

PATHOLOGY

Summer/Fall Edition 2015

MAGAZINE

www.pathology.ubc.ca

DEPARTMENT MEMBERS

Featuring

Judith Lynn Isaac-Renton, Professor of Microbiology, Department of Pathology and Laboratory Medicine, University of British Columbia

EXCELLENCE

Research

BC Children's Hospital BioBank
Open for Business!

STATE OF THE ART

Education

We congratulate our graduates and know that they will excel as they take the next steps in their careers

ANNUAL EVENT

Pathology Day

Pathology Day 2015 was another terrific success this year, bringing together students, staff, fellows and faculty members



PATHOLOGY DAY 2015. Left to right: Tyler Verdun (Resident - GP), Mary Kinloch (Clinical Fellow), Brandon Sheffield (Resident - AP), Tony Ng (Clinical Assistant Professor)



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA



PATHOLOGY

Department Head:

Michael F. Allard, BSc, MD, FRCP(C)

Director, Human Resources and Administration:

Sandy Liu

Office Manager:

Adeline Chan

Contributors:

Co-Chairs of Pathology Day 2015

Mr. James Beresford

Dr. Susanna Zachara

Dr. Michael Nimmo and Ms. JieJi Sun

Dr. Diana Ionescu

Daniel Owen

Dr. Haydn Pritchard & Ms. Heather Cheadle

Dr. Amanda Bradley and Ms. Joanne Wouterse

Dr. Nick Sunderland

Dr. Muhammad Morshed

Dr. Jagbir Singh

Ms. Sandy Liu & Ms. Amelia Libonao

Dr. Hélène Côté

Dr. Judith Lynn Isaac-Renton

Dr. Arun Garg

Dr. Bibi Naghibi Torbati

Dr. Li Wang

Dr. Dragos M. Vasilescu

Dr. David Goldfarb

Dr. Suzanne Vercauteren

Dr. Nickolas Myles

Dr. Stephen Yip & Dr. Brandon S. Sheffield

Ms. Jennifer Xenakis

Copyright © 2015: Department of Pathology
and Laboratory Medicine

Publisher: PacBlue Printing

Editors: Debbie Bertanjoli, Michael Allard,

Adeline Chan, & Maria Issa

Designer: Debbie Bertanjoli

PATHOLOGY MAGAZINE

- 4 Pathology Day 2015
- 9 2015 Academic Gowns
- 10 Pathology Residency Program
- 16 Anatomical Pathology Residency Training Program
- 20 Bachelor of Medical Laboratory Science (BMLSc) Program
- 22 Graduate Studies
- 26 Pathology Arts Gala
- 30 This Summer
- 32 Faculty Promotions and Tenure Awards in 2014/15
- 33 Faculty Awards
- 34 The Spotlight
- 36 Pathology & Laboratory Medicine Fraser Health (FH)
- 38 Southern Medical Program
- 39 Neonatal Hyperbilirubinemia
- 40 The new MICRO CT SCANNER
- 42 A Big Summer for Lung Cancer Patients
- 43 Reverse Innovation Brings Technology from Developing Nations to Canada
- 44 BC Children's Hospital BioBank Open for Business
- 46 Overdiagnosis and Overtreatment
- 48 Personalized OncoGenomics (POG) Initiative
- 51 Uncovering Low Allelic Mutational Events in Somatic Mosaicism and Cancer – Why Bother
- 52 Welcome to New Faculty Members

BMLSc students made it to the **Storm the Wall** finals!



TECHNOLOGY

DISCOUNTED
PRICING
FOR ADOBE
SOFTWARE
OFFERED TO ALL
UBC STAFF AND
FACULTY

ADOBE SOFTWARE

UBC IT offers Adobe product licenses for faculty and staff on campus at a significant discount. UBC clients can subscribe to Adobe products for their license annually, at a fraction of the cost of what a full perpetual license used to cost. Since most Adobe products are upgraded every two to three years, clients can always work with the current release

and benefit from cost savings of up to 87% per year.

Our current packages include: **Acrobat Pro Package (\$15/year)**

Acrobat Pro Design and Web Collection (\$80/year)


Acrobat Pro
InDesign
Photoshop
Illustrator
Dreamweaver

Bridge
Edge Animate
Fireworks
Flash Professional
Muse

Master Collection (\$95/year)

Acrobat Pro
InDesign
Photoshop
Illustrator
Dreamweaver
Bridge
Edge Animate
Fireworks

Flash Professional
Muse
After Effects
Flash Builder Premium
InCopy
Audition
Premiere Pro
Lightroom
Prelude
Speedgrade

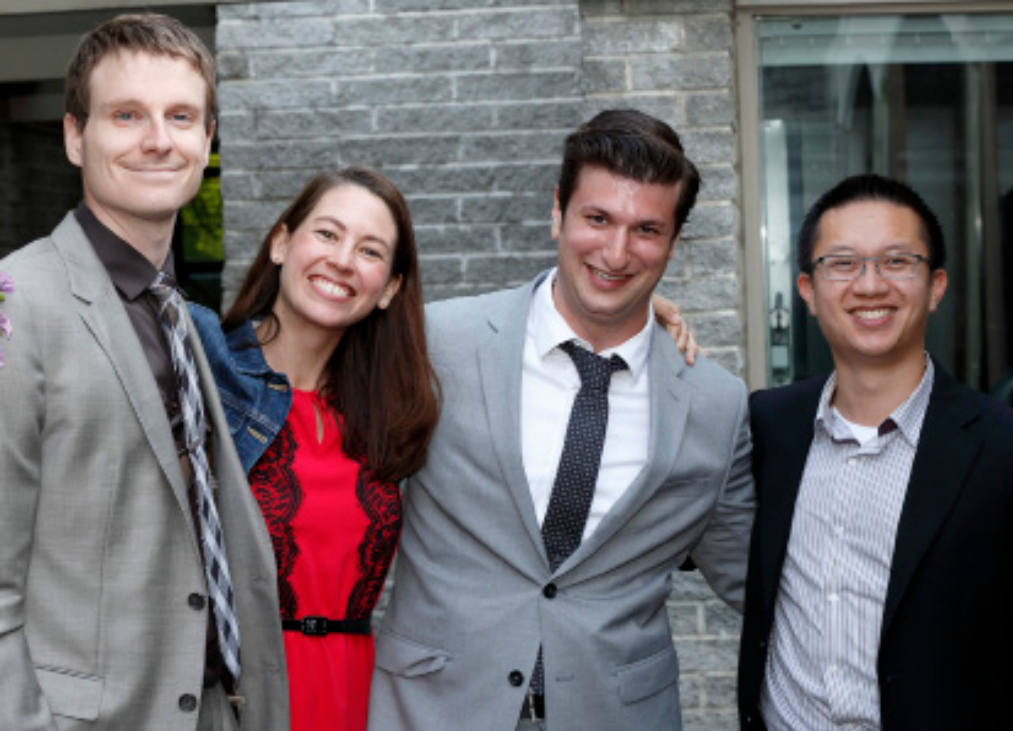
UBC students are eligible for academic rates for Adobe products through the UBC Bookstore. 

REQUIREMENTS

Currently only available for UBC owned computers

The current cost savings breakdown like this:

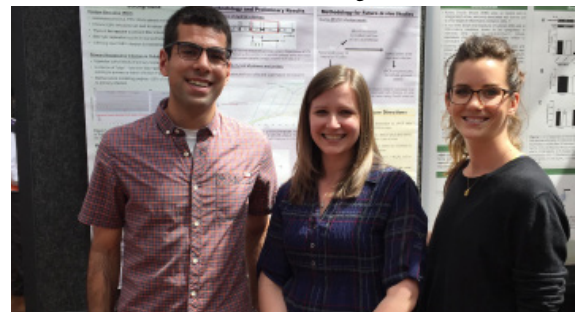
PRODUCT	BEFORE	NOW	SAVINGS PER YEAR	SAVINGS OVER 3 YEARS
ACROBAT	\$91	\$15/year	84%	51%
DESIGN & WEB PREMIUM	\$440	\$80/year	82%	45%
MASTER COLLECTION	\$735	\$95/year	87%	61%



Left to right: Tyler Verdun (Resident - GP), Mary Kinloch (Clinical Fellow), Brandon Sheffield (Resident - AP), Tony Ng (Clinical Assistant Professor)



Left to right: Hani Bagheri (PhD student), Emily Button (PhD student), Samantha Burugu (PhD student)



Left to right: Arash Samiei (MSc student), Karen Simmons (MSc student), Jessica Morrice (MSc student)

ANNUAL PATHOLOGY EVENT

PATHOLOGY DAY 2015

Co-Chairs of Pathology Day 2015

Pathology Day 2015 was another terrific success this year, bringing together students, staff, fellows and faculty at the Paetzold Education Centre at Vancouver General Hospital. More than 170 department members participated in the various sessions throughout the day. This demonstrates once again that Pathology Day is truly a great occasion to experience the caliber and diversity of research taking place throughout our department, both at the junior and established research levels. Shining the spotlight on our local best and brightest allows us to see the high quality of research that is taking place in our own backyard, raising the

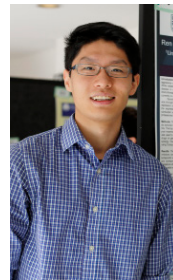
bar for all of us. We look forward to including more department members in the future, as a means to present junior faculty and re-introduce our more established researchers and their achievements to our growing department.



DR. DON BROOKS, PHD

"What's polymer science doing in a nice place like the Centre for Blood Research?"

Dr. Mike Allard introduced the day and our **James Hogg lecturer, Dr. Don Brooks**. Dr. Brooks has dedicated his career to surface and polymer chemistry, particularly in developing polymer constructs for biomedical applications including blood compatible materials, blood plasma protein substitutes and drug delivery for which his group is widely recognized. Drawing on his vast experience he gave an excellent talk entitled, "What's Polymer Science doing in a nice place like the Centre for Blood Research?" Dr. Brooks' lecture was very well received and generated much discussion and thoughtful questions from the audience.



Following on its introduction last year, Pathology Day 2015 showcased the research programs of two local Faculty: Dr. Cheryl Wellington discussed her work on "Alzheimer's Disease and Traumatic Brain Injury" and Dr. David Granville shared "Granzymes in Aging and Impaired Wound Healing".

New this year, the Postdoctoral Fellow with the top ranked

abstract was invited to present that research orally. This year Dr. Hugo Horlings discussed his work on the current understanding of "Granulosa-Cell Tumor of the Ovary: a Molecularly Defined Entity."

Over 70 abstracts were submitted by trainees and staff, highlighting the breadth of research topics throughout the department; from these

a number were selected for presentation during either the Resident or Graduate Student Oral Platform Sessions. The weather was great and the sun shone at the right time, allowing attendants at the poster session and accompanying luncheon to utilize the Medical Student Alumni Centre courtyard for networking and catching up with people for social and scientific discussion.



**DR. DAVID GRANVILLE,
PHD**

"Granzymes in Aging
and Impaired Wound
Healing"



**DR. CHERYL
WELLINGTON, PHD**

"Alzheimer's Disease
and Traumatic Brain
Injury"



**DR. HUGO
HORLINGS, MD, PHD**

"Granulosa-Cell Tumor of
the Ovary: a Molecularly
Defined Entity"



Next Pathology Day is
May 27th, 2016



KEYNOTE SPEAKER

The Keynote address "The Role of the Microbiota in Asthma." was given by **Dr. B. Brett Finlay**, Professor in the Michael Smith Laboratories, and the Departments of Biochemistry and Molecular Biology and Microbiology and Immunology at the University of British Columbia.



Dr. B. Brett Finlay, PhD

Pathology Day concluded with a well-attended reception back at the Medical Student Alumni Centre. There was lovely music by a jazz trio while department members mingled over delicious appetizers and cocktails. The evening was interspersed with some fabulous draw prizes and a variety of awards. Trainee award recipients included:

Trainee award recipients 2015

**DR. BRANDON SHEFFIELD****1st Place**

"Molecular Profiling of ER Weakly-Positive Breast Cancer"
Supervisor: Dr. Torsten Nielsen

**DR. INNA SEKIROV****2nd place**

"Carbapenemase Producing Organisms in British Columbia, 2008-2014"
Supervisor: Dr. Linda Hoang

**DR. LAWRENCE LEE****3rd place**

"Histopathologic Grading of Appendiceal Goblet Cell Carcinoids Predicts Survival"
Supervisor: Dr. David Schaeffer

RESIDENT PRESENTATIONS:

**MS. ROLINDA CARTER**

**Dutkevich Memorial Trust
Graduate Student Seminar
Award**

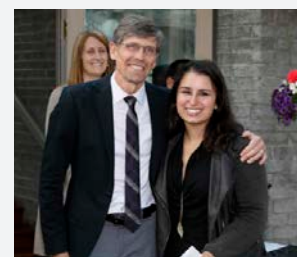
for the best Graduate Student Seminar course presentation as judged by peers

**MR. GABRIEL FUNG****1st place**

"Coxsackieviral Infection Causes Cytoplasmic Aggregation and Cleavage of TAR DNA Binding Protein-43"
Supervisor: Dr. Honglin Luo

**MR. HANI BAGHERI****2nd place**

"Identifying the 'Driver' Genes for Multi-systemic 2p15-16.1 Microdeletion Syndrome Using in vivo Zebrafish Assays"
Supervisor: Dr. Evica Rajcan-Separovic

**MS. TISSA RAHIM****3rd place**

"ARNT2, a Neuroprotective Transcription Factor, as a Regulator of neurodegenerative Processes in Models of Multiple Sclerosis"
Supervisor: Dr. Jacqueline Quandt

GRADUATE STUDENT PRESENTATIONS:

**MR. BRENNAN WADSWORTH**

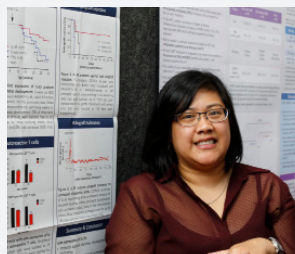
"Detection of Transient Tumour Hypoxia with a Novel Combination of Oxygen-sensitive Fluorescent Proteins"

Supervisor: Dr. Kevin Bennewith

**MR. ADAM YU**

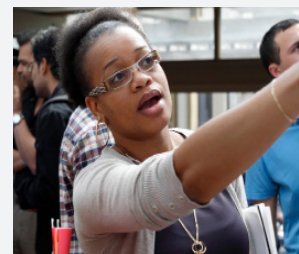
"Examining DNAJC13 Expression within the Neurovascular Niche and its Role in the Pathogenesis of Inflammatory Neurodegenerative Disease"

Supervisor: Dr. Jacqueline Quandt

**MS. SIGRID ALVAREZ**

"Islet Expression of Interleukin-35 Protects from Autoimmune Diabetes and Islet Transplant Rejection"

Supervisor: Dr. Bruce Verchere

**MS. ROLINDA CARTER**

"Novel Role for Direct Xa Anticoagulants in Fibrinolysis"

Supervisor: Dr. Ed Pryzdial

**Dr. Mary Kinloch**

"Morphological Features Associated with POLE Mutations: Implications for Risk Assessment of Endometrial Carcinoma"

Supervisor: Dr. Blake Gilks



Dr. Mary Kinloch with Dr. Allard

FACULTY & STAFF AWARDS 2015

The following faculty and staff were recognized with awards for their respective contributions to our department:

- 🏆 Most Valuable Player: **Dr. Maria Issa**
- 🏆 David Hardwick Lifetime Achievement: **Dr. Randy Gascoyne**
- 🏆 Early Career Excellence in Research and Discovery: **Dr. Sohrab Shah**
- 🏆 Excellence in Research and Discovery: **Dr. Aly Karsan**
- 🏆 Excellence in Education: **Dr. Lawrence Haley**
- 🏆 Excellence in Service: **Dr. Morris Pudek**
- 🏆 Staff Service Award in the Technologist/Technician Category: **Ms. Isabelle Gadawska**
- 🏆 Staff Service Award in the Administration Category: **Ms. Debbie Bertanjoli**

RECOGNITION OF LONG-STANDING SERVICE:

A number of department members were recognized for their long-standing service to the university:

Dr. Kenneth Berean (25 years)

Dr. Randy Gascoyne (25 years)

Dr. David Pi (25 years)

Dr. Gordon Ritchie (25 years)

Dr. Valerie White (25 years)

Dr. Hermann Ziltener (25 years)

Ms. Helen Dyck (25 years)

Dr. Janet Holden (28 years)

Dr. Wayne Moore (28 years)

Dr. Deborah Griswold (35 years)

Dr. Haydn Pritchard (35 years)

Dr. Joanne Wright (35 years)

Dr. Don Brooks (40 years)



ACKNOWLEDGEMENTS:



As always, the success of the day was largely attributable to the time and expertise offered by faculty and staff. Pathology Day is a team effort and we would like to extend our thanks to everyone who contributed to the 2015 edition. **Heather Cheadle** oversaw all of the posters, **Debbie Bertanjoli**, **Sarah Neil** and **Dmitry Turbin** took photographs, **Jenny Tai**, **Jennifer Xenakis** ensured the A/V worked for the lectures and presentations, **Helen Dyck** handled the registration table, and **JJ Sun** the Awards registration. **Matthew Budd**, **Jack Calder**, **Austin Taylor**, **Abigail Baticados**, **Ada Young** and **Gabriel Fung** helped with clean-up at the end of the night.



Adeline Chan and **Zunaira Saleem** were instrumental in handling the administrative and practical details of Pathology Day. **Debbie Bertanjoli** designed and managed the website tools in addition to preparing the abstract book.

We also wish to express our gratitude to department members who contributed their time and expertise and reviewed abstracts, moderated the oral sessions, and judged the oral and poster presentations. This year these include: **David Schaeffer**, **Deborah McFadden**, **Doug Filipenko**, **Kevin Bennewith**, **Diana Ionescu**, **Jiechuang Su**, **Jerome Robert**, **Masud Tehmina**, **Jane**



O'Hara, **Vicky Monsalve**, **Helene Cote**, **Jacquie Quandt**, **Karuna Karunakaran**, **Maria Issa**, **Amal El-Naggar**, **Hanh Huynh**, **Brian Skinnider**, **Hamid Masoudi**, **Linda Hoang**, **Aleksandra Stefanovic**, **Will Lockwood**, **Iva Kulic**, **Mike Nimmo**, **Tony Ng**, **Nickolas Myles**, **Muhammad Morshed**, **Dechang Yang** and **Wan Lam**.

We look forward to both increased faculty attendance and new opportunities to showcase the expertise and successes of our departmental members for Pathology Day 2016. Mark your calendars for May 27, 2016.

Mike Allard, Tony Ng, Corree Laule and Avi Ostry, Co-Chairs of Pathology Day 2015. □

2015 ACADEMIC GOWNS

James Beresford, PMP, Manager,
Governance and Recognition,
Faculty of Medicine, UBC

The 2015 Academic Gowns Dinner took place on May 7th at the University Golf Club and was an opportunity to recognize faculty members who were recently promoted to the rank of Professor or Clinical Professor, or were granted Emeritus status within the Faculty of Medicine.



