, training and validation of Cellavision for Hematology.
- Provided space and support for SHC training of new staff.
- Successful resolution of result testing from Shaw court Millenium downtime .
- Continue to provide lab tours to ED nursing with additional tours to newly hired OR nursing staff.
- Participated in Path 2 Home Project and reviewed start times to support early discharge of patients.
- Supported the opening of SHC clinics by providing routing of sample testing at RGH.

Mobile Collection Services:

- Completed roll-out of Long Term Care Pre-entry of lab requisitions for LTC facilities in
- Calgary. This process will result in decreased TAT for test results and less recollections due to collection errors.
 - Changes to Automated messaging services have made system message less confusing and more user-friendly for clients.
 - Expanded Mobile service to Strathmore and Okotoks. Agecare Sagewood Supportive Living facility in Strathmore (60 SL4/SL4D beds); Brenda Strafford Tudor Manor (126 SL4/SL4D beds) and Revera Heartland (40 SL4 beds) facilities in Okotoks.
 - Additional service within Calgary to Carewest Rouleau Manor (77 LTC beds), Agecare Walden (90 SL4 beds) plus another 84 beds across Calgary.
 - Completed roll-out of Telemed ECG system for Mobile. This system is completely paperless and uses CLS's default reader C-Era.
 - Addition of 0.5 FTE Operational Leadership Coordinator to asst Supervisor with Administrative functions.
 - Addition of new 1.0 FTE Clerk II position in Mobile office.
 - Participated in COR audit including drive-along for auditor with Mobile Collector.

• Completed competency assessments for new Telemed system.

• Development of new Mobile magnet for home patients to simplify and streamline patient identification process.

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- Installation of GPS units on all Mobile vehicles another working alone safety measure.
- Due to phase-out of Blackberry MIKE services, swapped all mobile collector Mikeberrys with Blackberry Bolds.
- Implemented Mobile Supervisor On-Call number for any Mobile collection issues on weekends and evenings.
- New filing system for patient files more ergonomic and space saving.
- Implementation of vehicle safety and inventory checklists and audits.
- Tracking of collection and data entry errors in Mobile error Database.

Peter Lougheed Centre - Rapid Response Lab:

- Continue to monitor and achieve established TAT's in chemistry and hematology section.
- Continue to investigate and participate in Safety Learning reviews.
- Participated in successful COR audit.
- Completed competency assessments in all three areas of the RRL.
- Implemented best practices to enhance workflow in the chemistry area.
- Provided a RRL Leaders retreat (Tech II & III) to enhance education and teamwork.
- Facilitated staff attendance at Speed of Trust, LEAN, Fierce Conversations and HR staff development courses.
- Facilitated the attendance of PLC RRL preceptors to SAIT education day.
- Provided in-services for staff on platelet usage, COBAS ISE calibration, and patient adverse effects.
- Trained 6 new staff members for replacement of staff to South Health Campus.
- Trained 6 new staff members to fill maternity leaves.
- Presented a needs assessment to AHS and PLC Administration requesting additional space to accommodate new initiatives increased Women's Health, Vascular OR and unit.
- Reviewed an incident with staff and AHS facilities after a fumes incident caused staff distress and included learnings in CLS Manager On Call information.
- Implemented change in Troponin TAT's from 90 minutes to 60 minutes to help patient flow in ER department.
- Assisted with training of South Health Campus staff in RRL workflow.
- Assisted in validation of the hematology analyzers for South Health Campus opening.
- Participated in P2H meetings and reviewed start times to support early discharge of patients.
- Implemented a change in procedures in chemistry to operate at full capacity during peak times.
- Implemented the IRIS urinalysis analyzer to standardize urine examinations and decrease TAT's for ER.
- Assisted with practicum training of MLT students: Trained 15 new SAIT student technologists in chemistry and 4 in haematology.
- Implemented C-Reactive protein testing onsite to provide critical care for newborns.
- Discontinued pre- Amikacin level collections as this was found to be a no value added procedure.
- Validated the new provincial Normal and Critical ranges for glucose on the new Cobas analyzers.
- Streamlined the process for verifying negative HIV results; enabling better patient care and less time spent in ER.
- Continue to provide opportunities for FMC Transfusion Medicine lab staff to job shadow at PLC to enhance staff relationships.
- Provide lab tours and education to new ER nurses and have expanded tours to NICU nurses on a monthly basis.
- Assisted in resolution of a CITRIX provincial change that affected all of CLS staff using Millennium.
- Piloted the IT "fix" to enable multi-session use in Millennium.
- Reviewed the 7 year old plans of the West Tower laboratory location with AHS planning staff.
- Continued increase in testing areas by 5 10%.
- Provided back up testing for DSC urinalysis, FMC chemistry, and Strathmore testing when their instruments were down.

- Managed critical reporting of results when the Shaw Court incident took our computers out of service.
- Card lock installed on second entrance to the lab to provide staff safety and limit access to confidential areas in the Anatomical Pathology area. Accreditation requirement.
- Trained staff and implemented Vocera technology for better communication between staff on off-shifts.

Hematology/Transfusion Medicine

The Clinical Section of Hematology and Transfusion Medicine actively pursued efficiency, quality assurance and technical advances in the field for better patient management during the year 2012.

The following sections identify various initiatives which were completed by different laboratories to achieve the goals set for 2012 for the Clinical Section of Hematology and Transfusion Medicine, in the Department of Pathology and Laboratory Medicine/ Calgary laboratory Services (CLS).

Hematology and Special Coagulation:

- Collaboration:
 - Discontinued free haemoglobin plasma and urine in Special Hematology. Testing is done at CLS and sent out to University of Alberta.
 - Collaborated with Molecular Hematology to implement PCR testing for alpha thalassemia which was previously done at Life Lab.
 - Performed D Dimer testing in Medicine Hat for their method validation.
 - Trained 9 fellows/ residents on benches in haematology.
 - Engaged in continuing education through teleconferences, slide reviews for CAP and CRL staff (Strathmore and Didsbury).
- Operational Efficiency
 - Improved workflow for STAT BM at 16:00 and ACH BM.
 - New BM distribution among pathologists to improve TAT.
 - Discontinued preliminary report on HGBELEC with MCV 76-81.
 - Changed total cells counted for the Bone Marrow differential from 500 to 300 and 150 cell count for staging lymphoma.
 - Reduced the number of iron stains by excluding staging bone marrows and follow up bone marrow from iron stain.
 - Implemented a new method for reporting INR and PTT in Millennium.
 - Trained additional staff member to perform Hgb electrophoresis.
 - Integrated Molecular tests (Factor II and Factor V Ladien) results into Millennium System (Laboratory Information System).
 - Installed ProService at DSC.
- Quality Improvement/ Assurance
 - Upgraded unity Real Time QC program to 2.0.
 - Annual hematology competency was completed by all staff.
 - Improved stain quality for Bone Marrow samples with:
 - B5 fixative and formalin containers which must be kept in a separate ziplock bag.
 - New Wright-Giemsa Fucillo stain.
 - New Sigma buffer.
 - Monitoring pH weekly.
 - Staining BM samples within 4 hours.
- Improving technology
 - Completed automated digital morphology technology "Cellavision" through laboratory validation and implemented this state of the art technology into our routine operation at all Hospitals and Diagnostic & scientific center (DSC). CLS is the first institution in Alberta to implement this technology in routine Hematology operations.

- New Zebra printer for labelling BM slides.
- Replaced ACL TOP with ACL TOP 700 and transferred testing from ACL Advance to ACL TOP.
- Acquired a walk in fridge for Hematology's samples and reagents.
- New racking samples for HGBELEC.
- Iron stores, cellularity and megakaryocytes are reported in the BM report and no longer required to be estimated and reported in the BM differential by technologists.
- Implemented New HIT Test.
- FMC installed new update software for Coag TOPS and changed vendor from Beckman Coulter to IL.
- Cellular Therapy Laboratory
 - Actively participated in Canada's first gene therapy clinical trial for treatment of Fabry's disease and clinical trial utilizing liver cells for treatment of urea cycle disorders in infants.
 - Passed 2012 FACT (Foundation for Accreditation of Cellular Therapies) inspection with no deficiencies and has been re-accredited for another 3 years.
 - Inspected by Health Canada under the cells, tissues and organs (CTO) Regulations Nov 2012 and found to be in full compliance.
 - Acquired and installed StemLab laboratory information system for CTL.
 - Revamped CTL policies, procedures and SOPs to match work-flow, align with CLS requirements and comply with newly revised standards and regulations.
 - Collaborated with Transfusion Medicine to develop and implement a provincial electronic notification system for transfusion requirements of allogeneic blood and marrow transplant patients.
- Flow Cytometry:
 - In order to improve the turnaround time (TAT) for complex testing, leukemia/lymphoma TAT is now monitored efficiently.
 - FCS Express (new software for flowcytometers) now automatically exporting disease information for hematopoetic neoplasms for QC/QA research purposes.
 - Alternative Assessment Program implemented for 16 assays that do not have commercial proficiency testing programs available.
 - Acquired HLA-B27 from Edmonton region through collaborative support.
 - Approved to develop and offer TRegs for immunodeficiency investigation.
 - Eliminated antibody cocktail waste and reduced wastage of single antibody in inventory.
 - Developed screen/reflex testing algorithm for lymphoma testing reduced workload and technical time / cost.
 - Replaced dim fluorochromes with Brilliant Violet series.
 - Improved specificity and interpretation of results by adding CD16 to NFUN assay.

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. The laboratory is now the provincial testing centre for alpha globin gene deletion detection in alpha thalassemia.

• Implementation of multiplex PCR assays for detection of alpha globin gene deletions in alpha thalassemia.

