



ANNUAL REPORT

JULY 2016 – JUNE 2017

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MESSAGE FROM THE DIRECTORS

Message from the Directors



The Biobank for the Molecular Classification of Kidney Disease (BMCKD) entered its operationalization phase on January 1, 2015 as the first comprehensive kidney-focused biobank in Canada. Over the past 2.5 years, our team has established a functional infrastructure to support the strategic and operational objectives of the biobank. Several milestones have been reached, including complete transfer and inventory of all renal biopsy materials and data from our partner Calgary Laboratory Services, establishment of an information technology infrastructure, and the capability to provide core biobanking support for translational research conducted in Calgary.

The infrastructure and organization that we have developed for renal pathology will improve the efficiency of clinical services and pave the way for innovation. In this regard, the BMCKD is well underway in its ambitious plan to digitalize renal histopathology data and create a user interface to herald the first digital pathology program in Alberta. We anticipate starting prospective collection of renal pathology specimens and data in late 2017 under the TARGET-KD Initiative.

From a research standpoint, the BMCKD has immediately established itself as the leading kidney biobanking program in Canada. The BMCKD has attracted several local and national research studies focused on glomerulonephritis or kidney diseases which rely on human biopspecimens. Several other studies currently in the planning stages. Overall the BMCKD has achieved all of its objectives in the first 30 months of operation and we expect much more demand for its services in the years to come. As of early 2017, the BMCKD is now fully certified by the Canadian Biobank Registry and we anticipate that the BMCKD will continue to attract research studies and will increasingly be involved in national and international projects.



Furthermore, the efficient organization of renal pathology and digital image database will serve as a model for delivery of pathology clinical care. We anticipate that the services provided by the BMCKD will become indispensable. We look forward to the upcoming year of growth, increased visibility and productivity for the BMCKD.

Dr. Daniel Muruve
Head, Division of Nephrology; Director, BMCKD

PROGRAM PERSONNEL & BIOBANK MANAGEMENT COMMITTEE

Program Personnel & Biobank Management Committee

Personnel:

Dr. Daniel Muruve – Co-director

Dr. Hallgrimur Benediktsson – Co-director

Michelle Nelson – Program Manager

Kevin Chapman – Facilities Manager

Sharon Clark – Laboratory Technologist

Sheila Li – Clinical Research Coordinator

Taryn Burghardt – Anatomic Pathology Research Co-ordinator

Josee Wong – Snyder Institute Biobanking Resource Co-ordinator

Biobank Management Committee:

Dr. Daniel Muruve – Nephrology, University of Calgary

Dr. Hallgrimur Benediktsson – Pathology, University of Calgary

Michelle Nelson – Nephrology, University of Calgary

Dr. Leland Baskin – Medical Director, Calgary Lab Services

Dr. Chris Naugler – Department Head, Pathology and Laboratory Services

Dr. Serdar Yilmaz – Nephrology Transplant, University of Calgary

Dr. Susan Samuel – Pediatric Nephrology, Alberta Children's Hospital

Dr. Pietro Ravani – Nephrology, University of Calgary

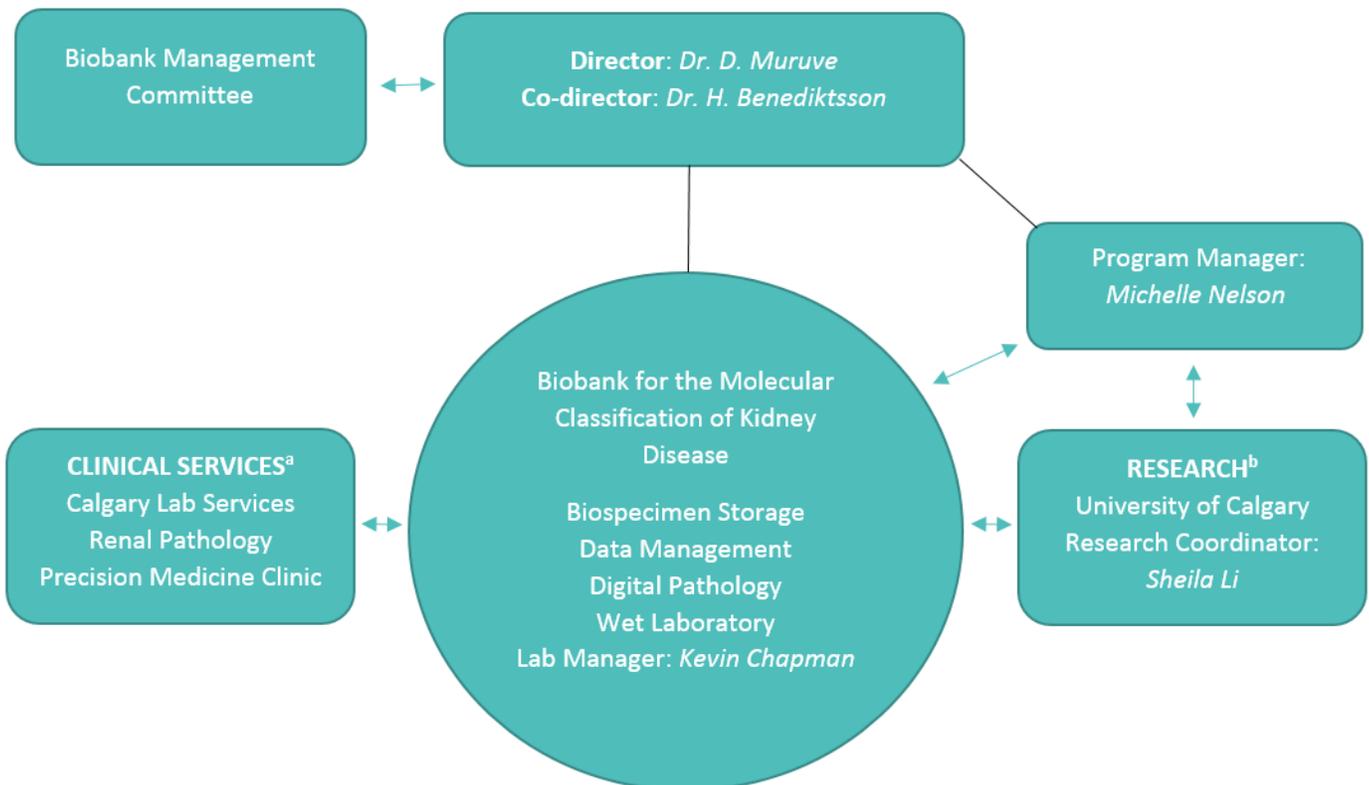
Taryn Burghardt – Pathology, Calgary Lab Services

Patient Representatives:

Jan Clemins – Southern Alberta Renal Program patient

GOVERNANCE & PROGRAM STRUCTURE

Governance & Program Structure



- a. Memorandum of Understanding with Calgary Laboratory Services 2014; Privacy Impact Assessment, Calgary Laboratory Services 2016
- b. Users governed by research agreements, data/materials transfer agreements, ethics

MISSION & VISION

Mission & Vision

The overall mission of the Precision Medicine in Nephrology Program (PMNP) is to support precision medicine-based kidney disease research, clinical practice, and diagnostic testing. To do this, the Program focuses on core activities including translational research and supporting clinical workflows. These core activities are supported by the biospecimen collections housed within the Program's Biobank for the Molecular Classification of Kidney Disease (BMCKD). The mission of the PMNP is to become the leader in precision medicine research, pathology, and diagnostic testing in nephrology, driven by a vision which includes the following strategic goals:

- Kidney disease research projects conducted within the University of Calgary and affiliate institutions will work in partnership with the PMNP to contribute and store samples in the BMCKD for future research and clinical testing
- The Program's BMCKD will be the first and only comprehensive pediatric and adult biospecimen resource for investigators wishing to conduct translational, precision-medicine based kidney disease research in Canada
- The PMNP will serve as a unique operational model for future precision medicine programs specializing in chronic diseases
- The PMNP will facilitate a transition from current health care practices to precision medicine-based care in nephrology

FUNDING BODIES & STAKEHOLDERS

Funding Bodies & Stakeholders

BMCKD STAKEHOLDERS

NAME	NATURE OF STAKEHOLDER RELATIONS
Canada Foundation for Innovation	Funder; Infrastructure
Calgary Lab Services	Partner; Operational
University of Calgary	Partner; Academic
Clinical Departments	Partner; Clinical
Amgen	Funder; Pharmaceutical
Precision Medicine Chair	Funder; Operational



FINANCIAL SUMMARY

Financial Summary

The Program and its' BMCKD is in its third year of funding from the Canada Foundation for Innovation and various clinical and industry partners. The operation of the BMCKD has remained on budget and has sufficient funding to operate for the next one to two years. The goal for the upcoming year will be to secure ongoing grant funding and strategic institutional and industry partnerships to ensure sustainability of the Program and its infrastructure into the future. Potential grant opportunities include the Genome Canada Large-scale Applied Research Project (LSARP) competition and the Canadian Institutes of Health Research Project Grants.

