BC CHILDREN'S HOSPITAL BioBank

Annual Report

BC Children's Hospital BioBank

APRIL 1, 2019 – MARCH 31, 2020

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1.0 Overview

This is the fifth annual report of the BC Children's Hospital BioBank (BCCHB), which has been operational since January 1, 2015 and made possible by a generous contribution from Mining for Miracles - the BC mining community's longstanding fundraising campaign for BC Children's Hospital. This report will cover operations and finance from April 2019 – March 2020.

The mission of the BCCH BioBank is to provide a comprehensive service for the collection, processing, storage, rapid access and retrieval of biospecimens and clinical information for research projects using a professional and compassionate approach to patient consenting that adheres to the highest standards of research ethics and patient privacy.

The BCCHB has a two pronged approach to supporting research, "general biobanking" and "PI-driven research". In the general biobank specimens are collected under the mandate of the BCCHB for future research. For PI driven research the BCCHB provide researchers with specified services to enable their own research.

Pages 13 – 17 of this report refer to projects that have utilized specimens from the general biobank. The BCCHB has released specimens to a range of projects from antibody research, immunity and responses to infections, cancer and rheumatic diseases.

Pages 18 – 21 describe the extensive list of PI driven studies that the BCCHB has been able to support over the last three years.

Dr. Vercauteren has continued to participate in a Pediatric Special Interest Group that she formed at the International Society of Biological and Environmental Repositories (ISBER). This is an international group which is leading discussions specifically about pediatric biobanking.

This year we received several requests from patients/parents for postmortem autopsy for research purposes only. The BCCHB in collaboration with Anatomical Pathology has been able to accommodate eight autopsies for research purposes, as per the wishes of the patients' family.

Below are data and other achievements from April 2019 – March 2020.

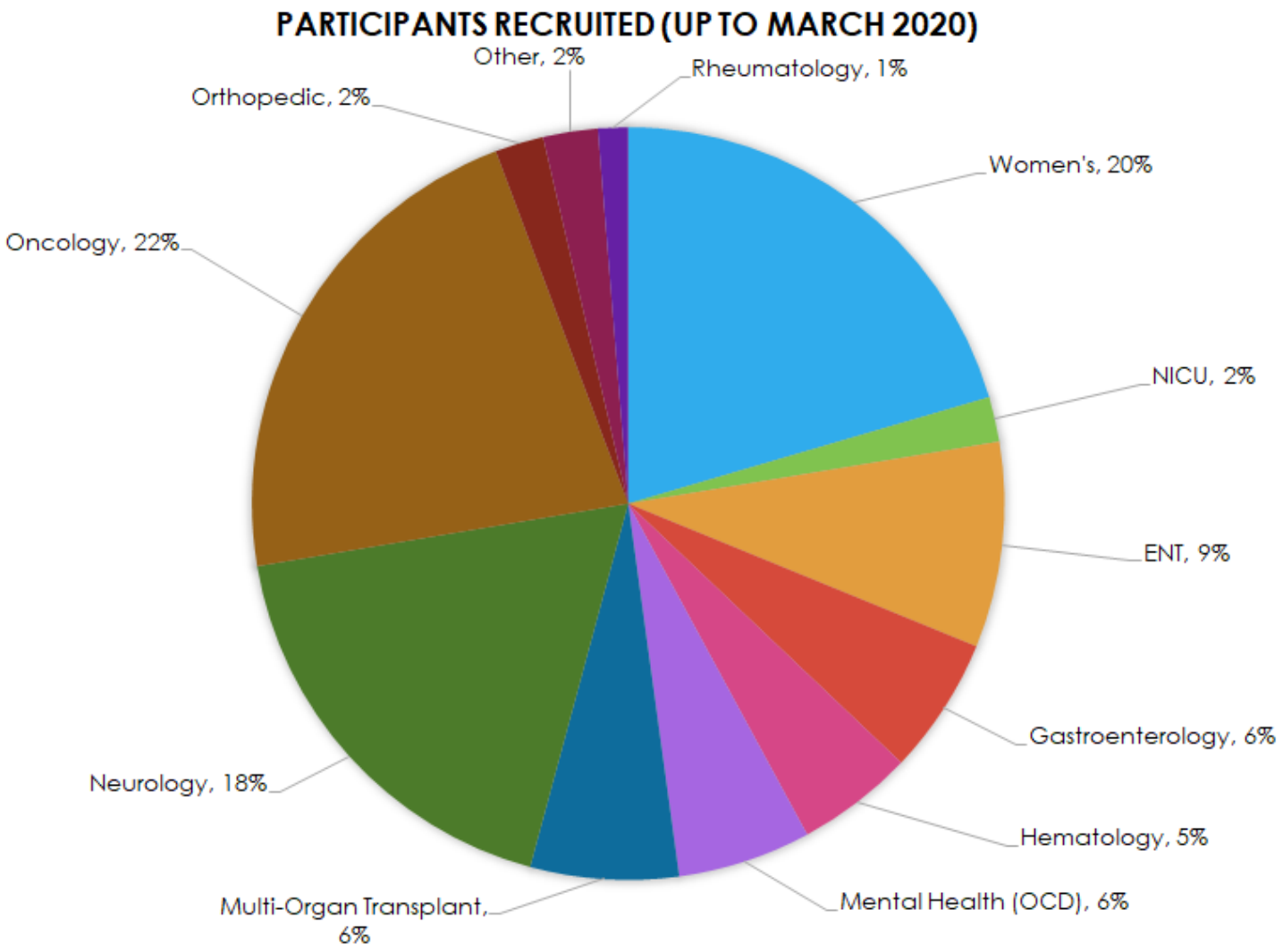
2.0 Participation Rate – General BioBank