- Addition of 0.9 FTE to help manage increased testing volume related to acquiring alpha thal testing for the whole province.
- Build of Alpha thal reporting into Millennium(Helix), SCM and Netcare.
- Initiation of STR Chimerism build in Helix which will allow access to STR chimerism reports in SCM and Netcare. About 50% complete in the build domain.
- Build of Factor II and Factor V reporting in Millennium improving patient safety and giving reporting responsibility back to the department.
- 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.
- Implementation of International Standard Scale reporting for quantitative assessment of BCR-ABL1 fusion transcripts in CML with improved test sensitivity and specificity.
- Hematopathology resident/fellowship training program specialized laboratory coordinator and molecu-lar hematology preceptor for 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.
- Implementation of a new workflow model that should allow for improved competency for technologist and decreased retraining.
- Tissue Typing
 - Passed 2012 Interim ASHI Laboratory Accreditation.
 - Streamlined antibody testing for Renal pre and post transplant monitoring.
 - Discontinued the AHG crossmatch for the more sensitive Flow cytometry and virtual crossmatching procedures.
 - Replaced serology typing with modern and precise molecular typing / testing.
 - Validated SSO Luminex Typing method for On-Call laboratory technologists.
 - Introduced DP Typing and extend DQA typing to renal patients previously typed.
 - Obtained two new centrifuges and one camera for SSP gel visualization.
 - Participated in the Canadian National HLA Flow Crossmatch PT survey.
 - Participation in the LDPE National Organ Exchange program.
 - Completion of second Histocompatibility Fellowship (2010-2012).
 - New Histocompatibility Fellowship for the period of 2012-14.
 - Bachelor student graduated (with honors).
 - Technologists presented two CE lectures to Hematology group.
 - Directors presented two CE lectures to the Solid Organ Transplant Research Rounds.
 - Directors presented two talks during CLS Research Conference.
 - Continuing Education through teleconferences, Bone Marrow, Renal Weekly Rounds, and Hematology Education sessions.
 - Completed 2 CLS research funded studies.
 - Initiated Tissue Typing Monthly Research Rounds.
 - Contributed to CLS Research Newsletter.
 - Five abstracts accepted in international meetings; three of which were presented by tissue typing lab technologists. One technologist received an award for best oral presentation at the annual ASHI conference in Puerto Rico.

Microbiology Section

- AHS closed the High River Microbiology laboratory due to severe staffing shortages. AHS asked CLS Microbiology to assume the work from the High River Microbiology laboratory.
 - Implemented MAST disks which is a more sensitive test to detect Amp C producing Enterobacteriaceae.

- Standardized sample volume on C. difficle specimens by implementing the Fecal QUIK Prep device. This resulted in improved specificity and lower costs as fewer specimens require PCR confirmation.
- Microbiology was receiving more requests for testing from other laboratories, i.e., organism identification, CRE PCR confirmation, etc. A new M REFIN orderable mnemonic was built in our LIS to better track these referred in tests.
- To reduce the potential for pre-examination errors due to potential mislabeling of tubes while pouring off plasma, Microbiology replaced the EDTA vacutainer tube with the PPT tube. HIV viral load testing can be tested directly from the PPT tube.
- Implemented new blood culture resin bottles, replacing the charcoal bottles. This resulted in improved quality gram stains due to the absence of charcoal.
- Phase 1 implementation of Vitek MS (MALDI-TOF) methodology for organism identification, providing organism identification in a fraction of the time and cost compared to current phenotypic methods.
- Secured a 2nd Vitek MS (MALDI-TOF) in order to realize the full consumable savings by eliminating most Vitek identification cards and other manual tests/reagents. The second Vitek MS will also serve as a back-up instrument as we have also realized some down-time due to instrument failure and mainten-ance. A second instrument increases our capacity to help with volume increases.
- Microbiology MLT completed her Lean Six Sigma Green Belt training, enabling her to help lead Lean events in the Microbiology department.
- Due to an increasing workload on the MLA anaerobe planting bench a Lean SCORE event was run. A visual management system for sample processing improved the routine gram stain TAT, non-value add activities were reduced, and resources were found to assist during peak volume times.
- As approved at the Micronet Committee, implemented an extended incubation on prosthetic/peri-prosthetic fluid and tissues rec'd for anaerobic culture to increase the recovery of Propionibacterium species.
- Developed a database of KOH/CW slide images from pictures taken in the Microbiology laboratory to assist staff training in mycology.
- As approved at the Micronet Committee, implemented the Microbiology provincial critical values list.
- CLS Microbiology confirmed an outbreak of Carbapenemase producing Enterobacteriacae (CRE) in the Edmonton zone by PCR.
- Performed a Point Prevalence Study with Infection Prevention and Control at all Calgary Acute Care Hospitals to determine if there are any Carbapenemase producing Enterobacteriacae (CRE) in the Calgary Zone in response to an outbreak in the Edmonton zone. No CRE were detected in the Calgary zone. Another point prevalence CRE screen will be performed in early 2013.
- Replaced the BD Geneohm PCR method with the Cepheid GeneXpert for confirmation of C. difficle by PCR. The test is easier to perform and improved TAT.
- Hosted the 7th annual Microbiology CE event. Funded 2 MLTs to attend ASM and 2 MLTs to attend CACMID.
- Effective, January 16, 2012, LIC began faxing Microbiology Cancellation notifications for Unlabelled, Mislabelled, and One identifier (e.g. DOB and first and last name only) received in Microbiology for Community patients.
- Effective January 23rd, 2012 LIC assumed phoning all Microbiology results previously phoned by Technologists.
- TRACCESS was implemented in Microbiology February 2012.
- To improve STAT gram stain TATs and provide a visual clue, orange frosted slides were implemented for STAT slides February 2012.
- As a result of audits and process review, quality initiatives were successfully implemented to resolve contamination issue in the Mycology laboratory.
- Effective May 9th the name of Streptoccus milleri group was updated to Streptococcus anginosus group. This change reflects current literature.
- Effective May 14th, 2012 Microbiology changed the criteria for testing throat swabs for patients with a history of penicillin allergy to provide improved turnaround time for Group

A Streptococcus results, as well as decreasing the number of order entry cancellations required for M BETA.

Education

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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, General 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. A new Pathologists' Assistant Master of Science degree training program was established, as a specialization within the Medical Sciences graduate program in 2012; this program enrolled its first 2 graduate students and will be eligible for National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) accreditation in early 2014.

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 2012. Two residents graduated in 2012 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 and this was supported by an Internal Review in December 2012.

General Pathology Residency Training Program (Program Director: Dr. Christopher Naugler)

This is a five-year program leading to certification in General Pathology by the Royal College of Physicians and

Surgeons of Canada. The University of Calgary through co-sponsorship with Calgary Laboratory Services offer General Pathology Residency Training highlighting on laboratory management and pathology informatics. Upon successful completion of the education program, the residents will be competent to function as consultants in General Pathology and medical laboratory directors.

Residents also benefit from our close association with the highly successful University of Calgary Anatomic Pathology Residency Training Program and our large group of over 80 pathologists and laboratory scientists.

Three key features of the program are General Pathology Mentorship, Community Laboratory Management and Pathology Informatics. The General Pathology Residency Program is 5 years in duration (4 years of laboratory Medicine and one basic clinical year). The basic clinical 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.

Research

The general pathology faculty has great interest in pathology informatics and so research in this area is promoted. General pathology residents are expected to complete at least one research project during their residency. Research committee coordinates resident research. Resident Training Committee monitors the manpower required for the project and our department has special funds available for resident research.

Didactic schedule

Pathology and clinico-pathologic seminars are held weekly on Fridays during academic half-day. Residents are exempted from work commitments during this period. Residents are also expected to present at clinico-pathologic rounds, held weekly in conjunction with the Department of Internal Medicine. Residents may also participate in medical student teaching at the University of Calgary. Presentations at other rounds (Department of Surgery/Nephrology) are also encouraged.

Evaluation

An in-training evaluation report (ITER) is completed after each rotation. The ITER is reviewed with the resident and emphasis is on continuous constructive feedback for the resident. Starting in the PGY2 year, all residents take two exams a year mimicking the fellowship exam by the RCPSC.

Training Sites: Diagnostic and Scientific Centre, Foothills Medical Centre (FMC), Alberta Children's Hospital (ACH), Peter Lougheed Centre (PLC), Rockyview General Hospital (RGH), Medical Examiner's Office, Community/rural laboratories (provide extensive opportunity for management training), Community hospital rotations are taken at Red Deer General Hospital in Red Deer, AB

Neuropathology Residency Training Program (Program Director, Dr. 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 was reviewed in 2012 and received full accreditation. In 2012 there were 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.

Resident History/Growth



Medical Sciences 515/Biology 515 Course (Course Director: Dr. X. Sean Gui)

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 enrolment 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.

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.

Fellowship Programs

Up to 6 internally (CLS) funded positions are available each year. Four of these positions are meant to fund board-certified (or board-eligible) Anatomic Pathology Fellows wanting to develop subspecialty skills in an area of Anatomic Pathology. In some years, we also train externally funded fellows.

The DPLM/CLS Fellowship Committee selects qualified applicants for internally and externally funded Fellowship positions. Positions are open to either MD or PhD applicants, depending upon the field of study. We currently offer fellowships in Cytogenetics, Cytopathology, Breast Pathology, Gynecological Pathology, Histocompatibility, Hematopathology, Renal/Transplant Pathology, Pulmonary 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.

Dr. Joanne Todesco assumed the Chairmanship of this Committee in 2012, when Dr. Keith Brownell stepped down. The DPLM and CLS would like to thank Dr. Brownell for his service and to welcome Dr. Todesco.

Clinical Biochemistry Fellowship Program (Program Director: Dr. Isolde Seiden Long)

This year, CLS and DPLM are launching a new fellowship training program in Clinical Biochemistry. The program will train PhDs with a background in biological sciences to become Clinical Biochemists and to direct clinical biochemistry labs. This program will meet the curriculum requirements for accreditation by the Canadian Academy of Clinical Biochemistry (CACB) and the Commission on Accreditation in Clinical Chemistry (ComACC) in the USA. The Fellowship program will be working closely with the General Pathology Residency Training program to enhance training opportunities for both residents and fellows. Graduates of our program will be eligible to take the Clinical Biochemistry specialist certification examinations in both Canada and the USA. The first trainee has been accepted and will start in July 2013. The plan is to accept one fellow per year for a 2 year training cycle, and there will be 2 fellows by the 2014 calendar year in the program. Seven clinical biochemists; Drs. Alex Chin, Lawrence de Koning, Valerie Dias, Richard Krause, Lyle Redman, Isolde Seiden Long and Hossein Sadrzadeh are the program faculty and will be directly involved in teaching and training the fellows. Dr. Isolde Seiden Long is the Program Director.

