

SURGICAL FRONTIERS

DEPARTMENT OF SURGERY
NEWSLETTER

QUARTER ONE 2016

TECHNOLOGY & RESOURCES AT THE UNIVERSITY OF ALBERTA

RAY RAJOTTE
SURGICAL
MEDICAL
RESEARCH
INSTITUTE

S.M.R.I. GETS A NEW NAME AND
WE LOOK AT THE HISTORY
OF THE INSTITUTE

ALSO IN THIS ISSUE

- MESSAGE FROM THE CHAIR
- ADVANCING THE EDMONTON PROTOCOL
- PROFILING THE DIVISION OF ANATOMY
- RESEARCH & EDUCATION DAY REVIEWS
- WELCOMING OUR NEWEST SURGEONS

SURGICAL FRONTIERS

Surgical Frontiers is published by the
University of Alberta's Department of Surgery

OUR OBJECTIVE

To profile the department's initiatives,
activities and accomplishments for the benefit
of our staff, alumni, friends and community

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MESSAGE FROM THE CHAIR

I AM VERY PLEASED TO WELCOME YOU TO ANOTHER YEAR IN THE DEPARTMENT OF SURGERY.

2016 brings with it change and new beginnings, but also ushers with it pause and cause for reflection. 2015 was a good year for us in surgery and I am proud of all that we accomplished. I sincerely look forward to seeing how we can continue to improve on our already strong efforts, and meet our full potential as a department.

We closed out 2015 with two big events in the form of the department's annual education day as well as the holiday wine and cheese party. It was during the latter that we welcomed our newest members who joined us during the year. Both events were well received. I would like to thank Jason R. Frank MD MA(Ed) FRCPC, Director, Specialty Education, Strategy, and Standards, Office of Specialty Education, Royal College of Physicians and Surgeons of Canada, for joining us as our keynote speaker for the education day, where we discussed competency by design and workforce & career planning. I would also like to take this opportunity to once again welcome our new surgeons, Dr. Deng Mapiour (General Surgery), Dr. Vanessa Fawcett (General Surgery), and Dr. Richard McLeod (Orthopedic Surgery) to the Department of Surgery.

As usual, we had a number of research and education days take place throughout the divisions this past year. A special thank you to all the event organizers and staff who

work tirelessly to ensure we can all stay sharp and up to date on best practices. Recently, the Division of Plastic Surgery sponsored a plastic surgery education day that was attended by over 300 people, and I wish to highlight their success and congratulate their efforts.

We began 2016 with our annual division directors meeting at Pigeon Lake (henceforth known as Surgical Executive Committee meetings). Many great ideas were tossed around amidst vigorous discussion, and I look forward to following up with the stakeholders involved to ensure that we follow through with our objectives. Also during our retreat, we announced that Dr. Ken Stewart has been appointed as Clerkship Coordinator for the Year 3 General Surgery clerkship. Ken is a valued member of the Department of Surgery and I have supreme confidence in what he will do with the position.

I would like to close my first address of 2016 by highlighting CaRMS. As I write this, we are currently in the midst of interviews, and I am pleased on so many levels. Those who have volunteered their time with interviews and tours, I thank you. To our faculty and staff who consistently strive to make our education programs of the highest caliber, you have my sincere thanks as well. We are all a part of something that is bigger than any individual and I am eager to watch those elements come together as the year presses on as they have done so many times before.



Douglas M. Hedden, MD FRCSC

Walter Stirling Anderson
Professor and Chair

Department of Surgery
Faculty of Medicine & Dentistry
University of Alberta

THE DIVISION OF ANATOMY IS A RELATIVE NEWCOMER TO THE DEPARTMENT OF SURGERY. Dean Lorne Tyrell originally established the Division in 1999 by the dissolution of the Department of Cell Biology and Anatomy into the Department of Cell Biology and the free-standing Division of Anatomy. The Division of Anatomy officially joined the Department of Surgery in 2014 under the direction of Dean Douglas Miller.

The Division was created primarily to address the educational needs of the Faculty of Medicine & Dentistry; specifically, the teaching of the anatomical sciences to medical and dental students, as well as students from the allied health sciences, at the undergraduate, graduate and postgraduate levels. In addition, the Division was charged with providing educational leadership in teaching the anatomical sciences across the U of A campus and raising the profile of anatomy teaching at this university through scholarship and the excellence of its teaching programs.

While the Division was primarily established as a teaching division, independent and collaborative research in the anatomy-related disciplines, as well as in educational methods and novel educational software, was a strongly encouraged and supported secondary mandate.

The Division currently consists of 5 full-time faculty members (1 Professor, Dr. Anil Walji; 3 Associate Professors, Dr. Daniel Livy (Director), Dr. Pierre Lemelin, Dr. Christine Webber; 1 Assistant Professor, Dr. Jennifer Hocking), 1 Adjunct Professor (Dr. Lalith Satkunam, Division of Physical Medicine and Rehabilitation, Department of Medicine), 1 Sessional Instructor (Dr. Lian Willetts), 2 technical staff (Mr. Jason Papirny and Mr. Hugh Barrett) and 1 administrative staff (Ms. Kalyn McIntyre).