	BCCH		BCWH*		Total (BCCH + BCWH)	
	This Year	Total	This Year	Total	This Year	Total
Consent Obtained	223	1505	17 (12 NICU)	418 (36 NICU)	240	1923
Declined	6	54	0	1	6	55
Withdrawn	1	19	0	0	1	19
Consent rate	96.9%	95.4%	--		--	

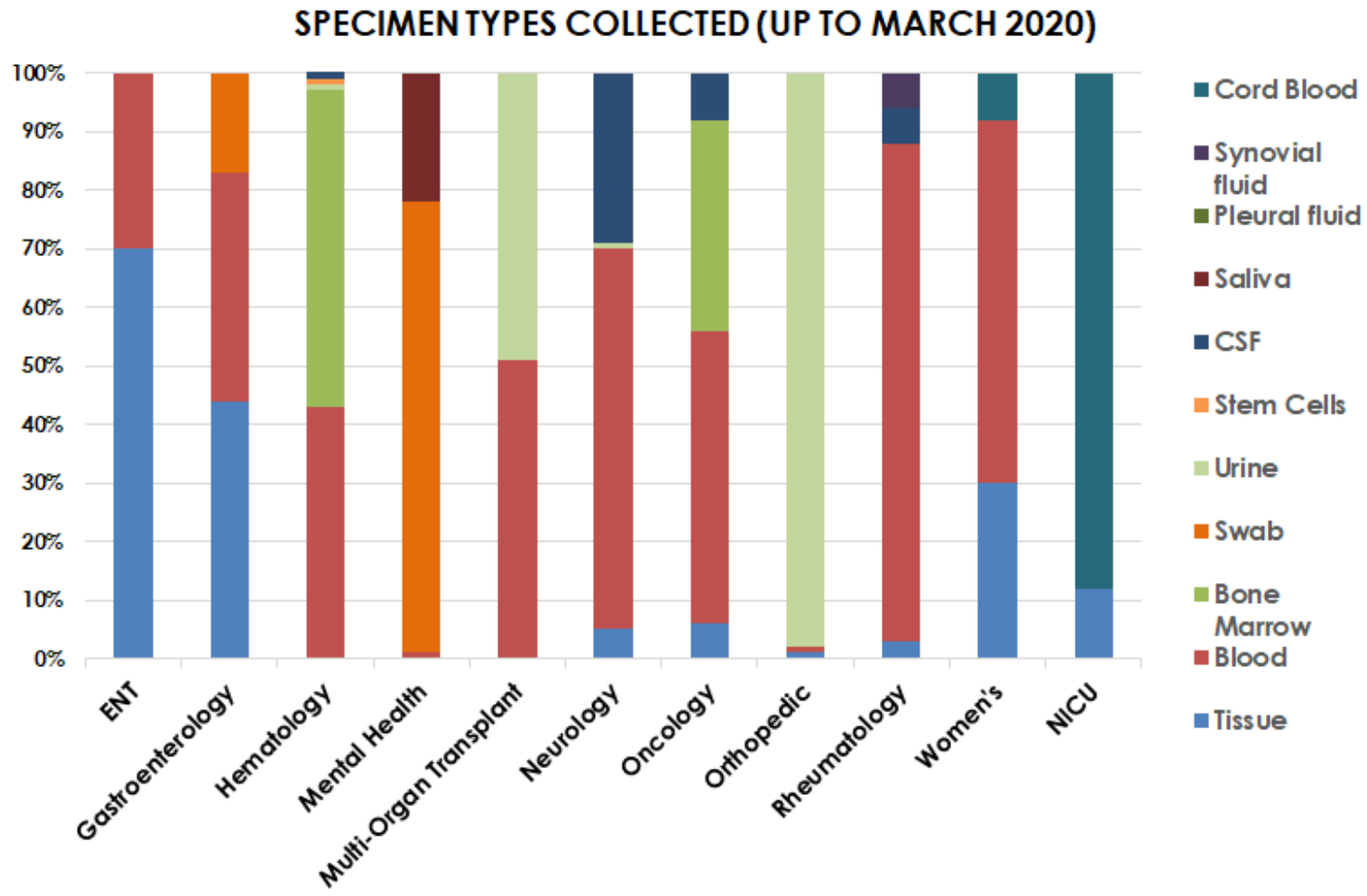
*BCWH recruitment has been minimized until a demand in maternal samples is observed.

As per PHSA Privacy Guidelines, the BCCHB has moved to obtain full informed consent from all participants who are 14 and over as opposed to obtaining assent.