ACADEMIC GOWNS

Newly promoted Professors and Clinical Professors were presented with Academic Gowns by the Dean and their Department Head or School Director, and Emeritus faculty were presented with small gifts. The evening was an opportunity to recognize excellence, and

featured a reception as well as a three course dinner. Three Emeritus / Emerita faculty members were being recognized from the Department of Pathology and Laboratory Medicine: **Dr. Janet Chantler**, Professor Emeritus, **Dr. Haydn Pritchard**, Professor Emeritus and **Dr. Nadine Urquhart**, Clinical Associate Professor Emeritus. **Dr. Diana N. Ionescu** was promoted to Clinical Professor and was one of the youngest faculty reaching this academic rank. Congratulations! □



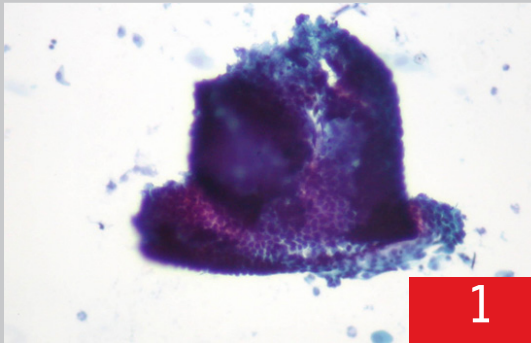
2015 HISTOLOGY PICTURE CONTEST

Dr. Susanna Zachara

When reviewing slides, intent on finding the accurate diagnosis, sometimes funny things are seen under the microscope. These incidental configurations often make us laugh, perhaps get passed around a bit, but are quickly forgotten. The Anatomical and General Pathology Chiefs wanted to immortalize these treasures and ran a contest over the 2014/15 year, inviting residents to submit pictures of histology slides that struck their fancy in any way. In all, winners were chosen by the senior residents blinded to the contestants.

TOP HAT (WINNER)

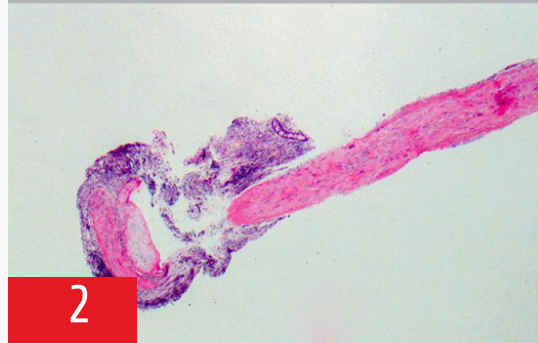
Submitted by Nick Sunderland*



1

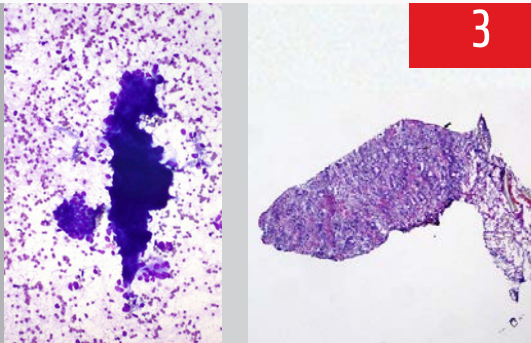
GUITAR TUNES (RUNNER UP)

Submitted by Tyler Hickey



2

3



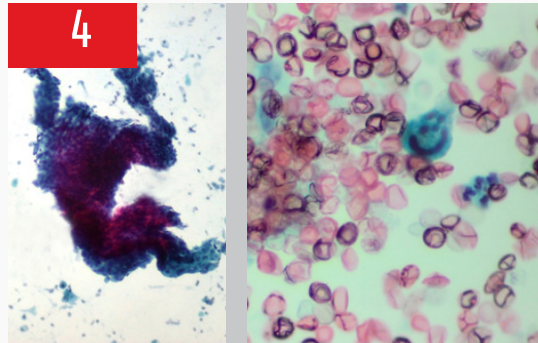
SEA HORSE

Submitted by Nick Sunderland*

HORSE

Submitted by Brandon Sheffield and Emma Todorovic

4



GRRR ARRRR (SPECIAL MENTION)

Submitted by Nick Sunderland*

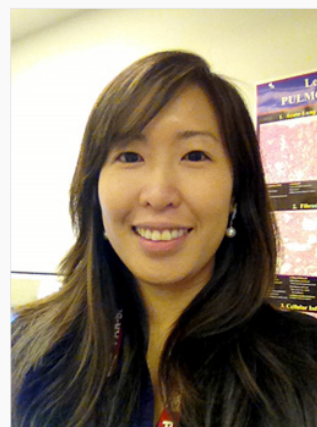
JUST SO HAPPY (SPECIAL MENTION)

Submitted by Susanna Zachara

* Special mention: Brenda Smith

CONGRATULATIONS GRADUATING RESIDENTS AND FELLOWS 2014-2015

Dr. Michael Nimmo and JieJi Sun



4 DR. LIEN N. HOANG Anatomical Pathology Graduate

- BSc UBC Physiology (Hons) 2006
- MD UBC 2010
- Residency UBC Anatomical Pathology 2015

Future plans:

- Fellowship in Gynecological Pathology, MSKCC
- Meet Jimmy Fallon & John Oliver in New York

Best quote from residency...

“Lien, even if you're going to \$#!t your pants... you must stay cool as a cucumber”
– Dr. R. O'Connor

We congratulate
our graduating residents
and fellows and know
that they will excel as
they take the next steps
in their careers.

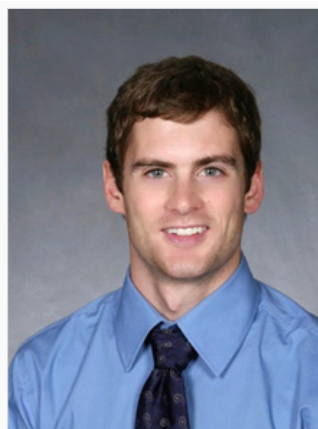


1 DR. MARTIN HYRCZA Anatomical Pathology Graduate

- Born-again British Columbian
- Prior life in Toronto (1998 BSc, 2001 MSc, MD/PhD 2008/2010)
- Perpetual student according to his parents
- Physician-scientist according to Martin
- Proud father of three (Sophie, Roman, and Darius) according to everyone

Future plans:

- Endocrine and Head & Neck pathology fellowship in Toronto
- Ocular pathology training (Vancouver? or England?)
- To live again in BC



2 DR. NICHOLAS SUNDERLAND General Pathology Graduate

- Bachelor of Science, Honours in Biochemistry, Queen's university 2002-2006
- Doctorate in Medicine, University of Western Ontario, 2006-2010
- General Pathology Residency, UBC, 2010-2015

Immediate future plans:

- Hematopathology/transfusion fellowship, Vancouver

3 DR. JOYCE LEO Anatomical Pathology Graduate

- University of California, Riverside BSc Neuroscience
- University of British Columbia MSc Neuroscience
- University of British Columbia MD
- Residency in Anatomical Pathology
- Future Plan: Fellowship in Breast Pathology



5 DR. PEYMAN TAVASSOLI General Pathology Graduate

- National University of Iran with MD in 1996
- University of British Columbia with PhD in 2010
- Residency in General Pathology, UBC, 2010-2015
- GU Fellowship in Weill Cornell Medical College 2015-2016

Highlights from residency:

- Multi-headed Microscope rounds!
- Meet Tyler Verdun!!!!



6 DR. RAMESH SAEEDI Medical Biochemistry Graduate

- University of Guilan, Iran with an MD
- UBC, Department of Pathology & Laboratory Medicine with a PhD
- UBC, Department of Medicine, HIV division, one year Post-doc fellowship
- UBC, Residency in Medical Biochemistry

Highlights from residency:

- Working at Healthy Heart Lipid Clinic
- Finding Great New Friends



9 DR. IAN GARBER Medical Biochemistry Graduate

- BSc Biochemistry (Honours, Co-op), UVic, 2001-2006
- UBC MD class of 2010
- General Pathology resident, 2010-2012
- Medical Biochemistry resident, 2012-2015

Future plans:

- Awarded \$140k through the UBC Clinician-Investigator Program to pursue his PhD. in Experimental Medicine Will be working with Dr. Clara van Karnebeek at the Centre for Molecular Medicine and Therapeutics (BC Children's Hospital), using metabolomics in conjunction with whole exome sequencing to discover and characterize inborn errors of metabolism causing intellectual disability.



7 DR. SOPHIA WONG Medical Biochemistry Graduate

- BSc, Physiology Honours & Music Minor, UBC, 2005
- MD, UBC, 2010
- Residency in Medical Biochemistry, UBC, 2015

Future plans:

- Will be working at St. Paul's Hospital and somewhere in Fraser Health



8 DR. MICHAEL PAYNE Medical Microbiology Graduate

- UWO BSc Geography in 2006
- UWO MD in 2010
- Residency in Medical Microbiology 2010-2015

Future plans:

- Working at St. Paul's Hospital



10 DR. SALWA BAKHSH Fellowship Graduate

- Training Program: Cytopathology Fellowship
- Dates: 2014 to 2015
- Supervisor: Dr. Chen Zhou

11 DR. MAXIM SIGNAEVSKI Neuropathology Graduate

- MD, Medical Military Academy, St. - Petersburg, Russia, 1993
- PhD, Petrov Institute of Oncology, St. - Petersburg, Russia, 1999
- Residency in Neuropathology, 2010-2015



12 DR. PETER SCHUTZ Neuropathology Graduate

- St. John's College, Cambridge, BA/MPhil in Natural Sciences and Philosophy in 1995
- Vienna Medical School, MD in 2004
- University of British Columbia, PhD in Pathology in 2011
- Residency in Neuropathology 2011- 2015

Future plans:

- Fellowship in Neuromuscular Pathology, UCL Neurological Institute, Queen Square, London - planned

15 DR. MARILYN KINLOCH Fellowship Graduate

- BSc University of Saskatchewan, 2002
- MD University College Dublin, 2008
- Maternity Leave, 2010
- FRCPC University of Saskatchewan, 2014

Fellowship highlights:

- Tyler Verdun's description of me: Early 30's, brown hair.
- The very first Wednesday afternoon gyne staff rounds and Dr. Gilks showing up at the door at 4:01 pm saying, "Got a teleconference, Mary – can you run the rounds?"
- But let's be clear: My 2 year old made the most out of this fellowship year!

Best quote from residency...

“In sign-out with Dr. Gilks: “I think most people find it stressful to be an expert, but I find it quite relaxing. I can say almost anything and no one will question me.”

Future Plans:

- Back to Sask!



13 DR. TAREQ MOHAMMAD Fellowship Graduate

- Medical School: Royal College of Surgeons in Ireland (RCSI)
- Residency in Anatomical Pathology
- Fellowship in Head & Neck / Oral pathology 2014-2015 with Dr. Tony Ng

Future plans:

- Will be working in LA doing a Dermopath fellowship



14 DR. MOHAMMAD ALKANDARI Fellowship Graduate

- Graduated from university of Aberdeen, UK, 2003 with MBCHB.
- Completed the Kuwaiti board of Anatomic pathology in 2013.
- Fellowship in GI pathology, VGH, 2014-2015

Future plans:

- Returning to Kuwait to practice in one of the major hospitals in the country



Anatomic Pathology

Program Director: Dr. Diana Ionescu

PGY 1



Jennifer Pors

PGY 1



Deidre Camille
Ongaro

PGY 1



Yi Ariel Liu

PGY 1



Alisa Abozina

PGY 1



Ellen Cai

PGY 2



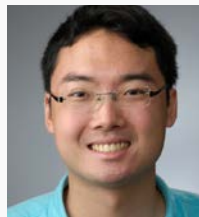
Nissreen
Mohammad

PGY 2



Kyra Berg

PGY 2



Kenrry Chiu

PGY 2



Daniel Owen

PGY 2



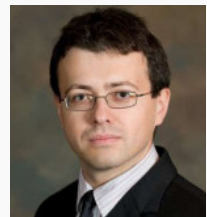
Jessica
Saunders

PGY 2



Basile
Tessier Cloutier

PGY 3



Catalin
Taraboanta

PGY 3



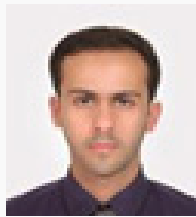
Tyler Hickey

PGY 3



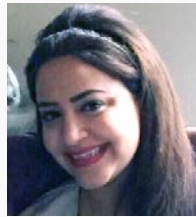
Emilija
Todorovic

PGY 3



Yazeed Al
Welaie

PGY 4



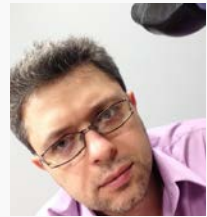
Noorah Al
Madani

PGY 4



Eric Bol

PGY 4



Maziar Riazzy

PGY 4



Lawrence Lee

PGY 4



Gang Wang

PGY 5



Susanna
Zachara -
Szczakowski

PGY 5



Brandon
Sheffield

Current
Pathology
Residents
2015 - 2016

■ Hematopathology

Program Director: Dr. Suzanne Vercauteren

PGY 1



Hamish William
Nicolson

PGY 2



Maryam
Al Bakri

PGY 3



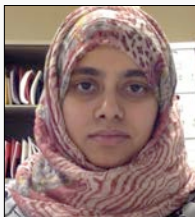
Krista Marcon

PGY 4



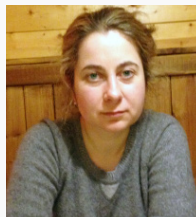
Audi Setiadi

PGY 5



Shadhiya Al
Khan

PGY 5



Natalia
Blaszczyk

PGY 5



Habib Moshref
Razavi

PGY 5



Eman Khan

■ Neuropathology

Program Director: Dr. Stephen Yip

PGY 1



Fatemeh
Derakhshan

PGY 5



Veronica Hirsch
Reinshagen

■ Medical Biochemistry

Program Director: Sophia Wong &
Associate Program Director: Mari
DeMarco

■ General Pathology

Program Director: Dr. Michael Nimmo

PGY 5



Tyler Verdun

■ Medical Microbiology

Program Director: Dr. Chris Lowe

PGY 1



Victor Tsun Ho
Yuen

PGY 2



Lisa Marina Li

PGY 3



Sarah
Cherian

PGY 4



Shazia Masud

PGY 4



Inna Sekirov

RESIDENT AWARDS

Director of the Anatomic Pathology Residency Program

The Anatomic Pathology residency training program, similar to other UBC Pathology residency training programs, supports resident research through several \$3000 project grants. This represents a direct investment into the residents' academic future and encourages faculty to continue to involve the residents in their ongoing research. Every year such work is presented at national and international meetings, and published in prestigious medical journals - a win-win situation for faculty, residents and the residency program.

Last academic year was particularly good - our residents received numerous awards and grants for their research work (listed below). I would like to congratulate the award winners for their hard work and I wish to encourage junior trainees to follow their footsteps to lengthen the future list of awards.



2015 Betty Rice Award Recipients: Daiana Becker-Santos, PhD candidate in Interdisciplinary Oncology - Dr. Wan Lam lab (far left) and Dr. Brandon Sheffield, AP PGY5 resident working with Dr. Diana Ionescu (second from right)

DR. BRANDON SHEFFIELD, MD

- 1. 2015 BETTY RICE AWARD:** Awarded by the **BC Cancer Agency Foundation** and **BCCA Lung Tumor Group** for research in pulmonary pathology by a trainee.

Awarded research: *"Evaluation of biomarker testing strategies to select patients for immunotherapy in non-small cell lung cancer"* (Supervisor: Dr. D. Ionescu)

- 2. 2015 ASCO ANNUAL MEETING MERIT AWARD:** Awarded by the **Conquer Cancer Foundation** in recognition of outstanding abstracts submitted to the Scientific Program Committee for the

upcoming Annual Meeting.

Awarded research: *"Molecular profiling of ER weakly-positive breast cancer."* (Supervisor: Dr. S. Chia)

- 3. BEST TRAINEE PRESENTATION—FIRST PRIZE:**

Awarded by the **Pulmonary Pathology Society** for best presentation in Pulmonary Pathology by a trainee at 2015 USCAP Meeting.

Awarded research: *BAP1 Immunohistochemistry and p16 FISH to separate benign from malignant mesothelial proliferations* (Supervisor: Dr. A. Churg)

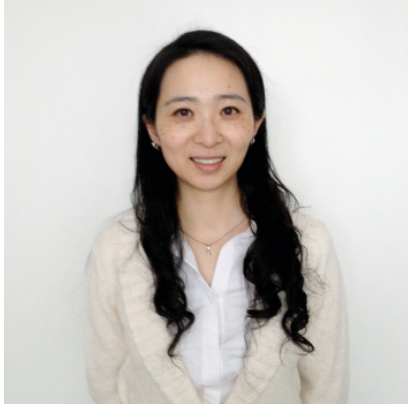
- 4. 2015 IASLC LUNG CANCER YOUNG**

INVESTIGATOR AWARD: Awarded by **International Association for the Study of Lung Cancer** for research submitted to the World Lung Cancer Conference as first authors by investigators 35 years old or younger.

Awarded research: *Predictive biomarker testing for programmed death 1 inhibition in non-small cell lung cancer.* (Supervisor: Dr. D. Ionescu)

- 5. BEST TRAINEE PRESENTATION - UBC PATHOLOGY DAY:** Awarded by the **UBC Department of Pathology and Laboratory Medicine** for the best presentation by a resident.

Awarded research: *Molecular profiling of ER weakly-positive breast cancer.* (Supervisor: Dr. S. Chia)



DR. JOYCE LEO, MD

1. Joyce was awarded a **2015-16 TEACHING AND LEARNING ENHANCEMENT FUND** (TLEF) grant (20G36902, \$38,560, supervisor D. Ionescu) by UBC to develop an education module of integrated breast pathology for UBC medical students. She will also be pursuing a breast pathology fellowship at the BCCA and will work with BCCA Pathologists (Dr. M. Hayes, Dr. G. Naus, Dr. D. Ionescu) and Radiologists (Dr. C. Wilson) to develop an integrated breast pathology teaching module of a "breast mass".



DR. LIEN HOANG, MD

1. **ROBERT E. SCULLY YOUNG INVESTIGATOR AWARD:**
Awarded by the *International Society of Gynecological Pathology* for the best scientific article published in the International Journal of Gynecological Pathology in 2014.

Awarded research: *Immunohistochemical survey of mismatch repair protein expression in uterine sarcomas and carcinosarcomas* (Supervisor: Dr. Lee CH)



DR. MARTIN HYRCZA, MD, PHD

1. **RESEARCH AND CLINICAL TRIALS ADVISORY GROUP** (RCTAG) Seed Funding Grant (\$5000.00)

Awarded research: *Mammary Analogue Secretory Carcinoma in British Columbia - Case finding and outcome analysis* (Supervisor: Dr. Tom Thomson)



RESIDENT TEACHING AWARDS!

2015

CONGRATULATIONS TO THE RECIPIENTS OF THIS YEAR'S RESIDENT TEACHING AWARDS!



« DR. LAWRENCE HALEY

Dr. Melvyn Bernstein Resident Teaching Award (for non-AP staff)

DR. TORSTEN NIELSEN »

Dr. Roberta Miller Resident Teaching Award (for AP Staff)



WARM WELCOME TO THE UBC PATHOLOGY DEPARTMENT 2015 RESIDENTS ORIENTATION

Daniel Owen, PGY2
Anatomic Pathology Resident

July the second marked the beginning of nine careers in pathology as this year's new residents started in the pathology residency program at UBC. Kyra Berg, Jessica Saunders, Daniel Owen, Kenrry Chiu, Basile Tessier and Nissreen Mohammad (anatomical pathology); Hamish Nicolson and Maryam Al Bakri (hematopathology); and Amanda Gruza (oral pathology) spent their first eight days together during orientation to their new residency programs.