The education mandate of the Division is our *raison d'être* and we are proud of our teaching excellence. Teaching represents by far the largest component of our time commitment. The Division provides instruction to well over 1000 undergraduate, graduate and postgraduate students each year accounting for well over 1000 half-days of direct student contact. We provide direct teaching support for several professional programs, including the MD and DDS programs, Radiation Therapy program, Pathologist's Assistant program, Nursing program, and Continuing Dental Education Programs. We also provide teaching to the pre-professional student body at the undergraduate and graduate levels. We are one of the few Anatomy programs in Canada to provide teaching to Medical

DIVISION SPOTLIGHT ANATOMY

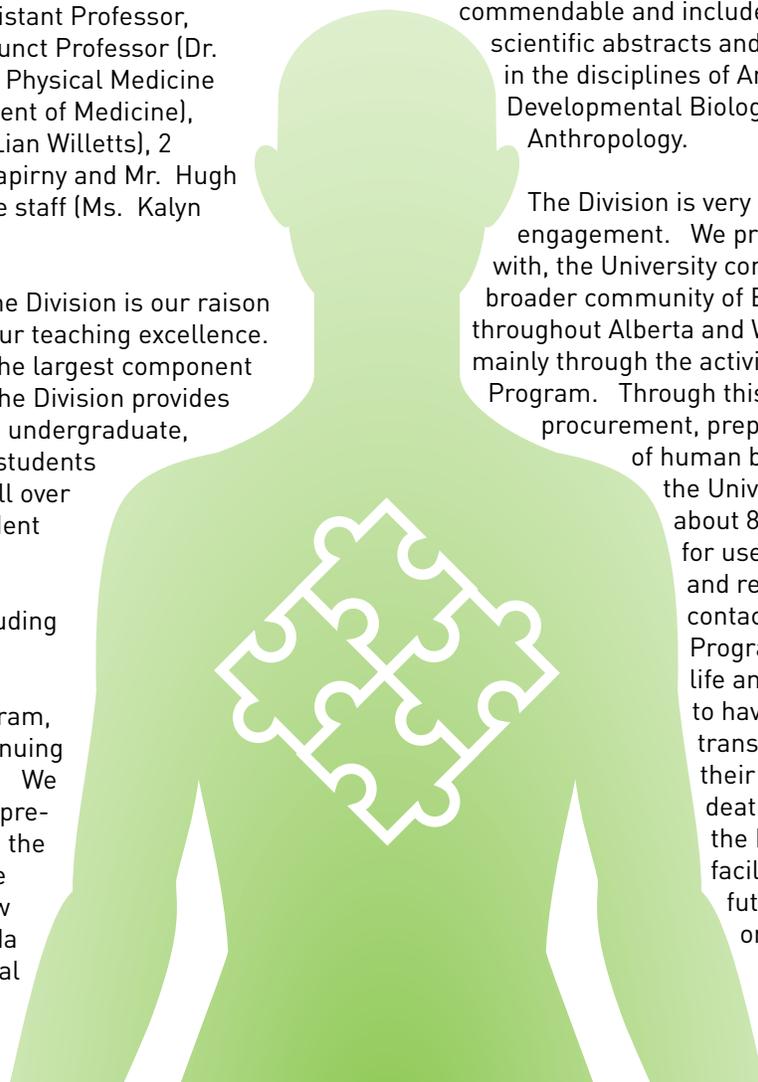
BY KALYN MCINTYRE

Residents and Fellows, offering comprehensive reviews in Anatomy to a broad range of clinical disciplines.

The Division has consistently maintained high standards of excellence for teaching since our inception. We have won many teaching awards including the Students Union Award for Leadership in Undergraduate Teaching (SALUTE, U of A), the Unit Teaching Award (U of A) and numerous Teacher of the Year and Excellence in Teaching awards (Medical Students Association). We have demonstrated imaginative and innovative approaches to our educational programs in keeping with the changing philosophy of curriculum content delivery with an emphasis toward a self-directed, student-centered, problem-solving approach to learning.

In addition to our teaching activities, the faculty in the Division are actively involved in individual and collaborative educational and discipline-based research. Given our small size and our primary commitment to teaching-related activities, our research productivity is commendable and includes textbooks, book chapters, scientific abstracts and peer-reviewed publications in the disciplines of Anatomy, Neuroscience, Developmental Biology, Clinical Medicine, and Anthropology.

The Division is very committed to community engagement. We provide service to, and interact with, the University community and with the broader community of Edmonton and extending throughout Alberta and Western Canada. We do this mainly through the activity of our Anatomical Gifts Program. Through this program, we manage the procurement, preparation, use and disposition of human body donations (cadavers) to the University of Alberta. We receive about 80 body donations each year for use in health sciences education and research. These individuals contacted the Anatomical Gifts Program sometime during their life and made arrangements to have the care of their body transferred to our Program upon their death. At the time of their death, their body is transferred to the Division of Anatomy morgue facilities, where it is prepared for future use in either education or research activities.



When the body has completed its service to our programs, some families prefer to attend to the disposition of the donor remains themselves, while others prefer to have the Division of Anatomy attend to this task. If the latter, the Division will arrange for cremation of the remains and subsequent interment at Westlawn Memorial Gardens. The University of Alberta has a wonderfully pastoral burial site located at Westlawn that is marked by the University flag and a monument that bears an inscription that reads: "Here lie those who, in the interest of Humanity, donated their bodies to medical education and research". At the end of each academic year, we invite all families of the current group of donors, as well as all student groups that participated in courses utilizing the body donor tissue, to attend a commemorative service to pay respect to the memory of the donors and honour their gift to medical education and research. This high profile, immensely popular and much appreciated service is attended by over 450 members of the donors' families, students and student representatives from the many groups that utilize the donor tissue, the Dean of the FoMD, the Chair of the Department of Surgery, and the Anatomy faculty and staff.

The success of the Anatomical Gifts Program is primarily by positive word-of-mouth associations but also through active involvement with the community at large, which has included invited speaking engagements with community-based groups and community-interest stories in popular media.

