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Fiscal Committee
Dr. D. Greenberg

A) Account activity within the funds is summarized below:

**Organ Imaging Fund**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Balance - April 1, 2015</td>
<td>$305,704.82</td>
</tr>
<tr>
<td>Closing Balance - March 31, 2016</td>
<td>$344,497.12</td>
</tr>
<tr>
<td>Income</td>
<td></td>
</tr>
<tr>
<td>Interest</td>
<td>$ 1,601.65</td>
</tr>
<tr>
<td>Sectional contributions</td>
<td>$17,384.37</td>
</tr>
<tr>
<td>Donation (from Vascular Angiography Trust Fund)</td>
<td>$25,000.00</td>
</tr>
<tr>
<td>Cheque write off (Leswick honorarium un-cashed)</td>
<td>$ 499.99</td>
</tr>
<tr>
<td>Total</td>
<td>$44,486.01</td>
</tr>
<tr>
<td>Expenses</td>
<td></td>
</tr>
<tr>
<td>Food (Meetings, including retreat at Manitoba Club)</td>
<td>$ 2983.53</td>
</tr>
<tr>
<td>Travel (Dr. Essig &amp; Dr. Demeter)</td>
<td>$ 1897.67</td>
</tr>
<tr>
<td>Other (publication reimbursement)</td>
<td>$  812.51</td>
</tr>
<tr>
<td>Total</td>
<td>$ 5693.71</td>
</tr>
</tbody>
</table>

**UM Radiology Scholarship and Travel Fund**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Balance</td>
<td>$203,270.00</td>
</tr>
<tr>
<td>Capitalized Revenue:</td>
<td>$112,686.88</td>
</tr>
<tr>
<td>Available Revenue</td>
<td>$ 15,862.83</td>
</tr>
</tbody>
</table>

B) Fellowship Support: None currently. A request for one year fellowship support of Dr. Josep Puig had been approved earlier with anticipated payments to be split between the HSC and SBGH. (Cost to HSC in the range of $46,000). Dr. Puig has not arrived.

C) The committee had approved a request from the Section of Pediatric Radiology in the amount of $2,000 towards recruitment of an additional radiologist. No reimbursement request has been submitted.

D) The committee approved travel support for Dr. S. Demeter towards attendance at an ICRP meeting in Korea. The committee agreed that up to $10,000 can be allocated for such support subject to a maximum disbursement of $1,000 per request.
Nuclear Medicine
Dr. Sándor Demeter, MHSc, MSc, MHP, FRCP
Co-Director – Winnipeg Great-West Life PET/CT Imaging Centre
Section Head – Section of Nuclear Medicine, HSC

Nuclear Medicine Section

Physicians
S. Demeter, MD, MHSc, MSc, FRCP
I.D. Greenberg, MD, FRCP
D.P. Levin, MD, FRCP
S. Stern, MD, MSc, FRCP
B. Bybel, MD, FRCP
J.B. Sutherland, MD, MSc, FRCP, FACR

Consulting
A.E. Peterdy, MD, FRCP
W. Leslie, MD, MSc, FRCP
J. Dupont, MD, FRCP

Secondary Appointment
I. Barac, MD, FRCP
F. Cordova, MD, FRCP

Manager
S. Drawbridge, RTNM

Technical Instructor & Dept RSO
J. Phipps, RTNM

Senior Technologists
L. Clement, RTNM

General Duty Technologists
S. Koval, RTNM
J. Normandeau, RTNM
N. Pham, RTNM
J. Povey, RTNM
L. Stewart, RTNM
T. Whittleton, RTNM
T. Goetz, RTNM (on MAT Leave)
T. Steen, RTNM (MAT Leave coverage)
K. Kolt-Baete, RTNM
Office Staff
P. Duncan (secretary)
M. Kostenchuk (clerk)
A. del Rosario (clerk)

Nuclear Medicine & Radiopharmacy
Liaise with:
Corporate Radiation Safety Office
Medical Physics-Imaging Physics Nuclear Electronics

PET Suite Section
A. Goertzen, PhD, FCCPM, Co-ordinator, PET/CT Program
J. Patterson, Clinical Trials Coordinator
J. Ducharme, Senior Technologist
H. Comstock, Secretary
J. Toth, BSc Student, Biosystems Engineering
M.S. Khan, PhD Student, Electrical & Computer Engineering
G. Stortz, PhD Student, Physics & Astronomy
M. Teimoorisichani, PhD Student, Physics & Astronomy
J. Khilani, MSc Student, Physics & Astronomy
G. Schellenberg, MSc Student, Physics & Astronomy
R. Shrestha, MSc, Research Technician
B. McIntosh, MSc, Research Technician

PET Cyclotron Section
S. Mzengeza, PhD, Director
T. McKechnie, Cyclotron Specialist
C. Wang, Production Technologist
E. Pellerin, Cyclotron Technologist
K. Franz, Dept RSO & Quality Control Technologist
S. Paul, Postdoctoral Fellow
P. Drawbridge, Student
C. Sadowy, Secretary

Radiopharmacy Section:

Radiopharmacist / Chemists
R. Szweda, PhD, Director
M. Grigoryan, PhD, Technical Coordinator

Technologists
S. Greaves, BSc
T. Biru, BSc
J. Brown, BSc
Lab Aide
M. Capuno-Langley

Office Staff
A. Fryza, Secretary

Report through
Dr. Sandor Demeter – HSC NM Section Head & Central Radiopharmacy Medical Director
Christine Parfeniuk – HSC DI Director

Staffing
With the Winnipeg PET and Cyclotron facilities continually increasing their clinical and production services, as well as research projects, Nuclear Medicine as well as Radiology and Oncology residents have been exposed to excellent learning opportunities.

-Tannis Goetz returned from maternity leave in March 2016.
-Taylor Steen, who was hired to fill the 12 month maternity leave, agreed to stay on and fill the two part-time positions (0.4 EFT in NM and 0.6 EFT in the PET Suite).
-Tricia Hoare retired from the Dept in March 2016, creating a full-time opening for Kristen Kolt.
-Tricia Hoare, Keely Kirzinger and Kathryn Moss have been providing casual tech coverage in the department when required.

Jaylene Ducharme - PET/CT Senior Technologist – obtained a Second Discipline Certificate in MRI Imaging after completing a three month training course in the HSC MRI Department.

Equipment
The current compliment of gamma cameras in the Nuclear Medicine Department include two GE Infinia cameras, one GE Ventri, one Siemens Symbia T6, and a Siemens Ecam. The GE Infinia cameras as well as the Siemens Symbia are all SPECT/CT capable cameras. The GE Ventri is a dedicated cardiac imaging camera, and the Siemens Ecam is used as a general duty planar only camera.

A new Anjo-Hunter Leigh patient lift arrived in the department this year and is used to assist with patient transfers, as well as a new blanket warmer for patient comfort.

Funding has been approved to replace the existing PET/CT Siemens Biograph 16 HiRez Camera installed in the PET/CT Suite in 2005.

Workload & Wait Lists
Nuclear Medicine Section: For the 2015-2016 fiscal year, there were a total of 10,914 examinations (adult, pediatric, and PET) performed at HSC, which represents a 3.0% increase over the previous fiscal year. Workload units increased 2.0% during this time period. More studies having SPECT/CT were performed as part of the examination, as well as an increased PET workload, contributed to the steeper increase in workload units versus examinations.
PET/CT Suite: In the 2015-2016 fiscal year, 1,839 PET/CT studies were performed, representing a 6.3% increase over 2014-15 (1,730 studies) and 9.4% above 2013-14 (1,681 studies). Full capacity for a single PET/CT system with one operating shift is normally considered 2,000 studies per year, so the PET/CT program is now operating at near full capacity (projections are that we will slightly exceed 2000 cases in the next fiscal year). A total of 10 research PET/CT studies (neuro) were performed.

PET Cyclotron Suite: The Cyclotron continues to produce Fludeoxyglucose (18F) injection (FDG) daily for PET/CT patient scanning. Ten or more patients are being scanned daily at the HSC PET/CT Suite. FDG is also being used in small animal PET research imaging here at HSC-UM. FDG is being provided to Cubresa Inc for the NuPET small animal PET insert camera. We have provided FDG shipments to Saskatoon for routine PET patient scanning, as well as for their 18F-FDOPA clinical imaging of Parkinson's disease patients. The Cyclotron has manufactured 18F-fluoride and shipped it to Saskatoon for the set-up of their FDG manufacturing process there. The Edmonton PET facility used our manufactured FDG when their cyclotron had breakdown issues last fall.

Continuing Education and Academic Activities

Nuclear Medicine Physicians:

Dr. Bybel

- Member, WRHA Diagnostic Imaging Standards Committee.
- Member, Specialty Privileges Committee.
- Member, University of Manitoba Nuclear Medicine Resident Training Program Committee.
- Coordinator, Nuclear Medicine Physician and Resident Weekly Rounds, University of Manitoba.
- Lecturer, Case Reading Sessions with Nuclear Medicine Technology Students carried out throughout the year.
- Lecturer, Case Conference Sessions with Radiology Residents.
- Participant, Interdisciplinary Rounds, Lymphoproliferative DSG, Thyroid DSG, Pediatric Tumour DSG, Pediatric Uroradiology, Radiology Urology Nephrology (RUN), University of Manitoba.
- Reviewer, Expert Review of Anticancer Therapy.
- Reviewer, Journal of Radiology Case Reports.
- Reviewer, Head and Neck.
- Chair, RCPSC Nuclear Medicine Specialty Examinations, Ottawa, Ontario.
- Examiner, RCPSC Nuclear Medicine Specialty Examinations, Ottawa, Ontario.

Dr. Demeter

• Presenter, ICRP Committee and Protection in Medicine, HSC Nuclear Medicine Rounds, Winnipeg, May 2015.
• Co-Director, Great-West Life PET/CT Imaging Centre, Winnipeg.
• Chair, Provincial Imaging Advisory Committee Nuclear Medicine Subcommittee.
• Member, Provincial Imaging Advisory Committee Executive Committee.
• Member, Manitoba Health Regional Authority Medical Isotope Committee.
• Executive Member, Canada Safe Imaging Committee.
• Consultant, Canadian Agency on Drugs and Technologies in Health (CADTH) Health Technology Expert Review Panel (HTERP) member for Optimal Imaging for Pulmonary Embolism Project.
• Consultant, Canadian Agency on Drugs and Technologies in Health (CADTH) External Reviewer for CADTH, related to a National DI Imaging Inventory Survey.
• Physician Advisor, Canadian Nuclear Safety Commission (CNSC), related to various Nuclear Generating Power Stations across Canada.
• Physician Advisor, Department of Physics Adjunct Professor, University of Winnipeg.
• Member, International Commission on Radiation Protection (ICRP) Committee 3 (protection in medicine).

Dr. Goertzen
• Instructor, PHYS 7440 – Physics in Nuclear Medicine, Department of Physics and Astronomy, University of Manitoba.
• Lecturer, PHYS 2503 – Medical Imaging: Physics of PET Imaging, Department of Physics, University of Winnipeg.
• Lecturer, Physics of PET Imaging, University of Manitoba, Nuclear Medicine Resident Training.
• Board Member and Secretary, IEEE Nuclear and Medical Imaging Sciences Committee.
• Panel Member, Collaborative Health Research Projects Committee CIHR/NSERC Partnered Program.
• External Reviewer, Research Foundation Flanders (FWO).
• Reviewer, ETH Zurich Research Commission.
• Chair, University of Manitoba Radiation Protection Committee.