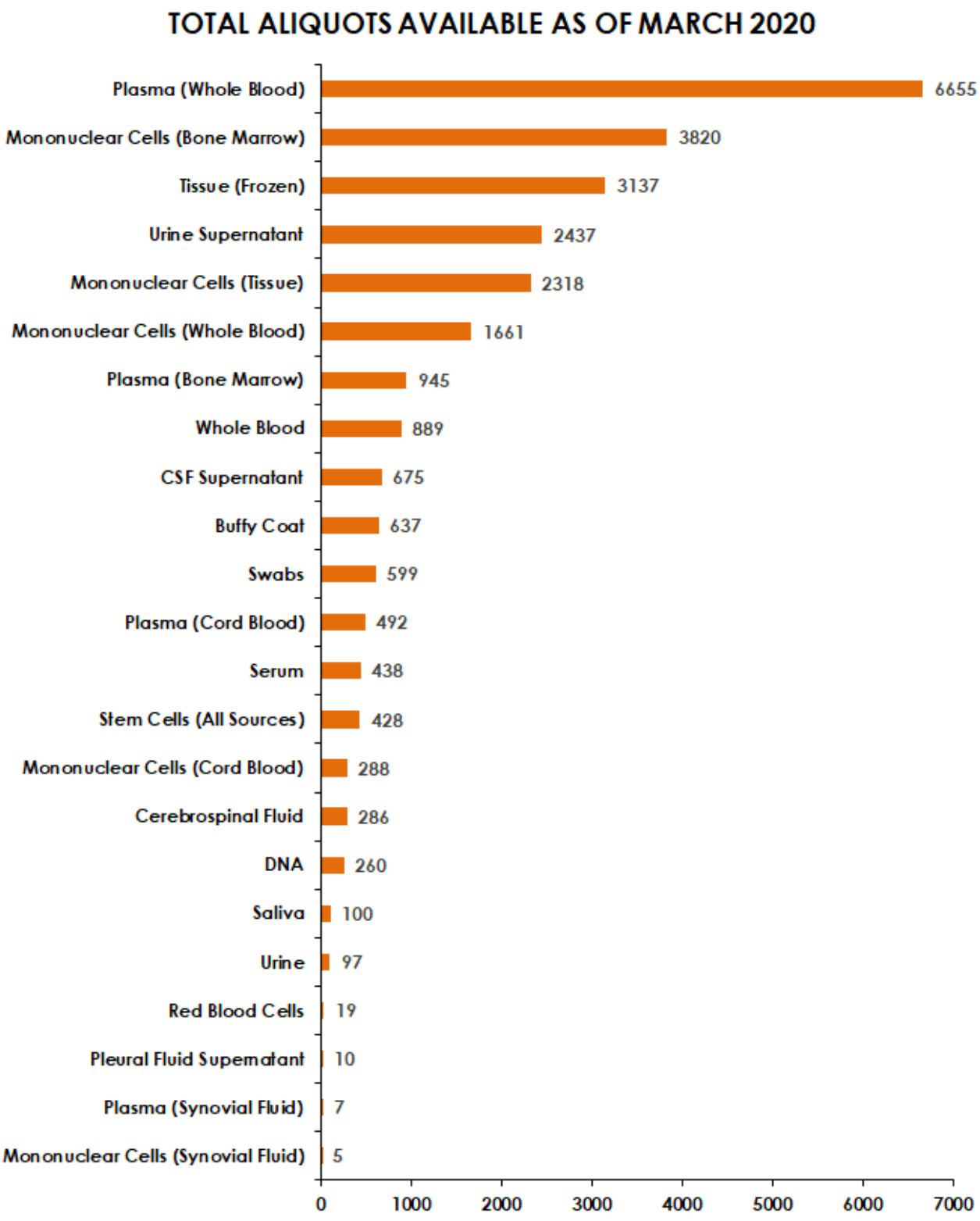
3.0 Clinic Representation – General BioBank