The donation program permits the Division to provide an educational experience that is unique in Canada. It allows medical residents and fellows an opportunity to refine their skills and techniques and allows practicing clinicians the opportunity to practice difficult procedures prior to their implementation on living patients. It also expands the possible range of research that is possible at this institution. We support basic and clinical research programs across campus and provide a rare opportunity to engage with human tissue without fear of inducing harm.

We also engage with other community partners to provide unique opportunities for education and Mornand training, including a number of community college programs, various medical equipment companies, and community-based health-care providers. We consult to a number of educational programs and institutions at the national and international level to provide our perspective on the use of Anatomical Sciences in the provision of health sciences education

As we progress to the future, we hope to expand the scope of our Anatomical Gifts Program to include options for teaching and research utilizing fresh-frozen cadaveric tissue. As always, the Division will continue its commitment to excellence in the provision of education, research and community service in the Anatomical disciplines and strive to provide a safe, exciting, and enjoyable experience.



Dr. Ray Rajotte poses outside of SMRI
Photo provided by SMRI

SMRI. TO DON NEW MONIKER

BY AMY HEWKO

THE FACULTY OF MEDICINE AND DENTISTRY, AND THE DEPARTMENT OF SURGERY ARE PROUD TO ANNOUNCE THAT THE SURGICAL MEDICAL RESEARCH INSTITUTE (SMRI) WILL BOAST A NEW NAME IN THE NEW YEAR: THE RAY RAJOTTE SURGICAL MEDICAL RESEARCH INSTITUTE.

The renaming will honour faculty member Dr. Ray Rajotte (BSc '71, MSc '73, PhD '75) for his contributions to both SMRI and the faculty at large. Dr. Rajotte has strong ties to the U of A, holding three degrees and a Faculty of Medicine & Dentistry faculty appointment since 1979.

In 1982, Dr. Rajotte founded the Islet Transplantation Group, which would later establish the Edmonton Protocol, the surgical implantation of islet cells in patients with Type 1 diabetes that results in independence from insulin for patients. He was director of the group from 1982–2009 and made significant contributions to its world-renown research.

Dr. Rajotte's sphere of influence does not end there: he was also director of SMRI from 1987–2011 and was the founding director of the Alberta Diabetes Institute from 2003–2007.



Thank you to all those who attended our 2015 Department of Surgery Education day, Career By Design, where we explored competency by design and workforce & career planning options.

Special thanks are also due to the day's presenters and speakers; Drs. Jason Frank, Sean Grondin, Marcia Clark, Douglas Hedden, Erin Wright, Jon White, James Xu, Keiran Purich, Katie Kinaschuk, Brittany Barber, Colleen Weeks, Cian O'Kelly and Tyler Alford.

Drs. Max Buchko and Bree Erickson lead a session on December 1, 2015
 Photo by Mark W. Regier

Department Education Day and Holiday Wine & Cheese

PHOTOS BY ALLISON DRAGSTEN

We wish to thank everyone who came out to celebrate the holiday season with us on December 17 in Bernard Snell Hall. It was a pleasure to spend the evening mingling and discussing the year that was with friends and peers. The evening was highlighted by the formal welcoming of several new surgeons who joined the department over the course of 2015.

Dr. David Williams, Associate Chair poses with new surgeon Dr. Vanessa Fawcett



Kaitlyn Haug, Administrative Assistant poses with Department Chair, Dr. Douglas Hedden



MEET OUR NEW SURGEONS

Dr. Vanessa Fawcett
General Surgery at the RAH:
Assistant Professor
(Special Continuing)

Dr. Fawcett joins the University of Alberta as a special continuing assistant professor in the Division of General Surgery, working as a general and trauma surgeon at the Royal Alexandra Hospital.

Following a general surgery residency at the University of British Columbia, Dr. Fawcett completed a Master of Public Health in Global Health at Harvard University followed by a fellowship in Trauma and Surgical Critical Care at Harborview Medical Centre in Seattle. Prior to joining the faculty at the U of A, she spent a year working as a surgical instructor in Rwanda. Her clinical and research interests focus on global surgery and injury prevention.



Dr. Deng Mapiour
General Surgery at Fort Sask:
Clinical Lecturer
(Clinical Academic Colleague)

Dr. Mapiour joined the Department of Surgery in August of 2015 as a general surgeon at the Fort Saskatchewan Community Hospital.

Prior to this, he completed medical school at the University of Saskatchewan, followed by residency at the same institution, which he completed in 2014. Leading up to his position within the department, Dr. Mapiour completed one year of Acute Care and Emergency Surgery (ACES) at the University of Alberta.

Dr. Mapiour has interests in trauma surgery and surgical education. He has presented papers on such topics at several surgical conferences.



Dr. Richard McLeod
Orthopaedic Surgery at the RAH:
Clinical Lecturer
(Clinical Academic Colleague)

Dr. McLeod completed medical school at the U of A prior to his residency within the Division of Orthopaedic Surgery, which concluded in 2007. He is the first Aboriginal surgeon to graduate from U of A, and the first Aboriginal orthopaedic surgeon to graduate in Canada. Dr. McLeod completed a fellowship in lower extremity reconstruction at Mount Sinai Hospital in 2008 prior to holding positions as an arthroplasty/trauma surgeon in Kamloops, BC, and a clinical instructor at UBC.

He is currently an arthroplasty specialist working at the RAH and is interested in prosthetic joint infections, periprosthetic fractures, primary hip and knee arthroplasty and revision.



GIVING BACK

A FOCUS ON COMMUNITY SPIRIT

The Department of Surgery has a long standing tradition of giving back to the community. Through a host of initiatives, we make efforts to improve the lives of others in more places than just the operating room.