The new residents' first day began with a generous helping of breakfast burritos, coffee and yogurt during a breakfast meet-and-greet with the residency program directors. Next, the anatomic pathology residency program director, Dr. Diana Ionescu, relayed some practical details about the organization of the residency programs. Dr. Ionescu also provided some general career advice, as well as some humorous anecdotes about her own career and experiences with residents. If any of the new residents were initially nervous about their first day, they certainly felt relaxed and welcome almost as soon as they arrived at orientation.

The remainder of the orientation included time for computer access and I.D. badges, introductions to laboratory safety and resident wellness and extensive tours of the B.C. Cancer Agency, Vancouver General Hospital and Saint Paul's Hospital, the three main training sites for U.B.C. Pathology residents. The new residents had ample time to meet most of the pathology staff, many of whom kindly provided introductory teaching sessions on the normal histology of the major organ systems. An introduction to the morgue, autopsy and gross pathology was also provided, including an excellent session on lung cutting with Dr. John English (*see photo*).

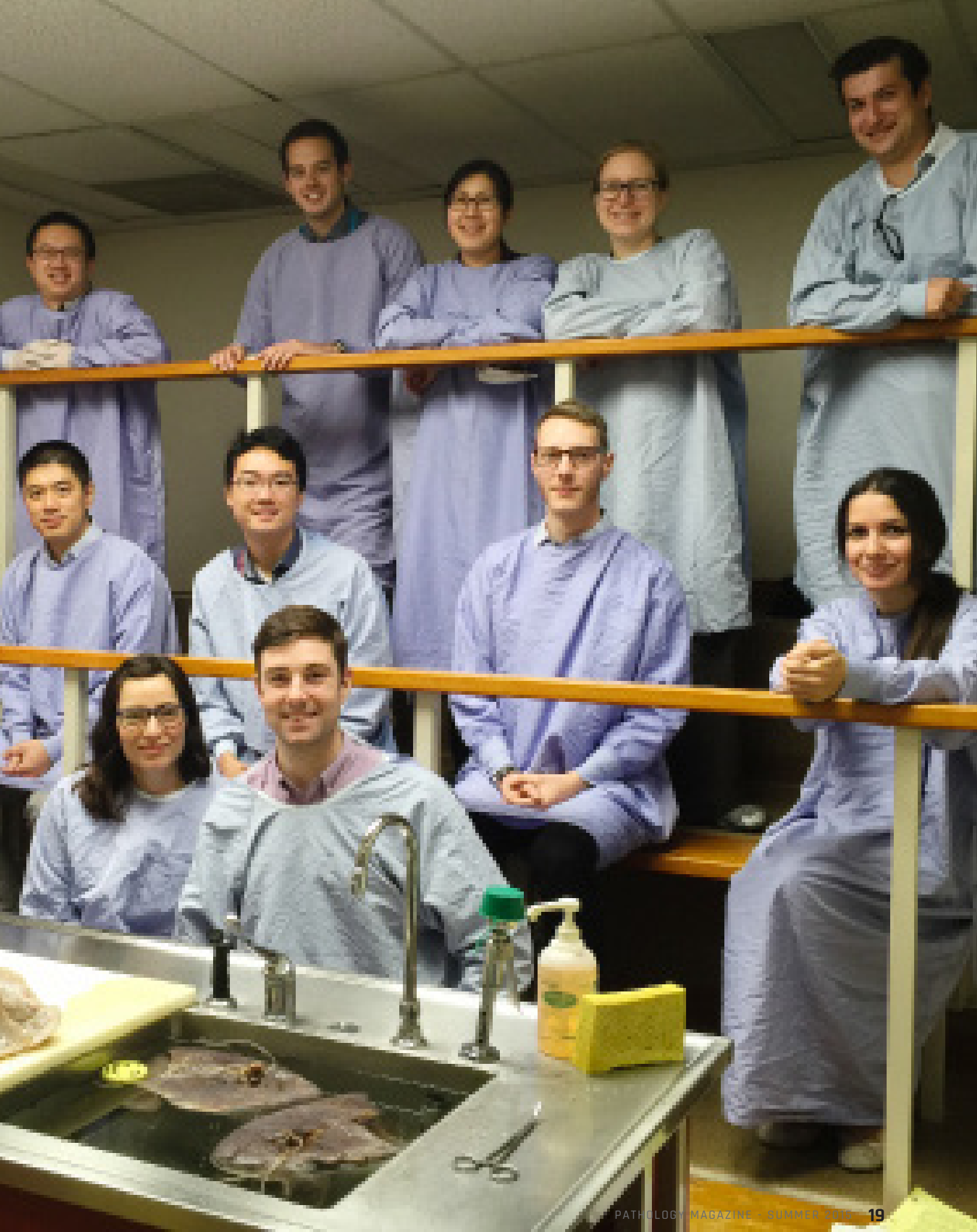
Pathology orientation finished with a dinner at The Wicklow Pub, giving the new residents a chance to socialize more informally with some of the senior pathology residents and fellows. Although the orientation period is now officially over, the senior pathology residents remain extremely generous in providing frequent advice and guidance to the new residents, who are continuing to become acquainted with their surroundings and with the various procedures involved in the day to day practice of pathology.

All of the new residents would like to extend their sincere thanks to the pathology program directors, teaching staff, senior residents, laboratory professionals and administrative staff, without whom such a well-organized, informative and enjoyable pathology residency orientation would not have been possible. □

SESSION ON LUNG CUTTING

An introduction to the morgue, autopsy and gross pathology was also provided, including an excellent session on lung cutting with Dr. John English (see photo).





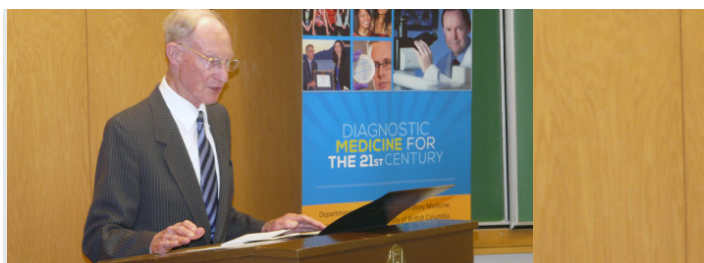
BACHELOR OF MEDICAL LABORATORY SCIENCE (BMLSC) PROGRAM

Dr. Amanda Bradley and Joanne Wouterse

WELCOME BACK ... Juliana! We are very pleased to have Juliana Li back from her leave.

WITH APPRECIATION... a number of exceptional individuals have tirelessly dedicated their time and expertise to our Program over the years and are now moving on to other pursuits.

Thank you to **Cedric Carter** for his longstanding stewardship of both the Introduction to Hematology section of PATH 300 (Introduction to Medical Laboratory Sciences) and PATH 402 (Hematopathology). **Tyler Smith** has assumed the role of section lead of PATH 300 and **Nadia Medvedev** the role of Course Coordinator of PATH 402



We are grateful to **Donald McLean**, Professor Emeritus for his continued interest in the Program and his thoughtfulness toward those who run it. Dr. McLean is one of the founders of the BMLSc Program and coordinated and taught in PATH 327 Medical Microbiology since the program's inception. Although he retired in 1991, he continued to lecture in the course, provide sage advice on academic program matters and stops by often to visit and update us on his travels.

We thank **Tanya Gillan** for her excellent work as section co-lead and instructor of the Basic Human Genetics & Cytogenetics section of PATH 303 (Cytogenetics, Tissue Culture and Cytology) and **Graham Sinclair**, for his consummate efforts as lead and instructor of the carbohydrate section of PATH 301 (Basic and Physical Biochemistry).

We are grateful to **Jiri Frohlich** (PATH 406 Clinical Chemistry), **Lawrence Haley** (PATH 304 Normal Human Histology), and **Patrick Tang** (PATH 327 Medical Microbiology) for their thoughtful instruction over many years.



A WARM WELCOME TO NEW INSTRUCTORS...

Nima Mohtaram and **Bojana Rakic** have joined the PATH 301 course. They will be section leads and instruct the Physical Biochemistry and Carbohydrate sections, respectively.

Tracy Tucker has joined as section lead for the Basic Human Genetics and Cytogenetics section of PATH 303. Tracy and colleagues **Ian Bosdet** and **Kamila Schlade-Bartusiak** will share the teaching for the course section.

Natalie Prystajecy and **Agatha Jassem** have joined the teaching team for PATH 327 and **Rodrigo Onell** has joined the PATH 304 Normal Human Histology course.

Michael Sutherland joined the PATH 405 teaching and coordination team in 2014-15 and continues on as both instructor and course co-coordinator.

We are grateful to our new and continuing instructors. The success of the BMLSc Program is due to these dedicated individuals.



2015 GRADUATES

This past May, 23 students received their BMLSc degrees, bringing the total number of program graduates to 513.





STUDENT AWARDS

The annual BMLSc Awards Tea recognized the following students of the 33rd graduating class for their outstanding academic achievements:

CELINE CHAN

Celine Chan was awarded the Professor C.F.A. Culling Bachelor of Medical Laboratory Science Prize for highest overall standing of the graduating class and the Donald M. McLean Prize in Medical Microbiology for the highest standing in PATH 327 Medical Microbiology.

JENNY WANG

Jenny Wang was awarded the William J. Godolphin Prize for Excellence in Critical Thinking.

JESSIE WANG

Jessie Wang received the B.J. Twaites Prize in Laboratory Administration, awarded to the student with the highest standing in Laboratory Administration. She also was awarded the Prize for Best Overall Performance in PATH 405 Seminars in Current Topics.

BRINN POWELL

The Eugenie Phyllis and Philip Edward Reid Prize in Morphological Sciences for academic excellence in histology, histochemistry and microscopy was awarded to Brinn Powell.

Congratulations to our 2015 BMLSc Graduates and award recipients!



FACULTY AND STAFF AWARDS

GRADUATES' CHOICE FOR TEACHING EXCELLENCE AWARDS

The graduates recognized the following instructors, who each received a BMLSc Graduates' Choice for Teaching Excellence Award: **Dr. Morris Pudek, Dr. Mathieu Garand** and **Ms. Jennifer Xenakis.**

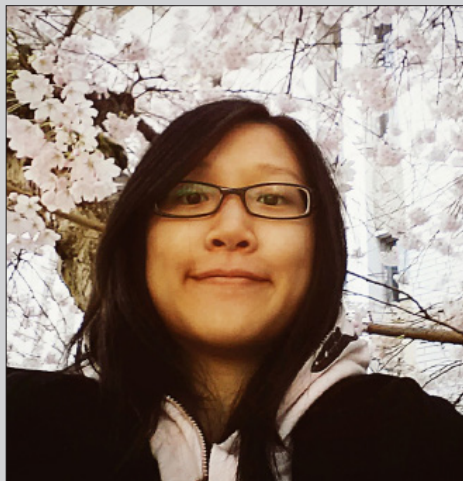


THE REID MEMORIAL CUP

This award, chosen by the graduating class, recognizes a Faculty, Staff member or student who made an outstanding contribution to the educational experience of the BMLSc students. This year's recipient is **Dr. Amanda Bradley.** □

17 new graduate students registered for the 2015-16 academic year!

Here are the 13 new graduate students who just joined and the 4 who started earlier in the year. Please welcome them to our program!



1 ANGELA MO, MSC
Supervisor: Aly Karsan

My research area: Myelodysplastic Syndromes.

Academic background: I did my undergraduate degree in Microbiology and Immunology at UBC.

In my free time, I like reading, birding (not good at it), painting, ceramics/sculpting, playing with animals, travelling and trying new things in general. I also enjoy eating and sleeping very much.

Why I chose UBC: I chose UBC because it's a pretty good school for doing research in science.



2 DEREK WONG, MSC
Supervisor: Stephen Yip

My research area: Brain cancer.

Academic background: Bachelor of Life Science from UBC. After graduating, I worked at a biotech company for a little while before turning my interests to academic research. Prior to academic lab work, my work experience is mostly in development and QC of rapid analytical medical tests.

In my free time, I enjoy going for hikes and rock climbing; I mainly boulder but also lead climb from time to time. Aside from the outdoors I'm also an avid pc gamer.

Why I chose UBC: I chose UBC because of the many affiliations and opportunities available through the university. I have also heard good things from current graduate students and alumni, especially of the pathology department.



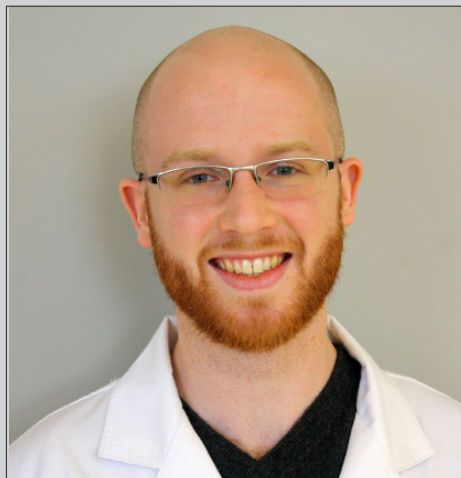
3 ALBERTO DELAIDELLI, MSC
Supervisor: Poul Sorensen

My research area: Metabolic adaptation is essential for cancer cells' survival during nutrient deprivation, this makes it essential for tumor development. The main interest of my work in Dr. Sorensen's lab is to investigate which metabolic pathways are responsible for stress adaptation in Glioblastoma and Medulloblastoma, the most common and most aggressive primary brain tumors, and how targeting those pathways can increase survival in experimental tumor models.

Academic background: During my early life I focused on becoming a professional pianist and an Olympic athlete; however, taking my MD cum laude from the University of Milan and investigating how surgery for intrinsic brain tumors affects patients' language and memory made me fall in love with science. I aim to continue my training, after my PhD, as a neurosurgery resident. This way I will be able to work in both the lab and the clinic to find and also directly apply novel therapeutic strategies, thereby helping patients and families devastated by brain cancer.

Why I chose UBC: I chose the Department of Pathology, within the vast and collaborative scientific community at UBC Vancouver, for the great chance to combine its experience in molecular oncology with my background in neuroscience.

In my free time, I enjoy every possible activity in contact with nature and practicing with my friends the five languages I fluently speak.



4 FRASER MUIR, MSc Supervisor: Wayne Moore

Academic background: My first steps into science began with my undergraduate degree in cell biology and genetics at UBC, which I completed in 2013. Following two years of volunteering abroad, and working as a lab technician at Vancouver General Hospital I decided to take the plunge and move to the next stage of my education – a master's degree.

Why I chose UBC: The choice of where to pursue my degree, for me, was an easy one - UBC. This decision was founded in my love for UBC, my exposure to the fantastic research being done within the department while I was a lab tech, as well as the department of pathology and laboratory medicine's stellar reputation.

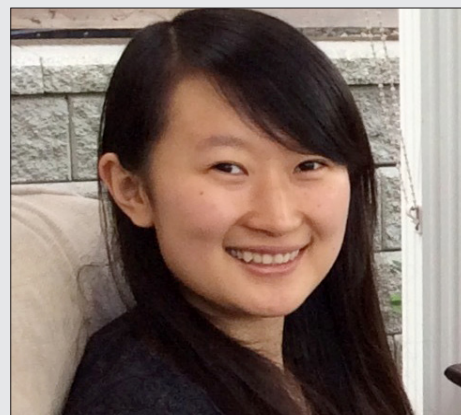
My research area: My current research revolves around the underlying pathology of diffusely abnormal white matter, an abnormality found in multiple sclerosis. This abnormality is currently defined as a region of intensity intermediate to that of the plaque and the normal appearing white matter as shown by proton density and long-T2 MRI scans.

In my free time: when I'm not in the lab one can generally find me outside – whether I be rock climbing, hiking, camping, cycling, or boating.

5 (ZHOUCHUNYANG) YANG XIA, MSc Supervisor: David Huntsman

Academic background: I graduated from University of Toronto with Honours B.Sc. in June 2014.

My research area: after completing an independent research project and realizing that translational clinical research was not the niche I was looking for, I joined a lab at the VGH Eye Care Centre as a volunteer research assistant after coming back to Vancouver. That was when I realized that I wanted to know more about genetics research. At the start of my studentship this May in Dr. David Huntsman's lab, I was introduced to LI retrotransposition, a curious fusion event occurring quite frequently in certain ovarian cancer subtypes. Retrotransposons are mobile genetic elements with the ability to jump into and potentially disrupt gene functions. Does LI retrotransposition affect tumorigenesis ovarian cancer? If so, How? Where do LI retrotransposons insertions occur in novel patients? These research questions and the many more amazing projects in Dr. Huntsman's lab prompted me to look into graduate studies at UBC. I am excited by the prospect of performing hands-on laboratory research, and broadening my knowledge on cancer genetics. Although I cannot predict the course my research project may take, I am sure that my experience at UBC will be a challenging but enjoyable one.



6 THYRSA MAY TOLEDO, MSc Supervisor: Suzanne Vercauteren

Academic background: I recently graduated from the Bachelor of Medical Laboratory Science (BMLSc) program at UBC on May 2015.

My research area: During my last year in the program, I did a directed studies project under Dr. Suzanne Vercauteren's supervision at the BC Children's Hospital Biobank. My project was about optimizing biospecimen processing and storing procedures in Biobanking. For those of you who may not be familiar with what a biobank is, it is a facility where biospecimens with associated clinical data are collected, processed and stored for research purposes. Starting September 2015, I will be doing my graduate studies in the BC Children's Hospital Biobank with Dr. Suzanne Vercauteren and Dr. Gregor Reid. We are interested in detecting circulating free tumor DNA or RNA in plasma or serum in pediatric cancer patients. This is of great interest to us because serum and plasma can be easily obtained from a blood sample which means that invasive procedures such as bone marrow or tissue biopsies can possibly be minimized.

Why I chose UBC: I chose UBC because it is recognized around the world for its high academic standard and its strong commitment to research. I cannot wait to continue my academic journey at UBC!



7 MARYAM GHAEDI, PHD Supervisor: Fumio Takei

Academic background: I graduated as a veterinarian from Ahvaz University of Iran and joined Fumio Takei's lab in BC Cancer Research Center in 2012. I have completed my MSc degree and started PhD in the same lab.

Why I chose UBC: I chose UBC because I loved to become an immunologist and I had my best offer from here.

My research area is in the field of Immunology and my project is to elucidate the developmental processes of different lymphocytes in neonatal versus adult mice: Immunity is mediated by lymphoid and non-lymphoid cells. Lymphoid cells include adaptive and the recently discovered innate lymphoid cells (ILCs). ILCs are important mediators of antigen-non-specific mucosal homeostasis and immunity. I started my research studying the developmental processes of ILCs and expanded to that of different lymphocyte subsets.

In my free time: coming from south part of Iran, I can still enjoy the rainy days of Vancouver! My goal is to learn as much as possible not only in my academic field but also through the vibrant life that I can experience in Vancouver and to make this time a beautiful stage in my life experience.



8 (MARIA) STEPHANIE SANTACRUZ, MSC Supervisor: David Granville

My research area: the activities of a family of granule secreted enzymes (Granzymes) in health and disease. My thesis will be investigating the role of the serine protease, Granzyme B, in diabetes and sun exposure on skin integrity.

Academic background: I did my undergrad at Simon Fraser University with a major in Health Science and a minor in Kinesiology.

In my free time, I like to head outdoors and spend time at the beach, play sports such as volleyball and softball, or go out hiking.

Why I chose UBC: I chose UBC because my research interests were easily met in the department of Pathology, but also because the campus itself is a very open and diverse community which has many activities and programs that appeal to my interests. I look forward to starting my Masters at UBC and working with everyone in the program.