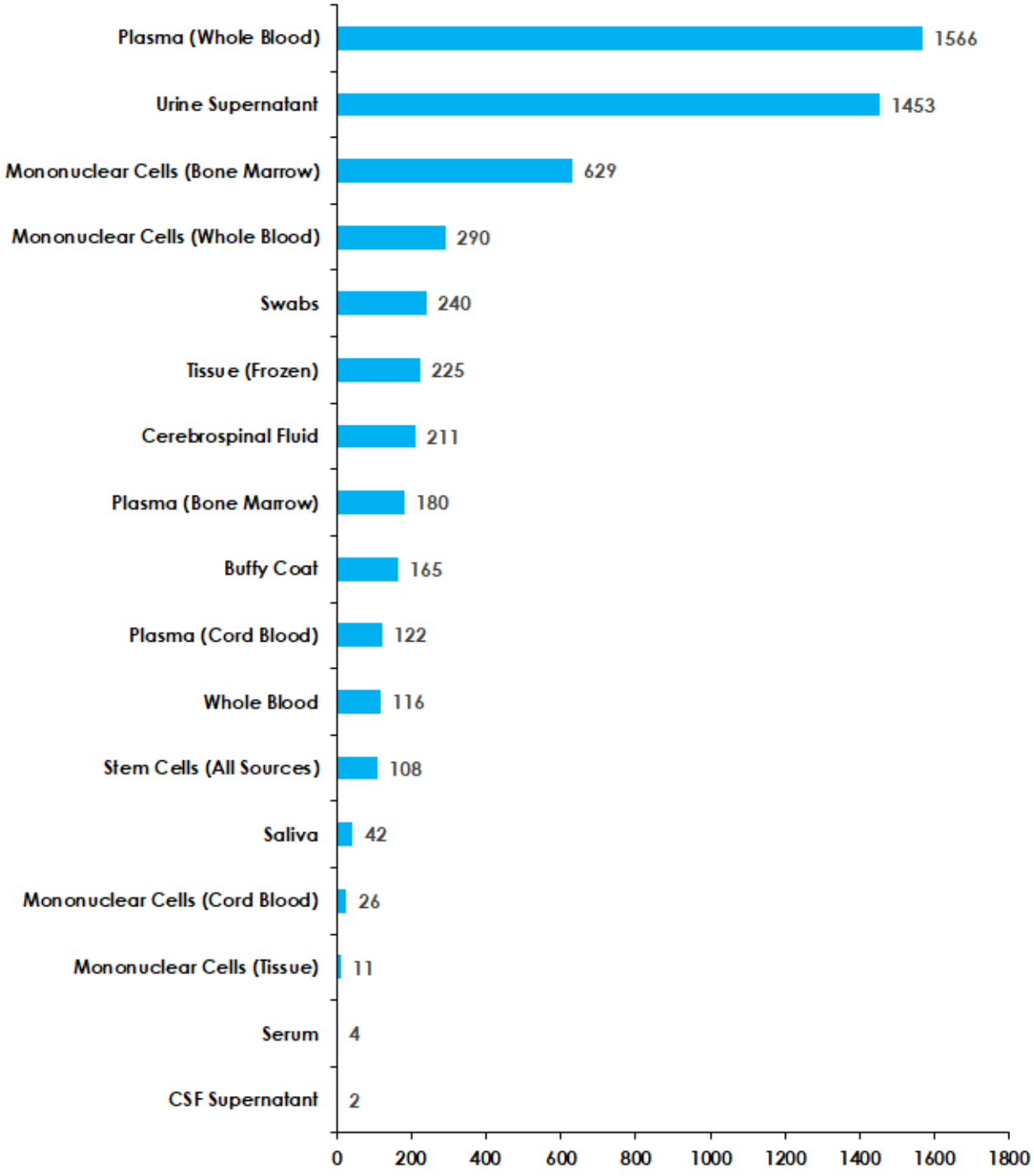
4.0 Specimen Collections – General BioBank



5.0 Aliquots Accrued and Aliquot Availability – General BioBank



ALIQUOTS ACCRUED (APRIL 2019 - MARCH 2020)



6.0 BioBank Oversight Committee (BOC)

Suzanne Vercauteren Chair of BOC	**Director of BCCH BioBank**
Don Brooks	Head of pathology and Laboratory Medicine, UBC
Kathryn Dewar	Senior Research Manager, WHRI
Ellen Giesbrecht	Department of Obstetrics and Gynecology, UBC (BCWH Site Head)
Vacant Spot	*Representative for the Head of Pediatrics, UBC*
Peter Watson	External Biobank Expert
Erik Skarsgard	Head of Department of Surgery at BCCH
Soren Gantt	BCCHR Director of Clinical Research
Mike Burgess	External Ethics Expert
Vacant Spot	*Head of Pathology and Laboratory Medicine at C&W*
Anthony Bailey	Professor and Chair of Child and Adolescent Psychiatry, UBC
Ashton Ellis	Research Coordinator, BCCH BioBank (ex-officio)

Anne Junker and Deborah McFadden have retired. We are actively seeking replacements.

7.0 BioBank Executive Committee (BEC)

Suzanne Vercauteren Chair of BEC	Director, BCCH BioBank
Caron Strahlendorf	Member of Research Ethics Board
Wendy Robinson	Member of BCCHR
Sheila O'Donoghue	Representative from OBER
Anna Lee	Pediatric and Perinatal Pathologist, Anatomical Pathology, BCCH
Tanya Nelson	Member of Pathology and Laboratory Medicine at C&W
Luis Nacul	Member of WHRI, Medical Director CCDP at BCWH
Gregor Reid	Member of BCCHR
Adam Velenosi	Research Coordinator, BCCH BioBank (ex-officio) until October 2019
Ashton Ellis	Research Coordinator, BCCH BioBank (ex-officio) starting October 2019