Dr. Greenberg
• Facilitator, RRCC Biomedical Electronics Engineering Class Tour through HSC Nuclear Medicine, PET Suite and Cyclotron Departments, Winnipeg, November 2015.
• Member, University of Manitoba Nuclear Medicine Resident Training Program Committee.
• Member, Manitoba Quality Assurance Committee, Nuclear Medicine Subcommittee, CPSM.
• Member, Promotion and Tenure Committee, UM Department of Radiology.
• Chairman, Fiscal Committee, HSC Department of Radiology.
• Member, Provincial Nuclear Medicine Advisory Committee, Manitoba Health Services Commission.
• Member, WRHA Radionuclide Safety Committee (RNSC).
• Lecturer, Case Reading Sessions with Nuclear Medicine/Radiology/Radiation Therapy Residents, and carried out throughout the year.
• Lecturer, Case Reading Sessions with Nuclear Medicine Technology Students and carried out throughout the year.

Dr. Levin
• Chair, Education Task Force, Canadian Association of Nuclear Medicine.
• Chair, Choosing Wisely Canada Project, Canadian Association of Nuclear Medicine.
• Co-Chair, Canadian Association of Nuclear Medicine-Canadian Association of Radiopharmaceutical Scientists Regulatory Consultative Group.
• Member, Provincial Imaging Advisory Committee Nuclear Medicine Subcommittee.
• Board Member, Canadian Association of Nuclear Medicine.
• Member, Pediatric Council, Society of Nuclear Medicine.
• Member, Pediatric Council, Dose Reduction Committee, Society of Nuclear Medicine.
• Member, General Imaging Council, Society of Nuclear Medicine.
• Member, University of Manitoba Nuclear Medicine Resident Training Program Committee.
• Lecturer, Case Reading Sessions with Nuclear Medicine Technology Students carried out throughout the year.
• Participant, Interdisciplinary Rounds: Lymphoproliferative DSG, Thyroid DSG, Pediatric Tumour DSG, CancerCare Manitoba; Pediatric Uroradiology; Radiology Urology Nephrology (RUN), University of Manitoba.
• Member, Lymphoma DSG In-Sixty Committee, CancerCare Manitoba.

Dr. Mzengeza
• Director, WRHA-HSC PET Cyclotron Centre, Winnipeg.
• Member, WRHA Radionuclide Safety Committee (RNSC).
• Member, Small Animal and Materials Imaging Facility Oversight Committee, WRHA-HSC Winnipeg.
• Member, Chemistry and Manufacturing National Committee, Medical Imaging Trial Network of Canada (MITNEC).

Dr. Stern
• Program Director, RCPSC-University of Manitoba Nuclear Medicine Resident Training Program.
• Lecturer, Case Reading Sessions with Nuclear Medicine Technology Students carried out throughout the year.

Dr. Leslie
• Co-Director, Great-West Life PET/CT Imaging Centre, Winnipeg.
• Member, University of Manitoba Nuclear Medicine Resident Training Program Committee.
• Member, Provincial Imaging Advisory Committee Nuclear Medicine Subcommittee.

Section participation in the CNSC Radioisotope Licensure Inspections of all HSC Nuclear Medicine Labs and PET Suite and PET Cyclotron Suite.
Nuclear Medicine Technologist Training Program
HSC Nuclear Medicine had two students in their second year of the training program during the period September 2015 to August 2016. Their clinical practicum included training rotations through the PET/CT Suite, PET Cyclotron, Radiopharmacy, and to the other community hospitals in Winnipeg where they’ve received experience working with a variety of different scanning cameras. With their graduating in August, they will be writing their national exam in September 2016.

- Nuclear Medicine Technology Students Sept 2015 to Aug 2016: Cecilia Le and Daphne (Guan) Lu Peng
- Nuclear Medicine Technology Students who graduated in Aug 2015: Leah Carrette, Keely Kirzinger and Kathryn Moss

Due to the retirement of a number of technologists in Winnipeg over the past few years, part-time and full-time positions have become available for these graduating technologists.

Research
Dr. S. Demeter is the principle investigator of the MITNEC – Medical Imaging Trial Network of Canada Clinical Trial A Cross-over comparison of the Diagnostic Accuracy of Technetium (99mTc) Medronate Injection Preparation with 99mTc Derived from Neutron-activation Produced 99Mo versus the Current Reference Standard of 99mTc Derived from Fission-produced 99mMo, NA 99Mo 001. - Ongoing

Dr. B. Bybel is a co-investigator in the Bayer 16298 Trial on Assessing Efficacy and Safety of Radium-223 Dichloride in Subjects with Human Epidermal Growth Factor Receptor 2 Negative (HER2 negative) Hormone Receptor Positive Breast Cancer with Bone Metastases Treated with Hormonal Treatment Background Therapy.

Dr. B. Bybel and Dr. S. Demeter are co-investigators in the Bayer 15396 CRPC A Phase III Randomized, Double-Blind Placebo-Controlled Trial of Radium-223 Dichloride (BAY 88-8223) in Combination with Abiraterone Acetate and Prednisone/Prednisolone in the Treatment of Asymptomatic or Mildly Symptomatic Chemotherapy-Naïve Subjects with Bone Predominant Metastatic Castration-Resistant Prostate Cancer (CRPC).
Sponsor: Bayer Inc. - Ongoing

Dr. B. Bybel is the principle investigator in PANCRT-1 Trial on Phase 3 Study of 90Y-Clivatzumab-Tetraxetan with Low-Dose Gemcitabine, Versus Placebo and Low-Dose Gemcitabine in Metastatic Pancreatic Cancer Patients who have Progressed on at Least 2 Prior Therapies for Metastatic Cancer.

Drs. B. Bybel is collaborating with the University of Sherbrooke (principle investigator) on a Multicentric Canadian Study to Measure the Safety and Efficacy of Synoviorthesis Performed with Yttrium-90 or Rhenium-186 Sulfide. CIMS 2011-03 - Ongoing
Dr. S. Demeter is the principle investigator of the project entitled Occupational Assessment of Lens of Eye Radiation Dose in Nuclear Medicine Workers, HSC Nuclear Medicine Physician Trust Account funded. - Ongoing

Dr. B. Bybel is a co-applicant involved with Dr. Ji Hyun Ko (PI) on the project Early Diagnosis of Alzheimer’s Disease Using Quantitative Assessment of Positron Emission Tomography. The Dr. Paul H.T. Thorlakson Foundation Fund, grant funded 2015 to 2016.

Dr. A. Goertzen is the principle investigator on the project High Resolution PET Imaging System for Small Animal Imaging. Mitacs Accelerate Cluster Project with Industrial Partner Cubresa Inc., grant funded 2014 to 2017.

Dr. A. Goertzen is the principle investigator on the project Extended Field of View Detectors for a MRI Compatible Positron Emission Tomography System. National Sciences and Engineering Research Council of Canada, grant funded 2014 to 2016.

Drs. S. Mzengeza and D. Levin are collaborators working on project [18F]FDOPA PET/CT to Monitor the Effectiveness of Fetal Dopaminergic Grafts in Parkinson Patients, grant funded 2014-2016.

Drs. W.D. Leslie and A. Goertzen are co-applicants in the Canadian Institute of Health Research Grant Improving assessment of fracture risk with DXA-based finite element modeling: Large-scale technical and clinical validation, grant funded 2014 to 2015.

Dr. B. Bybel is a member of the CIMS-2011-03 Multicentric Canadian Study to Measure the Safety and Efficacy of Synoviorthesis performed with Yttium-90 or Rhenium-186 sulfide. B2012:52 May 2013-Ongoing.

Dr. A. Goertzen is the principle investigator on the project Technologies to Advance Hybrid Multimodality Positron Emission Tomography and Magnetic Resonance Imaging. National Sciences and Engineering Research Council of Canada, grant funded 2012 to 2017.

Drs. A. Goertzen and S. Mzengeza are co-applicants involved in the Canadian Institute of Health Research Grant Regenerative Medicine and Nanomedicine Initiative, Development of Multidisciplinary Stem-Cell Program to Fight Congestive Heart Failure, grant funded 2009 to 2015.

Dr. D. Levin is the principal investigator for the CTA 18F-Fluorodeoxyglucose (18F-FDG) Positron Emission Tomography (PET) in Pediatric Oncology project in collaboration with the BC Cancer Agency.

Ms. J. Ducharme and Dr. B. Bybel are collaborators working on project Optimization of Image Reconstruction Methods for 18F-FDG PET/CT Scans in the Obese Population and Impact on Quantitative Standardized Uptake Values (SUV) and Image Quality.

Drs. D. Demeter and S. Mzengeza are involved in the establishment of the PET/CT Cyclotron Facility in terms of product output and research possibilities.
Publications


Demeter, S., Applegate, K.E., Perez, M. Internet-based ICRP resources for healthcare providers on the risks and benefits of medical imaging that uses ionizing radiation. Ann ICRP 2016; 45(1 Suppl):148-55.


Conference Presentations / Abstracts / Posters / Meetings Attended


Book Chapter

Other

Drawbridge, S. and Mzengeza, S.: Have given many PET Suite and PET Cyclotron Suite tours to dignitaries outside of the HSC complex as well as staff and students within the HSC-CCMb-UM departments.

Leslie, W.D.: Director, Manitoba Bone Mineral Density Program

Goertzen, A.L.: Supervisor to the following research projects

**PhD Students**
Mohammadreza Teimoorisichani, PhD Student in Physics & Astronomy at the University of Manitoba. Project Title: Development of a PET/MRI system for neuroimaging applications. (2014-to date).

Muhammad Salman Khan, PhD Candidate in Electrical & Computer Engineering at the University of Manitoba. Project Title: Open PET based acquisition system for a MR compatible PET insert. Co-supervised with Dr. Ken Ferens. (2013-to date)

Greg Stortz, PhD Student in Physics & Astronomy at the University of British Columbia. Project Title: Design and simulation of MR compatible PET systems. Co-supervised with Dr. Vesna Sossi. (2011-to date).

**MSc Students**
Jatin Khilani, MSc Student, Department of Physics & Astronomy, University of Manitoba. Project title: A scalable control system for a MR compatible PET imaging system. (2015-to date)

Graham Schellenberg, MSc Student, Department of Physics & Astronomy, University of Manitoba. Project title: Phoswich detectors for high resolution PET imaging. (2013-to date)
Mzengeza, S.: Supervisor to the following research projects

**Postdoctoral Fellow**
Soumen Paul  
Project Title: PET Imaging in Adenosine A1 Receptors in rats using 18F-CPFPX.  
(2015-to date).

**Honours Research Student**
Pamela Drawbridge, University of Winnipeg  
Project Title: Automated Synthesis of 18F-CPFPX for PET Imaging of Adenosine-A1 Receptors.  
(2015-to date)

Granting Agency Reviewer  
-Career Investigator Program,  
Michael Smith Foundation for Health Research

Demeter, S.: Professional Masters of Health Physics Degree  
-Illinois Institute of Technology, Chicago
Radiopharmacy

Roman Szweda, PhD
Director Radiopharmacy and Head Radiopharmaceuticals Research Group

Staff

Radiopharmacy (GC219)
Roman Szweda, PhD – Director
Marine Grigoryan, PhD – Technical Coordinator
Shelley Greaves, BSc – Technologist
Tadd Biru, BSc – Technologist

Jenna Brown, BSc – Technologist
Maria Capuno-Langley – Lab Aide
Alison Fryza – Secretary III
Keely Kirzinger Technologist (casual)

NM Residents
Ilya Tchaikov
Kelly Chu

Radiopharmaceuticals Research Group Staff (JBRC807)
Kennedy Mang’era, PhD – Head (until Oct 14, 2015)
Marine Grigoryan – Research Associate
Ayana Alipio – Research Assistant
Candace Ikeda Douglas – Project Res. Assistant
Daisy Mendez – Administrative Assistant

Jared Fitzpatrick – Research Assistant
Jenna Brown, BSc – Technologist
Gurmeet Bhindra – Research Associate
Rutha Tesfamichael – Research Assistant

Pharmacy Students
Nicholas Malzahn

Supplies and Services
Supply for the year was stable.
New well counter has been installed in the Quality Control laboratory.
WRHA capital budget awarded funds to purchase a laboratory fridge (~$10k)

Clinical trials

Radiopharmacy is involved in the following clinical trials:

1) A phase III randomized, double-blind, placebo-controlled trial of radium-223 dichloride in combination with abiraterone acetate and prednisone/prednisolone in the treatment of asymptomatic or mildly symptomatic chemotherapy-naïve subjects with bone predominant metastatic castration-resistant prostate cancer (CRPC).