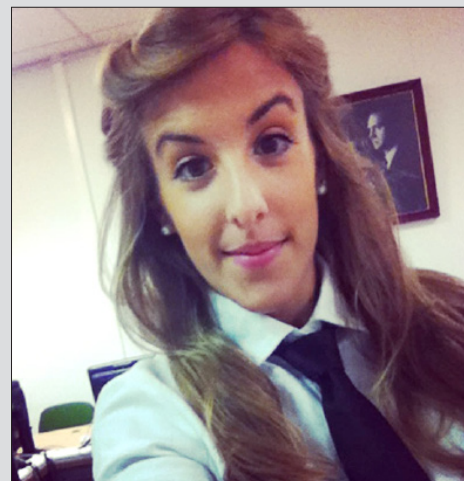


9 JENNA COLLIER, MSC Supervisor: Kevin Bennewith

My research area is in the field of cancer immunology: I will be investigating the role of myeloid-derived suppressor cells in metastatic breast cancer at the BC Cancer Agency.

Academic background: I received my BSc in honors biochemistry with a specialization in biotechnology from the Univ. of Waterloo in 2015. During my undergraduate studies I volunteered to provide interactive science activities for youth in the classroom and spoke to prospective students as an ambassador for the biochemistry program. I decided to move to the West coast to work full-time in the therapeutic antibody discovery department at Amgen for almost two years where I developed my interest in immunotherapy and target discovery for the treatment of cancer. For the summer before starting my graduate studies at UBC, I worked as an intern in the immunology discovery department at Genentech in South San Francisco. I intend to pursue a PhD and a rewarding career in the biotechnology industry in the future.

Why I chose UBC/ In my free time: I chose to attend UBC for my graduate studies because I enjoy living in the city of Vancouver and having access to outdoor activities such as kayaking in the ocean and hiking or snowboarding on the nearby mountains!



10 MARTA SALVADOR ORDONIZ Supervisor: Helene Cote

My research area: What most calls my attention is the neuroscience area, with special emphasis on the Alzheimer's disease which is, under my point of view, one of the saddest diseases of XXI century. But in general, pathologies such as HIV or Cancer, really intrigue me and motivate me for working towards its eradication.

Academic background: I got my degree in Pharmacy at the University of Granada, founded in 1531, one of the toughest and more prestigious public Universities of Spain, so I'm originally a Pharmacist but not enclosed in the classic view that most may have about my profession. I have also had the privilege to study in the United States at the University of Montana during the year that I took as exchange student, where I got a research fellowship at the CSFN Center for Structural and Functional Neuroscience of Missoula. I also did a summer exchange in South Korea that allowed me to study at the University of Seoul. As a pharmacist, I love helping others, and personal interaction with the patients. Assisting people to improve their health really moves my world but I want to get further, I would like to be useful to society by contributing with my passion for research, to the eradication of diseases or the development of new drugs and hence achieve improvement of the quality and expectancy of life.

Why I chose UBC: I've chosen UBC for its well-deserved prestige since it is on the rankings of the Top Universities and for all the opportunities it brings to their students.



11 TANYA DE SILVA, PHD Supervisor: Will Lockwood

My research area is lung cancer, genomics, drug discovery, oncogene signaling, and therapeutic strategies. My previous research work was rooted in Toronto, which focused on the paradoxical roles transforming growth factor beta signaling in ovarian and brain cancers. I was motivated to learn about what makes a cancer cell different from a normal cell at an early age when a childhood friend developed brain cancer. Since joining the department of PALM, I've thrown myself right into the thick of things in the lab but whenever possible I like to take part in conferences as well as opportunities to build my teaching portfolio.

In my free time, I enjoy getting outdoors hiking, yoga and camping whenever I get the chance- Vancouver is my dream city.

Why I chose UBC: It was my destiny to join UBC, and so far, the most exciting part of it all is that I get to work with brilliant people every day. It was key for me to seek out the right people to work with and to do research that truly drives me (which is incredible). I started off wanting to find oncogenes and now this is developing more broadly to better understand lung cancer biology and what the unanswered or forgotten questions could be- I feel this is the best place under phenomenal mentorship where I can carve out a unique niche.

12 CHRIS WANG, MSC Supervisor: Mads Daugaard

Academic background: I did my undergraduate at UBC in Biology specializing in Cell Biology and Genetics. During my undergraduate degree I obtained a Co-op position at the Vancouver Prostate Centre (VPC) where I developed a passion for research. Following this new found passion I decided to pursue a graduate degree.

Why I chose UBC: UBC is an amazing school and it offers one of the best educations available for graduate students, coupled with that fact it is located in one of the world's best city, the decision to stay was easy.

My research area: I am currently being supervised by Dr. Mads Daugaard at the Vancouver Prostate Centre. My research is focused on determine how glycosylation modifications can regulate the signaling pathway in Cancer cells. I hope to elucidate new mechanisms for cells to communicate with each other.

In my free time: Outside of school I enjoy doing a lot of outdoor activities during the summer. I love paintballing and have been an avid player for many years. I also like to play ultimate, soccer, and dodgeball with friends in leagues around Vancouver. At home I enjoy video games and cooking. They help me relax after a long day at work.



13 LISA DECOTRET, MSC Supervisor: Catherine Pallen

My research area: I will be conducting my research under the supervision of Dr. Catherine Pallen at the Child and Family Research Institute. My research will focus on investigating the role of novel defects of selected protein tyrosine phosphatases (PTPs) in cell signaling, health, and disease particularly focusing on pediatric malignancies.

Academic background: I have recently graduated from Carleton University with a Bachelor's Degree in Biochemistry. As an undergraduate student at Carleton, I conducted my fourth year thesis alongside Dr. William Willmore investigating the regulation of Nrf1 by endoplasmic reticulum (ER) stress. During my undergraduate degree, I had the opportunity to go on a one-year exchange to the University of Leeds in the United Kingdom. While studying abroad, I conducted research within the Department of Molecular and Cellular Biology under the supervision of Dr. Eric Blair. It was during this research internship when I realized that I would like to peruse a career in cancer research. After living and studying in Ottawa for most of my life, I am very excited for the big cross-country move from Ottawa to Vancouver and even more thrilled to embark on new adventures on the west coast.



NEWS FLASH!!!

THE PATHOLOGY ARTS GALA RIDES AGAIN!!!

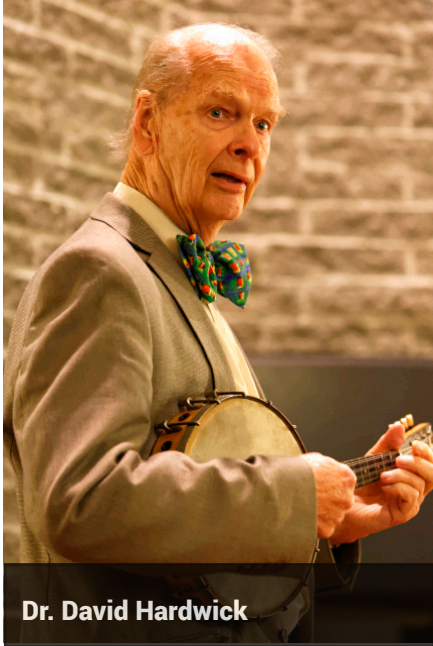
Dr. Maria Issa



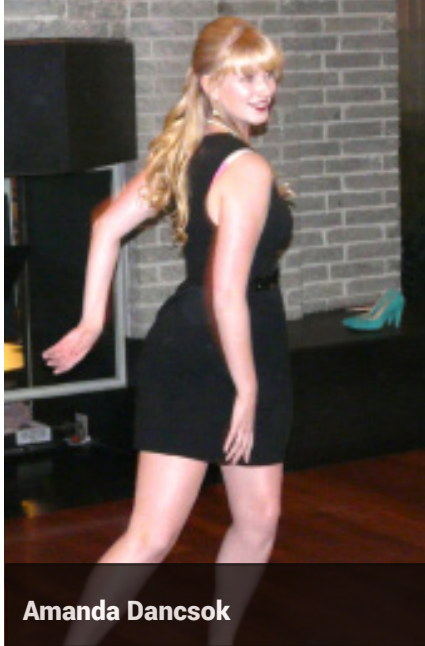
Tissa Rahim (vocals) and Nick Swyngedouw (guitar)



Yulia Merkulova



Dr. David Hardwick



Amanda Dancsok



Dr. Nick Myles and Ada Young

From your on-the-scene, local correspondent from the UBC Med Undergrad Centre – The long-awaited Pathology Arts Gala was **baaaaack!** A favourite event that usually happens at the beginning of the summer was delayed to October 16th, under the heading of “better late than never”. and BETTER, it was! Oh, the people! Oh, the **artistes!** Oh, the food! Even the weather cooperated: a beautiful fall evening, with just a touch of chill in the air – the flickering candles on the tables drew everyone outside.

For those who missed this – sorry you were not among the *glitteriat!i* – there were delicious nibbles (and lots of ‘em!) with good wine and yummy desserts – arranged and re-supplied by an army of smiling volunteers. The service was better than a 5-Star!

The gastronomically replete audience repaired to the seating area and prepared to be regaled. Our elegant hosts, Ada Young and Nick Myles, the latter a “Dr. Hardwick wannabe”, complete with bow-tie, squired us through the star-studded evening that commenced with the REAL



Paul Orban (cello) and Kevin Tsai (piano)

Dr. Hardwick, also complete with bow-tie. The traditional banjo?ukelele? sing-along of the Old Texas Trail set the tone for the proceedings.

The first half of the evening showcased old friends and new surprises. An Elgar concerto played by Paul Orban (cello) and Kevin Tsai (piano) besides lovely melodies, had a medical context, as apparently Elgar wrote it promptly after coming out of

anesthesia. This was followed by a charming contemporary dance number by Amanda Dancsok who performed to Etta James’ At Last (my love has come along): a gem of a dance, professionally executed. Yours truly is already looking forward to her performance next year! (Do they offer PhD in dance? Amanda should get one!) New additions were a rousing Rachel Platten Fight Song presented by Yulia Merkulova and a Spanish



Irene Vavasour



Jacqui Siu & Kelsey Lee



Verchere -
Next -
Generation



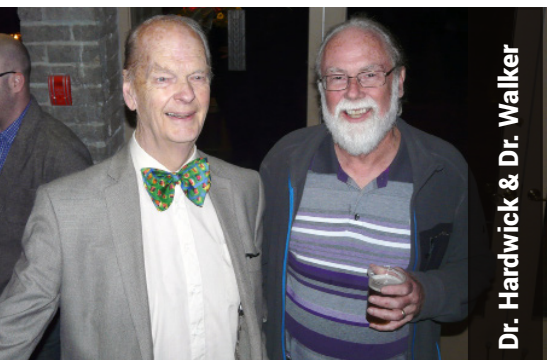
Shawna Stanwood
& Anthony Hsieh



Frank Lee



Romance by the flying-fingered classical duo of Jacqui Siu (violin) and Kelsey Lee (piano) who reminded of flamenco on hot summer nights. Then came “the ringer” – Irene Vavasour from Radiology, she does have a connection to Pathology through Corree Laule, but we’re happy to adopt her: she has been trained in Indian classical dance since she was a small sprog – and her beautiful hands tell age-old stories of Devi, the Mother Goddess.



Dr. Hardwick & Dr. Walker

The intermission was a little like asking 6-year-olds about their favourite school class – which always gets you “Recess!!” – Intermission was great. More food. More drinks. More ART: visual art, this time. Dr. Walker brought

a wonderful organic bronze sculpture entitled *Good and Evil* and some great pen and ink drawings. These were accompanied by a new-to-us ‘living art’ of flower arrangement. Yulia Merkulova’s hyper-modern flower *Fall Arrangement* and Katherina Othonos’ classical and clean Ikebana both present flowers as an art form that is worth exploring. Clever, thoughtful and beautiful photos of were contributed by Tom Cheng and Yulia. We admired Galina Soukhatcheva’s acrylic painting of Sr. Petersburg and saw some watercolours by Maria Issa. Another new addition to Pathology’s artistic base is Dr. Robert Kisilevsky, who stole himself from Queen’s University and retired himself here to the Path Arts Gala’s benefit – with an elegant, sleek, minimalist cherry-wood carving of a heron. More next year, please!

We returned to the second half of the show to hear more extraordinary voices – Frank Lee singing *Ordinary People*. Then Shawna Stanwood and Anthony Hsieh gave us *More Than Words*,

sheer artistry! Kevin and Paul returned with a Casadesus concerto, with a hauntingly beautiful slow movement. This year, “old” favourites, the Verchere-Next-Generation (Toby and Graham) teamed up with two talented young artists, Julia and Jaime MacLean. They entertained us with some musical theatre numbers, accompanied on the piano by the original Verchere. This generation is really good and we get to watch their careers develop: check with Bruce and get tickets for their public performances! Unfortunately, the Verchere tap vs the Wellington zills rhythm competition didn’t materialize this year as promised – but we live in hope for next year.

What, you think I forgot? Of course, not! I write this column – so I get to pick my personal favorite: Tissa Rahim not only rocks behind the scenes, she and Nick Swyngedouw (guitar) can really rock a blues song! Better than the original, *If it hadn’t been for love* still sings in my head. I could happily pay money for an entire evening with these two: Tissa, Nick - how about it?

VANIER SCHOLARSHIP

The Vanier Scholarship is one of the highest awards given to PhD candidates in Canada. We're very proud that Frank is one of the 2015 winners!

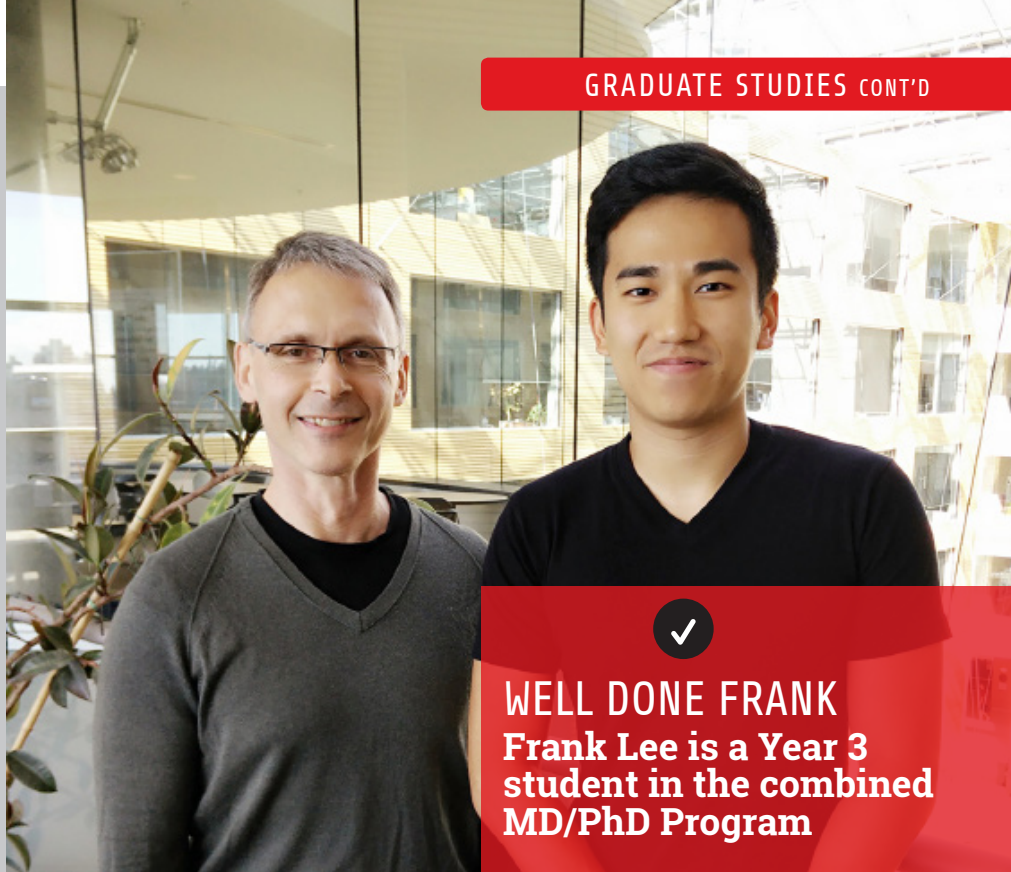
Once again, one of our MD/PhD students affiliated with the PALM graduate program has won a Vanier scholarship. These are highly competitive awards funded by the Government of Canada. The Vanier Canada Graduate Scholarships program "attracts and retains world-class doctoral students and helps establish Canada as a global centre of excellence in research and higher learning". It is truly an honor for Frank and our program to have his achievements recognized in this manner. Frank is a Year 3 student in the combined MD/PhD Program. His research supervisor is **Dr. Ed Prydzial** at the Centre for Blood Research, and his hosting department is Pathology and Laboratory Medicine.

Frank's research focus is studying the mechanism of how blood clots are dissolved, a process known as fibrinolysis. Tissue plasminogen activator (tPA), the physiological initiator of

fibrinolysis, has been used as a vital "clot-busting" therapeutic for almost two decades to treat prevalent conditions such as pulmonary embolism, myocardial infarction and stroke. However, tPA may cause life-threatening hemorrhage, many patients' clots are resistant to its action, and it is useful only within a few hours after the onset of symptoms. Frank's lab has discovered that proteins not considered within the current fibrinolysis paradigm enhance tPA function in the vicinity of the clot. Frank's research will further

elucidate this auxiliary cofactor mechanism and the role of these proteins in fibrinolysis. This knowledge will be used in the development of novel clot-busting agents with enhanced safety and efficacy in comparison with existing medicines.

Outside the lab, Frank has been involved in a variety of musical pursuits including singing for a university rock band and for the UBC Faculty of Medicine acapella and choir groups. He also enjoys playing basketball, ultimate frisbee, and powerlifting.



WELL DONE FRANK
Frank Lee is a Year 3
student in the combined
MD/PhD Program

✓ IN ADDITION TO THE VANIER SCHOLARSHIP, FRANK HAS ALSO BEEN RECOGNIZED BY WINNING SEVERAL OTHER AWARDS WHICH INCLUDE:

Four Year Doctoral Fellowship (2015) | CIHR MD/PhD Studentship Award (2014) | Faculty of Medicine Graduate Award (2014) | Centre for Blood Research Summer Scholarship (2013) | Young Investigator Award, XXIV Congress of the ISTH (2013) | University Senate Scholarship (2012) | Canadian Hemophilia Society Dream of a Cure Summer Research Scholarship (2012) | The Dr. Harry Lyman Hooker Scholarships (2010/11) □

THIS SUMMER




FROM MARCEL BALLY'S LABORATORY

Jagbir Singh is a postdoctoral fellow in Dr. Marcel Bally's laboratory. In March, he received 2014/15 Canadian Breast Cancer Foundation - BC/Yukon Annual Breast Cancer Research Doctoral and Postgraduate Fellowship for a period of two years. In addition to this, Dr. Singh has been successful in securing additional funding from the Michael Smith Foundation for Health Research in July, 2015 as a recipient of a postdoctoral trainee awards.




More information about these awards and my project details are available at:

CBCF-BC/Yukon: <http://www.cbcbf.org/bc/YourDollarAtWork/fellowships/> and MSFHR: <http://www.msfhr.org/funding/2015-msfhr-trainee-awards#biomedical> 

PEDAL POWER

500KM CYCLING TOUR



Pathology residents Tyler Hickey and Nick Sunderland travelled to the Sierra Nevada region of Northern California in June for a five day, 500km cycling tour through that scenic region. The supported ride included 4-6 hours of cycling each day and camping in different scenic locales each evening. Although there were about 90 individuals on the tour, Drs. Hickey and Sunderland were the only Canadian representatives. The two committed cyclists were regularly among the first finishers each day and were not deterred by the nearly 9000 meters of vertical ascent through the hot and dry mountainous tour. Highlights of the trip included ascending Carson Pass (8574' elevation), swimming in Lake Tahoe and of course, crossing the finish line on the final afternoon under the warm California sun. For those interested, the ride runs annually in June. www.cyclethesierra.com 



HOSTING A CONFERENCE?