Direct costs recovered from research activities performed within the Program are contributed back into the operating budget.

RESEARCH: UPCOMING AND ONGOING RESEARCH PROJECTS

Research: Upcoming and Ongoing Research Projects

As of July 2016, the Program was supporting six research projects. One year later, the Program now supports more than double that number; thirteen research projects are currently ongoing or in the initiation phases at this time.

Project Name	Department	Approval Date	Resources Utilized	Sample Size
<i>Canadian GN Registry</i>	Nephrology	Expected November 2017	Patient recruitment, study co-ordination, processing and storage of urine samples, storage of subject data	320
<i>TARGET-KD</i>	Nephrology	Expected November 2017	Patient recruitment, study co-ordination, processing and storage of urine samples, storage of subject data	3000
<i>Permission to Contact Program</i>	Nephrology	Expected November 2017	Storage of subject data	10000
<i>TESTING Study (Steroids in IgAN)</i>	Nephrology	September 2017	Patient recruitment, study co-ordination, processing and storage of urine samples, storage of subject data	10
<i>ChildNEPH Study</i>	Pediatric Nephrology	Nov 29 2016	Processing and storage of urine samples, storage of subject data	50
<i>Precision medicine for diabetic nephropathy and hypertensive nephrosclerosis: a pilot study</i>	Nephrology	Nov 1 2016	Patient recruitment, study co-ordination, processing and storage of urine samples, storage of subject data	15
<i>Healthy volunteer donation program</i>	Nephrology	August 2 2016	Patient recruitment, study co-ordination, processing and storage of urine samples, storage of subject data	500

RESEARCH: UPCOMING AND ONGOING RESEARCH PROJECTS

<i>Treatment of obstructive sleep apnea in chronic kidney disease</i>	Sleep Medicine	April 27 2016	Processing and storage of urine samples, storage of subject data	300
<i>Risk factors for cardiovascular, cognitive and metabolic dysfunction in adult OSA patients: Identification of biomarkers and impact of working schedules (Clinical Trial)</i>	Sleep Medicine	March 31 2016	Processing and storage of urine samples, storage of subject data	300
<i>Quantification and bioassay development for toxicity testing of faba bean varieties</i>	Veterinary Medicine	March 8 2016	Blood collection	10
<i>Precision medicine in microscopic hematuria: a pilot study</i>	Nephrology	Feb 10 2016	Patient recruitment, study coordination, processing and storage of urine samples, storage of subject data	30
<i>Trends in biopsy-based kidney disease diagnosis</i>	Nephrology	Feb 2 2016	Provision of de-identified patient data	10,000
<i>Biomarkers of contrast-induced AKI</i>	Nephrology	Jan 19 2016	Patient recruitment, study coordination, processing and storage of urine samples, storage of subject data	200

CLINICAL: PATHOLOGY DATABASE DEVELOPMENT

Clinical: Pathology Database Development

10,390

80% complete

The number of biopsies conducted in Southern Alberta since 1970, currently stored within the BMCKD. All biopsy slides and accessions will be digitized and input into a digital database to be developed to aid in pathology clinical practice.

Since January 1, 2015, 10,390 of these cases have been digitized by the biobank, up from 6,700 in July 2016.

Of the 6,700 cases digitized, the BMCKD currently houses 104,853 digitized slide images, up from 74,000 in July 2016