Dr. Erika Haase, Dr. Dan Schiller, Dr. Haili Wang and Dr. Jonathan White took part in Top to Bottom in 2015, where The University of Alberta network raised a total of \$79,445, good enough for 3rd place in the country! Top to Bottom exists to aid the fight against colon cancer.

Congratulations are due to the Alberta Urology Institute, who showed us how it is done this winter by bringing together a grand total of 287 kilograms of food for the Edmonton Food Bank.

Manuary may sound lighthearted, but the movement backs a serious issue. The organization's goal is to raise funds and support research related to head and neck cancers. Dr. Vincent Biron, Dr. Sherif Idris, Dr. Daniel O'Connell, Dr. Hadi Seikaly and Dr. Erin Wright made it their mission to grow beards in support of Manuary in 2016. Prior to this, we took on a different form of facial hair based fundraising by way of the Movember challenge, where we raised funds for men's health issues.

Dr. Marc Moreau of the Division of Orthopaedic Surgery, is the President of CAMTA (Canadian Association of Medical Teams Abroad). A founding member of the organization, Dr. Moreau leads efforts to travel to Ecuador to provide orthopedic surgery to patients since 2001.

MEETINGS OF THE MINDS

SURGICAL FOUNDATIONS RESEARCH DAY

THE 6TH ANNUAL SURGICAL FOUNDATIONS RESEARCH DAY TOOK PLACE ON OCTOBER 7, 2015 AT THE LI KA SHING CENTRE FOR HEALTH RESEARCH INNOVATION.

Congratulations are due to the day's winners:

First Place:

Dr. Logan Zemp (Urology)

Preoperative pad usage and elevated BMI are independently associated with failure of male transobturator slings in otherwise well selected patients

Second Place:

Dr. Jessica Clark

(Otolaryngology Head & Neck Surgery)

Nodal SUVmax as a surrogate for HPV status in OPSCC

Third Place:

Dr. Jerry Dang

(General Surgery)

Predicting type 2 diabetes remission after bariatric surgery: A multivariate analysis

UROLOGY RESEARCH DAY

ON FRIDAY, NOVEMBER 6, 2015, THE DIVISION OF UROLOGY HELD THEIR 5TH ANNUAL RESEARCH DAY.

The event was held in conjunction with the J.O. Metcalfe Lecturer Dr. Manoj Monga, the Director of the Stevan Strem Centre for Endourology and Stone Disease at the Glickman Urological & Kidney Institute of the Cleveland Clinic.

Dr. Monga presented on the Medical and Dietary Therapy for Stone Prevention. The residents and students from the Division of Urology had opportunity to present current research projects to Dr. Monga and local guest adjudicators Dr. Adrian Wagg and Dr. Niels Jacobsen. Following a full day of presentations and reflecting various research topics the following winners were selected.

First Place Resident Research Paper:

Dr. Adam Kinnaird, PGY4/CIP

Second Place Resident Research Paper:

Dr. Lucas Dean, PGY4

Third Place Resident Research Paper:

Dr. Mark Assmus, PGY1

First Place Student Paper:

Zhihao (James) Xu, University of Alberta

Second Place Student Paper:

Callum Lavoie, University of Alberta



Drs. Erika Haase, Michael Lapner, Jerry Dang, Kevin Klingbeil, Jessica Clark, Colin Anderson, Logan Zemp at the 6th annual Surgical Foundations Research Day
Photo by Peggy Yin



PLASTIC SURGERY EDUCATION DAY

ON SATURDAY NOVEMBER 14, 2015 THE DIVISION OF PLASTIC SURGERY SPONSORED A PLASTIC SURGERY EDUCATION DAY.

The event, which was open to the public, was organized by the team leaders in plastic surgery at the Misericordia, Royal Alexandra, Stollery and University Hospitals.

The group effort culminated in a fantastic effort. Three hundred people attended the day within the storied Bernard Snell Lecture Theatre. The audience included OR nurses, recovery room nurses, physiotherapists, occupational therapists, nurses from the wards and outpatient departments and office staff, leaving the hall at full capacity.

Drs. Regan Guilfoyle, Michael Morhart, Jaret Olson, David Edwards, Edward Tredget, Gorman Louie and Gordon Wilkes of the Department of Surgery presented on a wide range of topics, including ear, lower limb, brachial plexus and peripheral nerve reconstruction, bionic nerve and arm implants, negative pressure wound therapy, management of burn care patients and the role of CT imaging in craniofacial surgery.

The day was very enthusiastically received and the evaluations from attendees were extremely positive. We would like to thank Michele Gervais from the Misericordia, Gail Shepherd from the Royal Alexandra, Julie Hoefling from the Stollery and Debbie Nystad from the University of Alberta Hospital for their time and effort. Their hard work ensured that the event was the success it was.

The excellent feedback has resulted in a plan to repeat the event every two years, with the next event planned to take place in 2017.



Julie Hoefling addresses attendees in Bernard Snell Hall

ORTHOPAEDIC SURGERY RETREAT

LATE INTO JANUARY, THE DIVISION OF ORTHOPAEDIC SURGERY HELD THEIR ANNUAL RETREAT IN JASPER.

Dr. Paulose Paul and Dr. Don Glasgow received the division's "Teacher of the Year" honours for 2015, and a total of 13 speakers consisting of surgeons and fellows from spine related and orthopaedic disciplines addressed the attendees on a variety of engaging topics. Hailing from Nevada, Dr. Holman Chan, a visiting guest of the division, spoke on the subjects of practicing Orthopaedics in America ("Are the bucks greener on the other side") and obtaining fellowships in the United States "A matching experience".