If you are hosting an event, we can help you create an online registration form with credit card processing free of charge.

E-mail to **Debbie Bertanjoli** at dbertanjoli@pathology.ubc.ca for more info.



UBC WORKSPACE

Hosted on-campus, UBC Workspace is a cloud-based file sharing service that offers an easy and secure way for staff and faculty to share files via folders, both internally and externally with colleagues, partners and clients. <https://it.ubc.ca/projects/workspace-20>

GROUP RUN

DIAGNOSTIC DASHERS LAB MEDICINE RUN GROUP

Join other lab medicine and diagnostic medical professionals in a social group running atmosphere! This is a great way to get motivated and meet new people. The group has a team webpage with all sorts of information including:

- Information on run schedules including times and meeting places
- Suggested / planned running or jogging routes, usually with an easier and harder option
- Information on confirmed participants for each run
- Information on additional

member posted events (for example, weekend Grouse Grind)

- Comment board for suggestions, requests or carpooling

Currently, runs are weekly on Thursdays, meeting at 5:10 pm from the corner of 10th Ave and Laurel (across from

VGH Emergency), and plan to return to the same location. Most runs are around an hour but can be flexible. To join the website and view current activities, email nicksunderland@gmail.com, or visit <http://tinyurl.com/q4kopr3>. □



LEFT TO RIGHT

Ryan, (M4 visiting student), Dr. Webber, Dr. Gilks, Catalin Tarboanta (R3), Kyra Berg (R2), Ariel Liu (R1), and Nick Sunderland (fellow)

SUMMER FISHING TRIP - DR. MUHAMMAD MORSHED

CAMPBELL RIVER

Staying true to our scientific roots, Dr. Jalal Bhuiyan and I researched extensively to determine the ideal geographic location where fish yields were high. Campbell River became the unanimous choice. First of all, Campbell River is the undisputed Fishing Capital of B.C.; we couldn't have made the

wrong choice, right? We discovered a resort called Painter's Lodge Resort which attracts elite fishermen from all over the province. The resort was equipped with all the fancy boats, the best fishing gear one could buy in the Pacific Northwest, and of course a stellar fishing record year after year.

Our guide knew exactly where to be, at what tide, and what depth to maximize the catch. We caught our limit of Pink, and caught/released a few but no luck fishing for Chinook which was our ultimate goal. We hope to make this trip an annual tradition. □



THERE'S MORE TO FISHING THAN CATCHING FISH

Can I say I am an avid sport fisherman? Not really, but I try to go every year at least once to try my luck.

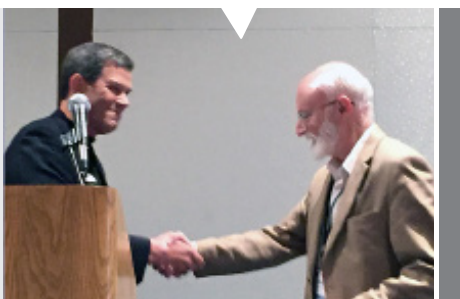
THIS SUMMER



LIFETIME ACHIEVEMENT AWARD

The Pulmonary Pathology Society is proud to announce **Dr. Andrew Churg** as the Lifetime Achievement Award recipient for 2015. Dr. Churg received a unanimous nomination, ratified by the entire Society membership. The award was presented at the 9th Biennial Meeting in San Francisco, CA on June 5, 2015.

This prestigious award was received eleven years ago by another member of the UBC Department of Pathology and Laboratory Medicine, **Dr. J. Hogg**.



FACULTY RETIREMENTS

Congratulations to **Judith Isaac-Renton, David Hoar, and Enid Edwards**, each of whom have made tremendous contributions to the Department of Pathology and Laboratory Medicine and to the medical profession. The three long-time department members retired this summer after many years of academic clinical practice and many professional accomplishments.

FACULTY PROMOTIONS AND TENURE AWARDS IN 2014/15



Congratulations to the following colleagues whose promotion and/or award of tenure were approved by the UBC Board of Governors.

2014

ACADEMIC FACULTY PROMOTIONS:

To Professor:

Luo, Honglin

To Associate Professor:

Shah, Sohrab

2015

CLINICAL FACULTY PROMOTIONS:

To Clinical Professor:

Nimmo, Michael

To Clinical Associate Professor:

Leung, Victor
Myles, Nickolas
Naghbi Torbati, Bibi
Slack, Graham William
Vercauteren, Suzanne Maria

To Clinical Assistant Professor:

Shiau, Carolyn,
Wang, Li,
Wong, Titus

2014

To Clinical Professor:

Ionescu, Diana

To Clinical Associate Professor:

Al Rawahi, Ghada
Galbraith, John

To Clinical Assistant Professor:

Stefanovic, Aleksandra
Reyes, Romina

Congratulations to the
Successful Applicants
for 2014/15!

**Faculty
Awards &
Honors**

Jan 2015 -
present



DR. BRUCE MCMANUS

- 2015 Faculty of Medicine:
Overall Excellence –
Senior Faculty (service)
- 2015 Howard Morgan
Award for Distinguished
Achievements



DR. BRUCE VERCHERE

2015 Faculty of
Medicine: Award
for Excellence in
Mentoring Early Career
Faculty (service)



DR. DAVID HARDWICK

2015 Doctors of BC: Dr. Cam
Coady Medal of Excellence
(lifetime achievement)



DR. IAN MACKENZIE

Vancouver Acute
Medical, Dental & Allied
Staff Association:
Vancouver Acute 2015
Scientific Achievement
Award



DR. DANA DEVINE

Canadian Academy of Health
Sciences: Elected Fellow of the
Canadian Academy of Health
Sciences

**Congratulations
to Our Latest Award Recipients!**

FOUNDATION GRANT SUCCESSES

Canadian Institutes of Health Research: 2015
Foundation grant recipients



**DR. POUL
SORENSEN**



**DR. WAN
LAM**



**DR. DAVID
GRANVILLE**



**DR. SOHRAB
SHAH**

STAND UP TO CANCER CANADA



DR. SAMUEL APARICIO

Dr. Aparicio's new \$9M SU2C grant
with Tak Mak in Toronto

Congratulations to our very
own Dr. Samuel Aparicio who
was recently named co-lead
of the Stand Up to Cancer
Canada—Canadian Breast Cancer
Foundation Dream Team!

CANADIAN ANATOMIC AND MOLECULAR PATHOLOGY CONFERENCE

JANUARY 28TH - 31ST, 2016

FAIRMONT CHATEAU WHISTLER, BC, CANADA

SAVE THE DATE

www.pathologycamp.ca

Featured speakers include:

Dr. W. Travis, Dr. A. Gown, Dr. C. Marginean
Dr. M. Hayes, Dr. M. Trotter, Dr. G. Slack, Dr. B. Sheffield, Dr. K. Schrader

Conference Chairs: Dr. Diana Ionescu and Dr. Greg Naus



The- SPOTLIGHT

Judith Lynn Isaac-Renton, Public Health Laboratory Director and Medical Microbiologist, British Columbia Public Health Microbiology Reference Laboratory, British Columbia Centre for Disease Control, and Professor Of Microbiology, Department of Pathology and Laboratory Medicine, University of British Columbia



John G. FitzGerald
CACMID Award
– Outstanding
Microbiologist
(Inaugural), 2012



SHORT BIO:

Judy grew up in Toronto, Ontario, where she attended the University of Toronto, and obtained a degree in medicine. She met her husband Bob there, where he was studying architecture. After medical school, she completed a rotating internship at the New Mount Sinai Hospital. Following this, Judy studied with several outstanding public health leaders, including Dr. Harding LeRiche. During this time, she became fascinated with infectious and tropical diseases leading to residency with Drs. Michael Lenczner and Jay Keystone at the Toronto General Hospital Tropical Disease Unit.

Following this medical residency, Judy and Bob both took a year-long sabbatical to study theology at Regent College, University of British Columbia (UBC). To the dismay of the Ontario families, they fell in love with Vancouver and returned only briefly to pack up their library into a U-Haul trailer. They trekked west, and never looked back!

Judy then completed further fellowship training in Medical Microbiology in the Department of Pathology and Laboratory Medicine. Her first job at the Vancouver General Hospital (VGH) launched an academic trajectory and subsequent leadership posts in Vancouver. These posts included Head of the Division of Medical Microbiology and Infection Control and Acting Department Head at VGH. She then returned to the world of public health and became the province's Public Health Laboratory Director at



WITH BOB,
MY HUSBAND



the British Columbia Centre for Disease Control (BCCDC).

During three consecutive terms, she led her team to respond to water-borne outbreaks of giardiasis and then through the world's largest outbreak of toxoplasmosis, screening thousands of pregnant women during that life-changing event. This sparked her interest in the challenges of safe drinking water and the impact of water-borne infections worldwide. Research in this area culminated in her leading a national Genome Canada research team to identify bio-markers of water pollution using metagenomics and next generation sequencing.

Over the years, she and her public health colleagues have responded to a variety of threats and outbreaks, including those due to *Bacillus anthracis*, *Cyclospora*, Norovirus, and the SARS virus. Each new challenge was also seen as an opportunity to identify and implement quality improvements to the British Columbia public health laboratory services. These cumulative improvements

led to the laboratory at BCCDC becoming internationally accredited by the College of American Pathologists (CAP). After eight years of uninterrupted success (with unannounced inspections by audit teams from different parts of the USA or Canada), this remains a unique status amongst the large public-sector laboratories in British Columbia. Another unique event, of which she is proud, was her being the first Canadian Microbiologist to receive the American Society for Microbiology Gen-Probe Joseph Public Health Award.

Recently, Judy decided to pass on the leadership baton on to younger talented colleagues within public health microbiology. She acknowledges the excellent work of her broad circle of colleagues and team members, from the acute care and public health microbiologists, to the laboratory technologists at the bench, all of whom contribute to protect the health of British Columbians. Looking back, she says that it has been a gratifying career and an honour to work with them all. □

JUST FOR FUN

WHY DID YOU CHOOSE YOUR PROFESSION?

Because bugs are incredibly fascinating! For example, why do some helminths travel through the heart and lungs before finding their final place of residence in the gut? Go figure!

WHAT WAS YOUR FIRST JOB?

Paper-girl for the Toronto Star. This meant delivering over 80 papers, rain or shine, up and down Dufferin Street. There were great Christmas tips!

TOP THREE THINGS ON BUCKET LIST?

Plan not to plan, plan not to plan, and then plan not to plan.

WHAT WILL BE THE MOST IMPORTANT TO YOU IN RETIREMENT?

Plan not to plan.

WHERE WOULD YOU LOVE TO LIVE?

Could there be anything better than beautiful BC?

WHO IS YOUR FAVOURITE AUTHOR?

God. He writes the best articles in "nature" and "science".

DO YOU HAVE ANY HOBBIES? WHAT ARE THEY?

The usual: gardening (22 lilac cultivars on an old farm on Mayne Island), playing several musical instruments (all badly), oil painting, and singing (alto, loudly).

TELL US SOMETHING YOU CARE A LOT ABOUT AND WHY?

That we are not just about DNA and deep dark space. We are Imago Dei.

WITH MY TWO
DAUGHTERS





PATHOLOGY & LABORATORY MEDICINE – FRASER HEALTH (FH)

Arun Garg, PhD MD FRCPC

FEATURED SITE

1

INTEGRATION AND OPTIMIZATION OF SERVICE

Like all health care delivery, efficient and effective delivery of services is required and our department is no exception. Being one of the first services which operated as regional service, we continue to integrate and consolidate where possible. Our mantra of *Think Regionally-Act Locally* guides us in this planning.

During the last 12 months, we worked to consolidate the Medical Microbiology service to one site within Fraser Health. Only 15 years ago, Fraser Health provided on-site Medical Microbiology service at all its 12 acute care sites. Today, there are human resource challenges, technology advances, capital equipment funding challenges, and increased expectations of enhanced service provision through extended hours of service. These have required the department to consolidate this service from 12 to 10 to 7 to 4 to 3 to 2 and now to one site. With this final phase of integration, our goal is to operate a central hub that will provide a comprehensive and standardized Medical Microbiology service aimed at improving quality and sustainability. It will provide a critical mass of expertise which will facilitate future staff recruitment and provide opportunities for enhanced service. No delay or reduction of services has been experienced and with full consolidation, the same turnaround time is expected. Medical oversight

The Department of Pathology & Laboratory Medicine in Fraser Health provides comprehensive Laboratory and Pathology services to a network of 13 acute care hospitals and a large number of residential care facilities from Burnaby to Boston Bar. The department serves a population of approximately 1.6 million people with very diverse needs. The department has evolved over the last 50 years and currently has over 40 full-time medical professional staff covering all areas of Laboratory Medicine and Pathology.

As 12 acute care sites have busy and active Emergency services, the department provides an integrated regional service with all sites providing 24/7/365 basic rapid turnaround testing, with other tests centralized to either reference labs of Fraser Health or Lower mainland reference sites. The service is operated as part of the Lower Mainland Pathology and Laboratory Medicine Service. The current report emphasizes some of the major initiatives in the department.

Yearly Workload

Current yearly workload includes over 1.3 million blood specimen collections, over 110,000 Anatomic Pathology/Surgical specimens, over 3 million Medical Biochemistry and Hematopathology tests, over 80 thousand Transfusion Medicine specimens, and over 400,000 Medical Microbiology specimens.

Current year overall procedures performed were approximately 19.6 million and show a recent growth of over 750,000 procedures.

and coverage by Medical Microbiologists will continue with individual site support and presence. The Medical Microbiologists work closely with the Fraser Health Infection Prevention and Control service and the consolidated laboratory service will continue the same relationship. The building of a brand new acute care facility at Surrey Memorial Hospital made it possible to plan a comprehensive consolidated Medical Microbiology service. The service will provide 24/7/365 testing, a major evolution in Medical Microbiology service.

2 TEACHING PROGRAMS

Royal Columbian Hospital was a pilot site for the UBC Medical Undergraduate Teaching Program, where pathology teaching was integrated into the teaching module. Members of the department continue to actively participate in the program. We provide a lecture series for the RCH interns, and teaching for residents on rotations at the hospital. Department representatives participate in various residency training committees. Dr. Michelle Wong is chair of the undergraduate Foundations of Medicine, Blood, and Lymphatics block and is actively involved in the renewal of the medical school undergraduate teaching program.



Our mantra 'Think Regionally - Act Locally'

3 SURREY ACUTE CARE TOWER

One of the major developments for the department was completion of Surrey Acute Care Tower with an expanded emergency service and several new clinical programs. The clinical laboratory service was moved into a brand new full 4th floor facility and allowed us to plan for delivery for a very rapidly enlarging and growing area.

The service has fully automated robotics and an enhanced patient identification system, along with availability of various emerging technologies. Positive Patient Identification (PPID) technology (IATRIC system) and immediate voice contact (Vocera) are utilized during the collection of laboratory specimens. This has virtually eliminated labelling errors and allows for optimal deployment of laboratory assistants. Highly sophisticated automated Medical Biochemistry (Roche) and Hematopathology (Sysmex) lines have been introduced. This configuration allows for a high degree of auto-validation and improved turn-around times, major requirement for busy acute care sites. Middleware and workload management software maximize the efficiency and throughput of these instruments. High resolution image analysis in Hematopathology (Cellavision) has significantly reduced the number of manual differential counts. The laboratory is also a designated site for potentially emerging infectious diseases, such as Ebola, and will play an

important and emerging role in the management of infectious diseases. The new facilities will enable Surrey Memorial Hospital to play a major and critical role as a reference facility.

4 GLOBAL LINKS

Another major activity for the department was participation and development of global links. Fraser Health has the largest South Asian population, therefore, it was natural to build links with South Asia and, more importantly, provide population-based service to the local South Asian population. Fraser Health along with Simon Fraser University, British Columbia Institute of Technology and the University of BC hosted a very successful two day international conference on the Canada India Network initiative in June 2014. The conference's main theme was "Health and Civil Society" and covered areas of Primary Care in chronic disease management, allied health training, role of yoga in health, and emerging technologies. The follow-up from the conference continues to build on these themes. Support and participation of the UBC Pathology Department was much appreciated. More information can be found on the Fraser Health website or the Canada India Network Society (www.thecins.org). It has been a busy year for the department and we look forward to working with the regional academic framework as UBC builds on a regional network and participation in the distributed academic training program. □

SOUTHERN MEDICAL PROGRAM

Bibi Naghibi Torbati

KELOWNA GENERAL HOSPITAL/OKANAGAN PATHOLOGISTS AND MICROBIOLOGISTS

From Left to right: Lower row:
Dr. Kate O'Connor, Dr. Bibi
Naghibi Torbati, Dr. Qiuyan Li,
Dr. Jill Wanklyn,

Upper row from Left to right:
Dr. Dwayne Wenzel, Dr. Balazs
Gerloczy, Dr. Terry Bainbridge,
Dr. Murray Savard

Drs. Kasper, Coupland, Moss,
Lesack, Blondel-Hill, Wang
and Wilmer, who are valuable
contributors to the teaching,
are missing from the photos,
holiday, etc.



Pathologists, Microbiologists and other laboratory professionals have long been recognized as integral members of the healthcare team. The evolution of the UBC Southern Medical program has brought both the need and the opportunity for medical student and resident teaching in laboratory medicine. The group of laboratory physicians in the Okanagan have met this challenge and responsibility with incredible enthusiasm and energy. This vital medical educational experience arises at the bedside, in the laboratory, beside the microscope, in small group settings as well as in the classroom, and serves to introduce students to the wonder of pathology and the laboratory.

First and second year medical students get their first exposure to pathologists during their pathology course and small group sessions encompassing a wide range of conditions and diseases from congenital heart disease to colorectal carcinoma. These sessions are always met with very positive reviews from both the students and the pathologists. Microbiologists contribute their valuable knowledge and expertise during the infectious disease and medical microbiology (IDMM) course and participate in hands-on microbiology laboratory sessions. Once UBC-SMP students advance to the clinics and wards,

the contribution of pathologists and microbiologists continues with individual learning sessions in dermatopathology, transfusion medicine and gynecological pathology, and by attending the CPC case presentations in autopsy pathology. Some students have the opportunity to perform bone marrow biopsies and fine needle aspirations under pathologist guidance. Of course, medical students and residents are always welcome in the Department of Pathology and Laboratory Medicine and microbiology electives. We were approved in 2008 and started offering pathology electives in anatomical/general pathology for 4th year medical students. Since then we have had about 15 students rotate through our department from the Vancouver, Southern and Northern Medical Program.

Interactions between Okanagan laboratory physicians and UBC-SMP medical students allow for mentorship opportunities to develop. Through the commitment of time and effort, students are exposed to the day-to-day activities of pathologists and microbiologists, and maybe, just maybe, some curious students can be persuaded to seriously consider a career in laboratory medicine. Last year 3 or 4 of our Southern Medical Program students who rotated through our department matched to pathology residency positions. □

NEONATAL HYPERBILIRUBINEMIA

Li Wang, MD, MSc, FRCPC

Evaluation of whole blood bilirubin as a screening tool for neonatal hyperbilirubinemia



Hyperbilirubinemia is very common and approximately 60% of term newborn infants develop mild jaundice within the first two days after birth. In 2% of infants, severe hyperbilirubinemia with acute bilirubin encephalopathy develops and will cause detrimental damage to the central nervous system if left untreated.