Sponsor: Bayer HealthCare AG

Study no.: BAY 88-8223/15396
2) A phase II randomized, double-blind, placebo-controlled trial of radium-223 dichloride versus placebo when administered to metastatic HER2 negative hormone receptor positive breast cancer subjects with bone metastases treated with hormonal treatment background therapy.

Sponsor: Bayer HealthCare AG

Study no.: BAY 88-8223/16298

3) An international, multi-center, double-blinded, randomized, phase III trial of 90Y-Clivatuzumab Tetraxetan plus low-dose Gemcitabine versus placebo plus low-dose Gemcitabine in patients with metastatic (stage IV0 pancreatic adenocarcinoma who received at least two prior treatments (PANCRIT-1)

Sponsor: Immunomedics, Inc.

Study no.: IMMU-107-04

4) A Phase 3 study to evaluate the safety and efficacy of 99mTc-MIP-1404 SPECT/CT imaging to detect clinically significant prostate cancer in men with biopsy proven lo-grade prostate cancer who are candidates for active surveillance.

Sponsor: Progenics Pharmaceuticals.

Study no.: MIP-1404-3301

Research and Development

The PIPE project was awarded in $7.45 million in Federal funding in Feb 2013, for the period till March 31, 2016. Additional funding ($311k) was received and the project has been extended to September 30th, 2016. PIPE is developing alternative methodologies for production of molybdenum-99 (Mo-99). Until October 14, 2015 Dr. Mang’era was the Scientific Leader at the Prairie Isotope Production Enterprise (PIPE) project on behalf of the WRHA/HSC. Other PIPE partners are the University of Winnipeg and Acsion Industries, Pinawa. The Canadian Light Source Inc in Saskatoon is a major collaborator for this project.

Major developments include:

- We have consistently received Mo99 shipments from MURR over the last several months and efficiently processed and evaluated the technetium-99m extracted from these shipments
- Clinical trial application (CTA) [“A cross-over Comparison of the Diagnostic Accuracy of Technetium 99m(Tc) Medronate Injection Prepared with 99mTc Derived from Neutron-activation Produced 99Mo versus the Current Reference Standard of 99mTc Derived from Fission-produced 99Mo”] was submitted with Health Canada in February, 2016
- Construction of our new Radiopharmaceuticals Research Centre facility at KIAM is projected to be completed December 2016
Publications and Scientific Presentations


Training, continuing education and professional development

- All staff have completed various Radiation Safety and Transport of Dangerous Goods training in the last year.
- Jenna Brown and Dr. Kennedy Mang’era attended CRPA conference, May 2015
- K. Mang’era and J. Fitzpatrick attended the Annual Meeting of the Society of Nuclear Medicine and Molecular Imaging, Baltimore, June 2015
- R. Szweda and S. Greaves attended the CNSC Outreach Session, Winnipeg, January 2016
- Ayana Alipio – hands-on training in animal imaging, University of Boston, Boston 2015

Dr. Szweda:
- Member Radiation Safety Officer Group, WRHA
- Member WHRA RNSC Committee
- Member HSC Workplace Safety and Health Committee

S. Greaves
- Member Radiation Safety Officer Group, WRHA
- Member Nuclear Medicine Technologists Training Committee HSC
Cyclotron
Dr. Shadreck Mzengeza, PhD, Director

Cyclotron Staff
S. Mzengeza, PhD, Director
T. McKechnie, Cyclotron Specialist
C. Wang, Production Technologist
K. Franz, Dept RSO & Quality Control Technologist
E. Pellerin, Cyclotron Technologist
S. Paul, Postdoctoral fellow
P. Drawbridge, Student
C. Sadowy, Secretary

PET CYCLOTRON REPORT
- The Cyclotron Facility continues to produce Fludeoxyglucose (18F) injection (FDG) daily for patient scan. 10 or more patients are being scanned daily.
- The FDG is also being used in small animal PET imaging.
- FDG is being provided to Cubresa Inc for the NuPET small animal PET insert camera.
- The Cyclotron facility shipped FDG to Saskatoon for patients PET scanning.
- Provided FDG to Edmonton PET facility when their cyclotron had major breakdown
- The Cyclotron facility has completed the development of 18F-FDOPA and started shipping it to Saskatoon for clinical imaging of Parkinson’s disease patients.
- Shipped 18F-fluoride to Saskatoon for setting up their FDG manufacture

A-Continuing Education
- Presenter, Nuclear Medicine Rounds, Winnipeg, January 2016: Highlights of the Annual Congress of the European Association of Nuclear Medicine, October 10-14, 2015 Hamburg, Germany.

B-Committees and other academic activities
- Member, WRHA Radionuclide Safety Committee (RNSC).
- Member, Small Animal and Materials Imaging Facility Oversight Committee, WRHA-HSC Winnipeg.
- Member, Chemistry and Manufacturing National Committee, Medical Imaging Trial Network of Canada (MITNEC).

C-Meetings attended
1. Annual Congress of the European Association of Nuclear Medicine, October 10-14, 2015 Hamburg, Germany
D-Research Grants

(i) Currently Held

Sylvia Fedoruk Canadian Centre for Nuclear Innovation (2014-2016)
[18F]FDOPA PET/CT to Monitor the Effectiveness of Fetal DopaminergicGrafts iParkinson Patient
Principal Investigator: Dr. Rajan Rakheja, Department of Medical Imaging, University of Saskatchewan
Co-Investigators: Babyn, Paul; Rajput, Ali; Mendez, Ivar; Mzengeza, Shadreck; Rajput, Alex; Levin, Daniel; Bonavia-Fisher, Bruna; Fonge, Humphrey
Total Amount: Can$89,900

Sylvia Fedoruk Canadian Centre for Nuclear Innovation (2014-2016)
Imaging gene delivery nanoparticles targeted to melanoma
Principal Investigator: Dr. Ildiko Badea, Pharmacy & Nutrition, University of Saskatchewan
Co-Investigators: Mzengeza, Shadreck; Fonge, Humphrey
Total Amount: Can$220,910

Canadian Institutes of Health Research (CIHR) (2009-2016)
Title: Development of a Multidisciplinary Stem-Cell Program to Fight Congestive Heart Failure.
Principal Investigator: Gonghong Tian
Co-Investigators: Rakesh Arora, Benoit Simard, Boguslaw Tomanek, Andrew Goertzen, Jixian Deng, Shetuan Zhang, Davinder Jassal, Darren Freed, Jiuyong Xie, Shadreck Mzengeza
Program: Emerging Team Grant-Regenerative Medicine and Nanomedicine
Total amount: Can$251,806 per annum.

The Winnipeg Health Sciences Centre Department of Research (2007-2015)
Title: Development of radiotracers for imaging with positron emission tomography
Principal investigator: Shadreck Mzengeza
Program: Start-up Funds
Total amount: Can$75,000.

E-Peer-Reviewed Papers


F-Student and Postdoctoral Fellow Supervision

1. Soumen Paul, Postdoctoral Fellow
   Research Project: PET imaging of adenosine A1 receptors in rats using 18F-CPFPX

2. Pamela Drawbridge: University of Winnipeg Honours research student
   Research Project: Automated synthesis of 18F-CPFPX for PET imaging of adenosine A1 receptors
CT & MRI
Dr. J. Mottola

Staffing

CT
Charge Technologist (1) 1.0FTE
Senior Technologists (10) 1.0FTE, (3) 0.8FTE, (3) 0.7FTE, (1) 0.5FTE – Total 18 Technologists
Nursing (3) 1.0FTE, (1) 0.8FTE, (2) 0.7FTE, (2) 0.6FTE, (1) 0.4FTE – Total 9 Nurses
Unit Assistant (1) 1.0FTE

- Patricia Kasloff retired in July 2015 after having worked full time as a nurse in CT for 27 years.
- Natasha Singh, who held a 0.7 FTE positions as a nurse in CT, moved to Saskatoon, however remains casual with us.
- Sue Hill who held a 0.4 position nursing position in CT resigned.

With these three positions vacated we were able to hire Melissa McAuliffe from Seven Oaks Hospital, Laura Moniz from Children’s hospital and most recently Karen Katcher from St. Boniface Hospital.

Joy Milan is a unit assistant who was hired to provide assistant to the CT and Radiology areas in the Ann Thomas Wing. He assists with supplies, laundry, patient transport as well as break relief for clerical staff in those two areas.

Staff challenges for technologists continued throughout the year due to maternity leaves as well as a sick leave.

MRI
Charge Technologist (1) 1.0 FTE
General Duty MRI (10) 1.0FTE, (5) 0.8FTE, (4) 0.7FTE, (2) 0.6FTE, (1) 0.4FTE

Paul Barrette resigned to take a charge position at Grace Hospital, and two of our most senior technologists accepted positions in the pediatric program in anticipation of their new MRI scanner opening. Most recently we had our new charge resign to take a teaching position at Red River College. We also had a senior MRI position created to assist the MRI charge. With four magnets to manage, one of them off site, and many more students doing their clinical practicum at HSC, we felt it necessary to create this position to assist the charge.

We currently have 5 vacant positions in MRI (both the charge and senior are vacant), as well as three other positions. We have a maternity leave coming up at our site in the near future, another maternity leave in the region at Grace Hospital, and two charge positions posted in Selkirk and in Dauphin. We will have a hard time filling all of these vacancies with so many jobs posted, although there are quite a number of radiology staff that have now completed the MRI training.
Equipment and Facility
During the 2015/2016 year two of the three CT scanners in the adult program were replaced – these scanners are both located in Ann Thomas. As a result we have re-organized the work and all procedures are now performed in the old GH1 CT area with patients being recovered in this area as well.

We are hopeful that that the remaining 16 slice scanner in the GH1 area will be approved for replacement this year.

The 1.5T MRI unit has been approved for replacement and will be replaced once the pediatric 1.5T unit is installed and running in the new DCE building. Meetings have begun to determine the configuration of the replacement unit.

Workload & Waitlists
Below is the workload for both CT and MRI for the 2015/2016 Year.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>40,130</td>
<td>39,521</td>
<td>40,984</td>
<td>2.3%</td>
</tr>
<tr>
<td>MRI</td>
<td>17,600</td>
<td>21,104</td>
<td>23,323</td>
<td>24.6%</td>
</tr>
</tbody>
</table>

We continue to have long waitlists in MRI – they averaged 25 weeks throughout the 2015/2016 year. There is talk of some initiatives to try and decrease this list, but would again involve hiring additional staff temporarily, and we are already struggling with hiring the vacancies we currently have.

The CT waitlists grew during the replacement of the two scanners and we have yet to try and get these back to a manageable level – they averaged 6 weeks throughout the 2015/2016 year – 2 weeks higher than recent previous years.