The entire event was a great success; even the annual resident/staff hockey game on Lake Mildred went off without a hitch, thanks to stunning mountain weather.

With one of the largest attendance turnouts so far, we wish to congratulate the Division of Orthopaedic Surgery on their continued success.



Orthopaedic residents and staff participate in the annual hockey game
Photo by Holly Millin

STORY BY MARK W. REGIER
PHOTO BY RICHARD SIEMENS

ALBERTA CELL THERAPY MANUFACTURING

Dr. Greg Korbutt



Dr. Greg Korbutt, Scientific Director, ACTM

AS THE ONLY GOOD MANUFACTURING PRACTICE (GMP) LAB IN WESTERN CANADA, the Alberta Cell Therapy Manufacturing (ACTM) facility, located within the Li Ka Shing building, provides the University of Alberta with a distinct advantage when it comes to bringing cell-based therapies from bench to bedside.

Set to fully open this year after a final round of validations, the 10,000 square foot, world-class facility will offer clean room facilities, equipment for manufacturing cell-based therapy products, GMP cell therapy production for clinical trials, non-GMP cell therapy production for pre-clinical studies, product development services, regulatory assistance and GMP training. ACTM is also affiliated with CellCAN, which exists as a network for stakeholders in stem-cell research.

It has been a long road, with the progress beginning on the project back in 1999. Regenerative medicine and stem cell therapy has long been on the collective mind of the U of A. Dr. Greg Korbutt, Scientific Director of the facility and Professor of Surgery within the Department of Surgery, expended significant energy through grant writing to see the facility move from vision to reality.

But outside of its rarity, what makes ACTM lab so valuable?

Providing support to researchers is an integral service that ACTM provides. "This is a key facility that can help translate basic findings in to patients", explains Dr. Korbutt as he discusses how taking basic research and findings to the patient level is a significant step that involves a myriad of procedures.

"This is a key facility that can help translate basic findings in to patients"

Cell therapy for various diseases, which can include processes such as transplanting islets, or bone marrow cells, needs to be done in special facilities that adhere to strict guidelines. Gayle Piat, ACTM Project Manager, emphasized how important keeping paper-trails are, and how ACTM can help with the process. "When you're manufacturing something to go in to a patient, as opposed to doing R&D, you want to go back and trace everything... you're tracing all of your reagents that went in, what equipment you used, and who did the processing."

Apart from initial backing, ACTM is expected to sustain itself on a fee-for-service design. The lifeblood of the facility comes by way of projects flowing through its channels, and though it is not yet fully operational as final verifications are still being processed, some projects have already been taking advantage of what ACTM has to offer as it operates at a limited capacity.

When Dr. Ian MacDonald, a professor of ophthalmology at the U of A began a clinical trial to treat Choroideremia via gene therapy, critical items were stored at the ACTM facility, prior to usage at the Royal Alexandra Hospital. Dr. John Mullen of the Division of Cardiac Surgery is also making use of the facility with his clinical trial where patients receive bone marrow mesenchymal stem cells that are inserted in combination with a left ventricular assist device. ACTM currently provides service for the trial in the form of acquiring the cells, storing them, and randomizing samples for use against placebos. "Without this GMP facility, these are projects that would have to go elsewhere" explains Dr. Korbutt, a statement which highlights just how unique and valuable this facility is.

Potential future projects include work by Dr. Adetola Adesida of the Division of Orthopaedic Surgery, who wishes to use the space to generate meniscus for joint repair. Dr. Korbutt himself would like to isolate neonatal porcine islets for clinical transplantation and is interested in mesenchymal stem cells to co-transplant with islets. Another interesting project on the horizon with University of Alberta ties comes from Dr. Lori West of the Department of Pediatrics. Her objective is to use T Regulatory cells in organ transplantation due to their theoretical potential to regulate immune systems and help prevent rejection.

In the coming months, the Alberta Cell Therapy Manufacturing facility will reach its full operating potential, and in doing so will open the door to new and exciting opportunities for researchers seeking to bring their research to the patient level.



ADVANCING THE EDMONTON PROTOCOL FOR THE IMPROVED TREATMENT OF TYPE 1 DIABETES

STORY & PHOTO BY ROSS NEITZ

Drs. Boris Gala-Lopez and James Shapiro

AN ANTIFREEZE GLYCOPEPTIDE THAT MIMICS A NATURALLY OCCURRING GLYCOPROTEIN FOUND IN ARCTIC FISH IS HELPING TO SIGNIFICANTLY IMPROVE THE EFFICACY OF CELL TRANSPLANT TREATMENTS FOR DIABETES PATIENTS - A PROCEDURE THAT TRANSPLANTS INSULIN PRODUCING ISLETS TO RENDER THEM INSULIN INDEPENDENT FOR PERIODS OF TIME.

Anti-aging Glycopeptide (AAGP™) is the focus of a new study published in the journal *Diabetes*. Researchers from the University of Alberta's Faculty of Medicine & Dentistry found that by soaking islet cells in AAGP™ for an hour and then washing it off prior to transplantation, the cells were protected from tacrolimus--an antirejection drug commonly used during transplants that is toxic to islets cells.

"Normally when we expose human islets to tacrolimus in the petri dish, they flat line and don't release insulin at all," says James Shapiro, senior author of the study and Canada Research Chair in Transplant Surgery and Regenerative Medicine at the U of A. "When we add the AAGP™ and wash it all off, the cells work perfectly normally, and are protected in a remarkably durable manner. We find we need far fewer cells to treat diabetes in our preclinical models than we would normally."