Fellow	Specialty Area	Supervisor	Funding Source	Year
K. Paisooksantivatana	Hematopathology	I. Auer-Grzesiak	External	2011 - 2012
S. Al Bashir	Cytopathology	M. Duggan	External	2012 - 2013
Andrea Vaags	Cytogenetics	J. van den Berghe	CLS	2012 - 2014
Jinguo Wang	Histocompatibility	N. Berka	CLS	2012 - 2014
Salwa Bakhsh	Pulmonary Pathology	M. Kelly	External	2012 - 2013
Nicole Bures	Breast Pathology	H. Yang	CLS	2012 - 2013

During 2012 the following Clinical Fellows were trained at CLS:

Fellow	Specialty Area	Supervisor	Funding Source	Year
Sandra Lee	Gynecological Pathol- ogy	M. Koebel	CLS	2012 - 2013
Mona Anand	Hematopathology	I. Auer-Grzesiak	CLS	2012 - 2013

Graduate Students

There is currently no pathology graduate 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	Bakkar (Postdoctorate)	S. Liu (PhD)
	T.T. Wang (Postdoctorate)	
	S. Hegasy (Postdoctorate)	
	N.A.M. Al-Saadoun (MSc)	
CHAN, JENNIFER	A. Rogers ((MSc)	D. Dennis (PhD)
	S. Lawn (Postdoctorate)	M. Blough (PhD)
	R. Dixit (Postdoctorate) M. Mobahat (MSc)	
	W. Wu (Postdoctorate)	S. Li (MSc)
	C. Perotti (Postdoctorate)	
DEMETRICK, DOUG		S. Gao (PhD)
		M. Al-Mali (MSc)
		Z. Levacque (MSc)
		M. Al-Shalalfa (PhD)
GREEN, FRANCIS	P. Choudhury (MSc)	D. Polley (MSc)
		C. Fahey (MSc)
		H. Payne (MSc)
KELLY, MARGARET	A. Alansaru (MSc)	C. Downey (PhD)
		T. George (PhD)
		M. Amin (MSc)
ZHANG, KUNYAN	K. Wu (PhD)	J. Kim (MSc)
	L. Bahafzallah (MSc)	S. Abaco (MSc)
	D. Tambalo (Post-doc)	
	A. Khateb (MSc)	

Pathologists' Assistant M.Sc. (Program Director, Dr. Amy Bromley; Medical Director 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 2012, we started a thesis-based Pathologists' Assistant M.Sc. training program at University of Calgary as a specialization within the Medical Sciences Graduate Program and accepted our

first two MSc students. The first year curriculum is didactic with courses in anatomy, histology, physiology, and pathology. CLS is the clinical affiliate providing the second year practicum training. The 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. Our program is eligible for accreditation in early 2014 after submission of a self-study and after a NAACLS site visit. Our students, because they are enrolled in a 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. There is currently only one accredited training program in Canada and it offers both options.

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, now that the thesis-based program is active, we have started the application process for Provincial approval of a parallel course-based Pathologists' Assistant M.Sc. program. Ultimately, we intend to offer both options.

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 Gl 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 (RCPSC accredited), gynecology/oncology (RCPSC accredited), 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. Kathryn Foucar from the University of New Mexico; the Paul Kneafsey lecturer was Dr. George Netto, from John Hopkins University.

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 2012 course was hosted by the University of Calgary, the topic was Breast Pathology, and was once again a very successful event, with an excellent program and 140 registrants. The Program is shown as Appendix 1.5.

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 2013 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 accommondate 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 May CLS partnered with SAIT to achieve accredited status by the Canadian Medical Association (SMA) Conjoint Accreditation Services for the current Medical Laboratory Program. A six year accreditation status was awarded by CMA until 2018.

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 College of Medical Laboratory Technologists of Alberta (CMLTA) for use in the continuing competence program mandated by the Health Professions Act (HPA). In May 2012 SAIT sponsored a free Preceptor Continuing Education Symposium offered to all Health and Public Safety preceptors. A total of 43 preceptors from CLS participated at the event.

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.

Clinical Education once again chaired the organization of a very successful "MLA Getaway 2012". 142 participants attended the event on October 13, 2012. Lectures included: "Millennial's Are Coming" by Dr. Marianna Hofmeister, "Everything You Wanted to Know About Menopause" by Dr. Amid Abdullah, "Street Drugs – What You Need to Know" by Dr. Valerian Dias and "What About You and Your Relationships" by Michele Luit.

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 misalignments 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 2012, 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.

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.

Dr. Doug Demetrick is the 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

Calgary Laboratory Services recognizes that research is on integral part of quality patient care, and that academic laboratory medicine plays a crucial role in developing new knowledge and in applying it to improve patient care. Research is recognized in the CLS Mission Statement, further demonstrating a commitment to research activities. The Medical Director provides direction and leadership for all research within CLS.

Over sixty physicians and scientists, along with staff throughout the organization, provide services to more than 700 research projects. Projects involve researchers, both internal and external to CLS.

Staff within the Research Department coordinate laboratory related clinical trial and study activity that takes place within Alberta Health Services Calgary Zone and the University of Calgary. CLS Research Coordinators serve as a liaison between the Principle Investigator, Study Coordinator, and CLS. They ensure that appropriate specimen collection, handling, and testing procedures are utilized for each Clinical Trial or study protocol. Research Lab Assistants provide support for research specimen processing at a laboratory dedicated to research at the FMC Special Services Building.

The Research Laboratory Specialist provides Anatomic Pathology Immunohistochemistry support for research at the U of C. The Research Supervisor is responsible for the overall administrative coordination of research throughout CLS. The CLS Program Coordinator, Research and Development is responsible for the coordination, reporting, and communication of research and development activities and outcomes.

A summary of initiatives undertaken by Research and Development Program Leader, Dr. Douglas Demetrick and the Research Department in 2012 were as follows:

• The U of C Pathology/ CLS Biomarker Protocol titled: "Identification and Characterization of Diagnostic, Prognostic and Predictive Biomarkers in Pathology Tissue Specimens: An Umbrella Protocol ", was submitted to the Conjoint Health Research Ethics Board

(CHREB) for renewal and received approval on 16 February 2012. The Protocol provided U of C Pathology Faculty/CLS Investigators with valuable support in enabling pilot projects in Anatomic Pathology. The Umbrella Protocol had tremendous success in producing published outcomes in various medical journals and presentations at local and International Medical Conferences (see publications listed below).

- An application was submitted to Alberta Innovates Health Solutions (AI-HS) on 23 March 2012 to highlight the need for partnerships with AI-HS and AHS Laboratories in order to secure Research Infrastructure support to align with Provincial priorities to establish Alberta as a centre for Excellence in Medical Research and Innovation.
- A review of CLS Research Services culminated in a report titled: "CLS Research: Increasing Research Capacity" which was presented to CLS Executive and to the CLS Board in September 2012. Recommendations for addressing the identified Research Barriers detailed in the report were: Improving Researcher Access to Research Space and Facilities, the dire need for funding for Research Infrastructure and Capacity to align with the Provincial Health Strategy for Excellence in Medical Research & Innovation, the allocation of dedicated Resources in the Informatics for Research Service, the need to Improve Research Communications(CLS Research Web Portal) and an Organizational review of Research Services for example to suggest improvements in Research Capacity (space, staffing) and the reporting and tracking of Organizational Research Finances.
- Met with CLS Executive to move forward on solutions to Barriers to Research as identified in our Review of CLS Research Services.
- Met with AHS Millennium IT personnel, CLS Data Team & CLS VP Technical Operations to identify resources in order to ensure researcher access to historical pathology data in the CLS Laboratory Information system.
- Dr. Demetrick presented "The Role of the Diagnostic Laboratory in the New Era of Personalized Medicine: Cancer Diagnosis" and Zane Ramdas presented "The Healthcare Continuum, Better Research Outcomes requires fewer Research Barriers" at CLS Innovation Day on 19 October 2012 which was attended by AHS Provincial Lab Leaders, CLS Executive and U of C Pathology/ CLS Medical & Scientific Staff.
- At the request of Paula Hall, Dr. Demetrick developed a Provincial Research Strategy for AHS Laboratories with feedback from the U of C Pathology/ CLS Research Committee & ACRC.
- Attendance and active participation by Dr. Demetrick in 2012 Stakeholder Meetings held by Alberta Clinical Research Consortium (ACRC), Alberta Cancer Foundation(ACF) and Alberta-Innovates Health Solutions(AIHS).
- The revision of the CLS Research Policy in conjunction with CLS Privacy Office, CLS Executive, MAC & External Stakeholders was completed. Collaboration on the development of the Provincial Laboratory Research Pricing list was also completed with CLS finance, Clinical Section Research Contacts and the AHS Provincial Clinical Trials Research Coordinator.

Umbrella Protocol CLS Biomarker Pilot Projects Update:

Since the inception of the program in 2011, the U of C Pathology/ CLS Research Committee has enabled 33 pilot projects. The Chair of the Committee, Dr. Kiril Trpkov, together with the Research Office and CLS AP Research Contact ensured quick turnaround times, by providing timely expert review and feedback on research proposals. Preliminary feedback from faculty members with Umbrella Pilot projects indicated that the Biomarker Protocol was invaluable in providing them with a platform on which to conduct Pathology research and to present their findings both locally and internationally.

A list of Umbrella Pilot sub-project publications follows:

1. Sub-Project Publication/Presentation: Predicting clinical outcome among Mantle cell lymphoma patients following high dose chemotherapy and bone marrow stem cell implant (BMT) through bio-marker study. (RS11521). Zarrin R, Street L, Kosari F, Pournazari P, Shabani-Rad MT, Patel J, Stewart DA, Mansoor A. Accepted for Poster Presentation 2012 USCAP Annual Meeting 17-23 March 2012, Vancouver, Canada.