Radiologist Staffing
5 fellowship trained Radiologists joined Radiology Consultants this summer including:

Dr. James McEachern – diagnostic and interventional neuroradiology
Dr. Chris Lindquist – Abdominal Imaging
Dr. China Hillman – Thoracic Imaging
Dr. Greg Ratcliffe – Diagnostic neuroradiology
Dr. Adam Globerman – Diagnostic neuroradiology
4 Radiologists have retired/resigned this academic year including
Dr. Hardy Bock
Dr. Thomas Mammen
Dr. Israel Krongold
Dr. Larry Lindquist
Grants and Awards
Brain Canada Foundation Research Grant – 200 Thousand - Essig M.
Manitoba Public Insurance Research Grant – 1 million - Essig M.

Publications


Pediatric Radiology
Dr. M. Bunge

I. INTRODUCTION
New initiatives: Plain film imaging studies performed at the new Specialized Services for Children/Rehabilitation Center for Children located at the new facility at 1155 Notre Dame Ave will be interpreted by members of the section.

New faculty member: Dr. Katya Rozovsky joined the Section as assistant professor on August 1, 2015.

The Section advertised for a Pediatric Radiologist with expertise in MRI Cardiac imaging, several qualified candidates applied, as yet no appointment has been made.

II DEPARTMENT

Faculty
Dr. Martin Bunge, Lecturer Section Head.
Dr. Rick Higgins, Lecturer.
Dr. Martin Reed, Professor.
Dr. Jens Wrogemann, Lecturer.
Dr. Hayley Moffat, Lecturer.
Dr. Katya Rozovsky, Assistant Professor.
Dr. Linda Yeo, permanent Locum.

Technical support staff

<table>
<thead>
<tr>
<th>STAFF MEMBER</th>
<th>QUALIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jerry Hlady</td>
<td>RTR, ACR</td>
</tr>
<tr>
<td>Judi Cherniak</td>
<td>RTR, ACR, CRGS, CRCS-AE, RDMS, RDCS (AE, NE)</td>
</tr>
<tr>
<td>Richard Hurd</td>
<td>RTR</td>
</tr>
<tr>
<td>Peter Kubrakovich</td>
<td>RTR, ACR, CMS</td>
</tr>
<tr>
<td>Shirley Luczenczyn</td>
<td>RTR, ACR</td>
</tr>
<tr>
<td>June Wagner</td>
<td>RTR, ACR</td>
</tr>
<tr>
<td>Darlene Ans</td>
<td></td>
</tr>
<tr>
<td>Karen James</td>
<td>(Retired and returned as Casual)</td>
</tr>
<tr>
<td>Maria Mikawoz</td>
<td></td>
</tr>
<tr>
<td>Allan Maydaniuk</td>
<td>RTR</td>
</tr>
<tr>
<td>Debbie Wiebe</td>
<td></td>
</tr>
<tr>
<td>Nimfa Serrano</td>
<td></td>
</tr>
<tr>
<td>Mary Wenger</td>
<td>(New hire to Children’s, Casual) RTR, CRGS, CRCS-AE, RDMS, RDCS (AE)</td>
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### Staff Members

<table>
<thead>
<tr>
<th>Sonographer</th>
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<tr>
<td>Bonnie Picklyk</td>
<td>RTR</td>
<td></td>
</tr>
<tr>
<td>Maria Miranda</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandy Bodnaruk (Retired)</td>
<td>RN</td>
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<tr>
<td>Heather Werner (Move from Child Health to DI Program)</td>
<td>RN</td>
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<tr>
<td>Barbara Remillard (Move from Child Health to DI Program) (Retiring Dec, 2016)</td>
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<tr>
<td>Elaine Kalyta (Move from Child Health to DI Program)</td>
<td>RN</td>
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<tr>
<td>Debbie Wrublowsky</td>
<td>RTR, ACR</td>
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<table>
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<tr>
<td>Cathy Cowen</td>
<td>B.A, RTR, CRGS, CRCS-AE, RDMS, RDCS (AE)</td>
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<td>Lori Neufeld</td>
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<td>Susan Thomson (Retired and returned as Casual)</td>
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<tr>
<td>Laura Martineau</td>
<td>RTR, CAE</td>
</tr>
<tr>
<td>Shelley Rennie</td>
<td>RTR, CRGS, CRCS-A, RDMS, RDCS (AE)</td>
</tr>
<tr>
<td>Kathy MacKinnon</td>
<td>RTR</td>
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<tr>
<td>Mary Jean Reyes</td>
<td></td>
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<tr>
<td>Paulita Camungol (New hire)</td>
<td></td>
</tr>
<tr>
<td>Tracy Jacobson (Move from Child Health to DI Program)</td>
<td>RN</td>
</tr>
<tr>
<td>Shannon Tayler (New hire for Ped MRI)</td>
<td></td>
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<tr>
<td>Flo Toews</td>
<td>RTR</td>
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<tbody>
<tr>
<td>Louise Forlini</td>
<td>RTR, CTIC</td>
</tr>
<tr>
<td>Jeri-Lynn Graham</td>
<td>RTR</td>
</tr>
<tr>
<td>Sharon Milne</td>
<td>RTR, CTIC</td>
</tr>
<tr>
<td>Crystal Steck</td>
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<tr>
<td>Angela Castro (Move from Child Health to DI Program)</td>
<td>RN</td>
</tr>
<tr>
<td>Sarah Tucker (Move from Child Health to DI Program)</td>
<td>RN</td>
</tr>
<tr>
<td>STAFF MEMBER</td>
<td>QUALIFICATIONS</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Laura Garry (New hire for Ped MRI)</td>
<td>RTR, MR</td>
</tr>
<tr>
<td>Randi Anderson (Resigned to relocate out of province)</td>
<td>BSc</td>
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### 5-9 Years

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<tbody>
<tr>
<td>Olga Litovtchenko</td>
<td>CRGS, RDMS, HCA, Dr. Veterinary Medicine</td>
</tr>
<tr>
<td>Nadel McNeil</td>
<td>RTR</td>
</tr>
<tr>
<td>Gord Stelmack</td>
<td>RTR</td>
</tr>
<tr>
<td>William Toms</td>
<td></td>
</tr>
<tr>
<td>Brandy Adolphe (New hire for Ped MRI)</td>
<td>RTR, MR</td>
</tr>
<tr>
<td>Mark Soliven</td>
<td>RTR</td>
</tr>
<tr>
<td>Leanna Lohre</td>
<td>RTR</td>
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<tr>
<td>Jennifer Pagdato</td>
<td>RTR</td>
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### 1-4 years

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<tr>
<td>Stacey Gerardy</td>
<td>RTR</td>
</tr>
<tr>
<td>Kelly Gillon</td>
<td>RTR</td>
</tr>
<tr>
<td>Amy Michalchuk</td>
<td>B.Sc., CRGS, RDMS</td>
</tr>
<tr>
<td>Laura Ripley (New hire)</td>
<td>RTR</td>
</tr>
<tr>
<td>Kateri Muys</td>
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### New Staff Members – 2016-2017 Fiscal Year

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Enzo Gigliotti</td>
<td></td>
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<tr>
<td>Abi Agboje</td>
<td>RTR</td>
</tr>
<tr>
<td>Kirby Boss</td>
<td>RTR</td>
</tr>
<tr>
<td>Nicole Friesen</td>
<td>RTR</td>
</tr>
<tr>
<td>Kristi Marchinko</td>
<td></td>
</tr>
<tr>
<td>Angela Tumambing</td>
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</table>
III POSTGRADUATE MEDICAL EDUCATION

- The PGY2 residents during their 4 month pediatric radiology rotation are encouraged to present at least one journal club meeting and are also encouraged to contribute interesting cases to the teaching file.

- Radiology Residents:
  
  PGY2
  Dr. Thelina Amaratunga
  Dr. Signy Holmes
  Dr. Xiaozhou Du
  Dr. Gina Nirula
  Dr. Michael Willcock
  
  PGY5
  Dr. Matthew Frankel
  Dr. Jordan Fogel
  Dr. Laurence Stillwater
  Dr. Neda Faridian-Aragh.

- Pediatric Radiology Fellow:
  
  Dr. Lina Qublan will be completing a Pediatric Radiology Fellowship on October 12, 2016. The fellowship included a 6 month research component.
  
  3 pediatric residents and 1 genetic resident rotated through the section.

IV UNDERGRADUATE MEDICAL EDUCATION

2 Medical students rotated through the section in the past year

V EQUIPMENT AND FACILITY

The section is housed on two floors in the CS wing of The Winnipeg Children’s Hospital. A satellite imaging clinic providing plain film imaging services is located in the Ann Thomas Building adjacent to Children’s Emergency.

Equipment

- Fluoroscopy unit
  GE Precision 500D, purchased in 2002.

- Mobile Fluoroscopy
  GE OEC 9900 Elite C-Arm, purchased 2009.

- General Duty X-ray
  GE Definium 8000 DR, purchased in 2007.
  Philips Bucky Diagnost, purchased in 1999.
  Siemens Polydorus, purchased in 1993.
  Agfa CRm, purchased in 2007.
Mobile X-ray  Carestream DRX-Revolution, purchased in 2014.
GE AMX-4, purchased in 1989.
GE AMX-4, purchased in 1994.

CT  Toshiba Asteion M/S 4, purchased in 2002.

Ultrasound  Philips iU22 purchased in 2006
Philips iU22 purchased in 2007
Philips iU22 purchased in 2012
Philips mobile HD11 purchased in 2006
Philips mobile HD11 purchased in 2006

VI  CLINICAL WORKLOAD
Number of Radiologists EFT’s 4.9 (4.5 GFT and 0.4 Locum), this does not included 0.2 EFT administrative duties and 0.2 EFT protected research time.

Actual workload 2015 – 2016 5.58 EFT

Radiologist EFT:
Dr. Martin Bunge 0.8 EFT + 0.2 EFT (administration)
Dr. Rick Higgins 1.0 EFT
Dr. Martin Reed 0.6 EFT
Dr. Jens Wrogemann 0.8 EFT
Dr. Hayley Moffat 0.5 EFT
Dr. Katya Rozovsky 0.8 EFT + 0.2 EFT (research)

Number of Films read

<table>
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<tr>
<th>Modality</th>
<th>2015-2016</th>
<th>2014-2015</th>
<th>% change</th>
<th>% out patients</th>
<th>% emergency</th>
<th>% in patients</th>
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<tr>
<td>MRI</td>
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<td>3034</td>
<td>4.6</td>
<td>80</td>
<td>1</td>
<td>19</td>
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<td>US</td>
<td>7240</td>
<td>6851</td>
<td>5</td>
<td>63</td>
<td>11</td>
<td>27</td>
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<tr>
<td>CT</td>
<td>1596</td>
<td>1526</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Plain Film</td>
<td>25860</td>
<td>23352</td>
<td>10</td>
<td>31</td>
<td>40</td>
<td>28</td>
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<tr>
<td>Fluoroscopy</td>
<td>1703</td>
<td>1557</td>
<td>8.5</td>
<td>53</td>
<td>3</td>
<td>44</td>
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<tr>
<td>Total Peds</td>
<td>27682</td>
<td>25038</td>
<td>10.5</td>
<td>29</td>
<td>32</td>
<td>38</td>
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</table>
Royal College accredited rounds
Clinical case based rounds usually last an hour and are typically held over the lunch hour.

- Oncology: every Friday
- Respirology: every Monday
- Surgery: once a month
- ENT: once a month
- Neonatology: once a month
- Urology: once a month
- Emergency: once a month
- GI: once a month
- Neurology: every Thursday
- Brain Tumor: twice a month
- Epilepsy: twice a month
- Pediatric Service: every Friday
- Radiology resident 3:30 rounds: once a month
- Radiology-Urology-Nephrology rounds: once a quarter
- Genetics-Metabolic: once every 6 weeks
- Rheumatology: once per month
- Orthopedics: once per month
- Infectious Disease: once per month
- Pediatric Radiology Section Interesting Case rounds: once a week

Committees
Dr. Wrogemann: Royal College Specialty Committee for Pediatric Radiology, WRHA Standards Committee.