Since creation of the Edmonton Protocol in 1999, more than 250 patients have been treated by Shapiro

through islet cell transplantation. A key challenge of the procedure though is that most patients typically need two islet infusions, each prepared from a separate pancreas organ donor. Shapiro says there aren't enough organ donors to meet demand. Through the use AAGP™, a greater number of islet cells will survive the procedure, potentially allowing more patients to be treated.

"Just a one-hour soak in AAGP™ is enough to protect the islet cells for up to a month or two afterwards. It has a very potent and profound effect," says Shapiro. "As a direct result of these findings, we're now moving forward with plans for a first in human clinical trial--led at the University of Alberta--testing this drug in our human islet cell transplant program."

"This synthetic molecule seems to provide significant protection to cells exposed to multiple deleterious conditions, such as UV radiation, starvation, extreme temperatures and oxidative stress," says Boris Gala-Lopez, lead author of the study and a clinical/research fellow at

the U of A's Department of Surgery. "We are certainly very excited for the multiple opportunities this finding entails to the field of transplantation research."

Funding for the study was provided by the Diabetes Research Institute Foundation of Canada, while the drug AAGP™ was provided in kind by Protokinetix--a biotechnology company that provides medical researchers assistance in enhancing cell survival and health.

"We are very excited to have our AAGP™ molecule showcased in this prestigious journal. We are also extremely confident in the ongoing success of our collaboration with Dr. James Shapiro and his outstanding team," says Clarence Smith, president and chairman of ProtoKinetix.

If proven successful in human clinical trials, Shapiro believes the inclusion of AAGP™ could soon become a permanent addition to the Edmonton Protocol--representing a significant step forward in the treatment of Type 1 diabetes through islet transplantation. While more research is needed, he also believes the drug shows promise for a wide range of transplantations--potentially working to protect organs as effectively as it protects islets.

S.M.R.I.

A BRIEF HISTORY

STORY BY GREG OLSON
PHOTOS PROVIDED BY SMRI

THE SURGICAL MEDICAL RESEARCH INSTITUTE STARTED OUT IN 1952 AS THE J.S. MCEACHERN CANCER RESEARCH INSTITUTE. Located on the north side of the Medical Sciences (Dent/Pharm) Building, the laboratory comprised a basement and ground floor of about 5000 sq. ft. with two small windows. The idea behind the institute from the start was to provide facilities where academic clinicians could do experimental studies, an idea that was fully realized when research fellows came to work here.

On October 5, 1960 the facilities were officially designated the Surgical Medical Research Area. Dr. Kowalewski was appointed administrator of the institute, and in 1962 he was appointed director of Surgical Research. On May 2nd, 1963 the University's Board of Governors officially designated the title 'Institute' and it eventually became the oldest free standing Institute on campus. In 1978, Dr. Kowalewski retired to be succeeded by Dr. G.W. Scott as director of the Institute. During the time that Dr. Scott served as Director construction of an electron-microscopy unit was completed with both a transmission and scanning electron microscope.

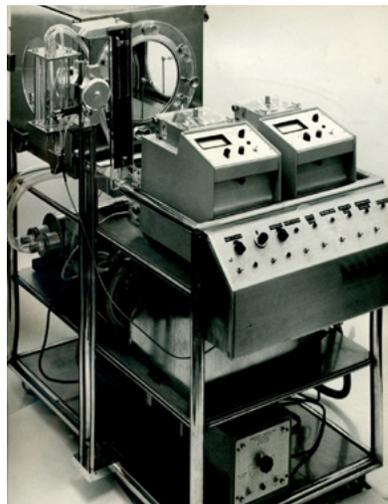
In July of 1987, Dr. Scott retired and Dr. R.V. Rajotte was appointed director. During his appointment which lasted from 1987 to 2011 Dr. Rajotte was fundamental in the relocation of the Institute to the Heritage Medical Research Centre which allowed it to become a state of the art surgical teaching and research facility. Dr. Rajotte's research into islet cell preservation and transplantation was key to the formation of the Edmonton Protocol and the Alberta Diabetes Institute. In 2011 Dr. Rajotte retired as director and Dr. G. Rayat was appointed the new director in January of 2012.

In the early days the general research orientation was to gastroenterology and endocrinology, mainly because the directors and assistant directors interests were in those specialties. Soon, urologists and cardiovascular surgeons were making major contributions to the research program. Dr. J.C. Callaghan did his research at the McEachern/SMRI laboratories which allowed him to carry out Canada's first open heart surgery. Dr. Callaghan went on to also create an artificial placenta used in heart and lung surgeries. Dr. Peter Allen and Dr. J.O. Metcalfe also worked on a dialysis unit which allowed them to carry out the 1st dialysis on a patient at the University of Alberta.

The Surgical Medical Research Institute continues to be a major contributor to medical research and surgical training using advanced surgical and simulation equipment.



1. Worked on initially by Dr. J.C. Callaghan and later by Dr. D.T. Morris, Dr. G.S.H. Lock, Dr. C.M. Couves and Dr. L. Fisk in 1971 led to the development of the Jarvic artificial heart. In 1970 Dr. Morris submitted his thesis in Mechanical Engineering on development of an artificial heart. He went on to enroll in a PhD program in Experimental Surgery to design, construct and test in vitro various models at the Surgical Medical Research Institute. 12 different models of an artificial heart made with rubber, polyethylene, silicone, and Plexiglas. Both Sac-type and Diaphragm-type hearts were developed and studied. The two models displayed here are his original molds of the early models used. Dr. Morris and Dr. C. Couves are pictured here touring delegates from China circa 1971.