8.0 BioBank Biospecimen Advisory Committee (BAC)

William Gibson (Chair of BAC)	Member of BCCHR
Suzanne Vercauteren	Director, BCCH BioBank
David Cabral	Member of BCCH
Helene Cote	Member of UBC
Jacob Rozmus	Member of BCCH
Anthony Cooper	Member of BCCH
Wee-Shian Chan	Member of BCWH
Clare Beasley	BC Mental Health and Addiction Services
Isabel Jordan	Founder of Rare Disease Foundation parent advocacy group
Jefferson Terry	Member of the Department of Pathology and Laboratory Medicine
Veronica Chow	Laboratory Manager, BCCH BioBank

9.0 Staff

Suzanne Vercauteren	Director
Veronica Chow	Research Technician (until July 2019); Laboratory Manager (as of Aug 2019)
Ashton Ellis	Research Coordinator
Iryna Kayda	Undergraduate Research Assistant
Vi Nguyen	Research Technician (September 2019 – present)
Qudrat Aujla	Co-op Student (July 2019 – present)
Diana Farhat	Co-op Student (January 2020 – present)
Rosa Balleny	Volunteer (November 2019 – present)
Nidhi Arora	Senior Laboratory Technician (until July 2019)
Adam Velenosi	Research Coordinator (until October 2019)
Rumbidzai Chiwaya	Research Technician (until August 2019)
David Yang	Undergraduate Research Assistant (until August 2019)
Paige Muir	Undergraduate Research Assistant (until August 2019)
Yohaan Johnson	Co-op Student (Sept 2018 - April 2019)

10.0 Applications & Biospecimen Release

Between April 2019 and March 2020 the BCCH BioBank has received six new applications for biospecimens. Applicants and their research project titles are displayed below.

1. Salivary Biomarkers in Childhood-Onset Obsessive Compulsive Disorder Study. Evelyn Stewart- specimens granted. ***44 saliva samples from pediatric obsessive-compulsive disorder positive patients.***

   Lay summary: This project aims to investigate the possible immune-related biomarkers in saliva from children diagnosed with obsessive-compulsive disorder compared to controls. It is hypothesized that children with OCD have an impaired salivary host defense in which IgA, lysozyme, and α-amylase are reduced and CRP plus pro-inflammatory cytokines are increased compared to a control population. The study also aims to determine a relationship between the salivary measures and severity of OCD symptoms and lastly, if there is an association between the salivary biomarkers and demographics of the participants.

2. CODEX deep imaging training, validation, and optimization. Fabio Rossi- specimens granted. ***1 tonsil sample.***

   Lay summary: The research project has just acquired a novel instrument called the CODEX microfluidics controller that allows for the detection of up to 50 antibodies within a single tissue section. The setup and optimization of this method requires a stained human immune tissue, such as tonsils or spleen, with a specific set of antibodies provided by the manufacturer.

3. Comparing Serum Immunoglobulin G4 to Esophageal Biopsy Samples in a Prospective Cohort of Pediatric Eosinophilic Esophagitis Patients. Jon Bush- specimens granted. ***10 tonsils and 10 plasma samples from pediatric eosinophilic esophagitis positive patients.***

   Lay summary: The project aims to find screening, diagnostic, or prognostic methods alternative to conventional endoscopies to diagnose pediatric eosinophilic esophagitis, which are not cost-effective and are highly invasive. It is hypothesized that the concentration of presence of serum food-specific immunoglobulin G4 (FS-IgG4) correlates to disease severity and histologic appearance in patients diagnosed with EoE. Correlation with the EoE tissue collected, serum IgG4, and food specific IgG4 levels will also be made.

4. Assessing early-life exposures by analyzing compounds in baby teeth. Michael Kobor- specimens granted. ***10 deciduous teeth.***

   Lay summary: It is well known that exposure to numerous environmental compounds during the fetal and infant periods of development can have long-term effects on physiology and behaviour that lasts into adulthood. Techniques have been developed to measure dentin and enamel compounds in baby teeth (shed deciduous teeth) to retrospectively assess exposures to exogenous and endogenous

compounds. Teeth normally begin to form during the 2nd trimester of pregnancy and a complete crown finishes developing in the first year of age. It is hypothesized that teeth will provide a comprehensive assessment of exposure to inorganic and organic compounds during development.