Dr. Hayley Moffat: Department of Radiology – Postgraduate Committee

Dr. Higgins: Manitoba Association of Radiologist Executive Committee, Department of Radiology Fiscal Committee.

Dr. Reed: Canadian Association of Radiology, ACR editorial board.

Dr. Rozovsky: Research oversight Committee.

VII GRANTS AND AWARDS
Dr. Reed – American College of Radiology Gold medal award.
The American Academy of Pediatrics Section on Radiology 2016 Outstanding Clinical Education Poster award
VIII RESEARCH

Publications


Include any research that the program is involved with. This includes any publications, peer-reviewed articles and invited presentations

Current research
A Model of Integrated Lung and Focused Heart Ultrasound as a New Screening Examination in Infants at Risk of Hypoxemia.

Yasser Elsayed MD PhD, Mohamed Abdelmawla MD, Michael Narvey MD, Jens Wrogemann MD

Imaging findings in pediatric blastomycosis.

Principal investigator: Dr. Rozovsky

Collaborators: Dr. Martin Bunge, Dr. Martin Reed, Dr. Lina Alquablan (fellow), Dr. Sergio Fanella (ID department), Dr. Rachel Consunji-Araneta (pulmonology)

Status: Approved by Ethics Research Board, finished data collection, data analysis started.

Neurological Complications of Influenza Infection in Children: Imaging Patterns from the 2009 H1N1 Pandemic to the Current Seasonal Outbreak.

Principal investigator: Dr. Katya Rozovsky

Collaborators: Dr. Martin Bunge, Dr. Hayley Moffatt, Dr. Jens Wrogemann, Dr. Samantha Marin (neurology), Dr. Mabeen Rafay (neurology), Dr. Sergio Fanella (ID).

Multicenter research project, collaboration with Diagnostic Imaging department of CHEO (Ottawa) and Montreal Children's Hospital

Status: REB submission, data collection.
Cerebellar radiological abnormalities in children with neurofibromatosis type 1: a natural history study.

Principal investigator: Dr. Michael Salman (neurology)

Collaborators: Dr. Michael Salman (neurology), Dr. Lina Alquablan (fellow), Dr. Martin Bunge.

Status: Completed data collection, data analysis started, work on manuscript.

Prospective comparison of ultrasound to x-ray for confirmation of central vascular catheter placement and early detection of complications.

Principal investigator: Dr. Reem Amer (NICU)

Collaborators: Dr. Katya Rozovsky, Dr. Yasser Elasyed, Dr. Martin Bunge, Dr. Hayley Moffatt, Dr. Aaron Chiu (neurology).

Status: Conditional REB approval. Application for the Research Grant.

Brain MRI in pediatric patients with craniosynostosis: does it contribute to proper management?

Principal investigator: Dr. Katya Rozovsky.

Status: Pilot review of the database.

Presentations

IPR 2016 (May 15-20, Chicago).


Katya Rozovsky, Rick Higgins, Hayley Moffatt, Rachel Consunji-Araneta , Lina Alqublan, Elka Miller, Martin Bunge.

RSNA 2016 (November 27-December 2, Chicago)

Neurological Complications of Influenza A Infection in Children: Imaging Patterns from the 2009 H1N1 Pandemic to the Current Seasonal Outbreak

Dr. Rozovsky, Dr. Bunge, Dr. Moffatt, Dr. Wrogemann, Dr. Miller, Dr. Rafay (Neurology), Dr. Rafay (neurology), Dr. Fanella (ID).
Ultrasound
Dr. S. Dashefsky

II. INTRODUCTION
The Health Sciences Centre Section of Diagnostic Ultrasound performs examinations on approximately 23,000 - 26,000 patients per year. Since its opening in July 1964, the ultrasound section has played an important role in patient care, research, and teaching. The equipment inventory includes state of the art equipment capable of performing a wide range of examinations including real-time three dimensional imaging, and contrast ultrasound.

Ultrasound studies performed in the section include obstetrical and gynecological sonography, and evaluation of the abdomen, chest, superficial structures (thyroid, parathyroid, salivary glands, scrotum, breast, and prostate), peripheral vascular system (venous and arterial imaging including carotid sonography), the musculoskeletal system, and superficial soft tissues. The examinations are modified to address the needs of the referring physician and patient, so that essentially any type of reasonable request can be accommodated. In addition to the standard diagnostic examinations, we also perform interventional procedures including fine needle and core needle biopsies, catheter drainage of abscesses and fluid collections, and intraoperative ultrasound with radiofrequency tumour ablation.

The Section of Ultrasound participates in undergraduate, postgraduate, and fellowship training in the Department of Radiology of the University of Manitoba, and is also involved in postgraduate training of other specialties. Over the years, numerous BSc (Med) students have performed summer research projects in the section.

In 1973, the Section of Ultrasound opened Canada’s first ultrasound technologist training program, which has been operating continuously since then. The didactic program is situated at Red River College, with clinical training sites at Health Sciences Centre, St. Boniface General Hospital, and Seven Oaks General Hospital. Alumni from this program have been hired into clinical, teaching, administrative, and industry positions across North America.

II. STAFFING

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<tr>
<td>Physicians</td>
<td>3.4</td>
<td>5 (4.0 EFT)</td>
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<tr>
<td>Manager</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Charge Sonographer</td>
<td>1.0</td>
<td>1.0</td>
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<tr>
<td>Secretary III</td>
<td>1.0</td>
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<tr>
<td>Clerk III</td>
<td>5.16</td>
<td>6 (5.16 EFT)</td>
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<tr>
<td>Unit Assistant</td>
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<td>1.0</td>
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<tr>
<td>Ultrasound Sonographer</td>
<td>14 (13.2 EFT)</td>
<td>15 (14.2 EFT)</td>
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<td>Technical Instructors</td>
<td>2.8</td>
<td>3 (2.8 EFT)</td>
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<tr>
<td>Sr. Imaging Service Technician</td>
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<tr>
<td>Imaging Service Technician</td>
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Faculty Staff, Administrative Staff & Support Staff

- Dr. Sidney Dashefsky, Section Head
- Dr. Clifford Levi, Radiologist
- Dr. Edward Lyons, Radiologist
- Dr. Noam Millo, Radiologist
- Dr. Michael Katz, Radiologist
- Suzanne Zdanuk, Manager
- Kathleen Abraham, Charge Technologist
- Jennifer Ducharme, Department Secretary
- Tracey Nelson, Clerk
- Vince Tabo, Clerk
- Arlyne Candelaria, Clerk
- AC Castor, Clerk
- Tracey Kolbauer, Clerk
- Melissa Oliveira, Clerk
- June Marcelino, Unit Assistant
- Rob Gallos, Sonographer
- Lisa Burns, Sonographer
- Sohail Anjum, Sonographer
- Bernadine Kostyk, Sonographer
- Chantal Dufault, Sonographer
- Matthew Epp, Sonographer
- Roshni Tailor, Sonographer
- Courtnie McInnes, Sonographer
- Megan Perron, Sonographer (On Maternity Leave as of May 2015)
- Carmen Dyck, Sonographer
- Stephanie Johnson, Sonographer
- Mary Truong, Sonographer
- Sarah Barker, Sonographer
- Michelle Dewyn, Sonographer
- Chelsea Catrysse-Brook, Sonographer (Effective August 2015)
- Orla Nazarko, Sonographer (Casual)
- Tara Chegwin, Sonographer (Casual)
- Lenny Kwasiuik, Technical Instructor (Retired – January 2016)
- Nanette Goldsworthy, Technical Instructor
- Tracy Anderson, Technical Instructor
- Tony Whitford, Sr. Equipment Service Technician
- Tyler Vogt, Equipment Service Technician
- Currently 1 Sonographer Vacancy
### III  EQUIPMENT AND FACILITY

Scanners       13 + 3 portables       13 + 4 portables

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### IV CLINICAL WORKLOADS

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**Analysis of Workload**

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**Average Workload per Day**

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### V GRANTS AND AWARDS

n/a

### VI RESEARCH

**HSC Studies**

- **Protocol:** A Multi-Center, Randomized, Double-Blind, Placebo Controlled Clinical Trial of Deferasirox (Exjade®) in Patients with Myelodysplastic Syndromes (low/int-1 risk) and Transfusional Iron Overload. ICL670A2302
  - Principal Investigator: Dr. Rajat Kumar

- **Protocol:** SuperNOVA: Stenting of the Superficial Femoral and Proximal Popliteal Arteries with the Boston Scientific INNOVA™ Self-Expanding Bare Metal Stent System.
  - Principal Investigator: Dr. Brian Hardy

- **Protocol:** Phase I/II Interventional Clinical Trial Of Balloon Venoplasty For Chronic Cerebrospinal Venous Insufficiency (CCSVI) In Multiple Sclerosis Patients.
  - Principal Investigator: Dr. Reza Vosoughi

**Reviewer of Journals**

- Reviewer: Journal of Clinical Ultrasound: 1996-Present  Dr. CS Levi
- Reviewer: Journal of Diagnostic Medical Sonography 2004 – present Dr. EA Lyons
- Reviewer: Radiology 2004 – present Dr. EA Lyons
- Reviewer: Journal of Reproductive Medicine  2009 – present  Dr. EA Lyons
- Member, Editorial Board: Diagnostic journal www.diagnosticjournal.info  2009 – Present Dr. EA Lyons
VII OTHER

Committees

Dr. S. Dashefsky
Residency Program Committee (RPC), Dept. of Radiology, HSC, Member - 2013-Present
Ultrasound Committee for Training Program, HSC, Member - 2013-Present
Diagnostic Imaging Council Committee, HSC, Member - 2013-Present

Dr. C.S. Levi
Standards Committee of Diagnostic Imaging, WRHA, Member-2006-Present
Promotions & Tenure Committee, Dept. of Radiology, Chair-1996-Present
Committee on Diagnostic Ultrasound, Canadian Association of Radiologists, Member-1985-Present
Provincial Ultrasound Advisory Committee, Manitoba Health, Member-1991-2015
Provincial Ultrasound Advisory Committee, Manitoba Health, Chair-1993-2015
Provincial Imaging Committee, Manitoba Health, Member-1993-2015

Dr. E.A. Lyons
FMO Committee of Faculty of Medicine, University of Manitoba-2014-Present
CAR rep to the MIIMAC (Medical Isotope and Imaging Advisory Committee) 2010-Present

Non-Professional
Jewish Federation of Winnipeg
Board of Governors 2013 – present  Dr. E. A. Lyons

The Saul and Claribel Simkin Centre (The Sharon Home Inc.) (Seniors Home)
Past Chairman of the Board of Governors October 2012 – 2014  Dr. E. A. Lyons
Chairman of Fundraising Committee March 2015-Present
Medical Physics

Dr. Jeff Bews

This report highlights the major initiatives undertaken by the Division of Medical Physics between April 2015 and August 2016. These initiatives are over and above the routine clinical work for which the Division is responsible.

Clinical

Department of Radiation Safety & Image Quality
- The Departments of Diagnostic Imaging Physics and Radiation Protection have been unified as a single Department with the name Radiation Safety and Image Quality.
- The new Radiation Protection Act (Bill 37) has passed legislation. This Act will provide authority to the Medical Physics Radiation Protection Officers to ensure that x-ray based diagnostic imaging equipment provides image quality and appropriate dose levels. The Department is working with Manitoba Health and the Radiology community to create regulations associated with the Radiation Protection Act.
- A new database for x-ray based diagnostic equipment survey results has been completed by an in-house Computer Engineer. The database will automatically analyze data and generate reports to provide users with accurate information.
- A computer algorithm project to make decisions regarding diagnostic imaging equipment replacement is ongoing.
- An Imaging Physicist (nuclear medicine expert) is on maternity leave. Her responsibilities are being covered by our newest Imaging Physics staff member who also has expertise in this area.
- The Department is a Provincial resource provides radiation safety and health physics expertise in clinical and industrial uses of ionizing radiation – optimizing diagnostic radiology and environmental safety.