104,853

22.3TB

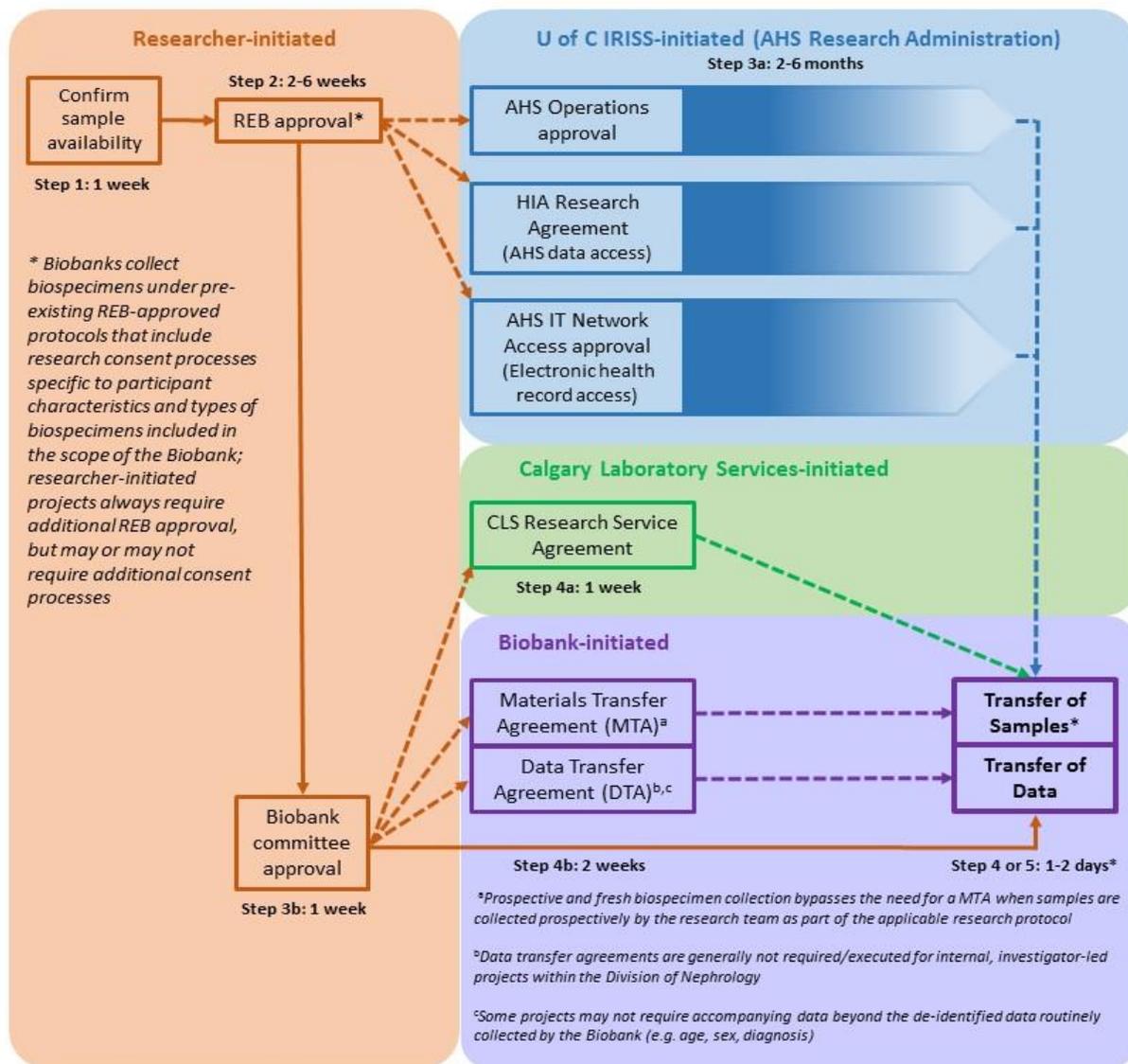
To date, the BMCKD digital pathology database stores approximately 22.3 terabytes of clinical biopsy information accessible to pathologists and physicians for clinical and research purposes, up from 15.6 terabytes in July 2016.

GENERAL ASSESSMENT OF OPERATIONS

General Assessment of Operations

RESEARCH

The flow of research protocol intake and execution within the Program and the larger research and medical network within the University of Calgary/Alberta Health Services has been fine-tuned over the past year and continues to evolve. Aligned with an ongoing effort to increase patient engagement and awareness of biobanking and precision medicine, the Program strives to maintain a streamlined, simple, and time-effective approach to approving research projects that involve its resources.



GENERAL ASSESSMENT OF OPERATIONS

CLINICAL

Efforts to complete the digital renal pathology database for clinical care over the past several years have almost come to completion. Scanning of the slides to create digital case files is over 80% done, and is expected to be finished in the Fall of 2017. The eSlide Manager platform is currently undergoing a Privacy Impact Assessment in order to allow for pathologists to access the digital slide database for routine clinical care, evolving from the current system in which the pathologist must request and wait up to 2-3 days for physical slides to be delivered to their office when assessing a patient case.



An amendment of the Memorandum of Understanding between the BMCKD and CLS is also currently underway. The requested changes, approved by the Management Committee on June 23rd, 2017, include altering the availability of biopsy tissue for research purposes. The amendment will allow biopsy tissue stored within the BMCKD that is older than 3 years to be used 100% for research purposes. Currently, tissue must be held for 5 years prior to being available fully for a research project.