2. Organ Perfusion Apparatus. Completed at the University of Alberta in 1972 by Dr. K. Kowalewski et. al., this apparatus was used to keep organs such as the kidney, heart and lung alive for up to 24 hours.

3. Dr. J.C. Callaghan performed Canada's first successful open heart surgery in 1956 which ultimately saved the life of a 10 year old girl. Experimental work at the Surgical Medical Research Institute assisted his team in the use of a heart-lung pump which was a major contribution in the early days of heart surgery. Dr. Callaghan also developed an artificial placenta at the SMRI (pictured here in 1962) which was key in providing extracorporeal support of newborns with Respiratory Distress Syndrome (RDS).



SURGERY IS STEEPED IN TRADITION.

An intimate craft, knowledge of best practices and proven methods are typically passed from seasoned veteran to a new initiate in a personal, and often times, hands on fashion.

With all its complexities and nuances, efficiency in surgery is difficult to measure, and many evaluations are subjective and relative. At the Surgical Simulation Research Lab (SSRL), located on the University of Alberta's Northern Campus, researchers are investing ways to objectively evaluate performance in surgery, and improve the learning process through innovative training techniques.

Headed by Dr. Bin Zheng, Director and Endowed Research Chair in Surgical Simulation, SSRL has been working a plethora of projects, primarily focused on basic science and simulating different components of surgery, both in the form of procedures themselves, and how people learn and acquire the appropriate motor skills. These projects include the analysis of eye tracking in surgery, team cognition studies, the expanded use of haptic feedback based teaching devices, improving the assessment of surgical efficiency and innovations in simulated training exercises.

Applying haptic guidance to the learning process allows novices to replicate the motions experienced surgeons. Utilizing this teaching technique offers the potential to optimize learning and expedite competency in surgery. In SSRL, this information is conveyed via a kinesthetic interphase which is feedback adjustable based on a user's level of expertise.

Innovations brought forth from the lab take several forms, including augmented reality, where images and information are superimposed in simulated settings through the use of advanced technology, such as the Microsoft HoloLens. The team has also utilized tools such as the Oculus Rift and similar devices to provide a live heads up display, allowing surgeons to have access to unrepresented amounts of information

FOCUS ON TECHNOLOGY



Dr. David Pinzon demonstrates a haptic feedback based laparoscopic box

during procedures. These studies dive deep into best practices as well, and study when it is best to prompt a surgeon with information, and when it would simply prove to be distracting to the overall process.

SSRL is a frequent collaborator with other groups at the University of Alberta. When Dr. Wenjing He analyzed team cognition between pairs of surgeons, where one performed the surgery and the other maintained camera operation, computer science graduates were brought in to lend their expertise. By combining the two specialties, SSRL was able to better understand and analyze the elements of team dynamics, and study what influenced synchronization.

A recent study undertaken by Dr. Simon Bryns of SSRL focused on video gaming and how it affected laparoscopic box training. The team analyzed how three groups of people, those who played games on a Nintendo Wii, those who did traditional training, and those who combined the two, compared on standard laparoscopic box training. The results of this study, which are being

submitted as a potential presentation at the 2016 Tom Williams Surgical Research Day on May 13, yielded interesting results that showed playing games had a positive effect on spatial awareness and the manipulation of tools in a laparoscopic setting.

Dr. Bryns has also been developing a project of significant importance as part of his master's thesis that has implications of changing how we evaluate surgical skills. With patents pending, the technology behind the study remains secretive, but Dr. Bryns is working diligently to improve the way surgeons are assessed and evaluated through a combination of eye tracking, movement plotting, kinematic data, video and predictive algorithms, with the goal being to reduce the subjective nature of traditional evaluations.

In a field rich with history, such as surgery, bridging the gap between technology and tradition can be a challenging, daunting and ultimately rewarding process. The Surgical Simulation Research Lab, and its many efforts, stand as reminder that continuous improvement is a constant force in surgery.

Focus on Education



WE ARE PLEASED TO ANNOUNCE THAT DR. KEN STEWART HAS BEEN APPOINTED AS CLERKSHIP COORDINATOR FOR THE YEAR 3 GENERAL SURGERY CLERKSHIP (SURG546) EFFECTIVE JANUARY 18, 2016.

Dr. Stewart is an Associate Professor in the Division of Thoracic Surgery. He obtained his MD from the U of A in 1993 and completed General Surgery residency here in 1999. He then trained as a thoracic surgeon in Vancouver and completed a Lung Transplant fellowship in St Louis. He has been a member of our Department of Surgery since 2002. He currently spends most of his time at the Royal Alexandra Hospital, and proudly provides care to patients in the northern half of the province, and portions of BC, Saskatchewan and territories.

Professionally Dr. Stewart has held many positions within the Department including Program Director for Foundations of Surgery and Division Head of Thoracic Surgery. He has also held many positions within the College of Physicians and Surgeons of Alberta, Alberta Medical Association, Alberta Health Services, and Royal College of Physicians and Surgeons of Canada. He has been acknowledged as a driving force for programmatic improvement in Edmonton and the province with awards for innovation and leadership in patient-centered care.

Dr. Stewart has also received multiple "Top Ten Teacher" awards in the Department of Surgery, and was the recipient of the 2014 William Shandro Award for Teaching Excellence in Clinical Surgery. His hallmarks as an educator are empathy for his trainees and finding time for all of his students, providing individualized attention to their needs. He lists his heroes as Winston Churchill, Mr. Incredible and his father-in-law.

We also thank Dr. Heather Cox for all of her hard work and dedication to this position over the past many months.