Universal screening for newborn hyperbilirubinemia with either total serum bilirubin (TSB) or transcutaneous bilirubin (TcB) has been adopted by many countries. Currently, TcB is most common as it is non-invasive and can be performed at the bedside. However, it is also known to be less accurate at high bilirubin levels and may be affected by skin pigmentation (improved with newer models) and skin thickening, making it unsuitable for older babies. Most important however, is that TcB is a physiologically different parameter from TSB. TcB assesses mainly extravascular bilirubin whereas TSB reflects the intravascular bilirubin concentration. Whole blood bilirubin (TwB) analyzed on a blood gas instrument is a promising alternate method for neonatal hyperbilirubinemia screening. Compared to TSB, it requires a smaller sample volume, has a faster turnaround time, and offers concurrent measurement of a full range of analytes (blood gas, electrolytes, glucose, lactate and co-oximetry), allowing efficient comprehensive assessment of the newborn's status. This is especially

beneficial for critically ill neonates whose blood volume is small.

Given these potential advantages of TwB, my colleagues and I conducted a clinical study to compare TwB to TSB at the Children's and Women's Health Centre of BC. 440 heel prick whole blood samples were collected in plain heparinized microtainers from healthy babies < 14 days postnatal age, who had bilirubin testing as their usual care. If visually the samples had sufficient volume for both tests, TwB was measured first and the remainder of the blood was centrifuged for TSB measurement. TSB results were reported as usual.

We found an imperfect correlation between TwB and TSB. There are many factors that can contribute to the observed different results. First, although TwB is measured, the instrument reports "a plasma equivalent bilirubin" using a calculation that relies on the measurement of total hemoglobin (tHb). While this conversion facilitates comparison with the Bhutani nomogram, which is the current clinical standard for risk stratification, inaccurate tHb (analyzer related or not) causes a deviation of "plasma equivalent bilirubin" results. Second, we collected capillary samples in plain heparin tubes. Microscopic clot formation may have affected the accuracy of the co-oximetry results if specimens were poorly mixed. Third, commercial calibrators used by field methods are known to affect the accuracy of bilirubin

✓ **Our abstract won an NACB (National Academy of Clinical Biochemistry) distinguished abstract award**

measurements by chemistry analyzers. Standardization is needed for all bilirubin methods. All these factors raise challenges for the design of whole blood bilirubin methods. In summary, TwB is not yet ready for neonatal hyperbilirubinemia screening. Handling the difficult matrix of whole blood requires technological improvements to control both preanalytical and analytical variables.

Our abstract on this project was selected for an NACB (National Academy of Clinical Biochemistry) distinguished abstract award. Subsequently, the poster was presented at the AACC (American Association of Clinical Chemistry) annual meeting in Atlanta in July 2015. A brief snapshot about this project was published in the NACB scientific shorts providing an excellent way to showcase our research to a larger and more diverse audience.

From the sources of variability we identified, we are planning to conduct a follow-up evaluation study with comparison to a reference procedure to further assess the bias between TwB and TSB. □

THE NEW MICRO CT SCANNER

Dragos M. Vasilescu, PhD

Studying the 3D pathology of the lung *via* Micro Computed Tomography



The UBC Centre for Heart Lung Innovation (HLI) located at St. Paul's Hospital has a long-standing tradition of performing pathology studies of the heart and lung. On April 9th 2015, the Centre acquired a state-of-the-art Nikon XT-H 225 ST Micro Computed Tomography (micro CT) scanner that can be used to acquire images of structures in the range of 2-3 μm . This resolution is ~ 1000 times greater than that of clinical CT scanners used for imaging organs *in vivo*. Thus, compared to clinical high-resolution CT scanners which can be used to visualize airways

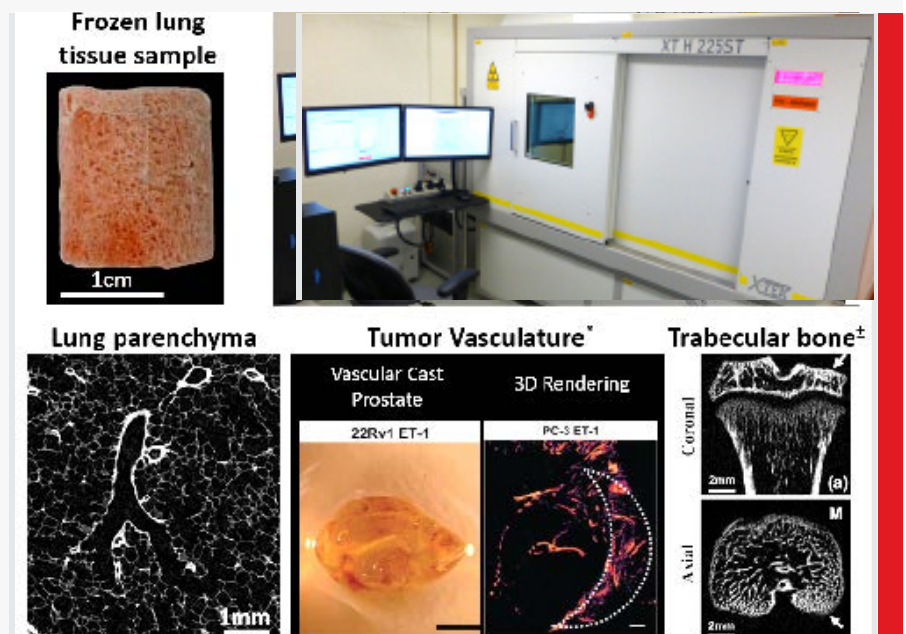
of 1-2 mm diameter within the human lung, a micro CT scanner can image the wall structure of individual alveoli at the 15-30 μm range within lung tissue samples.

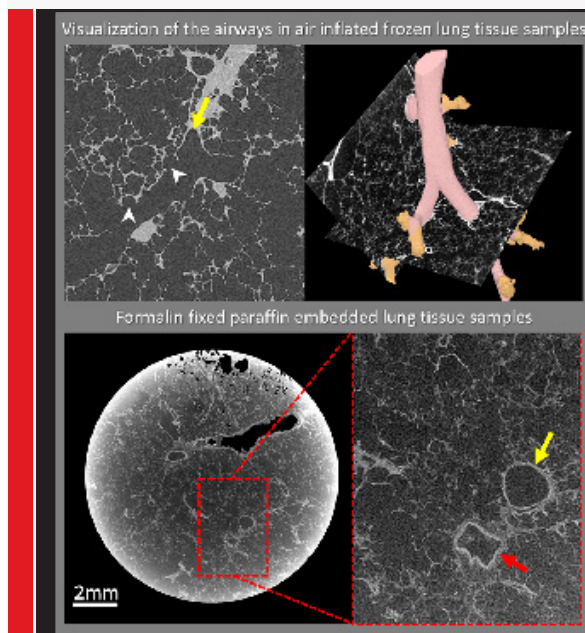
The unique configuration of this micro CT scanner, built by Nikon, allows the visualization of a variety of biological samples such as lung, heart, bones and tumors (See figure 1). Traditionally all samples have had to be fixed and dried for micro CT imaging. In a recent publication, HLI investigator Dr. Tillie Hackett, in collaboration

with the University of Southampton, UK, published a new imaging protocol which allows scanning of formalin fixed paraffin embedded tissue samples. The unique configuration of this scanner provides the necessary contrast between tissue and paraffin. This allows the performance of structural quantification on airways and parenchyma as well as scouting for lesions of interest within a tissue block, which can save valuable time during sectioning (Scott and Vasilescu et al. PLoS ONE 10(6), 2015).

THE NEW NIKON XT-H225ST MICRO CT SCANNER

Figure 1: The new Nikon XT-H225ST installed at the HLI provides high resolution imaging of structures down to 2-3 μm . Dr. Vasilescu is the scientific at the HLI for developing imaging protocols for micro CT. Dr. Vasilescu is involved in projects to scan the lung parenchyma, coronary arteries, vascular tumor casts or the trabecular bone structure. (Figures modified from: *Weydert et al., Cancer Biology & Therapy 8:8, 720-729; 15 April 2009, ±Mohan et al., Arthritis Research & Therapy 2011, 13:R210)





VISUALIZING THINGS INSIDE AND OUT

Figure 2: Imaging the complex lung structure with micro CT enables the study of the smallest airways and tissue structures within the lung. Visualizing frozen lung tissue samples is a great challenge because of the extended scanning times required. The elastic properties of lung tissue collapse the tissue and the RNA degrades if the tissue is not fixed or maintained frozen at less than -25°C. Formalin-fixed, paraffin-embedded tissue samples are also difficult to scan due to the small difference in density between paraffin and tissue.

Both these challenges have been overcome with the new micro CT scanner installed at the HLI, and the development of new imaging protocols. The Nikon micro CT scanner provides high enough resolution for both sample types allowing visualization of the airway structure (yellow arrows), blood vessels (red arrow) and alveoli (white arrow heads). The scans can then be used to segment the airways and perform 3D image visualizations for a better understanding of the branching patterns.

Dr. Dragoș M. Vasilescu is the scientist at the HLI who is using the new microCT scanner to study the pathology of different types of Chronic Obstructive Pulmonary Disease (COPD). COPD is the fourth leading cause of death in Canada and is generally diagnosed only when symptoms are past irreversible tissue destruction.

Working under the mentorship of Dr. James Hogg, Dr. Vasilescu was recently awarded (June 2015) an Alpha-1 Foundation Fellowship. Dr. Vasilescu's research was also funded this year by the BC Lung Association to study the molecular determinants responsible for the degradation of lung tissue of patients with alpha-1 deficiency. The objective of the project is to determine a gene signature present in the lungs of patients who lack alpha-1 antitrypsin which is directly related to the structural changes

that occurs during the disease. An understanding of this relationship lead us to improved clinical interventions that can be applied to change patient outcomes.

Dr. Vasilescu's research focus is to provide a better understanding of lung function and structure in health and disease by using three dimensional imaging tools such as computed tomography. He became interested in lung imaging and physiology. During his undergraduate degree in medical computer science with a major in image processing from the University of Applied Science, Giessen, Germany Dr. Vasilescu became interest in lung imaging and physiology. During his PhD, he joined the world-renowned lung imaging laboratory directed by Dr. Eric A. Hoffman at the University of Iowa. His PhD project focused on the development

of imaging-based analysis methods for studying the ultrastructure of the lung. As part of his training he also worked with esteemed lung anatomists Drs. Ewald Weibel and Matthias Ochs to develop methods that combine traditional stereology-based sampling with 3D micro CT imaging techniques. Since the installation of the micro CT scanner, Dr. Vasilescu has developed an imaging protocol that allows scanning frozen tissue samples which do not undergo any of the changes related to fixation or embedding. As shown in figure 2, these images provide the basis for image segmentation algorithms to study the 3D anatomy of small airways and alveolar air spaces.

If you would like to know more about the micro CT imaging performed at the HLI please contact Dr. Vasilescu at dragos.vasilescu@hli.ubc.ca. □



A BIG SUMMER FOR LUNG CANCER PATIENTS

Diana Ionescu, MD, FRCPC, FCAP

On June 16 and 18, the House of Commons Standing Committee on Health had a two day hearing on lung cancer. The motion for this hearing was introduced by **Wladyslaw Lizon**, MP for Mississauga East–Cooksville. MP Lizon has been working with Lung Cancer Canada (LCC), helping us increase lung cancer awareness.

The purpose of the two days was for the Parliamentary Standing Committee on Health to gain a better understanding of key topics in lung cancer, including:

- The level of awareness of the main causes of lung cancer beyond smoking, such as radon gas exposure;
- The fundraising challenges faced by the lung cancer community and researchers, due to the stigma associated with lung cancer being perceived as a “smoker’s disease”;
- The latest research about causes of lung cancer for men and women;
- Emerging best practices for the screening and detection of lung cancer.

On June 16th, the Standing Committee on Health heard from many professionals in the field, including Lung Cancer Canada President **Dr. Natasha Leighl**, as well as **Dr. Paul Wheatley-Price**, **Dr. Stephen Lam**, and **Dr. Diana Ionescu** – all members of Lung Cancer Canada’s Medical Advisory Committee (MAC).



I was honored and excited to being invited by the Standing Committee on Health to talk about the role of pathology and laboratory medicine in the diagnosis and treatment of lung cancer, and about companion diagnostic tests, several of which are now standard of care for lung cancer. This was a unique opportunity for me to also inform the Committee about what we do as pathologists and how our role is constantly changing in the era of personalized medicine.

In Canada since 2009, the landscape of biomarker testing for lung cancer has been shaped by multidisciplinary groups of medical oncologists, pathologists and molecular scientists, who work together to develop and implement the best testing strategies for Canadian patients. We take into consideration not only scientific results but also the economic realities of our healthcare system and so far have been very successful. This national approach to testing is unique and elegant. It makes us, as Canadian lung physicians, proud of being able to collaborate with each other and with health care authorities and to see our work being cited by academic and private testing centers around the world. I am very passionate about promoting our specialty to the patients and the public. Although this event was very important for lung cancer patients, I think my participation made it also important for Pathology as a medical specialty and raised the awareness of how crucial our role is in cancer care. To learn more about this event and about lung cancer in Canada please visit www.Lungcancercanada.ca. □

REVERSE INNOVATION BRINGS TECHNOLOGY FROM DEVELOPING NATIONS TO CANADA

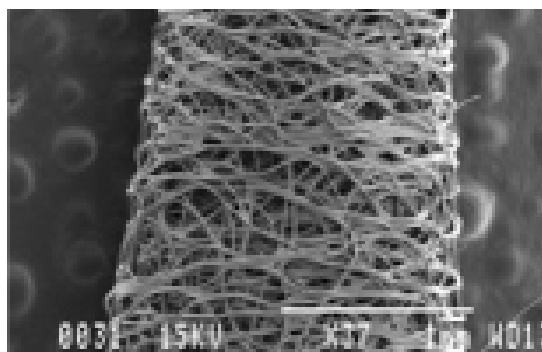
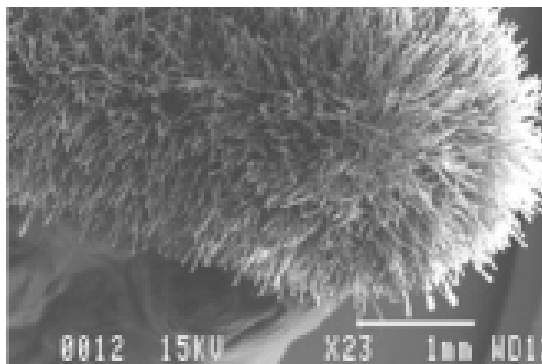
Dr. David Goldfarb, who has just joined C&W and UBC, is being featured in a CBC news -cast



David Goldfarb, left, with members of the Botswana gastroenteritis research collaboration. Goldfarb helped create a new swab to test children with diarrhoeal disease in Botswana. The test is now being used in Nunavut and other parts of Canada. (David Goldfarb)

FLOCKED SWAB

Goldfarb's flocked swab allows doctors to take a sample from a sick child immediately rather than waiting for a stool sample. (David Goldfarb)



MAGNIFIED SWAB

BOTSWANA SWAB USED IN CANADA

Canadian-trained doctor David Goldfarb was teaching at the University of Botswana's school of medicine, when he says he noticed how troublesome diarrhoeal disease is, often caused by intestinal tract infections.

According to the World Health Organization, diarrhoea kills about 760,000 kids under five in the developing world annually.


Normally, when sick child sees a doctor, they wait to have a stool sample collected for testing – a process that can take days.

Goldfarb helped create a new type of swab that lets doctors immediately grab a sample and have it tested sooner. It also can be shipped easily in a dry container. Grand Challenges Canada, a program funded by the government of Canada to support health innovations in the developing world, is now funding a study to determine whether faster diagnosis, thanks to the flocked swab, results in fewer deaths.

Meanwhile, Botswana is sponsoring a country-wide study using the swabs to determine the causes of gastroenteritis, an intestinal lining inflammation, and to evaluate the effectiveness of the rotavirus vaccine.

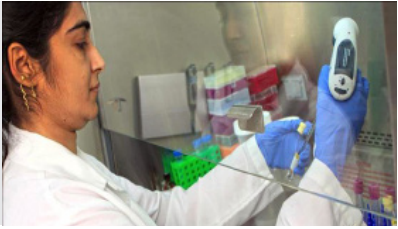
"The things that we're doing in Botswana are very much cutting-edge," says Goldfarb.

The swab's impressive performance prompted the researchers to team up with the government of Nunavut. They're testing the swabs in five communities to determine which might benefit from the rotavirus vaccine. Some groups in Alberta and Toronto's Hospital for Sick Children are also using the product.

Goldfarb, who now works as a professor at the University of British Columbia, didn't anticipate that the swab would be used so broadly. He says his experience has taught him **that innovation in the developing world is not a one-way street.** 

BC CHILDREN'S HOSPITAL BIOBANK OPEN FOR BUSINESS

Suzanne Vercauteren, MSc, MD, PhD & Tamsin Tarling



PLAQUE UNVEILING

The BC Children's Hospital BioBank (BCCHB) opened in January 2015 and is actively collecting biospecimens and clinical data from patients, who give their consent and who are seeking medical care at BC Children's Hospital or BC Women's Hospital.



Over the last decade, biobanking has become an important infrastructure of research institutes and academic health centers around the world. A biobank is a resource to aid the collection, processing and storage of biospecimens and annotated clinical data for research purposes. The role of a biobank is to provide researchers with high quality biospecimens obtained from patients in an ethical manner. The data associated include participant demographics

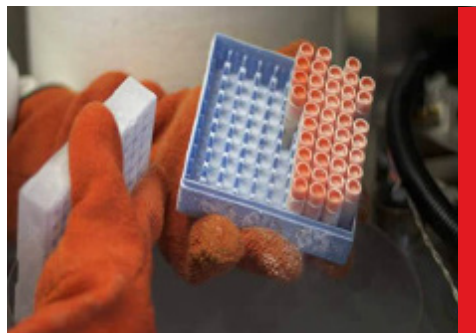
and clinical outcomes, thereby greatly increasing the value of the biospecimens.

Historically, biobanks have existed in a less formal manner and have each been owned by a single researcher resulting in numerous "biobanks" across a single institute. At BC Children's Hospital, a consolidated approach was taken whereby a single biobank has been established to serve the research community. Several advantages can be realized by establishing a campus-wide biobank - including standardization and improved quality of biospecimens, lower operating costs, efficient space allocation and a decrease of the "consent burden" for patients. A single specimen from one patient has the ability to fuel numerous research projects.



SAMPLES

The aim of the BC Children's Hospital BioBank is to provide researchers with high quality samples obtained from patients in an ethical manner.



The BC Children's Hospital BioBank (BCCHB) opened in January 2015. BCCHB is actively collecting biospecimens and clinical data from patients, who give their consent and who are seeking medical care at BC Children's Hospital or BC Women's Hospital.

The BCCHB is in a unique situation of being able to collect specimens from a wide variety of children and women. This includes specimens from patients with complex diseases covering multiple disciplines, as well as maternal biospecimens collected during pregnancy - a valuable resource for research into pediatric diseases influenced by the *in utero* environment.

The BCCHB has established a comprehensive collection of specimens from pediatric patients with leukemia and benign haematological disorders and has growing collections of specimens from:

- pediatric patients with solid tumours
- neurological disorders, particularly epilepsy
- blood, cord blood and placenta from healthy and complicated pregnancies
- pediatric tonsil tissue

In addition, the BCCHB supports researchers at Children's & Women's Health Centre of BC by offering support services such as:

- requesting consent from potential participants
- processing of specimens in such a way that they can be used for multiple research projects and are suitable for long term storage
- storing specimens in secure freezers with 24/7 monitoring



APPLICATIONS

SPECIMEN WITHDRAWALS

Researchers who have ethical approval for their study can apply to withdraw specimens and annotated clinical data from the BioBank for their research projects.