Department of Radiation Therapy Physics
- The EDGE linear accelerator has been commissioned and has treated four lung cancer patients using a Stereotactic Body Radiation Therapy process.
- A new technique entitled Deep Inspiration Breath Hold has been developed and implemented for breast cancer patients undergoing radiation therapy to ensure protection of the heart.
- Significant work has been completed in the area of 3D printing. A new formal process has been completed to produce custom bolus to provide accurate dose to tumors that encroach the skin. 3D templates for surgeries for cancers of the mandible have also been created.
- An Intensity Modulated Radiation Treatment (IMRT) protocol for advanced GI cases was developed and implemented.
- A new brachytherapy treatment planning system was implemented for High Dose Rate (HDR) gynae patients.
- A computer algorithm has been implemented to automate many routine aspects associated with treatment plan checking.
- Ten new clinical trials involving radiation therapy delivery have been introduced.
- Completed service training courses for GE infinia, GE Brightspeed CT, GE Discovery 670c SPECT, GE Discovery 530c Cardiac and Siemens Ecam.
Department of Medical Engineering
- Completed service training courses for GE in finia, GE Brightspeed CT, GE Discovery 670c SPECT, GE Discovery 530c Cardiac and Siemens Ecam.
- Participated in RFP committee process replacement for nuclear medicine equipment at GGH and the HSC PET suite.
- Two technologists have completed a digital mammography service training course for Breast Check’s new equipment
- Two technologists have completed service training courses for the new EDGE linear accelerator.
- Door to the KIAM radiation therapy vault was designed, fabricated and installed
- PICU air transportation system was designed and fabricated.
- Mechanical upgrades to the cyclotron were introduced to satisfy CNSC regulations.
- Contributions to the construction of the Radiopharmacy research lab were completed.
- Mechanical repairs to the new digital mammography mobile truck were completed.
- A soft tissue calibration phantom was fabricated using plastic materials.
- Heavy duty IV poles and phlebotomy carts were manufactured.
- The analog Breast Screening equipment usage has been terminated and the new Digital Mammography Breast Screening Program has been initiated. Five stationary units (4 in Wpg and 1 in Brandon) along with a mobile clinic on a brand new truck have been put into clinical use. The Department has been involved in all steps of the RFP, design and implementation.
- The Department has been involved with the RFP process to replace the Varian Acuity Simulator with another CT scanner and an old linac with a new TrueBeam version.
Medical Staff Executive
Scott Gregoire
HSC MSE representative Diagnostic Radiology

The medical staff executive remains active in funding residents and medical students.

Some highlights from the past year include:

- The 2016 medical staff/resident dinner was held successfully at the Fairmont Hotel on Saturday, March 19th with over 200 attendees.
- Five research fellowships of $2,000 and six fellow travel grants of $1,500 are awarded annually and were awarded this past year.
- A new medical student travel award will be awarded starting in 2017. This award is funded by the HSC MSE and is distributed by the university/medical school.

The HSC MSE annual general meeting (AGM) in June 2016 was a success with guest speakers Mr. Milton Sussman, new CEO of the WRHA and Dr. Brian Postl, Dean of the College of Medicine.
Project Update
Rebecca Austman, Ph.D., P.Eng
Regional Manager of Diagnostic Imaging Technology

The following constitute the highlights of Diagnostic Imaging related capital projects undertaken at Health Sciences Centre during the period 2015 Apr 1 to 2016 Mar 31:

1. **Diagnostic Centre of Excellence (DCE) – formerly called the “DI Building”**
   The DCE building construction began in 2011 and is nearing completion. It will contain a net new paediatric MRI, a replacement paediatric CT scanner, relocated paediatric US department and fluoroscopy suite, two paediatric general duty X-Ray rooms (one relocated and one replaced directly into the new building), a net new OR compatible adult abdominal/peripheral angiography suite, as well as two angio suites being replaced directly into the new building (one general vascular suite and one bi-plane neurovascular suite). A shared adult/paediatric bi-plane cardiac cath lab will also be installed. The aforementioned equipment will all be located on the first three floors of the building. Selection of the major new equipment was completed in late 2012 in consultation with users. The majority of the building space has been completed, with occupancy permits expected by early Fall 2016. The equipment spaces have been shelled out, and Capital Planning continues to work with the contractors to finalize the completion of the rooms and planning dates for equipment installs. The most recent estimates predict equipment installs in late calendar 2016, with potential occupancy in the first quarter of calendar 2017.

2. **PET/MRI (mMR) – Kleysen Institute for Advanced Medicine**
   The WRHA and Health Sciences Centre negotiated a very favorable purchase price for a Siemens PET/MRI as part of the resolution of a project that did not proceed within the KIAM building. The mMR was purchased in late calendar 2013 but has not been delivered yet. Further, WHRA and HSC lobbied government for a commitment to provide operating funds for the system and operating funds have been secured. The HSC Foundation agreed to fund, to a stipulated maximum, the PET/MRI capital requirements for renovations to accommodate the equipment within the KIAM building and to purchase needed small equipment. Detailed planning for the installation of the PET/MRI in KIAM resulted in a capital cost estimate substantially in excess of the Foundation commitment, in addition to other concerns regarding the location. A Feasibility Study was initiated by Capital Planning to investigate an alternative location for this system at HSC. Results of this study are to be presented at the end of September 2016, after which a decision will be made on how to proceed with this project.
3. **Adult CT Scanner Replacement**

   Government approved in Feb 2014 replacement of one of the 16 slice GE LightSpeed CT scanner located in Ann Thomas. At the same time, the CT scanners at Misericordia Health Centre and the Concordia Hospital were approved for replacement. The Regional DI Program in partnership with HSC, MHC and CH undertook a regional replacement project ultimately determining that a single award would be made for all three sites so that our purchasing power would be maximized. The project was successful, resulting in the award of a 3 year contract to General Electric for CT scanners. Using the funds available, the group was able to fund replacement of 4 CT scanners rather than the original 3 that were approved for replacement. The 2 CTs in Anne Thomas were replaced earlier this year. One of the scanners is Revolution GSI, and the other is a Revolution CT. Replacement of the 3rd adult CT scanner (currently located on GH1) was prioritized highly at the Provincial Imaging Advisory Committee Meetings in the spring of 2016. Plans have been made to consolidate all adult CT scanners to the area in Anne Thomas once funding is secured.

4. **Digital Mammography**

   In August 2014, government gave formal approval to proceed with the provincial digital mammography project. The new mammography system for HSC, a Siemens Mammomat Inspiration, was purchased as a part of this project was installed in October 2015.

5. **Rehab Hospital General Duty X-Ray Room**

   In Feburary 2015, government approved the replacement of the oldest general duty X-Ray room at HSC, located in the rehab hospital. The system had been in use since the 1970s. The DI Program, in consultation with DI Managers from across the region, determined that a multi-site, multi-year contract should be created for digital radiography suites. This approach was initiated following review of anticipated general duty room purchases throughout WRHA in the next 3 to 5 years. All potentially affected sites worked on the RFP, which was awarded to Carestream Medical. A dual detector digital radiography suite was installed in March 2016, along with a redeveloped reception space, waiting room, and change rooms across the hall.

6. **PET/CT Replacement**

   In December 2015, WRHA received approval from government to proceed with replacement of the current PET/CT scanner. The scanner is currently located in JBRC on the 7th Floor. A new location for the scanner is being sought, and forms part of the Feasibility Study mentioned in #2 related also to the PET/MRI. Ideally there would be a consolidated space for the PET systems. While a suitable new location is being pursued, an RFP for the equipment was released. Responses are expected back from the vendors at the end of September 2016, with an expected award in early 2017.
Financial Report
The HSC Diagnostic Imaging Department’s net expenditures (not including medical remuneration) totaled $26,836,421.93 in 2015/2016. We completed the fiscal year with an overall deficit of $900,730.48; however a large chunk of this was to be offset with funding from government to cover the deficits in MRI.

<table>
<thead>
<tr>
<th>Health Sciences Centre</th>
<th>Actual</th>
<th>Budget</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear Medicine</td>
<td>2,023,246.02</td>
<td>1,816,480.59</td>
<td>(206,765.43)</td>
</tr>
<tr>
<td>Radiopharmacy</td>
<td>26,077.56-</td>
<td>111,776.71</td>
<td>137,854.27</td>
</tr>
<tr>
<td>Support Services</td>
<td>2,138,507.24</td>
<td>2,188,679.30</td>
<td>50,172.06</td>
</tr>
<tr>
<td>MRI HSC Satellite NRC</td>
<td>490,197.98</td>
<td>94,385.16</td>
<td>(395,812.82)</td>
</tr>
<tr>
<td>MRI HSC KIAM</td>
<td>425,879.14</td>
<td>2,209.81</td>
<td>(423,669.33)</td>
</tr>
<tr>
<td>MRI</td>
<td>3,910,695.21</td>
<td>3,921,451.05</td>
<td>10,755.84</td>
</tr>
<tr>
<td>Pediatric Radiology</td>
<td>2,107,873.89</td>
<td>2,034,464.34</td>
<td>(73,409.55)</td>
</tr>
<tr>
<td>Adult Radiology</td>
<td>3,455,647.44</td>
<td>3,618,742.70</td>
<td>163,095.26</td>
</tr>
<tr>
<td>Adult CT</td>
<td>3,009,655.02</td>
<td>2,779,367.55</td>
<td>(230,287.47)</td>
</tr>
<tr>
<td>Pediatric CT</td>
<td>315,861.04</td>
<td>387,104.33</td>
<td>71,243.29</td>
</tr>
<tr>
<td>CT Nursing</td>
<td>586,723.92</td>
<td>453,830.82</td>
<td>(132,893.10)</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>1,854,059.43</td>
<td>1,912,178.81</td>
<td>58,119.38</td>
</tr>
<tr>
<td>Ultrasound Education</td>
<td>279,630.79</td>
<td>320,882.40</td>
<td>41,251.61</td>
</tr>
<tr>
<td>Pediatric Ultrasound</td>
<td>521,407.37</td>
<td>444,809.12</td>
<td>(76,598.25)</td>
</tr>
<tr>
<td>Interventional Radiology</td>
<td>2,950,982.52</td>
<td>2,900,982.52</td>
<td>50,444.42</td>
</tr>
<tr>
<td>Interventional Radiology Nursing</td>
<td>881,532.88</td>
<td>854,199.90</td>
<td>(27,332.98)</td>
</tr>
<tr>
<td>Radiology Student Training</td>
<td>4,055.65</td>
<td>4,293.00</td>
<td>237.35</td>
</tr>
<tr>
<td>Mammography</td>
<td>168,373.74</td>
<td>134,792.36</td>
<td>(33,581.38)</td>
</tr>
<tr>
<td>PET/CT Scanner</td>
<td>686,225.06</td>
<td>905,237.73</td>
<td>219,012.67</td>
</tr>
<tr>
<td>Cyclotron</td>
<td>1,048,566.37</td>
<td>1,018,665.25</td>
<td>(29,901.12)</td>
</tr>
<tr>
<td>Technical Services</td>
<td>-14.15</td>
<td>31,158.00</td>
<td>31,172.15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26,836,421.93</strong></td>
<td><strong>25,935,691.45</strong></td>
<td><strong>(900,730.48)</strong></td>
</tr>
</tbody>
</table>
## Workload Report