MEDICAL STUDENTS' ANNUAL GENERAL MEETING

After a strong campaign, the University of Alberta has been selected as the host site for the Canadian Federation of Medical Students' 2016 Annual General Meeting. This event offers medical students from around the country the opportunity to connect with their future colleagues to discuss relevant issues around education, advocacy, wellness and more. More information will be shared as it becomes available.

DR. HAMDY EL-HAKIM, DIRECTOR OF CLINICAL RESEARCH WOULD LIKE TO CONGRATULATE THE FOLLOWING RESEARCHERS ON THEIR SUCCESSFUL APPLICATIONS IN THE INAUGURAL CLINICAL RESEARCH GRANT COMPETITION.

Funds for these grants are provided by NACTRC and the Edmonton Civic Employees Charitable Assistance Fund.

Dr. Catherine Hui: Association among Return to Sport, Adiposity, Nutrition and Physical Activity in First Year Anterior Cruciate Ligament Reconstruction: A Pilot Study

Dr. Steven Meyer: Efficacy and Safety of Intravenous Iron Therapy to Treat Anemia Prior to Cardiac Surgery: A Pilot Randomized, Blinded, Controlled Trial

Dr. Hadi Seikaly: The Modified Submandibular Gland Transfer Procedure for Prevention of Xerostomia in Patients with Oral Cavity Cancer

Dr. Vincent Biron: Detection of Human Papilloma Virus-Related Head and Neck Cancer by Droplet Digital Polymerase Chain Reaction

Thank you to all the reviewers for taking the time to adjudicate the applications.

SURGICAL EXPLORATION AND DISCOVERY (SEAD) UPDATE

Our inaugural Surgical Exploration and Discovery (SEAD) elective for first year medical students is moving full speed ahead from May 2 – 13, 2016. 15 committee members from 8 divisions are collaborating with our surgical postgrad and undergrad teams for this initiative.

12-16 students will rotate through operating rooms and participate in simulation-based sessions with hopes this will facilitate interest in our residency programs and a surgical career. PowerPoint slides are available for anyone giving lectures to first year students. Please email surgpgme@ualberta.ca for more details.

STAYING KNOW



IN THE

AWARDS & ACCOLADES

Dr. Allan Ho

- *Canadian Association for Medical Education 2016 Certificate of Merit Award*
The CAME Certificate of Merit promotes, recognizes and rewards faculty committed to medical education in Canadian medical schools.

Dr. Kenneth Stewart

- *William A. Shandro Award*
Awarded for Teaching Excellence in Clinical Surgery

Dr. David Lim (General Surgery Resident)

- *Harry M. Vars Award*
Awarded by the American Society for Parenteral and Enteral Nutrition at the Premier Nutrition & Metabolism Paper Session, it recognizes the best presentation. Dr. Lim is co-supervised by Dr. David Bigam and Dr. Justine Turner (Department of Pediatrics).
- *Association for Medical Education in Europe - Research Paper Award*
Awarded for Dr. Lim's oral presentation, "How do students use written language to say what they see? A framework to understand medical students' written evaluations of their teachers." The award recognizes those who have demonstrated excellence in medical education research through their presentation at AMEE 2015. Dr. Lim's research was supervised by Dr. Jonathan White.

ADMINISTRATION UPDATES

The Department of Surgery is pleased to announce two additions to our core administrative team. Elaine Thorne joined us halfway through 2015 as our new Financial Coordinator, and Christine Wildeboer recently accepted the position of Executive Assistant to the Department Chair, Dr. Douglas Hedden in 2016.

As a member of the department's core administrative team, Elaine's office is located at 2D2.13 Walter C. Mackenzie Health Sciences Center on the University of Alberta campus. She is in the office Monday through Friday between the hours of 8:15am and 16:00pm.

You can find Christine in 2D2.23, Walter C. Mackenzie Health Sciences Centre, on the University of Alberta campus from Monday to Friday between the hours of 7:30 - 15:30.

SHARE YOUR STORIES

Surgical Frontiers exists as a communications conduit for the faculty, friends and alumni of the Department of Surgery. Our objective is to provide a voice for alumni and department news, successes and initiatives.

If you would like to submit an item for publication, or have questions about Surgical Frontiers, please email the Communications Coordinator at surgcomm@ualberta.ca.



IMPORTANT DATES

Tom Williams Surgical Research Day
&
Surgical Awards Dinner
Friday, May 13, 2016

MOVING?

Please send your change of address or email account to surgcomm@ualberta.ca, or mail your details to:

Surgical Frontiers
Department of Surgery
2D Walter Mackenzie Centre
University of Alberta
8440-112 St.
Edmonton, AB
Canada T6G 2B7



IN MEMORIAM

Lawrence W. Mix
Bsc., M.D., FRCS.(c), F.A.A.P.
1942 - 2015

It is with so much sadness that we announce that Dr. Lawrence Mix passed away on October 2, 2015. Larry is survived by his wife of 52 years, Elinor; his two sons Kendall (Debbie) of Kennewick, Wash. and Geoff of Victoria B.C.; his wonderful grandchildren who he loved so much Will, Graham and RYanne; his siblings, Sharon, Marilyn (David), Jane (Todd) and Lyle (Sherril) and his brother-in-law Neil. He was predeceased by his parents Martin and Hester, and his brother George.

Larry graduated from U of A Medical School in 1968, followed by a Urology residency at U of A. He studied Paediatric Urology at the Alder Hey Paediatric Hospital in Liverpool and returned to Edmonton to practice at the Charles Camsell Hospital, RAH, Glenrose Hospital and the Stollery Children's Hospital.

IMPROVING LIVES TOGETHER



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Department of Surgery



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