- Sub-Project Publication/Presentation: Prognostic Impact of WT1 Protein Expression on Overall Survival in De-Novo Acute Myeloid Leukemia (AML) with Normal Cytogenetics (RS11524). Haggstrom SJ, Pournazari P, Kosari F, Shabani-Rad MT, Patel J, Auer I, Luider J, Fourie T, Demetrick DJ, Geddes M, Storek J, Mansoor A. Accepted for Platform Presentation at USCAP Annual Meeting 17-23 March 2012, Vancouver, Canada.
- Sub-Project Publication/Presentation: Perineural Invasion (PNI) in Prostate Cancer Patients Who Are Potential Candidates for Active Surveillance: A Validation Study. (RS11529). Wang C, Zhang J, Yilmaz A, Bismar TA, Trpkov K. Accepted for Poster Presentation 2012 USCAP Annual Meeting 17-23 March 2012, Vancouver, Canada.
- 4. Sub-Project Publication/Presentation: IDH Mutation Detection in a Diagnostic Setting Utilizing Multiplex PCR and Single-base Extension Methodology on Formalin-Fixed Paraffin-Embedded Glioma Tissues. (RS11532). Perrizzolo M, Winkfein R, Hui S, Krulicki W, Demetrick DJ. Poster presented at ASCP Annual meeting Las Vegas, Nevada 19-21 October 2011.
- 5. Sub-Project Publication/Presentation: IDH Mutation Detection in Formalin-Fixed paraffin-Embedded Gliomas Using Multiplex PCR and Single-base Extension. (RS11532). Perizzolo M, Winkfein R, Hui S, Krulicki W, Chan JA, Demetrick DJ. Brain Pathology (In Press)
- 6. Sub-Project Publication/Presentation: Pilot study for Characterizing Novel miRNA in Relation to ERG Gene Rearrangement (RS11533). Poster presented at Banff ACF 2011.
- 7. Sub-Project Publication/Presentation: Laterality, squamous epithelial cells (SEC), lipid-laden macrophages (LLM) and bacteria / fungi in the detection of oro-pharyngeal aspiration (OPPA) in bronchioalveolar lavage (BAL) specimens. (RS12503). Mourad WA, Fontaine DG. Presented at the annual meeting of the American Society of Cytology (ASC), Las Vegas, Nevada, USA November 2012
- 8. Sub-Project Publication/Presentation: Accuracy of fine needle aspiration (FNA) of the thyroid in identifying papillary carcinoma in liquid-based cytology (LBC) (RS12504). Mourad WA, Fontaine DG, Dvorakova M, Waghray R, Abdulla A. Presented at the annual meeting of the American Society of Cytology (ASC), Las Vegas, Nevada, USA November 2012
- 9. Sub-Project Publication/Presentation: Fine needle aspiration (FNA) of the thyroid to identify papillary carcinoma in liquid-based cytology (LBC). (RS12504). Fontaine DG, Mourad WA. Presented at the 37th meeting of the European society of cytology (ESC), Cavta, Croatia October 2012
- Sub-Project Publication/Presentation: Follicular lesion of undetermined significance of the thyroid in liquid-based cytology (LBC). (RS12504). Fontaine DG, Mourad WA. Presented at the 37th meeting of the European society of cytology (ESC), Cavta, Croatia October 2012
- 11. Sub-Project Publication/Presentation: Insulin-like growth factor-1 receptor (IGF-1R) expression in liposarcoma as a potential target for therapy. A pilot study. (RS12506). Mourad WA, DiFrancesco L. Presented at the annual meeting of the international society of oncology and biomarkers (ISOBM), Jerusalem, Israel October 2012
- 12. Sub-Project Publication/Presentation: A review of radical prostatectomy specimens in patients requiring surgical correction of post-prostatectomy complications (RS12509). This project has been presented already at the Canadian Urology Association meeting. Receiver of the Top Abstract Award.

- 13. Sub-Project Publication/Presentation: Doc, Can I get my Prostate Back?": A Review of Radical Prostatectomy Specimens in Patients Requiring Surgical Correction of Post-Prostatectomy Complications" (5 Star Designation). (RS12509). Baverstock R, Carlson K, Trpkov K, Graham D, Khalon B CUAJ June 2010; 4(3Suppl1): S1-S101
- 14. Sub-Project Publication/Presentation: Management of post radiation therapy complications among prostate cancer patients. A case series. (RS12510). Flannigan R, Baverstock R, PUA 2011, abstract publication CUA 2012

The Research Office is responsible for Clinical Trial activity for Calgary Zone hospitals and community sites.

2012 CLS Research Competition

The CLS Research Department announced award results for the fifteenth annual CLS Health Services Research Funding Competition. A total of \$76,428.52 was awarded by CLS to researchers in 2012.

One hundred and five projects have received funding through the Research competition since it began in 1998.

Outcomes resulting from CLS Research Competition projects completed in 2012:

- Detection of clone ST131 among extended-spectrum B-lactamase (ESBL)- producing Escherichia coli isolated from blood in Calgary and Rotterdam. Dr. Johann Pitout, D. Gregson. The results of the research described the most effective PCR method that detected ST131. They determined the best phenotypic and genotypic methods for detecting carbapenemases in enterobacteria and determined the population structure of ESBL producing K. pneumoniae in Calgary and carbapenemase-producing K. pneumoniae in Calgary, Ontario and SMART study. In addition, they published the 1st ESBL characterization in the Netherlands, identified different pulsotypes among ST131 in Calgary, described the characteristics of ST131 from Chicago, Brazil and South Africa and described the 1st NDM-producing E. coli in Canada. Results have been published in high impact journals such as Antimicrobial Agents and Chemotherapy, Journal of Clinical Microbiology, Journal of Antimicrobial Chemotherapy and Emerging Infectious Diseases. For example: Lascols C, Peirano G, Hackel M, Laupland KB, Pitout JDD. Surveillance and Molecular Epidemiology of Klebsiella pneumoniae Isolates That Produce Carbapenemases: First Report of OXA-48-Like Enzymes in North America. Antimicrob Agents Chemother. 2013. Jan; 57(1):130-6. Additional funding in the amount of \$75,000.00 was received from Merk Frosst Canada LTD. Results were presented at CLS CME rounds as well as several IDRG seminars and international meetings such as ASM General meeting, ICAAC and ECMID.
- Impact of donor-recipient compatibility for HLA-DPBI on the outcome of allergenic Hematopoietic cell transplantation (HCT). Noureddine Berka, Faisal Khan, Jan Storek, Victor Lewis. The study provided insight about the role of HLA-DPB1 matching status in allogeneic Hematopoietec cell transplantation (HCT) and the findings will have implications on the laboratory testing for HLA matching performed for allogeneic HCT recipients and their donors. The research results showed that allogeneic HCT recipients are required to be matched for HLA-A, -B, -C, -DRB1 and -DQB1 but matching for HLA-DPA1 and DPB1 has no impact on HCT outcome. The findings also showed that HLA-DPB1 matching has no/minimal impact on the occurrence of Graft versus host disease when donor and recipients are already matched for the other 5 HLA loci. Results were published: N.Berka, D. koo, A. Liacini, RM Faridi, J. Taylor, J. Storek, V. Lewis, F. Khan. HLA-DP Matching is Not Clinically relevant in 10/10 HLA Matched Transplants: A Single Center Study. Biology of Blood and Marrow Transplantation, 2013. 19(2)-S343.
- Sensitivity, specificity and predictive potential of the pharmacogenetic test based on HLA-B*5701 and Heat shock protein- 70 M493T (Hsp-70 M493T) genotyping for Abacavir Hypersensitivity in HIV-1 positive patients. Faisal Khan, John Gill, Noureddine Berka. The study concluded that the absence of the T allele on the Hsp-70Hom M493T gene protects those with HLA-B

57:01 from developing Abacavir Hypersensitivity Syndrome (AHS), and that genotyping of both HLA-B*57:01 and Hsp-70Hom M493T will be a better pharmacogenetic test for AHS than genotyping of HLA-B*57:01 alone. With the current pharmacogenetic test of HLA-B*57:01 genotyping in HIV-1 positive patients, the Tissue Typing Laboratory is able to rule out a 'high risk' patient for AHS but could not categorize a 'low risk' patient due to high specificity but limited sensitivity of HLA-B*57:01 based testing. Results of this study demonstrating the association of Hsp70 Hom- 9564 CC with protection against AHS will lead to the incorporation of Hsp70-Hom genotyping together with that of HLA-B*57:01 which significantly increases the predictive potential of this pharmacogenetic test for ASH. The findings of this study provides evidence to test for both HLA-B*57:01 as well as Hsp-70 Hom M493T before subjecting the HIV-1 patients to Abacavir therapy. Patients carrying HLA-B*57:01 and Hsp-70 Hom M493T CC genotype, who would otherwise be deprived of Abacavir treatment can be identified for this therapy.

- The functional polymorphisms of IL17A, IL17F genes and chronic kidney allograft rejection. Abdelhamid Liacini, Faisal Khan, Serdar Yilmaz, Noureddine Berka. The results showed genetic predisposition to low/high dose production of pro-inflammatory cytokines is not a good predictive marker for Chronic Allograft Failure (CAF) and IL-17 gene variants have no/ minimal impact on the development of CAF. The research led to the development of a simple PCR based typing protocol to screen Interleukin-17 gene variants for their association with Pathological conditions. Publication: A. Liacini, D. Ibrahim, F. Rehan, F. Khan, A. Sar, S. Yilmaz, B. Berka. Interleukin 17 Gene Polymorphism and Chronic Kidney Allograft Failure. Human Immun,2012;73(s):112. No association of L17 gene variants with CAF reinforces their belief that a deficient regulatory milieu and not an aggressive inflammatory assault may represent a crucial predictor of chronic renal allograft damage.
- Molecular analysis of intracerebral abscesses to determine the microbiologic constituents: Comparison to routine culture practices. Dr. Michael Parkins, C Shibley, M Surette, D. Church. The polymicrobial nature of invasive pyogenic infections (IPI) may be underestimated by routine culture practices, due to the fastidious nature of many organisms and the loss of viability from prior antibacterials or during transport. Defining the polymicrobial nature of IPI is the first step towards appreciating the clinical and diagnostic implications of these complex communities. Pyrosequencing was used to identify bacterial DNA within abscess samples and was performed on brain and liver abscesses and pleural fluid and compared to routine culture data. The study results concluded that complex microbial communities are involved in invasive pyrogenic infections (IPI) of the lung, liver and brain. The research was presented at city wide infectious disease rounds and was telecasted to CLS. A manuscript is under revision after peer review for consideration of publication in the European Journal of Clinical Microbiology and Infectious Diseases.
- New Markers for Distinguishing Colitis- Associated from Sporadic Colorectal Dysplasia/ Neoplasia. Sean Gui. 80 cases were studied for the expression of 8 different proteins. Two of the proteins were found to show different expression in IBD-associated dysplasia, and they showed diagnostic value in discriminating IBD-dysplasia from sporadic adenomas. The results of the research will be used to establish a novel diagnostic test to discriminate IBD-associated dysplasia from sporadic adenomas in colonic biopsies. One abstract was submitted to the United States and Canadian Academy of Pathology (USCAP) annual meeting held in Vancouver.