### Total Diagnostic Imaging Procedures
#### 2013/2014 to 2015/2016

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>HSC Adult Radiology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiology (includes X-ray, Fluoroscopy &amp; Mammo)</td>
<td>91,394</td>
<td>89,701</td>
<td>90,131</td>
<td>-1.2%</td>
</tr>
<tr>
<td>CT</td>
<td>40,130</td>
<td>39,521</td>
<td>40,984</td>
<td>2.3%</td>
</tr>
<tr>
<td>MRI</td>
<td>17,600</td>
<td>21,104</td>
<td>23,323</td>
<td>24.6%</td>
</tr>
<tr>
<td>Nuclear Medicine (includes PET)</td>
<td>10,001</td>
<td>10,581</td>
<td>10,413</td>
<td>4.0%</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>23,327</td>
<td>25,762</td>
<td>30,360</td>
<td>23%</td>
</tr>
<tr>
<td>Angiography</td>
<td>2,964 (exams)</td>
<td>2,873 (exams)</td>
<td>3,010 (exams)</td>
<td>1.5%</td>
</tr>
<tr>
<td></td>
<td>6,153 (procedures)</td>
<td>6,679 (procedures)</td>
<td>7,819 (procedures)</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>185,416</td>
<td>189,542</td>
<td>198,221</td>
<td>6.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HSC Pediatric Radiology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiology (includes X-ray, Fluoro &amp; Pediatric Angio)</td>
<td>24,958</td>
<td>24,958</td>
<td>27,682</td>
<td>10%</td>
</tr>
<tr>
<td>CT</td>
<td>1,582</td>
<td>1,526</td>
<td>1,592</td>
<td>0.7%</td>
</tr>
<tr>
<td>MRI</td>
<td>2,937</td>
<td>3,034</td>
<td>3,174</td>
<td>7.5%</td>
</tr>
<tr>
<td>Nuclear Medicine</td>
<td>540</td>
<td>483</td>
<td>485</td>
<td>-10%</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>7,215</td>
<td>6,851</td>
<td>7,242</td>
<td>.04%</td>
</tr>
<tr>
<td>Totals</td>
<td>37,232</td>
<td>36,852</td>
<td>40,175</td>
<td>7.4%</td>
</tr>
</tbody>
</table>
Wait Lists

CT
The wait list for Adult CT averaged about 6 weeks throughout the 2015/2016 year which was a week higher than the previous year however was not bad considering we went up about 4 weeks throughout a large chunk of 2015-2016 due to the scanner replacements. As last year, there have been and will continue to be changes made to the schedules as the demand for invasive procedures in CT increases as well as the demand for quicker access for patients who have been identified in the Cancer Patient Journey Process.

The average wait list for CT for pediatric patients was 3 weeks which increase by a week from the previous year.

Ultrasound
The wait for an elective ultrasound for the adult population averaged 12 weeks throughout 2013/2014 which is a 1 week decrease from the previous year.

The average wait for an elective pediatric ultrasound was 14 weeks which is a 5 week increase from the previous year. Much of this increase is due to a medical LOA for a technologist in the area.

Nuclear Medicine
The average wait for MIBI procedures was 2 weeks in 2015/2016 which is a 2 week decrease from last year. The current wait is only a couple of days; however the minimum which is reported is 1 week. The manager and charge in the area are now exploring other procedures which this area could assist with such as Holter Monitors.

MRI
The wait for an elective MRI averaged 25 weeks throughout 2015/2016, up 5 weeks from last year’s wait. Despite now having run NRC for a year, the demand for MRI continues and the waitlist continues to grow. Part time staff have been working full time hours for a couple of years to help address this demand, however they are now only wanting to work their EFT, so wait lists will continue to grow if we end up having to cancel some shifts.

The pediatric wait for an elective MRI throughout 2015/2016 was 10 weeks which is down two weeks from the previous year.
## Wait List for Elective Procedures in Number of Weeks

<table>
<thead>
<tr>
<th>Dept.</th>
<th>HSC Average</th>
<th>HSC Monthly Average for 2015/2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT Adult</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>CT Peds.</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>US Adult</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>US Peds</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>MIBI</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>MRI Adult</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>MRI Peds with Anesthesia</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>MRI Peds no Anesthesia</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>
Adult & Interventional Radiology
Dr. Marco Essig, Department Head Diagnostic Imaging

DEPARTMENT

MANPOWER
The Section of Adult Radiology, which consists of General Radiology, Fluoroscopy, OR, Interventional Radiology, Mammography, CT Scanning and MR Imaging, is staffed by the following positions:

Radiologists 26
General Duty Technologists 26.4
General Duty MRI Technologists 22.0
CT Technologists 17.0
Charge Technologists 5.0
Clinical Resource Nurse 1.0
General Duty Nurses 12.4
Quality Technologist 0.3
Inventory Supplies Co-Coordinator 1.0
Secretary III Payroll and Scheduling 1.0
Technical Instructor 1.4
Managers 2.0
RIS/PACS Liaison 1.0
Secretary II 1.0
Medical Editors 5.5
Clerk III (Receptionists/Film Files) 21.72
Unit Assistants 2.8

NOTE

Radiologists – We welcome the following new radiologists; Dr. China-Li Hillman, Dr. Chris Lindquist, Dr. Adam Globerman, Dr. Greg Ratcliffe, Dr. James McEachern,

Technologists - the number of positions in CT, Interventional Radiology and MRI have remained the same as last year. We have increased the General Duty Technologist group by 1.7 EFT over the last year.
There is work underway to collapse all call in General duty and have staff on 24/7 that can provide coverage to the OR as well as emergent fluoroscopy procedures. A schedule has been developed, a meeting has been held with the union and we have our financial analyst working on assisting us with creating the new positions needed to make this change. We were hoping for a start date of October 1\textsuperscript{st}, however it looks like it may take a couple of more months to get this change implemented.

**Vacancies**

- **Adult Radiology**
  This past year showed an improvement in the number of vacancies from the past two previous years with only one current term vacancy.

- **IR**
  Interventional Radiology is fully staffed. We are currently waiting for government approval to hire the additional nursing and technologist required to run the third vascular suite in the new DCE (Diagnostic Centre of Excellence) Building.

- **CT**
  There are no staffing issues in CT at this time. We are in the process of hiring a technologist as well as a nurse for the one vacancy that is present in each of these groups.

- **MRI**
  MRI is completely staffed with a couple of casuals also being hired in anticipation of some hires that will happen at both the site, the region and throughout the province. There are also 8 technologists from other areas of Diagnostic Imaging enrolled in the NAIT program who will be completing their clinical rotations in MRI here with anticipation of eventually getting jobs in MRI.

**RESEARCH**

Diagnostic Imaging is involved in the CCSVI National Study for the treatment of patients with MS.

Interventional Radiology is involved with UBC and CHUM - Submitted by: Dr. B. Hardy, Section Head, Adult Radiology

There are multiple MRI studies ongoing in the section, mainly in the field of Neuroradiology but also in Abdominal Radiology and Chest.

**PUBLICATIONS**

We were able to achieve multiple publications over the last year – the list is provided in the department section
Clinical Operations
I would like to take the opportunity to again thank all managers and members of the HSC DI department for their commitment and hard work in the last year. As a team we have shown to provide the best care for our patients.

The patient feedback was overall very positive and the perception of radiology from the outside view has further improved.

A special thanks to Jennifer Iskierski for the administrative management of the department office and for organizing the annual meeting and collecting the section reports.

Workload and Waitlist Status
Based on the increasing demand, ongoing equipment replacement and a substantial increase of inpatient imaging requests, the overall wait for diagnostic imaging procedures, especially for MRI continued to grow. Even providing multiple proposals, no additional pieces of equipment were funded. However, recently we received additional short term funding which will have some temporary impact on the wait list. The DI program team is still promoting their MRI proposal that is with the new government and includes additional funding for shifts (technicians) and an additional MRI scanner within the system.

The other waitlists are still within or exceeded the benchmarks. Even after changing the distribution of Ultrasound requisitions within the region, there continues to be some waitlist and booking issues.

InSixty Cancer Patient Journey
The InSixty Cancer Patient Journey is a project that started in 2011 and finalized end of June 2016, with a goal to reduce the time from suspicion of cancer to first treatment in less than 60 days. Various medical professionals have spent the last five years developing cancer pathways for Breast Cancer, Colorectal Cancer, Lung Cancer, Prostate Cancer and Lymphoma and more recently the DI program has started tracking the DI wait times for patients in the Breast, Colon, Rectal and Lung Cancer Journey.

The timelines for DI are rigidly defined and we have been allowed to use a direct referral process to meet those guidelines. For breast cancer e.g. patients who have a mammogram that is suspicious and requires subsequent testing (either ultrasound, ultrasound core biopsy or stereotactic biopsy) are automatically sent to a site that can accommodate the next test, and a report is sent to the referring physician indicating that their patient has been referred on for further testing. This way, the patient continues on the path to diagnosis regardless of whether she/he is able to see her doctor after the mammogram and the physician is not required to fill out another request form.

Since the direct referral process went live in February, the time between Mammogram completed and the next site receiving a requisition for subsequent testing has been reduced from 6 days to 1 day and we meet the targets in more than 85% of cases.
E-Health related initiatives

**Voice recognition**
The currently used voice recognition comes to it’s end of life and the DI program is currently looking into replacement alternatives in a province wide RFP process.

Over the last year, the use of transcription for dictated reports has been substantially reduced and the resources have been reallocated to other areas such as billing.

**DI workstations**
The DI IMPAX Workstations have been fully transferred under the jurisdiction of e-health and are constantly updated and replaced if needed. There is currently no lack of workstations or radiology workspace.

The DI program is working on further improvements and the integration of advanced post-processing tools in a regional/ provincial wide project. A regional general purpose image post-processing project was launched, a vendor has been shortlisted and a pilot installation is planned for the fall of 2016. The intent is to implement a common general purpose image post-processing solution that will be integrated with the Agfa PACS. This is not expected to satisfy all post-processing requirements but should provide a common tool across all sites for 80% of use requirements.

**Recruitments and retirements**
At HSC we welcome the following new or returning staff members:

- **Dr. China-Li Hillman** to the Chest/Thoracic section of Adult Radiology (returning after a one year fellowship)
- **Dr. Chris Lindquist** to the Abdomen section of Adult Radiology (returning after a one year fellowship)
- **Dr. Adam Globerman** to the section of Neuroradiology in Adult Radiology (returning after a 2 year fellowship)
- **Dr. Greg Ratcliffe** to the section of Neuroradiology in Adult Radiology (returning after a 2 year fellowship)
The following staff have left the HSC:

**Dr. Kennedy Manger’a** from Radiopharmacy accepted a position with Canadian Isotope Innovations in Saskatoon, SK.

**Dr. J.B. Sutherland** has retired after almost 46 years of service in our section of Nuclear Medicine.

**2016 Long Service Awards**

<table>
<thead>
<tr>
<th>Years</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Dr. Jeffrey Earl Marantz</td>
</tr>
<tr>
<td>25</td>
<td>Dr. Sidney Martin Dashefsky</td>
</tr>
<tr>
<td>25</td>
<td>Dr. Daniel Philip Levin</td>
</tr>
<tr>
<td>10</td>
<td>Dr. Bohdan Bybel</td>
</tr>
<tr>
<td>10</td>
<td>Dr. Gordon Paul Kulbisky</td>
</tr>
</tbody>
</table>

Thanks a lot their exceptional commitment to the HSC and DI program.

**Education**

**Postgraduate Training**

The HSC DI facilities are heavily involved in the post-graduate training programs. Special thanks here to all department faculty for teaching and educating our residents of whom many will be our future Staff Colleagues.