Applications for access to specimens and requests for services are welcome.

- collecting clinical data
- The BCCHB strives for continuous quality improvement. As such, BCCHB also carries out its own research in a number of areas including optimization of biospecimen processing and addressing public opinions in regards to research and the ethical issues associated with biobanking.

The development of the BCCHB was supported by a donation from the BC mining industry's charity of choice, Mining for Miracles, through the BC Children's Hospital Foundation. Dr. Suzanne Vercauteren, MD PhD, is the director of the BCCHB as well as a Hematopathologist at BC Children's Hospital and a Clinical Associate Professor in the Department of Pathology and Laboratory Medicine at UBC.

The BCCHB is a registered and certified biobank. The BCCHB works closely with the Office of Biobank Education and Research, also part of the Department of Pathology and Laboratory Medicine at UBC. Visit the BCCHB website at www.cfri.ca/biobank. For further information, including accessing specimens, please contact the BioBank Administrative Manager, **Tamsin Tarling** by email tamsin.tarling@cw.bc.ca. □

APPLICATION PROCEDURE

1

CHECK AVAILABILITY

Contact BioBank Administrative Manager about availability of samples

2

FILL OUT FORM

Fill out BioBank Application form and submit to BioBank Administrative Manager along with ethics protocol and ethics certificate

3

APPLICATION REVIEW

Await application review by Scientific Access Subcommittee

4

OBTAIN SAMPLES

Sign Material Transfer Agreement to obtain BioBank samples



OVERDIAGNOSIS AND OVERTREATMENT

Nickolas Myles, MD, PhD, FRCPC

Preventing Overdiagnosis – Emerging Concepts
(Pathology crossing roads with evidence-based practice)

Improved access to healthcare services and technologies opens new frontiers to diagnosis and prevention of human diseases in a more personalized and targeted way. Ideally, it should lead to improved outcomes: mortality and morbidity reduction and improved quality of life for the patients and the population as a whole. If this does not happen, overuse of resources and technologies results in overdiagnosis and overtreatment and only contributes to healthcare costs and becomes a significant burden on patients, society and tax payers.

The Canadian Medical Association has launched the CHOOSE WISELY campaign (<http://www.choosingwiselycanada.org/>) which was endorsed by the Canadian Association of Pathologists. Its aim is to curb unnecessary medical testing and procedures which do not lead to improved patient outcomes. It coincides with another important international development. Two years ago, in 2013, the Center of

Evidence-based Medicine, University of Oxford, started an initiative on the PREVENTION of OVERDIAGNOSIS and has held several successful international meetings attracting huge interest from all medical specialties, with all lecture theatres packed and with people sitting on the stairs.

As the concept of overdiagnosis emerges, it requires an open and healthy academic debate. Below are several key excerpts from the Second International Conference on Overdiagnosis, hosted by the University of Oxford, in September 2014.



WENDY ROGERS, SYDNEY, AUSTRALIA:

"Overdiagnosis refers to health care that harms rather than benefits patients. Various types of overdiagnosis have different drivers and require different solutions.

Typology of Overdiagnosis:

- Misdiagnosis: labelling of benign growth, or conditions that do not cause symptoms or morbidity in ways that imply that they are

harmful (for example very small pulmonary emboli identified by CT angiography)

- Misclassification: conditions that are not harmful or progressive are classified as diseases:
 - a.** Explanation of categories by redefining cut-off levels of normal so that the "affected" population increases in size (e.g. type 2 diabetes, chronic kidney disease);
 - b.** Disease mongering where conditions previously considered trivial or part of ordinary life are reclassified as disease (restless legs syndrome, now known as the neurological disorder Wils Ekbom disease)
- Over detection: lesions are investigated and treated even though many of them are harmless:
 - a.** Screening identified abnormalities (for example breast and prostate cancer);
 - b.** "Incidentalomas" identified by increasingly sophisticated imaging.
- Overtreatment: may not be a type of overdiagnosis, but is often a mechanism for harm occurring, arising from:
 - a.** Treatment of risk factors;
 - b.** Failure to be able to distinguish aggressive from non-aggressive growths (i.e. breast cancer);
 - c.** Medical management of "ordinary life" events (similar to disease mongering)."

PREVENTING OVERDIAGNOSIS CONFERENCE 2016

The fourth international Preventing Overdiagnosis conference will be held in Barcelona Spain. <http://www.preventingoverdiagnosis.net/>



DARLENE MANGIN, MCMASTER UNIVERSITY, CANADA:

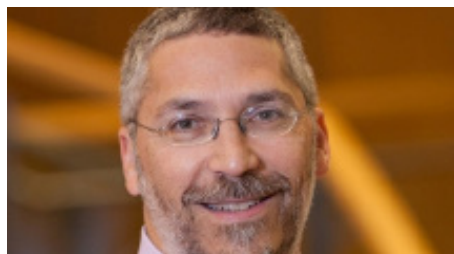
"Providing good care in the next decades could be identified by a new kind of prevention – where the values of research and clinical care support decisions to stop or reduce the dose of medicines and where comparative safety is as valued as much as comparative efficacy."



BARRY KRAMER, NATIONAL CANCER INSTITUTE, USA:

"The enthusiasm of increasingly sensitive cancer screening tests has dipped into a very large reservoir of indolent lesions and tumors whose biological behavior is poorly defined or unknown. Many such lesions represent overdiagnosis, but others have lethal potential. Fear of the latter drives overtreatment, one of the most pressing problems in clinical oncology. There are debates regarding how to recognize overdiagnosed lesions. One proposed strategy is the development of disease-specific biomarkers that can distinguish aggressive cancers from non-aggressive ones detected by imaging and other technologies. Innovation in molecular biology, genomics, proteomics and

immunology tools may provide insight. Advances have been made in identifying genetic and other molecular changes associated with growth, survival and proliferation of cancer cells. However, several lines of evidence point to the roles of variety of other factors, including stromal cells and immune cells in the microenvironment."



RONALD ADLER, UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL, USA:

"Cancer screening generates substantial over-diagnosis and over-treatment. The benefits of cancer screening are less than people believe while harms are greater than people think. Promotion of screening is often based on the mistaken concept – and conventional wisdom – that early diagnosis is always beneficial. Healthcare providers often experience a significant knowledge deficit regarding the interpretation of cancer screening statistics."

Many aspects of overdiagnosis originate from and are fueled by a self-feeding loop of medical testing. Therefore pathology and pathologists are not immune from over-testing and face increasing peer pressure to perform more and more tests. The Royal College of Pathologists of UK has published a blue-print position paper on "Histopathology and Cytopathology of limited clinical

value" (2005), attempting to reduce the diagnostic waste in anatomical pathology and cytopathology which could serve as a general guide on how to reduce unnecessary medical testing.

Here are some excerpts from this long and detailed document:

"Sputum samples should be requested in the main by respiratory physicians and only from patients unfit for bronchoscopy. After discussion of these guidelines with clinical colleagues, a 60% reduction of sputum samples has been reported"

"Only a single sample should be assessed when draining effusions related to cardiac failure, unless there is other good evidence of malignancy"

"Ascitic fluid: only a single sample should be assessed for patients with chronic liver disease" "Cerebrospinal fluid (CSF) cytological examination should only be performed on cases with a suspicion of malignancy, or aseptic meningitis; the possibility of multiple sclerosis is not an indication for CSF cytology"

"Oesophagus: There is no justification for a biopsy from the normal oesophagus. Biopsies from patients with reflux esophagitis are unhelpful; endoscopy is better at assessing reflux than histology."

"Stomach. There is no evidence base that biopsy of the normal stomach gives any useful clinical information that is likely to alter management in the routine setting. It is emphasized that there is always a need to biopsy abnormal areas of the stomach. Biopsies should not be done purely to identify H pylori (HP); there are equally good alternative and much cheaper tests"

Those readers who are interested to know more can download a free pdf from Royal College of Pathologists website: <https://www.rcpath.org>.

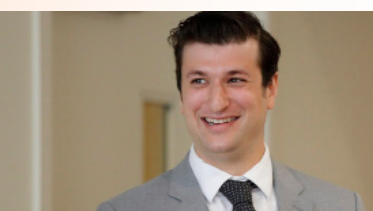
The problem of overdiagnosis is truly multidimensional and multidisciplinary and is directly applicable to modern practice of diagnostic pathology. □

PERSONALIZED ONCOGENOMICS (POG) INITIATIVE



BC Cancer Agency

CARE + RESEARCH



Stephen Yip, MD PhD & Brandon S. Sheffield, MD

The Advent of Genomic Pathology Rounds – How Personalized OncoGenomics is Transforming the Practice of Oncology and Pathology

The Personalized OncoGenomics (POG) initiative, started two years ago and co-lead by Drs. Marco Marra and Janessa Laskin, has altered how we perceive and interpret genomic data as it relates to clinical cancer care. POG uses next-generation sequencing technologies, performed in real time (in between the time of recurrence and the initiation of therapy) and integrates the data into individualized treatment plans. Since its inception, POG has transformed every step of the cancer-care process, from acquisition of biopsy samples to pathologic interpretation, and treatment decisions while simultaneously creating new elements such as library construction, sequencing, data analysis, and cancer cell pathway mapping: all

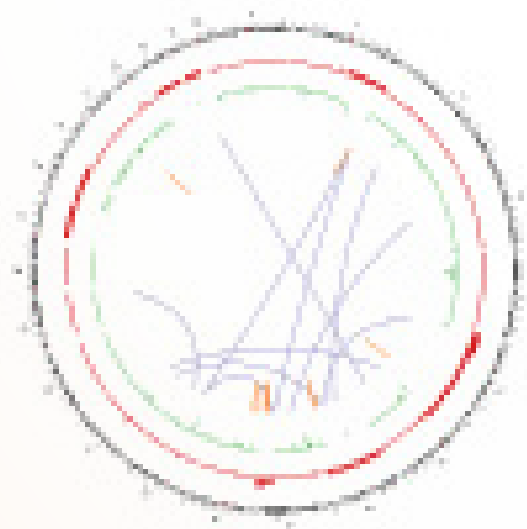
accompanied by the need for novel applications of quality assurance measures.

It has been a long journey from the very first weekly meetings, where an entire hour was devoted to a single case with long discussions on highly technical topics, to the current meetings that rapidly turn 'omic' data into precision treatment options. Throughout this evolution of the weekly POG rounds, attendance by oncologists, genomic scientists, bioinformaticians, and pathologists has been strong, building a robust multi-disciplinary approach to molecular oncology. Computational biology/bioinformatics and clinical medicine can be thought of as analogous to the "two cultures" of

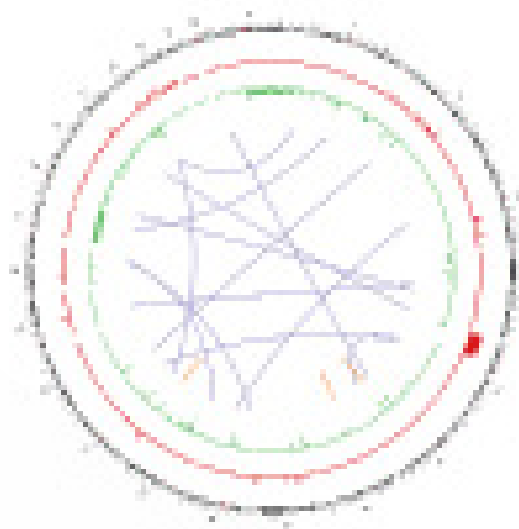
PERITONEAL MESOTHELIOMA

Circos plots representing multi-dimensional whole genome data sets of copy number and structural alterations of two peritoneal mesothelioma from the POG program.

Note the many differences between the two genomes despite having similar histologic diagnoses.



A Patient 1



B Patient 2

the sciences and humanities first proposed by C. P. Snow in 1959. The new era of genomic medicine has bred a much more complicated and nuanced interdependence of these entities.

After two years of weekly genomic pathology rounds, we have witnessed the coming together of these two cultures. Both clinicians and scientists are starting to speak and share the same language. Interestingly, pathology has become the lingua franca of these rounds. Terms such as “cellularity”, “immunohistochemistry”, “translocations” are routinely brought up at these rounds by both clinicians and genomic scientists. We have also seen a much heavier reliance on pathology in these rounds – initially for determination of tissue cellularity for library construction, to validation of sequencing findings with immunohistochemistry and fluorescent *in situ* hybridization (FISH). In our opinion, at these rounds pathologists are equal partners, along with the oncologists and computational scientists. Often, the pathologist would offer the most insight into particularly complex and rare cases as well as bridge the gap between basic science and clinical medicine. These skills and knowledge base are essential to directing genomic analyses to uncover potentially targetable cancer pathways.

POG offers tremendous opportunities to perform ground-breaking research in genomic pathology. The breadth and depth of cases sequenced is impressive: over two hundred unique cancer patients with whole genome and transcriptome data along with matched pathology specimens for additional study. For example, we have embarked

on a project to correlate genomic information, in the form of digital gene expression data, with protein expression identified *via* traditional immunohistochemistry. Given the ability to measure the expressions of all 22,000 genes in cancer cells, next generation sequencing has a significant advantage over the limited repertoire of antibodies available in a typical clinical pathology practice. This approach, which we term “virtual IHC”, has proven especially useful to deducing the natures of cancers of unknown primary origin as well as confirming pathologic diagnoses. Data generated from large-scale cancer sequencing projects, particularly by The Cancer Genome Atlas or TCGA, are also incorporated into the analytic pipeline and used to predict the diagnosis by comparing the tumour’s gene expression profile to thousands of known cancer specimens.

The heterogeneous nature of the tissue input for sequencing, which includes cancer cells, tumour associated microenvironment, and tumour infiltrating lymphocytes and macrophages works in our favour. We are actively looking at gene expression profiles of inflammatory cytokines and molecules, as well as immune checkpoint proteins such as PD-L1 which may help predict the response to immunomodulatory therapy. Recent studies have shown that hypermutated tumours, such as colorectal carcinomas with defects in the mismatch repair pathway, or smoking-related lung cancers, might benefit from immune checkpoint therapy. This is related to the elevated novel antigenic epitope burden in the hypermutated tumours, which helps to elicit a robust anti-tumour

immune response once the PD-L1 checkpoint inhibition is reversed. Bioinformatic and analytic tools developed at the Genome Sciences Centre have enabled POG to extract this type of information from the tumour sequencing data. For example, knowledge of the mutation burden (i.e. number of somatic mutations) as well as their context (what are the neighbouring nucleotides) has proven to be very informative of the nature of cancer-initiating-events such as MMR defects, BRCA deficiency, smoking exposure, post-alkylator exposure. This form of “oncogenomic archaeology” allows us to determine specific signatures in the cancer genome, and is being increasingly associated with a growing number of treatment options. Mutation signature analysis, and other resources available through POG, are helping us to decipher the life story of a cancer – its initiating events and changes in response to therapy – with the ultimate aim of predicting changes that could be countered by additional or novel therapies.

The POG genomic pathology rounds have increased from one to four patients per hour as clinicians and scientists, and trainees from all fields are swelling attendance. Each case presentation consists of a short clinical preamble followed by a pathology presentation discussing the pertinent histological features, cellularity and tumour content of the tissue, and lastly, the known immunohistochemical and molecular findings of the tumour. The rest of the case is devoted to the presentation of the genomic findings and identification of potentially targetable pathways. In our opinion, the most important aspect of the rounds is the

ensuing discussion among the oncologists, genomic scientists, and pathologists. These are not only working rounds but also lead to development of new ideas about disease pathogenesis. We strongly believe this represents the future of pathology (one can call it “molecular pathology”) – where genomic information is seamlessly integrated with classical pathology knowledge and histological descriptors rather than these cultures appearing as isolated silos. Our experience has taught us that the richest molecular data is derived from tissues chosen by experienced histopathologists, and conversely, that the most meaningful pathology reports embrace available molecular data. The integration of genomic

information into “traditional”, glass-based pathology aims to direct the appropriate therapy to the correct patient with the “correct” disease state which, in our opinion, fulfils both the formal and the classical definition of “individualized medicine”.

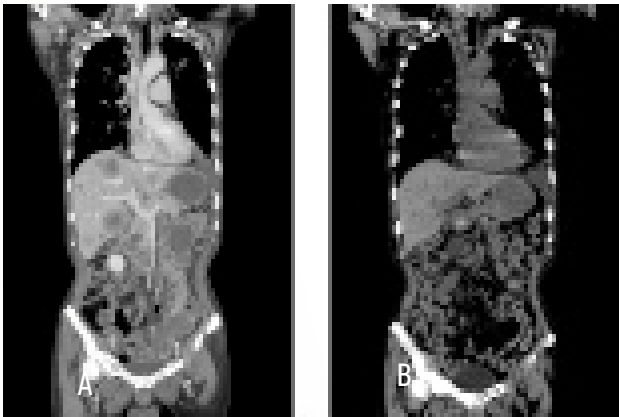
Lastly, the granular data generated in POG play a valuable role in quality control. A timely example involves a case of non-small cell lung carcinoma (NSCLC) in an Asian male never-smoker. As part of the standard molecular pathology algorithm the tumour tissue underwent focused sequencing for EGFR mutations and immunohistochemical testing

for aberrant ALK protein expression that eventually lead to (FISH) for structural rearrangement of the ALK gene. The novel fusion gene EML4-ALK is found in 3-5% of NSCLC. Patients with this relatively uncommon, but therapeutically important, somatic rearrangement respond dramatically to the tyrosine kinase inhibitor crizotinib – hence the importance of accurately identifying these patients. This particular tumour was negative for the EGFR mutation and was reported as negative for ALK rearrangement and the patient was deemed ineligible for targeted therapy. The patient was subsequently enrolled in the POG project, which identified an EML4-ALK fusion event in both the DNA and RNA. Crizotinib was initiated and had a dramatic clinical response. In this case, genomic pathology helps to unravel the sequence of events and individual steps of the decision process when a cryptic, yet not totally unexpected, genomic translocation leads to a particular molecular interpretation. Post-hoc genomic findings, particularly of pathognomonic events such as cryptic rearrangement of EML4-ALK, serve to provide confirmation of the traditional “glass- based” and molecular diagnose. In this case, the genomic pathology helped to alter the outcome of a disease by correctly identifying “actionable” genomic targets. Like it or not, the practice of pathology is changing.

Clinical trainees are in the ideal position to experience this exciting change, and also to participate in effecting this change and claim it for themselves, defining new roles in the molecular era. This is truly an exciting time to be a pathology resident.

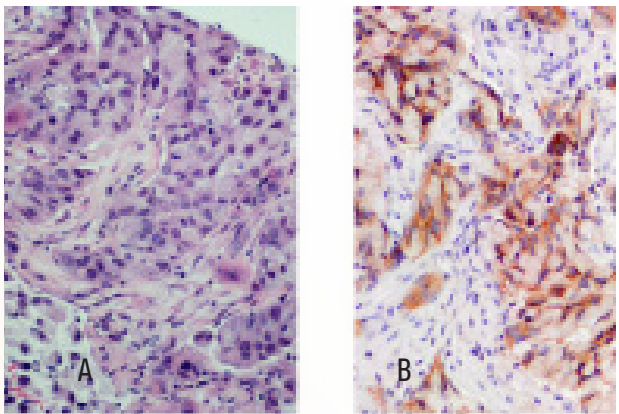
RESPONSE TO CRIZOTINIB

- A) Chest-abdomen-pelvis CT scan from prior to initiation of anti-ALK therapy
- B) Chest-abdomen-pelvis CT scan after initiation of anti-ALK therapy, note dramatic decrease in the size and number of visible liver metastases



SUPRACLAVICULAR LYMPH NODE BIOPSY

- A) H&E stain showing poorly differentiated adenocarcinoma
- B) ALK immunohistochemistry (5A4) showing diffuse 2+ membranous staining



UNCOVERING LOW ALLELIC MUTATIONAL EVENTS IN SOMATIC MOSAICISM AND CANCER – WHY BOTHER?