CLS Summer Studentship Competitions

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

2012 Master of Biomedical Technology Competition

No applications submitted.

Calgary Laboratory Services Undergraduate Competition

Supervisor	Student	Project
Dr. Dylan Pillai	Soyoon Lee	Molecular epidemiology of P. falciparum malaria in returning travelers to Calgary
Dr. Faisal Khan	Sam Griffin	Impact of donor-recipient mismatching for expression –influencing cytokine genotypes on the cytokine production profile of the recipient after allogenic HCT
Dr. Sean Gui	Ziran Meng	Understanding the molecular pathways responsible for the morphologic diversity of appendiceal malignant tumors.
Dr. Margaret Kelly	Simon Hasan	IL-17A positive inflammatory cells as diagnostic and prognostic markers of pulmonary fibrosis in chronic hypersensitivity pneumonitis.

Anatomic Pathology Research Lab (APRL)

The research laboratory which is situated at the Foothills Medical Complex, offers quality service to accommodate research projects including high quality immunohistochemistry (IHC) staining: single and double stain, IHC method development for new or untested antibodies, tissue micro array blocks, and tissue micro array and core punch construction.

The workload at the APRL has increased significantly from 2008 to 2012. The lab specialist at the APRL tested 180 antibodies, stained 1512 IHC slides and created 14 TMA's to accommodate 96 requests at the APRL in 2012. In 2008, the APRL supported 3 research projects for 2 CLS Principal Investigators and in 2012 this increased to 17 projects in support of 10 PI's. EBER ISH and EGFR ISH diagnostic assays were completed at the APRL for transfer to the diagnostic Immunolab. MAP-2 and Nestin (neuronal markers) were optimized at the APRL and have been transferred to the diagnostic lab for clinical use.

The Research Office developed an APRL price list, created a request form and implemented a system for tracking and monitoring APRL research activity and project cost based on assigned RS# so the work is more organized and managed more efficiently.

Dr. Tarek Bismar utilizes the APRL and has 5 publications supported from the CLS APRL:

- 1. Teng, L-H, Wang C, Bégin LR, Dolph M, Yklmaz A, Trpkov K, Donnelly B, **Bismar TA**. ERG protein expression and gene rearrangements are present at lower rates in metastatic and locally advanced castration resistant prostate cancer compared to localized disease. Gold Urology 2013 [In press]
- 2. **Bismar TA***, Dolph M, Teng LH, Liu S, Donnelly B. ERG protein expression reflects hormonal treatment response and is associated with Gleason score and prostate cancer specific mortality. Eur J Cancer. 2012 Mar;48(4):538-46.
- 3. **Bismar TA***, Yoshimoto M, Duan Q, Liu S, Sircar K, Squire JA. Interactions and relationships of PTEN, ERG, SPINK1 and AR in castration-resistant prostate cancer. Histopathology 2012 Mar;60(4):645-652
- 4. 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. 2011;224(1):90-100.
- 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 Therapy 2011 Mar 15;11(6):562-6

Iotal "calendar year-adjusted" P.I. grant funding for faculty members with primary appointments in the DPLM (2005 -2012)						
Year	Total Annual PI Funding	# GFT Faculty	\$ / GFT			
2005	\$1.30 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			
2012	\$1.83 M	27	\$67,778			

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 118 peer-reviewed papers in 2012 (Appendix 1.3). 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 (2005-2012)						
Year	Total Papers	Sum of Journal IFs	Mean IF/Paper	IF >10	I F >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	125	461.351	3.72	6	1	
2012	118	473.231	4.01	9	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. In 2012, we experienced a 5% decrease in total peerreviewed publications compared to our previous record in 2011; however, we also experienced a 16% decrease in GFT faculty members compared to the previous year.

DPLM: GFTS & Peer Reviewed Publications (2000-2012)



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 11 book chapters and one book in 2012 (Appendix 1.3).

Members of the DPLM also presented many scientific papers at prestigious national or international meetings in 2012. 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. Arthur Clark was promoted to Professor Emeritus, Dr. Doug Demetrick was promoted to Full Professor, Dr. Margaret Kelly was promoted to Associate Professor, and Dr. Noureddine Berka was promoted to Clinical Associate Professor. The Department congratulates Drs. Clark, Demetrick, Kelly and Berka and thanks them for their academic contributions.

Dr. Zu-hua Gao was also "promoted" as he was appointed as the new Chair of the Department of Pathology at McGill University.

Awards

Dr. Iwona Auer-Grzesiak

Teaching Award for Clinical, Adjunct, Research Faculty from the Faculty of Medicine.

Medical Leadership and Administration

Dr. Ranjit Waghray was the successful candidate to replace Dr. Gao as the Clinical Section Chief/Division Head of Anatomic Pathology Cytopathology in October 2012. In addition to this role, Dr. Waghray continues to provide leadership as the Group Leader of Cytopathology, the position he held prior to assuming his new role.

The newly recruited Chief of Clinical Biochemistry Section, Dr. SM Hossein Sadrzadeh, is a well established, internationally known clinical chemist and scientist with extensive experience in directing clinical laboratories at the US institutions such as Harvard Medical School, University of Washington and Cedars Sinai Medical

Center. Dr. Sadrzadeh has also established and directed clinical chemistry fellowship programs in the US. He has trained 24 MD and PhD fellows. Several of his former fellows are directing clinical chemistry labs at major academic institutions in US and abroad.

Challenges

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.
- Achieve \$4.1 Million in cost savings.
- Expand services at SHC to meet expanding needs as clinical services grow and evolve.
- Planning, funding, staffing and actualizing laboratory service at CLS' new facilities, including the McCaig Tower at the Foothills Medical Centre, expansions of the Rockyview and Peter Lougheed Hospitals, and the new Tom Baker Cancer Centre.
- 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 and hopefully use these funds to subsidize purchase of new capital

Responses to Issues, Ongoing Matters and Plan of Action

In the past few years, AHS has taken a Province-wide approach to lab services so as to promote excellent laboratory services throughout the entire Province. This means that DPLM/CLS will take on increasing responsibilities not only in Calgary but also throughout Southern Alberta. Therefore, we need to embrace a less Calgary-centric approach and become fully engaged with Province-wide laboratory planning initiatives and Laboratory Networks. Discussions are underway Provincially to introduce a Hub & Spoke" Model for laboratory services in which Calgary would provide additional laboratory services in the South Zone. These will be major foci of efforts for the next few years.

CLS views the prospect of a single-province wide system as an opportunity to improve, grow, and rationalize service. 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 testing vs. when we need to seek approval to do this through AHS Laboratory Services and its new Laboratory Networks.

Future Risks

Every year, we face the challenge of providing increased services without proportionate increases in funding. For the next two years, it will be even tougher as CLS will be expected to cut its spending by about \$4,000,000 per year. Therefore, we 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. This is happening again, but change is always difficult.

Workforce Planning

Since 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, through the diligence, dedication, and hard work of our highly skilled medical and scientific staff, the work gets done and there are no waitlists.

Fortunately, in the past year, there has been a very significant influx of funding for 14 new lab FTEs and this has already resulted in a massive recruitment effort. Funding for an additional 3.5 Anatomic Pathology FTEs has recently been confirmed related to implementation of a new Province-wide QA plan for AP as well as funding an additional 3.0 Lab FTEs has been even more recently confirmed related to a new contractual agreement between AHS and the pathologists that may result in the funding of the clinical portions of all pathologists' salaries moving into the Trilateral Master Agreement (TMA).

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.

MEDICAL STAFF - RECRUITMENT				
Medical Staff	Start Date	GFT/Clinical	Primary Division	
Abi Daoud, Marie	2012 July	Clinical Assistant	Anatomic Pathology/Cytopathology	
Anders, Karl	2012 May	Clinical Associate	Anatomic Pathology/Cytopathology	
Bromley, Amy	2012 July	Clinical Assistant	Anatomic Pathology/Cytopathology	
De Koning, Lawrence	2012 August	Clinical Assistant	General Pathology	
Flynn, Ethan	2012 July	Clinical Associate	General Pathology	
Hunter, Charlene	2012 November	Clinical Assistant	Anatomic Pathology/Cytopathology	
Morava-Protzner, Iza- bella	2012 December	Clinical Associate	Anatomic Pathology/Cytopathology	
Ni, Hongyu	2012 November	Clinical Associate	Hematology/Transfusion Medicine	
Sadrzadeh, Hossein	2012 December	Clinical Professor	Clinical Biochemistry	
Schell, Andrew	2012 October	Clinical Assistant	Anatomic Pathology/Cytopathology	

Summary of Recruitment

MEDICAL STAFF - RECRU	ITMENT		
Medical Staff	Start Date	GFT/Clinical	Primary Division
Seiden Long, Isolde	2012 July	Clinical Assistant	Clinical Biochemistry
Teman, Carolin	2012 July	Clinical Assistant	Anatomic Pathology/Cytopathology
MEDICAL STAFF - DEPAR	TURES		
Chebib, Ivan	2012 August	Clinical	Anatomic Pathology/Cytopathology
Clark, Arthur	2012 June	GFT	Anatomic Pathology/Cytopathology
Dupre, Marc	2012 June	Clinical	Anatomic Pathology/Cytopathology
Gao, Zu-Hua	2012 August	GFT	Anatomic Pathology/Cytopathology
Han, Guangming	2012 February	Clinical	Anatomic Pathology/Cytopathology
Lyon, Andrew	2012 April	GFT	Anatomic Pathology/Cytopathology
Lyon, Martha	2012 May	GFT	Clinical Biochemistry (Pathology)

Current Needs

In late 2012, Alberta's pathologists, through the efforts of the ASLP and AMA, ratified an agreement with AHS to facilitate moving pathologist remuneration into the Trilateral Master Agreement on a Provincewide basis. This has resulted in a need to harmonize the benefit packages in pathologists' contracts to a new Provincial standard requiring that all pathologists have the equivalent of 30 days of vacation and 10 CME days per year. AHS has committed to funding 3 new FTE for CLS so that we can provide full coverage of all clinical services when this is implemented in April 2014. These 3 new FTE positions need to be recruited. An additional 3.5 FTE have very recently been funded by AHS to allow for the implementation of a new Province-wide QA plan in Anatomic Pathology/Cytopathology. Therefore, a total of 6.5 new FTE positions will need to be recruited above and beyond any departures and retirements.