The Diagnostic Radiology program had challenges with the CARMS matching in 2016 but finally was able to recruit 4 very good candidates as PGY1 residents in the second iteration (3 local students and one IMG).

Thanks to Drs. Wadhwa, Dhaliwal, Kornelsen, Stern and Ong, Shelly Labossiere, April Bodnarchuk and Jennifer Iskierski for their commitment and hard work to our departments postgraduate training programs.

**Fellowship programs**

The department received approval for an advanced neuroimaging fellowship program supported by both tertiary centers and the research groups – the first neuroradiology-fellow, Dr. Ariane Poulin, completed her fellowship in December 2015. We anticipate the next advanced neuroimaging fellow in July 2017.

We currently have a pediatric radiology fellow Dr. Lina Faiz-Alqublan, fellow who completes her training in early October 2016.

**Research**

Our two UMFA members have been again active in their research over the past year. They have both secured funding (from the Health Sciences Centre Foundation) for their research which is ongoing at KIAM and NRC and they were able to publish their work in peer-reviewed journals.
The department was able to achieve funding from Brain Canada for a neuroimaging platform which went live in January 2016. The program welcomes Dr. Md Nazir Uddin, the platform coordinator who is funded by the program. The platform image core lab was opened in 2016 on MS 7.

**Research Oversight Committee**

The departmental research oversight committee is fully operational and monthly meetings are held. Teresa Figley is doing a great job as research coordinator for the department. Her office is at HSC and she is also actively involved in the facilitation of fMRI studies, which we now offer at the HSC neuroimaging section.

The scope of the committee is to monitor the research projects and confirm that each new project can be accommodated within DI. The committee also aims to engage radiologists in imaging related research from other departments, and to assign a departmental advisor to ensure consistent radiological reporting and high quality research.

Projects that are deemed to be of insufficient quality or will have too big of an impact are not approved. Teresa then becomes involved to help the projects through the approval process.

**Research Topics**

Both UofM UMFA members are studying human neuroimaging (MRI, fMRI, DTI). Dr. Figley is interested in the structural and functional correlates of cognitive change in Multiple Sclerosis, and Dr. Kornelsen is interested in Chronic Pain and functional imaging.

There are multiple other research topics within the department including oncologic imaging, PET research, abdominal imaging and interventional radiology.

**Platform for Research Protocols**

In January 2014 the department started to use a central platform to manage imaging research protocols. The cloud based system enables to centrally manage and store research protocols for all imaging modalities within the department. With the use we envision to improve the quality and consistency of the protocols over the sites and between institutions.
Research Publications:

1. **Effects of Body Mass Index and Body Fat Percent on Default Mode, Executive Control, and Salience Network Structure and Function.**  
   **Figley CR**, Asem JS, Levenbaum EL, Courtney SM.  
   PMID: 27378831 [PubMed] *Free PMC Article*

2. **Probabilistic atlases of default mode, executive control and salience network white matter tracts: an fMRI-guided diffusion tensor imaging and tractography study.**  
   **Figley TD**, Bhullar N, Courtney SM, **Figley CR**.  
   PMID: 26578930 [PubMed] *Free PMC Article*

3. **fMRI Localization of Spinal Cord Processing Underlying Female Sexual Arousal.**  
   Alexander MS, Kozyrev N, Bosma RL, **Figley CR**, Richards JS, Stroman PW.  
   PMID: 25635474 [PubMed - as supplied by publisher]

4. **Heads in the Cloud: A Primer on Neuroimaging Applications of High Performance Computing.**  
   **Shatil AS**, Younas S, Pourreza H, **Figley CR**.  
   Review.  
   PMID: 27279746 [PubMed] *Free PMC Article*

5. **Separating Neural Activity Associated With Emotion and Implied Motion: An fMRI Study.**  
   **Kolesar TA**, Kornelsen J, Smith SD.  
   Emotion. 2016 Aug 8. [Epub ahead of print]  
   PMID: 27504596 [PubMed - as supplied by publisher]

6. **An examination of the default mode network in individuals with autonomous sensory meridian response (ASMR).**  
   Smith SD, Katherine Fredborg B, **Kornelsen J**.  
   PMID: 27196787 [PubMed - as supplied by publisher]

7. **Altered Neural Activity Associated with Mindfulness during Nociception: A Systematic Review of Functional MRI.**  
   **Bilevicius E**, **Kolesar TA**, Kornelsen J.  
   PMID: 27104572 [PubMed] *Free PMC Article*
   Kolesar TA, Fiest KM, Smith SD, Kornelsen J.
   PMID: 26543372 [PubMed] [Free PMC Article]

9. **A neural correlate of visceral emotional responses: evidence from fMRI of the thoracic spinal cord.**
   Kornelsen J, Smith SD, McIver TA.
   PMID: 24993101 [PubMed - indexed for MEDLINE] [Free PMC Article]

10. **High-grade glioma management and response assessment-recent advances and current challenges.**
    Khan MN, Sharma AM, Pitz M, Loewen SK, Quon H, Poulin A, Essig M.
    PMID: 27536188 [PubMed] [Free PMC Article]

11. **Longitudinal Brain Magnetic Resonance Imaging CO2 Stress Testing in Individual Adolescent Sports-Related Concussion Patients: A Pilot Study.**
    PMID: 27458426 [PubMed] [Free PMC Article]

12. **Intravoxel Incoherent Motion Metrics as Potential Biomarkers for Survival in Glioblastoma.**
    PMID: 27387822 [PubMed - in process] [Free PMC Article]

13. **Retirement-from-sport considerations following pediatric sports-related concussion: case illustrations and institutional approach.**
    Ellis MJ, McDonald PJ, Cordingley D, Mansouri B, Essig M, Ritchie L.
    PMID: 27032925 [PubMed - in process]

14. **Traumatic Optic Neuropathy: A Potentially Unrecognized Diagnosis after Sports-Related Concussion.**
    Ellis MJ, Ritchie L, Cordingley D, Essig M, Mansouri B.
    PMID: 26745167 [PubMed - in process]
15. **Brain magnetic resonance imaging CO2 stress testing in adolescent postconcussion syndrome.**


PMID: 26684777 [PubMed - in process]


PMID: 26438560 [PubMed - in process]

17. **Contralateral recurrence of tumefactive demyelination.**

Khan MN, Guranda M, **Essig M**.

PMID: 26427896 [PubMed - indexed for MEDLINE]

18. **Association of cortical thickness and neurological soft signs in patients with chronic schizophrenia and healthy controls.**


PMID: 26277883 [PubMed - indexed for MEDLINE]

19. **Comparison of automated brain segmentation using a brain phantom and patients with early Alzheimer's dementia or mild cognitive impairment.**

Fellhauer I, Zöllner FG, Schröder J, Degen C, Kong L, **Essig M**, Thomann PA, Schad LR.

PMID: 26211622 [PubMed - indexed for MEDLINE]

20. **Magnetic Resonance Imaging and Computed Tomography of the Brain-50 Years of Innovation, With a Focus on the Future.**

Runge VM, Aoki S, Bradley WG Jr, Chang KH, **Essig M**, Ma L, Ross JS, Valavanis A.

PMID: 26050021 [PubMed - indexed for MEDLINE]
21. **Neuroimaging findings in pediatric sports-related concussion.**
Ellis MJ, Leiter J, Hall T, McDonald PJ, Sawyer S, Silver N, **Bunge M, Essig M**.
PMID: 26031620 [PubMed - indexed for MEDLINE]

22. **Neuropsychology, autobiographical memory, and hippocampal volume in "younger" and "older" patients with chronic schizophrenia.**
Herold CJ, Lässer MM, Schmid LA, Seidl U, Kong L, Fellhauer I, Thomann PA, **Essig M, Schröder J**.

23. **Comparison of grey matter volume and thickness for analysing cortical changes in chronic schizophrenia: a matter of surface area, grey/white matter intensity contrast, and curvature.**
PMID: 25595222 [PubMed - indexed for MEDLINE]

24. **Comparison of gadofosveset (Vasovist®) with gadobenate dimeglumine (Multihance®)-enhanced MR angiography for high-grade carotid artery stenosis.**
Amarteifio E, **Essig M**, Böckler D, Attigah N, Schuster L, Demirel S.

25. **Principles of T2 *-weighted dynamic susceptibility contrast MRI technique in brain tumor imaging.**
Shiroishi MS, Castellazzi G, Boxerman JL, D’Amore F, **Essig M**, Nguyen TB, Provenzale JM, Enterline DS, Anzalone N, Dörfler A, Rovira À, Wintermark M, Law M.
PMID: 24817252 [PubMed - indexed for MEDLINE]

**Capital Projects**

**CT replacement**
In 2016 both CT scanners in the central CT area could be replaced by state of the art high end scanners from GE including their top end product REVOLUTION CT. A third scanner is envisioned to be installed in 2017 in the same area.
**Varian Edge**
The Varian Edge program is moving ahead – the system has been installed and the clinical operation will start soon. There is a close research collaboration with CCMB and Varian.

**PET MRI – PET CT**
The PET MRI installation is still not to forseen. The proposed location was not approved because of interferences with the IMRIS magnet. Alternative locations are currently still discussed. The department got approval to replace its current PET CT and is actively looking into funding for a second PET CT at the HSC site. The plan is to move the section into a central location in the hospital and to establish a PET center of excellence.

**DCE Building**
There have been multiple not expected delays with the DCE building. The building is however now near completion and the first equipment is expected to be installed in the fall of 2016. Final operation is expected to be early 2017.

**Retreat Meeting & New Department Section Structure**
The annual retreat was held in April 2015 at the Manitoba Club and all physicians in the department were invited to attend. The focus was to discuss as a program how we could enhance the quality of radiology service for patients within Winnipeg (and Manitoba). The retreat began with a guest speaker Dr. Jacques Levesque, a power point presentation by the Head, followed by open and informal dialogue and breakout sessions to brainstorm on a few key topics:
Harmonization and quality improvement of clinical and educational radiology services

- Protocols, Eligibility, Coding, Priorities, Consulting
- Improve equipment management and service
- Undergraduate and Postgraduate programs & Fellowships
- Performance Evaluations
- Governance Structure: section rationale and set up
- 24/7 coverage
- Peer review
- Communications: intradepartmental/ interdepartmental

Improve academics and research

- Improve teaching
- Input into the research committee
- Research pathways and strategy (time and engagement)
- Performance evaluations
- Promotion

Since the retreat, the following section heads (some of whom were already in these roles and some with newly formed roles) were identified and accepted their position in an effort to harmonize clinical, education and radiology services as a program:

- Nuclear Medicine
  Sandor Demeter
- Pediatric Radiology
  Martin Bunge
- Ultrasound
  Noam Millo
- Interventional Radiology
  Alessandra Cassano-Bailey
- Neuroradiology incl. Neurointerventional
  Marco Essig
- Chest Radiology
  Jacek Strezlczyk
- Abdominal Radiology
  Iain Kirkpatrick
- MSK Radiology
  Rick Bhullar
- Breast and Womens Imaging
  Dawn Martens
- Oncologic imaging
  Jeffrey Mottola
- Informatics
  Graham Bay

A section head meeting is planned for the end of September, at which time the scope and duties will be discussed in more detail.

Miscellaneous

Homepage renewal
The departments’ homepage including the HSC sections is in progress, with a continued overhaul over the next few months. All faculty members are invited to provide feedback as to what information they would like to see included on the website. Please forward your suggestions to Jennifer Iskierski.
Centralized advanced post-processing
The department is currently working on a project to centralize the post-processing and advanced post-processing activities. The planning phase of an interdisciplinary imaging core lab (e.g. in the KIAM) is underway and the first projects using the planned platform have already began.

Consolidation of the DI Department in respect of space is under discussion