Stephen Yip, MD PhD

Traditionally, somatic mutations are thought to occur as either homozygous/hemizygous or heterozygous states in cancer displaying 100% and 50% allelic frequency (AF), respectively. Examples of common cancer mutations, such as BRAF V600E and IDH1 R132H, that behave as “oncogenic drivers” classically present as heterozygous mutations. Typically these events are easy to identify using traditional molecular assays including Sanger sequencing, the workhorse of the Human Genome Project during the last century. In fact, mutation-specific antibodies are available for these two particular events such that their identification becomes part of the routine diagnostic workup in clinical pathology.

Somatic mosaicism (SM) is an intriguing concept steeped in the history of developmental biology. This phenomenon is present in both health and disease and the prime example of the former is ‘Blaschko’s lines’ which was described in 1901. Existence of unique genetic clones arising during development, in conjunction with spatial and temporal heterogeneity, contributes to SM. These clones are typically rare, despite carrying *de facto* and well-documented oncogenic somatic mutations such as PIK3CA H1070R, but certainly can contribute to disease phenotype. Rather than outright cancerous growth, SM of PIK3CA occurs in a small number of cells in the body often displaying germ layer

restriction, and is associated with a variety of asymmetrical overgrowth syndromes such as CLOVES syndrome and fibroadipose hyperplasia. The presence of a small number of cells carrying oncogenic mutation(s), in a sea of genomically “normal” cells, contributes to the unique phenotypes observed in various SM-mediated disorders.

Cancer can be thought of as an organism displaying genomic, epigenomic, spatial as well as temporal heterogeneity. Myriad clones and subclones of cancer cells often co-exist and are selected for or against depending on growth conditions and treatment. Many of the genomically-unique, evolving clones, despite existence at low abundance, could potentially contribute to the biology and clinical behaviour, such as treatment resistance, of the cancer.

Until now, technological constraints have prevented the molecular dissection of such low allelic events in both cancer and SM. Next generation sequencing, particularly focused amplicon sequencing, allows for deep interrogations of genetic loci which can uncover such rare genomic events within cancer and seemingly normal tissue in SM. My collaborators and I have used this technology successfully to uncover SM in neurocutaneous melanosis and mesenteric lipomatosis. Moreover, deep amplicon sequencing was used to

demonstrate dual IDH1/2 mutations in a subset of cytogenetically - normal AML. For example, we found co-existence of mutations that lead to IDH1 R132H at 44% AF and IDH2 R140Q at 5% AF in the same clinical sample. Whether these exist in different cell clones or in *cis* or *trans* in the same clone is actively being investigated. However, the more pressing question is how these mutations progress temporally and in response to treatment, particularly treatment with IDH inhibitors. This illustrates nicely how technological changes lead to the constant challenging of existing paradigms and the evolution of concepts of health and disease. □

REFERENCES:

- Poduri, A., Evrony, G. D., Cai, X., & Walsh, C. A. (2013). Somatic mutation, genomic variation, and neurological disease. *Science*, 341(6141), 1237758.
- Shih, F., Yip, S., McDonald, P. J., Chudley, A. E., & Del Bigio, M. R. (2014). Oncogenic codon 13 NRAS mutation in a primary mesenchymal brain neoplasm and nevus of a child with neurocutaneous melanosis. *Acta Neuropathol Commun*, 2(1), 140.
- Cohen, A. S., Townsend, K. N., Xiang, Q. S., Attariwala, R., Borchers, C., Senger, C., Picker, W., Levi, J., Yewchuk, L., Tan, J., Eydoux, P., Lum, A., Yong, S. L., McKinnon, M. L., Lear, S. A., Everett, R., Jones, S. J., Yip, S., & Gibson, W. T. (2014). Somatic mosaicism for the p.His1047Arg mutation in PIK3CA in a girl with mesenteric lipomatosis. *Am J Med Genet A*, 164A(9), 2360-2364.
- Platt, M. Y., Fathi, A. T., Borger, D. R., Bruner, A. M., Hasserjian, R. P., Balaj, L., Breakefield, X. O., Lum, A., Yip, S., Dias-Santagata, D., Zheng, Z., Le, L. P., Graubert, T. A., Iafrate, A. J., & Nardi, V. Detection of dual IDH1 and IDH2 mutations by targeted next-generation sequencing in acute myeloid leukemia and myelodysplastic syndromes. *J Mol Diagn*. 2015 Aug 30. pii: S1525-1578(15)00148-8.

CLINICAL INSTRUCTOR
STAFF HEMATOPATHOLOGIST,
PROVIDENCE HEALTH CARE



DR. MAJID MOTEABBED, MD

I earned my Medical Doctor degree at Shaheed Beheshti (Melli) University of Medical Sciences, Tehran, Iran. I am currently a staff hematopathologist at the Department of Pathology and Laboratory Medicine at St. Paul's Hospital. I was appointed as a Clinical Instructor - Hematopathology in the Department of Pathology & Laboratory Medicine, UBC in 2015. My areas of interest include review of bone marrow and peripheral blood smears, flow cytometry and coagulation studies and transfusion medicine support. My contribution to medical education for residents includes: hematopathology and clinical hematology.

POST-DOCTORAL FELLOW
Supervisor: Torsten Nielsen



KARAMA ASLEH-ABURAYA, MD

I earned my Medical Doctor degree at Tel Aviv University. Following a one year medical oncology residency, I became extremely fascinated by the field of breast cancer care. My clinical work inspired me to pursue my art of care through breast cancer research. As a post-doctoral fellow at the "Genetic and Pathology Evaluation Center" and "BC Cancer Agency", I am presented with the opportunity to learn the basics of breast cancer translational research. Through this excellent educational experience, I am expanding my knowledge to explore clinically-relevant diagnostic assays and predictive markers based on immunohistochemistry, molecular assays and next generation diagnostic tools. My vision is to make a noticeable difference in patients' lives through research of outstanding value.

Coming to Vancouver allowed me to join the quest of honoring our nature and living a healthy life. Hiking Vancouver's superb trails from the purest sea to the giant sky became my favorite hobby.

CLINICAL PROFESSOR, HEAD,
DEPARTMENT OF PATHOLOGY AND
LABORATORY MEDICINE
PROVIDENCE HEALTH CARE



MARTIN J. TROTTER, MD, PHD, FRCPC

I am excited to be back in Vancouver in the Department of Pathology and Laboratory Medicine and working again at St. Paul's Hospital where I started my medical career as an intern in 1985. I received most of my post-secondary education at the University of British Columbia (BSc – Honours Physiology 1981; MD 1985, PhD 1990). After my Anatomic Pathology Residency at UBC, I did a Dermatopathology fellowship for one year in London, U.K., at St. John's Institute of Dermatology. I am a Diplomat (Dermatopathology) of the Royal College of Pathologists (U.K.).

I worked for six years as a pathologist at Vancouver General Hospital, and then moved to Calgary in 2000 where I was Division Head, Anatomic Pathology and Cytopathology for Calgary Laboratory Services and the University of Calgary. I practice exclusively dermatopathology, and my major research interests are in skin cancer, especially melanoma, and in workload/quality assurance issues in laboratory medicine. I am Past-President of the Canadian Association of Pathologists and continue to be involved with that organization as Resource Development Chair.

I am married with three grown daughters. If I could spend all my time hiking, climbing, and skiing, I probably would! Great to be back in B.C.!

POST-DOCTORAL FELLOW
Supervisor: David Granville



YASMIN HARVEY, BSC, MBBS (HONS)

I am thrilled to be undertaking a research fellowship in lymphoid cancer research at the British Columbia Cancer Agency in Vancouver. I am an Australian doctor completing specialty training in Pathology in the discipline of Haematology. I received my undergraduate degree in Biomedical Science and Bachelor of Medicine and Surgery at the University of Queensland in Brisbane, Australia. I am interested in utilizing genomic technologies to gain a deeper insight into the mechanisms underlying lymphoid cancers and specifically in developing a gene expression-based predictive biomarker model to identify Hodgkin lymphoma patients unlikely to be cured by standard therapies.

Experiencing the seasons has been a treat for my family and I. We have enjoyed the warm hospitality of Canadians and love the beautiful mountain views, beaches and Pacific Spirit Forest. I love skiing and have my fingers crossed for better snow next winter.

CLINICAL INSTRUCTOR
VGH



QUENTIN NAKONECHNY, MD

Currently, I am a Fellow in Gynecologic Pathology at VGH. I spent the past 8 years working as an Anatomical Pathologist at Abbotsford Regional Hospital and Cancer Center. Prior to working in Abbotsford, I worked for one year as a General Pathologist in Prince George. I completed my General Pathology training at UBC in 2006 and medical school at the University of Saskatchewan in 2001. Professionally, I am looking forward to the new challenges the fellowship offers as I am interested in gynecologic oncology research and teaching of both pathology residents and medical students.

My other interests include spending time with my three children and my wife. My children are involved in a number of different sports including rugby and soccer and we enjoy travelling as a family. Otherwise, I enjoy reading a good book with my favorite genre being historical fiction.

POST-DOCTORAL FELLOW
Supervisor: Poul Sorensen



SEAN MINAKER, PHD

I obtained my graduate training with Phil Hieter at UBC, studying mechanisms of genome instability in budding yeast. I subsequently accepted a postdoctoral fellowship at Vanderbilt University investigating the regulation of the mRNA export mediator Gle1, which is involved in formation of cytosolic RNA and protein aggregates called stress granules. I joined Dr. Poul Sorensen's group in June 2015 to study the role of RNA binding proteins involved in stress granule formation in human sarcomas. I am particularly interested in proteins and mRNAs that associate with YB-1, an important regulator of translation and a prognostic indicator in multiple cancers. Additionally, I am using genetic screening methods to identify novel factors that affect stress granule dynamics and potentially play a role in tumour growth and survival.

In my spare time, I enjoy snowboarding, live music, craft beers and culinary experiments at home. I also love being out in local parks and forests, including camping and hiking or volunteering with habitat restoration projects in Greater Vancouver.

POST-DOCTORAL FELLOW
Supervisor: Randy Gascoyne



EVA GINÉ SOCA, MD

Senior specialist in Hematology, Hospital Clínic of Barcelona, Spain
Post-doctoral Research Fellow, Lymphoid Cancer Research, BCCA

I am very excited to join the Centre for Lymphoid Cancer Research at the BC Cancer Agency for one year as a post-doctoral research fellow. I am a senior specialist in Hematology at Hospital Clínic of Barcelona, mainly devoted to the care of lymphoma patients. I completed my doctoral thesis in 2010 about the mechanisms of transformation in indolent lymphoproliferative disorders. My present research project is focused on follicular lymphoma and studies of the biological mechanisms underlying rituximab responsiveness by means of genomic tools. For me, this is an unique experience that will enrich me both professionally and personally.

I must confess I fell in love with Vancouver and its surroundings just after arriving, and despite being an indefatigable traveler around the world, I knew from the first moment that when leaving I will miss it forever.

POST-DOCTORAL FELLOW
Supervisor: Wayne Moore



BEHNIA S. LASHKARI, MD, PHD

I was awarded my PhD in immunology from the University of Sheffield, UK in 2014. I am also a qualified medical practitioner. During my PhD training, I investigated the role of sex hormones in modifying innate immune responses of epithelial cells of the cervix. In February 2015, I joined Prof. Moore's laboratory at International Collaboration On Repair Discoveries (ICORD), UBC. I am interested in understanding the pathophysiology of demyelination in the central nervous system. I have been studying the interplay between degeneration and inflammation in Multiple Sclerosis as a Postdoctoral Research Fellow.

In my spare time I enjoy cycling, hiking and listening to music.

POSTDOCTORAL RESEARCH FELLOW

Supervisor: Jay Kizhakkedathu



NIMA KHADEM MOHTARAM, PHD

My name is Nima Khadem Mohtaram and I moved from beautiful Victoria to Vancouver on January 2015 to start my postdoctoral research fellow position at the Center for Blood Research in Dr.Kizhakkedathu's lab. I hold a PhD in the field of Mechanical Engineering, from the University of Victoria, BC, where I have been focusing on engineering neural tissues using induced pluripotent stem cells for spinal cord injuries.

I am interested in designing new polymer biomaterials for stem cell therapy. I also serve as the vice-president of the UBC Postdoctoral Association. I play tennis and enjoy running in beautiful and amazing UBC trails. It is my sincere pleasure to join the Department of Pathology and Laboratory Medicine and I am so looking forward to working hard with my colleagues and learning so many new things from them and my students as well.

POST-DOCTORAL FELLOW
Supervisor: Cheryl Wellington



DHANANJAY R. NAMJOSHI, PHD, MSC, MPHARM, BPHARM

Hi, my name is Dhananjay and I am a Postdoctoral Fellow in the laboratory of Dr. Cheryl Wellington. I study pathophysiology, biomechanics, and lipoprotein metabolism in traumatic brain injury. I came to UBC in 2003 armed with a Master's degree in Pharmaceutical Sciences from the University of Mumbai, India. Here I worked in the laboratory of Dr. Peter Soja (Pharmaceutical Sciences) toward my second Master's in Pharmacology. I completed my PhD in Neuroscience with Dr. Wellington at UBC where I studied role of apolipoprotein E in the recovery from traumatic brain injury. I also developed a novel, surgery-free rodent model that faithfully mimics several aspects of concussion in humans.

Apart from my academic activities, I have a keen interest in photography, computers and related latest technology.

CLINICAL ASSISTANT PROFESSOR



REZA ALAGHEHBANDAN, MD, MSC, FRCPC, FCAP

I am a surgical pathologist and a clinical epidemiologist, currently serving as a consultant Anatomic Pathologist at Abbotsford Hospital & Cancer Centre, as well as Medical Director for Laboratory Medicine at the Chilliwack General Hospital. I completed my training in Anatomic Pathology at Memorial University and the University of British Columbia. Subsequently I served as a clinical fellow in surgical pathology at Washington University School of Medicine, Barnes Jewish Hospital in St. Louis, MO, USA, where I trained in oncopathology. My primary research interest is on gynecologic and breast surgical pathology. Being from a Kurd, my longstanding research interests include injury and chronic disease epidemiology related to populations vulnerable from a human rights and social justice perspectives.

Outside of work, I am a swimmer and also enjoy weight lifting and strengthening exercises. I have always been a big fan of Van Gogh and also love classical music with Bach and Beethoven being my top favourite composers.

ASSISTANT PROFESSOR /
SCIENTIST, CHILD & FAMILY
RESEARCH INSTITUTE



PHILIPP LANGE, PHD, MSC

I am an Assistant Professor of Pathology at the University of British Columbia, Vancouver, Canada. In my laboratory at the Child & Family Research Institute I study the molecular basis of childhood cancer. During my time as a Postdoctoral Fellow and Database Developer at the University of British Columbia, at the Centre for Blood Research in the laboratory of Dr. Christopher Overall, I investigated proteolytic processes, protein speciation and posttranslational modification in cancer using and developing novel proteomic and bioinformatics approaches.

I received a PhD in Biochemistry from the Free University Berlin and earned an MSc in Molecular Biology, Microbiology and Computer Sciences from the University of Hamburg. My graduate work at the Max Delbrück Centre for Molecular Medicine, Berlin focused on the genetic and biochemical origin of hereditary osteopetrosis and neurodegeneration in children and the identification of novel drug targets for osteoporosis. I have extensive experience in software development and management of international software development teams with a focus on bioinformatics applications, databases, web applications and social networks.

CLINICAL ASSISTANT PROFESSOR
ST. PAUL'S HOSPITAL/PROVIDENCE
HEALTH CARE



WEI XIONG, MD, PHD, FRCPC

After I obtained my medical degree from Tongji Medical College, China, I joined the graduate program at the University of British Columbia in 2002. Following my PhD, I moved to Seattle, WA, to receive pathology residency and fellowship training at the University of Washington. I then spent one year at the University of Calgary as a clinical assistant professor in the Department of Pathology & Laboratory Medicine in 2013 and finally came back to Vancouver in July 2014. I am currently an anatomical pathologist at the Department of Pathology and Laboratory Medicine at the St. Paul's Hospital. To my great pleasure, I was appointed as a clinical assistant professor in the Department of Pathology & Laboratory Medicine, UBC in 2015. My areas of interest include gastrointestinal/hepatic pathology and molecular pathology.

I enjoy travelling, photography and music.

CLINICAL ASSOCIATE PROFESSOR
PEDIATRIC PATHOLOGIST,
BC CHILDREN'S HOSPITAL



DAVID GOLDFARB, MD

I completed medical school at Dalhousie University and Pediatrics, Pediatric Infectious Disease, and Medical Microbiology residencies at the University of Ottawa. Afterwards, I relocated with my family to Gaborone, Botswana joining that country's newly established School of Medicine. Working on the pediatric wards there, I soon became "immersed" in diarrhoea research. Prior to coming to Vancouver I had worked as a member of the Division of Infectious Disease at McMaster Children's Hospital. My main research interest is novel diagnostics for childhood infectious disease, particularly in resource-limited and remote settings.

CLINICAL INSTRUCTOR
PEDIATRIC PATHOLOGIST,
BC CHILDREN'S HOSPITAL



JONATHAN BUSH, MD, FRCPC (ANATOMICAL PATHOLOGY)

I completed undergraduate, medical school, and residency in anatomical pathology in Manitoba before moving to Chicago and Northwestern University/Lurie Children's Hospital of Chicago for a one year clinical fellowship in pediatric pathology (while attending a few Cubs baseball games). I have yet to develop a core research interest but have worked on projects ranging from transplant and GI pathology, soft tissue/bone tumors, and infectious disease histopathology. My clinical interests are wide but he particularly enjoys medical-biopsy and transplant pathology and have a "soft" spot for soft tissue tumors. Another area of clinical interest is perinatal/placental pathology and cardiovascular/respiratory pathology, stemming from my training in Chicago.

CLINICAL ASSISTANT PROFESSOR
MEDICAL MICROBIOLOGIST,
BC CHILDREN'S &
WOMEN'S HOSPITAL



JOCELYN SRIGLEY, MD, MSC, FRCPC

I joined the Department of Pathology and Laboratory Medicine in 2015, and work as a Medical Microbiologist at BC Children's & Women's Hospitals where I am the Director of Infection Prevention & Control for the Provincial Health Services Authority. I trained in Internal Medicine, Infectious Diseases, and Medical Microbiology at McMaster University. My previous work experience includes McMaster University, Hamilton Health Sciences, and Public Health Ontario.

”MAKE-UP” OF SPRING

Tired landscapes
Cloaked in grey gloom
Biting cold gnawing raw
Barren branches
Unseen beauty in smooth cheeks of cool granite.

Softly, spring coaxes
Blushing buds to
Coily expose their
Dewy flesh;
Pungent with musky scents.

The bones of winter
Painted over with
Strokes of vibrant colour.

Drunkenly inhaling
Renders us senseless;
A silent reminder of where true beauty resides.

AUTHOR: J. XENAKIS