Future Needs

The current hiring spree should go a long way towards addressing the chronic shortage of laboratory physicians and scientists. Once the new steady state has been achieved and as we are informed of upcoming retirements, we can address whether there are additional needs, especially in subspecialty areas.

Goals and Strategies

One of the ways we have dealt with the increased clinical workload over the past 6-7 years has been to switch GFT positions to Clinical faculty positions or to decrease the percentage of academic protected time for some GFT positions. Seven 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 still flourished. 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, continues to be discussed.

Also to help address workload issues, we plan to increasingly utilize M.Sc. trained, board-certified Pathologist's Assistants to perform certain repetitive medically delegated tasks such as "grossing" surgical specimens and assisting on autopsies. This will allow our pathologists to spend more time looking at slides. To facilitate this, we opened a new training program (see Education - Pathologists' Assistant M.Sc.)

Impact on Other Departments and Regional Resources

Since we are a service provider recruitment or expansion of other clinical services impact the laboratory rather than the other way around. We try to be proactive and become aware of upcoming clinical expansions so that we are able to meet their laboratory service requirements. One upcoming major planning initiative will be to work with the Oncology Department to determine their service requirements and to plan for the new cancer hospital expected to open in about 5 years. CLS also plays an important role in ongoing efforts to optimize patient flow through the acute care facilities, such as in the Emergency Department or discharge planning (Path 2 Home).

Quality Assurance, Quality Improvement, and Innovation

General

- AHS Laboratory Services and CLS are supporting the provincial Path 2 Home (provincial discharge model) project to develop formal discharge pre-planning and discharge processes for patients. The laboratory's role in the model includes 1) supporting earlier laboratory reports to physicians allowing them to conduct their medical rounds earlier in the day, and 2) optimizing utilization both in terms of Stat and routine daily orders.
- Quality AHS Laboratory Services and CLS maintain systematic programs to monitor quality and the appropriateness of laboratory services. These programs are designed to meet accreditation, legal and regulatory requirements, recognized standards of laboratory practice and operational needs.
- A comprehensive internal and external audit program exists to ensure laboratories meet recognized laboratory standards. External audits include certification or accreditation organization assessments, clinical trial audits and regulatory inspections. The following external audits occurred during the last fiscal year:
 - College of Physicians and Surgeons of Alberta (CPSA):
 - Calgary Laboratory Services South Health Campus
 - College of American Pathologists (CAP)
 - American Society for Histocompatibility and Immunogenetics (AHSI):
 - Foundation for the Accreditation of Cellular Therapy (FACT):
 - Calgary Laboratory Services Foothills Medical Centre Cellular Therapy Laboratory (as part of the assessment for the Alberta Bone Marrow Transplant Program)
 - Health Canada Cells, Tissues and Organs (CTO):
 - Calgary Laboratory Services Foothills Medical Centre Cellular Therapy Laboratory
 - (as part of the assessment for the Alberta Bone Marrow Transplant Program)
- AHS/CLS Corporate Policy Alignment
 - CLS administrative policies were reviewed to ensure policies and practices are aligned and consistent with related AHS corporate and clinical policies.
- Laboratory Services Anatomic Pathology Quality Assurance Plan Implementation?
- Laboratory Services Network standardization initiatives.
- Implementation of document management software to standardize and streamline the management process for policy, process and procedure documents across the province.
 - Traccess learning management system implemented within the Calgary Zone to track staff competency and education activities

- Laboratory Services regularly monitors customer service and satisfaction in order to measure how well the needs of our internal and external customers are being met. Voice of the customer surveys were conducted to obtain feedback from:
 - Healthcare providers on the transfer of specified molecular pathology and immuno-histochemical testing from the Tom Baker Cancer Centre to Calgary Laboratory Services
 - CLS implemented a database to facilitate tracking and trending of patient and healthcare provider feedback across the organization in order to better identify opportunities for improvement
- The Calgary Laboratory Services South Health Campus laboratory opened for service on December 3, 2012 (General Laboratory, Transfusion Medicine and Anatomic Pathology). The Microbiology laboratory opened on February 25, 2013.
- Calgary Laboratory Services was contracted to provide technical management of Calgary Zone rural laboratories to promote standardization and optimization of laboratory services within the Calgary Zone.

Access of Family Physicians to Specialists

N/A

Patient Flow Through the Emergency Department

CLS has participated in initiatives to improve patient flow through the Emergency Department. Dr. Grant Innes assessment was "Lab is not a problem".

Future Directions and Initiatives

The year 2013 will be an exciting one with many short and long-term projects on the go and continued expansion of our Medical & Scientific Staff. Through a new Provincial "Hub & Spoke" Model, it is anticipated that we will provide some additional laboratory services in the Southern Zone.

Appendices

1.1 Membership Lists

Clinical Section of Anatomic Pathology/Cytopathology					
Medical Staff	GFT/Clinical	Rank	Site	Special Expertise	
Abi Daoud, Marie	Clinical	Asst. Professor	DSC	Dermatopathology	
Anders, Karl	Clinical	Assoc. Professor	SHC	Surgical Pathology	
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	
Bromley, Amy	Clinical	Asst. Professor	FMC	Autopsy Pathology	
Brown, Holly	Clinical	Asst. Professor	DSC	Dermatopathology	
Bruecks, Andrea	Clinical	Assoc. Professor	DSC	Dermatopathology	
Chan, Jennifer	GFT	Asst. Professor	FMC	Neuropathology	

Clinical Section of Anatomic Pathology/Cytopathology					
Medical Staff	GFT/Clinical	Rank	Site	Special Expertise	
Demetrick, Douglas	GFT	Assoc. Professor	HSC	Molecular Pathology	
DiFrancesco, Lisa	GFT	Assoc. Professor	FMC	Soft Tissue & Bone Pathology	
Duggan, Máire	GFT	Professor	FMC	Cytopathology, Gynecological Path- ology	
Dvorakova, Marie	Clinical	Asst. Professor	DSC	Cytopathology	
Eidus, Leslie	Clinical	Asst. Professor	RGH	Gastrointestinal Pathology	
Falck, Vincent	Clinical	Assoc. Professor	FMC	Gastrointestinal Pathology, Surgical Pathology	
Fontaine, Daniel	Clinical	Assoc. Professor	DSC	Cytopathology	
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	
Green, Francis	GFT	Professor	FMC	Pulmonary Pathology, Autopsy	
Guggisberg, Kelly	Clinical	Asst. Professor	RGH	ENT Pathology, Dermatopathology	
Gui, Xianyong (Sean)	Clinical	Asst. Professor	FMC	Gastrointestinal Pathology	
Hunter, Charlene	Clinical	Asst. Professor	DSC	Surgical Pathology, Dermatopathology	
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, Endocrine Pathology	
Klonowski, Paul	Clinical	Asst. Professor	DSC	Surgical Pathology, Lab Informatics	
Koebel, Martin	GFT	Asst. Professor	FMC	Gynecological Pathology	
Kulaga, Andrew	Clinical	Asst. Professor	RGH	Genitourinary Pathology, Surgical Pathology	
Luedtke, Chad	Clinical	Asst. Professor	SHC	Breast Pathology	
Medlicott, Shaun	Clinical	Assoc. Professor	PLC	Gastrointestinal Pathology	
Meier, Lucja	Clinical	Asst. Professor	DSC	Cytopathology	
Morava-Protzner, Izabella	Clinical	Assoc. Professor	PLC	Surgical Pathology	
Ogilvie, Travis	GFT	Asst. Professor	FMC	Breast Pathology, Gynecological Pathology, Molecular Pathology	
Oryschak, Allan	Clinical	Assoc. Professor	RGH	Ophthalmic Pathology, Surgical Pathology	
Paslawski, Doreen	Clinical	Asst. Professor	RGH	Breast Pathology, Surgical Pathology	
Pinto-Rojas, Alfredo	GFT	Assoc. Professor	ACH	Pediatric Pathology	
Rashid-Kolvear, Fariborz	Clinical	Asst. Professor	DSC	Cytogenetics	
Resch, Lothar	GFT	Assoc. Professor	FMC	Neuropathology	

Clinical Section of Anatomic Pathology/Cytopathology						
Medical Staff	GFT/Clinical	Rank	Site	Special Expertise		
Schell, Andrew	Clinical	Asst. Professor	PLC	Gastrointestinal Pathology		
Sienko, Anna	Clinical	Professor	PLC	Surgical Pathology, Cytopathology		
Teman, Carolin	Clinical	Asst. Professor	FMC	Surgical Pathology, Hematopathology		
Trevenen, Cynthia	Clinical	Professor	ACH	Pediatric Pathology		
Trotter, Martin	GFT	Professor	DSC	Dermatopathology		
Trpkov, Kiril	GFT	Professor	RGH	Genitourinary Pathology, Renal Path- ology		
Urbanski, Stefan	GFT	Professor	FMC	Gastrointestinal Pathology, Liver Pathology, 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, Experimental Pathology		
Yang, Hua	Clinical	Asst. Professor	FMC	Breast Pathology		
Yilmaz, Asli	GFT	Assoc. Professor	RGH	Urological Pathology, Surgical Pathology		
Yu, Weiming	Clinical	Assoc. Professor	ACH	Pediatric Pathology, Cardiac Pathol- ogy		