PUBLICATIONS

Publications

Title	Authors	Journal	Publication Date	Volume, Issue, Page Number
<i>The Biobank for the Molecular Classification of Kidney Disease: Research Translation and Precision Medicine in Nephrology</i>	Muruve DA, Mann MC, Chapman K, Wong J, Ravani P, Page S, Benediktsson H.	BMC Nephrology	2017	In press
<i>Immune Surveillance by Renal Phagocytes, the NLRP3 Inflammasome and Dipeptidase-1 are Essential to the Pathogenesis of Contrast-Induced Acute Kidney Injury</i>	Lau A, Muruve DA, et al.	Submission pending	2017	n/a
<i>NLRP3 Localizes to the Tubular Epithelium in Human Kidney and Correlates With Outcome in IgA Nephropathy</i>	Chun J, Chung H, Wang X, Barry R, Taheri ZM, Platnich JM, Ahmed SB, Trpkov K, Hemmelgarn B, Benediktsson H, James MT, Muruve DA	Sci Rep	April 20, 2016	6:24667 doi: 10.1038/srep24667
<i>A survey of patient perspectives on the research use of health information and biospecimens</i>	Page SA, Manhas KP, Muruve DA	BMC Med Ethics	August 15, 2016	17(1); 48. doi: 10.1186/s12910-016-0130-4

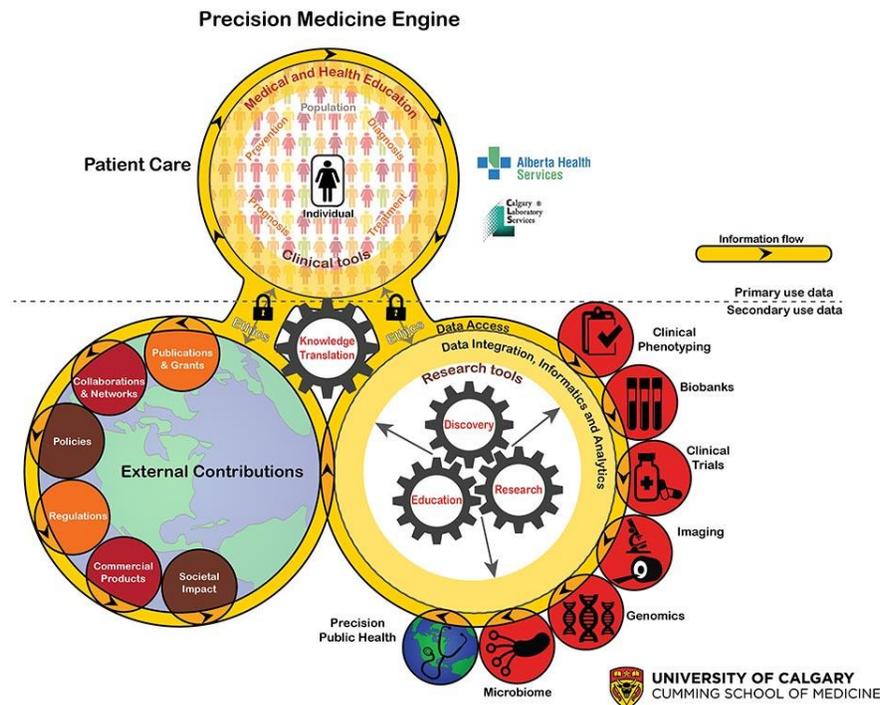
FUTURE DIRECTIONS AND PATIENT ENGAGEMENT

Future Directions and Patient Engagement

Precision medicine is a core priority for Alberta Health Services and the University of Calgary, which has been outlined in a recent operational strategy published by the Department of Medicine here:

<http://www.departmentofmedicine.com/initiatives/precision-medicine/prec-strategy-implementation/>

The PMNP provides support to several of the key elements of this strategy, including a comprehensive biobank, clinical trial support, pathology imaging, and provides infrastructure and programming to bridge between research and clinical care.



Looking forward in to 2018, the PMNP will continue to expand as we strengthen our focus on exploring external collaborations with other precision medicine research programs at the University of Calgary and beyond. The Program aims to instill a culture of research and biobanking into the Nephrology clinical programs in Calgary, underscored by strong patient education, awareness, and engagement in research efforts. This engagement will be facilitated by advertising, partnerships with key stakeholders, and communication opportunities via social media, the Division of Nephrology research newsletter, as well as on our Program's new website, www.TARGET-KD.com.

CONTACT INFORMATION

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