Clinical Section of Clinical Biochemistry							
Medical Staff	GFT/Clinical	Rank	Site	Special Expertise			
Chin, Alex	Clinical	Asst. Professor	DSC	Immunochemistry, Clinical Biochem- istry			
de Koning, Lawrence	Clinical	Asst. Professor	ACH	General Pathology, Pediatric Clinical Biochemistry			
Dias, Valerian	Clinical	Assoc. Professor	DSC	Clinical Toxicology, Special Chem- istry			
Krause, Richard	Adjunct	Assoc. Professor	DSC	Clinical Biochemistry, QA/QC			
Sadrzadeh, Hossein	Clinical	Professor	DSC	Endocrinology, Nutrition, Pharma- cogenomics, Clinical Biochemistry			
Seiden Long, Isolde	Clinical	Asst. Professor	FMC	Clinical Biochemistry			

Clinical Section of General Pathology						
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 Pathol-		
				ogy		

Clinical Section of General Pathology						
Medical Staff	GFT/Clinical	Rank	Site	Special Expertise		
Flynn, Ethan	Clinical	Assoc. Professor	SHC	General Pathology		
Gorombey, Steve	Clinical	Asst. Professor	DSC	Cytopathology, General Pathology		
Larsen, Erik	Clinical	Asst. Professor	RGH	Surgical Pathology, Clinical Chem- istry		
Mourad, Walid	Clinical	Professor	DSC	General Pathology, Hematopathology, Cytopathology		
Naugler, Christopher	Clinical	Asst. Professor	DSC	Lab Informatics, General Pathology		
Redman, Lyle W.	Clinical	Locum	DSC	Point Of Care, Clinical Chemistry		

Clinical Section of Hematology/Transfusion Medicine							
Medical Staff	GFT/Clinical	Rank	Site	Special Expertise			
Auer-Grzesiak, Iwona	Clinical	Assoc. Professor	FMC	Flow Cytometry, Lymphoma			
Berka, Noureddine	Clinical	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	HMR	Tissue Typing			
Mansoor, Adnan	GFT	Assoc. Professor	FMC	Hematopathology			
Ni, Hongyu	Clinical	Asst. Professor	FMC	Hematopathology			
Patel, Jay	Clinical	Asst. Professor	FMC	Hematopathology			
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	Molecular Hematology			

Clinical Section of Microbiology						
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, Parasitol- ogy		
Church, Deirdre	GFT	Professor	DSC	Medical Microbiology, HIV Diag- nostics, STDs, Anaerobes, Mycology		
Gregson, Daniel	GFT	Assoc. Professor	DSC	Virology, Sirology, General Micro- biology		
Pillai, Dylan	GFT	Assoc. Professor	DSC	Molecular Diagnostics, Parasitology		
Pitout, Johann	GFT	Professor	DSC	Antibiotic susceptibility/ARO Bac- teriology, Parasitology		

1.2 Current Workforce Plan (see Workforce Planning)

1.3 Scholarly Publications

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- 13. Bosch M, **Khan FM**, Storek J. Immune reconstitution after hematopoietic cell transplantation. Curr Opin Hematol. 19(4):324-35, 2012
- 14. **Bromley AB**, Altman AD, Chu P, Nation JG, Nelson GS, Ghatage P, Kalloger SE, Han G, **Köbel M**. Architectural patterns of ovarian/pelvic high-grade serous carcinoma. Int J Gynecol Pathol. 31(5):397-404, 2012

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1.4 Research Grants

2012 CLS HEALTH SERVICES RESEARCH FUNDING COMPETITION PROJECTS AWARDED FUNDING

Competition Year	Principal Investigator/Co- Investigators	Торіс	Budget
2012	Dr. Yinong Wang , Christopher Naugler, Daniel Fontaine	Diagnostic Value of T helper Type 17 (Th17) Cells in Moderate Acute Cellular Rejection of Cardiac Allograft	\$6500.00
	Paul Klonowski , Patricia Tang, Chad Luedtke, Hua Yang, Daniel Heng, Alexander Klimowicz	Comparison of the 21 gene Recurrence Score with immunohistochemical assessment of estro- gen receptor, progesterone receptor, HER2-neu, and ki67 in patients with estrogen receptor posi- tive, node negative breast cancer	\$34997.80
	Michael Vickers, Patricia Tang, Alex Klimowicz, Vincent Falck, Gwyn Bebb	Influence of ATM expression on outcome in pa- tients receiving neoadjuvant chemoradiation for locally advanced rectal cancer	\$34930.72

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
BERKA, NOUREDDINE				
"Biomarkers for Viral Pathogenesis"	2011-14	Emerging Health Research Teams Grant Program/ The Canadian Institutes of Health Research	\$300,000	Co-Inv
"Assessment of T-cell receptor exci- sion circle (TREC) quantity after hematopoietic cell transplantation: a biomarker for immune reconstitution and thymic function."	2011-14	The Kids Cancer Care Foundation of Alberta (KC- CFA)	\$25,000	Co-Inv

MEDICAL STAFF	YEAR	FUNDING SOURCE	total Award	*PI/ CO- INV
"BMT translation research, non HLA immunogenetics study."	2011-15	Childhood Cancer Col- laborative Funding- ACH Foundation	\$500,000	Co-Inv
BISMAR, TAREK				
"MiRNA Predictors of Lethal Hor- mone Refractory Prostate Cancer"	2010-12	Prostate Cancer Canada	\$120,000	PI
"Combined role of TMPRSS2-ERG fusion gene and PTEN genomic de- letions in prostate cancer development, progression and metastasis"	2008-14	Prostate Cancer Research Foundation USA	\$238,660	PI
"New Insights into the Molecular Pathology of Scleroderma"	2011-14	Canadian Institutes of Health Research	\$157,850	Co-Inv
"The ING3 Epigenetic Chromatin Regulator in Prostate Cancer"	2011-13	Alberta Cancer Foundation, Edmonton, Alberta	\$306,000	Co-Inv
"A Matched Case Control Study to Charac6terize the TMPRSS2-ERG gene rearrangement in patients treated with prostate brachytherapy"	2011-13	ACURA (Abbott Oncol- ogy)	\$25,410	Co-Inv
"Interaction of TMPRSS2-ERG fu- sion gene and PTEN genomic de- letions in prostate cancer progression"	2012-15	Prostate Cancer Research Foundation USA	\$450,000	PI
CHAN, JENNIFER				
"MicroRNA functions in cerebellar development and disease"	2010-13	Alberta Heritage Founda- tion Establishment Grant	\$360,000	PI
"MicroRNA functions in cerebellar development and disease"	2010-17	Alberta Heritage Founda- tion Clinical Investigator Award	\$770,000	PI
"A novel platform for glioma modeling to accelerate the therapeutic targeting of GBM"	2011-14	Terry Fox Research In- stitute, New Investigator Award	\$397,614	PI
"Stratifying and Targeting Medullo- blastoma through Genomics"	2011-14	Genome Canada with mul- tiple co-funding sources	\$208,384	PI
"Modeling and Therapeutic Targeting of the Clinical and Genetic Diversity of Glioblastoma"	2011-16	Terry Fox Research Insti- tute (with multiple co-fund- ing sources)	\$252,090	PI
CHURCH, DEIRDRE				
"Infection of the Gut by HIV-1"	2008-11 Re- newed 2008-12	Canadian Institutes of Health Research	\$144,100	Co-Inv

MEDICAL STAFF	YEAR	FUNDING SOURCE	total Award	*PI/ CO- INV
DEMETRICK, DOUGLAS J.				
"Molecular Auditing: An Evaluation of Tissue Specimen Misidentification"	2011-14	Canadian Institutes of Health Research	\$380,000	PI
"MicroRNA Gene Polymorphism/ Mutation Association with Metastatic Breast Cancer"	2012	Breast Cancer Society of Canada	\$36,125	PI
"Uncovering Mechanisms of Cell Regulation in Human Chronic Dis- ease"	2012	Ruth Barker Foundation	\$22,500	PI
GREEN, FRANCIS				
"High resolution microscopy of human cancer"	2011-12	Anonymous Foundations	\$30,000	PI
"Treatment of acute asthma with per- fluorocarbon/carbon dioxide formula- tions"	2011-13 Exten- sion 2011-13	AHFMR ForeFront Pro- gram	\$41,000	PI
"Disseminating a novel rescue therapy for severe asthma to a wider commer- cialization focused audience"	2011-13 (exten- sion for one year)	CIHR Knowledge transla- tion operating grant	\$77,269	PI
"Development and validation for a novel rescue therapy for severe asthma"	2012-14	Alberta/Pfizer Translation- al Research Fund Oppor- tunity	\$198,780	PI
GUI, XIANYONG (SEAN)				
"Colonic Mucosal Lymphocyte Sub- sets and Cytokine Profiles Associated with Disease Phenotypes and Thera- peutic Responses of IBD"	2012-14	Alberta Innovation and Health Solution (though Alberta IBD Consortium)	\$36,000	PI
KELLY, MARGARET				
"The Innate Immune Response in the Pathogenesis of Hypersensitivity Pneumonitis"	2009-16 2012 (estab- lishment grant)	Alberta Heritage Founda- tion for Medical Research	\$1,170,000 (\$75,000)	PI
"Neutrophil-Mast cell interactions in the Pathogenesis of Hypersensitivity Pneumonitis"	2012	Alberta Lung Association	\$30,000	PI

MEDICAL STAFF	YEAR	FUNDING SOURCE	total Award	*PI/ CO- INV
"The role of PAR2 in inflammation and fibrosis in chronic hypersensitivity pneumonitis"	2012	Snyder Institute Summer Studentship	\$5,000	PI
"The anti-inflammatory actions of in- haled corticosteroids in the lung"	2012	AstaZeneca: Investigator Initiated	\$120,000	Co-Appli- cant
"The correlation of pathological chan- ges in the lungs with clinical outcome in ANCA-associated vasculitis"	2012	Dept of Respiratory Medi- cine Resident Retreat	\$1,800	PI
KHAN, FAISAL				
"Non-HLA Immunogenetic Bio- markers Important for Pathogen- esis and Therapy of Complications of Paediatric Hematopoietic Cell Trans- plantation"	2011-15	Alberta Children Health Foundation. Cancer Care Collaborative	\$500,000	PI
"Biomarkers of viral pathogenesis in transplant recipients"	2011-14	University of Calgary. Emerging Team Grant	\$3,000,000	Co-Inv (collabor- ator)
"Effect of a physical exercise program on the immune system recovery and quality of life in paediatric patients undergoing autologous stem cell trans- plantation"	2011-14	Alberta Children's Health Foundation. Cancer Care Collaborative	\$62,826	Co-Inv
"Assessment of T-cell receptor exci- sion circle (TREC) quantity after hematopoietic cell transplantation: a biomarker for immune reconstitution and Thymic function"	2011-14	Alberta Children's Hospital Foundation/KCCF Chair in Pediatric Oncology	\$25,000	PI
KOEBEL, MARTIN				
"A Pan-Canadian platform for the de- velopment of biomarker-driven sub- type specific management of ovarian carcinoma"	2011-15	Terry Fox Research Insti- tute	\$4,070,000	Co-Inv
MANSOOR, ADNAN				
"Predicting benefit of salvage and high dose chemotherapy with autologous stem cell transplantation for relapsed Duffuse Large B-cell Lymphoma pa- tients through tissue array based bio- marker classifications"	2011-12	Alberta Cancer Foundation	\$47,527	Co-Inv

MEDICAL STAFF	YEAR	FUNDING SOURCE	total Award	*PI/ CO- INV
"Predict Benefit and Improve Out- comes of Conventional High Dose therapy/Stem Cell Transplantation for Lymphoma Patients through Molecu- lar Biomarkers"	2012-14	Stephure Directed Dona- tion, TBCC/Alberta Can- cer Foundation	\$250,000	Co Inv
"Influence of fludarabine phar- makinetics on outcome of allogeneic stem cell transplantation with fludar- abine-busulfan conditioning"	2012-13	Division of Hematology and Hematologic Malignancies	\$16,000	Co-Inv
"Role of cereblon and the Cul-4A ubi- quitin E3 ligase complex in myeloma cells sensitivity of IMiDs"	2012-13	Division of Hematology and Hematologic Malignancies	\$16,000	Co-Inv
"Predicting benefit of standard treat- ment and personalize medicine for relapse/refractory diffuse large B-cell lymphoma using genetic and prote- omic testing"	2012-13	Donor directed funding through Alberta Cancer Foundation	\$40,000	Co-PI
"Molecular basis of familial haemato- logical malignancies and relating these findings to sporadic disease"	2012-13	Division of Hematology and Hematologic Malignancies	\$10,000	Co-Inv
"Creation of a lymphoma tissue bank through establishing a cancer research fellowship"	2012-14	Alberta Cancer Foundation	\$250,000	PI
NAUGLER, CHRISTOPHER		•		
"Translating evidence to improve- ments in care and outcomes for people with diabetes"	2012	Canadian Institutes of Health Research, Planning Grants	\$24,995	Co-Inv
PITOUT, JOHANN				•
"The importance of international travel in the spread of extended-spectrum ß- lactamase-producing Escherichia coli"	2011-13	Merck Frosst Canada Ltd.	\$75,0000	PI
PILLAI, DYLAN				
"Canada-UK team in bacterial resist- ance to Beta-Lactam antibiotics"	2011-14	Canadian Institutes of Health Research	\$3,565,700	Co-Inv
"Start up Funds" not reported in 2011	2011-12	University of Calgary/Cal- gary Laboratory Services	\$70,000	PI
"Novel dapatomycin derived lipopep- tide antibiotics"	2011-14	CIHR/NSERC	\$447,999	Co-Inv
"Toward a rational and novel therapy for Clostridium difficile infection"	2012-15	CIHR/NSERC	\$558,000	Co-Inv

MEDICAL STAFF	YEAR	FUNDING SOURCE	total Award	*PI/ CO- INV
"Clinical validation of the molecular- based automated BD MAX Enteric Bacterial Panel"	2012-13	Becton Dickinson	\$25,792	PI
WANG, YINONG				
"Pathological Changes of Atrial Ap- pendages of Patients with Atrial Fi- brillation"	2011-13	University of Calgary	\$5,000	PI
SHABANI-RAD, MEER-TAHER				
"Metabolomic signature of myelodys- plastic syndrome"	2012	Institute for Environmental Toxicology	\$3,000	Co-Inv
ZHANG, KUNYAN				
"Investigation into the virulence of Community-associated methiciliin- resistant Staphylococcus aureus (CA- MRSA) isolates from Guangdong using the Caenorhabditis elegans in- fection model"	2012	University of Hong Kong Overseas Fellowship Award	\$2,350	PI
"Molecular assay development and their applications in Centre for Anti- microbial Resistance (CAR) Program"	2007-12	AHS CAR Program	\$300,000 (2011) \$60,000	PI
"The Alberta Sepsis Network"	2009-14	AHFMR	\$4,998,191	Co-Inv
	2012 in- crease		\$2,257,734	
"Usability Testing of Cleankeys Key- boards on an Acute Care Medical Unit"	2011-12	Alberta Advanced Educa- tion and technology/Alberta Innovation Voucher Pilot Program	\$50,000	Co-Inv

1.5 Banff Pathology Course

2012 BANFF PATHOLOGY COURSE PROGRAM				
Wednesday, September 12, 2012				
TIME	EVENT	LOCATION		
5:00 - 6:30 p.m.	Registration	Wildrose Prefunction		
Thursday, September 13, 2012				
6:30 - 7:30 a.m.	Registration and Full Breakfast	Wildrose Prefunction Salon A		
7:30 - 7:45	Dr. Jim Wright - Introductory Remarks and Welcome	Salon BC		

2012 BANFF PATHOLOGY COURSE PROGRAM				
7:45 - 8:35	Dr. Susan Lester "Grossing"	Salon BC		
8:35 - 9.25	Dr. Craig Allred "Preinvasive Ductal Lesions"	Salon BC		
9:25 - 10:15	Dr. Edi Brogi "'Triple-Negative' Breast Carcinomas"	Salon BC		
10:15 - 10:30	Break	Wildrose Prefunction		
10:30 - 11:20	Dr. Stuart Schnitt "Columnar Cell Lesions and Flat Epithelial Atypia"	Salon BC		
11:20 - 12:00 p.m.	Dr. Susan Lester "ER/PR/HER2 and Ki 67 Testing"	Salon BC		
12.15 - 1:30	Question & Answer Period (for AM Session)/ Working Lunch			
1:30 - 2:30	Dr. Gilbert Bigras "Image Analysis in Breast Cancer"	Salon BC		
2:30 - 4:00	Interactive Session with Interesting Case Presentation (local faculty)	Salon BC		
5:30 - 7:30	Wine and Cheese Reception	Wildrose Prefunction and/or Salon A		
Friday, September	14, 2012			
6:30 - 7:30 a.m.	Registration and Full Breakfast	Wildrose Prefunction and Salon A		
7:30 - 7:45	Dr. Hallgrimur Benediktsson - Introductory Remarks	Salon BC		
7:45 - 8:35	Dr. Edi Brogi "Sentinel Lymph Nodes"	Salon BC		
8:35 - 9:25	Dr. Craig Allred "Molecular Classification of Breast Cancer"	Salon BC		
9:25 - 10:00	Dr. Susan Lester "Post-neoadjuvant Reporting"	Salon BC		
10:00 - 10:15	Question & Answer Period	Salon BC		
10:15 - 10:30	Break	Wildrose Prefunction		
10:30 - 11:05	Dr. Alexander Paterson "Breast Cancer – Medical Oncologist's Perspective"	Salon BC		
11:05 - 11:40	Dr. May Lynn Quan "Surgical Management of Sentinel Lymph Nodes and Positive Margins in Breast Cancer"	Salon BC		
11:40 - 12:15 p.m.	Dr. Bobbie-Jo Docktor "Breast Cancer- Diagnostic Imaging and Pathology Correlation"	Salon BC		
12:15 - 12:30	Question & Answer Period	Salon BC		
12:30 - 2:00	AMA - ASLP Annual General Meeting of the AMA Section of Laboratory Physcians (ASLP)	Salon A		
Afternoon	Free			
6:30 - 7:30	Cocktails (Cash Bar)	Salon A-B		
7:30 p.m.	Banquet	Salon A-B		
Saturday, September 15, 2012				
6:30 - 7:15 a.m.	Registration and Full Breakfast	Wildrose Prefunction/ Salon A		
7:15 - 7:30	Dr. Jim Wright - Introductory Remarks and Welcome	Salon BC		

2012 BANFF PATHOLOGY COURSE PROGRAM			
7:30 - 8:15	Dr. Moosa Khalil "Cytopathology in Breast Cancer Diagnosis"	Salon BC	
8:15 - 9:00	Dr. Stuart Schnitt "Uses and Limitations of Immunohistochemistry in Breast Pathology"	Salon BC	
9:00 - 9:45	Dr. Susan Lester "Spindle Cell Lesions"	Salon ABC	
9:45 - 10:00	Break	Wildrose Prefunction	
10:00 - 10:45	Dr. Stuart Schnitt "Papillary Lesions"	Salon BC	
10:45 - 11:30	Dr. Edi Brogi "Lobular Neoplasia"	Salon BC	
11:30 -12:30 p.m.	Question & Answer Period	Salon BC	
12:30	Dr. Jim Wright "Closing Remark"	Salon BC	

Guest Faculty

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 Associate Professor, Clinical Pathology & Laboratory Medicine New York, NY

Local Faculty

Gilbert Bigras, MD University of Alberta

Bobbie-Jo Docktor, MD University of Calgary

Moosa Khalil, MD University of Calgary

Alexander Paterson, MD University of Calgary

May Lynn Quan, MD University of Calgary

Susan C. Lester, MD, PhD

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

Stuart J. Schnitt, MD Beth Israel Deconess Medical Center Professor HMS FT Section Harvard Medical School Boston, MA