5. Pilot Study: Exploring whether natural killer T cells regulate the expansion of tonsillar B cells following EBV infection and if this virus preferentially infects specific B cells. Peter van den Elzen- specimens granted. ***5 mononuclear cells samples from control tonsils and 5 matched plasma samples.***

   Lay summary: The project aims to investigate if natural killer T cells regulate the expansion of tonsillar B cells following Epstein-Barr virus infection and whether EBV preferentially infects specific B cells. NKT cells are lymphocytes that possess the ability to recognize glycolipids presented in the context of the CD1d antigen-presentation molecule and it has been established that B cells express high levels of CD1d. EBV infection of B cells results in a down regulation of CD1d surface expression. EBV positive tonsils will be compared to EBV negative tonsils (controls) from in order to study the effects of EBV infection on NKT cells and B cells.

6. Methylation Sequencing of EoE Children. Denise Daley- specimens granted. ***10 whole blood (EDTA), 10 whole blood (Paxgene), and 10 esophageal tissue samples from positive eosinophilic esophagitis patients with peanut allergies.***

   Lay summary: The developmental origins of health and disease (DOHaD) hypothesis states that environmental stimuli and exposures influence developmental pathways during critical periods of prenatal and postnatal development, and it also states that predictive adaptive responses of the fetus in its in-utero environment promote a phenotype that is optimally suited for the postnatal environment. Food allergies are thought to be a result of both genes and the environment, Atopic diseases may demonstrate a shared genetic architecture but epigenetic signatures such as methylation profiles may distinguish between atopic phenotypes. The research project hopes to define the epigenetic signatures of patients with peanut allergies, general food allergy, EoE, and asthma.

Over the period of April 2019 and March 2020, the following seven projects requested additional specimens for their studies which had previously been approved.

1. Crystal Karakochuk (University of British Columbia, Vancouver, BC) – specimens granted***. (2 serum samples and 2 plasma samples from pediatric patients with sickle cell disease)***
   Folate status in children with sickle cell disease.

   Lay summary: Over 65,000 newborns in the US and Canada are born each year with sickle cell disease (SCD), an autosomal recessive disorder that causes the production of abnormal red blood cells (RBCs). Infants born with SCD have an increased risk of anemia, infections, stroke, and death. This study will

help to determine if there is a potential risk of excess intake, and will inform the need, optimal dose and/or form of folic acid for children with SCD. The findings will have immediate applicability to clinical care in regards to the current controversy regarding safe supplementation practices in children with SCD. Additional samples were released to continue this project.

2. Dr. David Cabral (University of British Columbia, Vancouver, BC) - specimens granted. (***56 control plasma samples)***
Chronic Childhood Vasculitis: Characterizing the Individual Rare Diseases to Improve Patient Outcomes.

Lay summary: Previously, 48-60 plasma samples were requested from children 0 – 18 yrs of age; 8-10 samples in each of 6 age brackets (0-2 yrs , 3-5 yrs, 5-7 yrs, 9-11 yrs, 12-14 yrs, 15 -18 yrs). 8-10 samples were provided to the investigators in each age group (45 samples total) with the exception of 15-18 yrs in which no samples were available. These samples were used to establish preliminary age relative "normal" intervals of adenosine deaminase 2 (ADA2) enzyme activity and circulating protein concentration. Additional plasma samples from these otherwise healthy children are being requested to further refine the normative ranges of ADA2 enzyme activity and concentration. This will be imperative for accurate assessment of ADA2 dysfunction in pediatric patients.

3. Dr. Marina Ulanova (University of British Columbia, Vancouver, BC) - specimens granted. ***(13 plasma samples and 15 serum samples from pediatric participants under 17 years age)***
Studies in support of a new vaccine to prevent invasive Haemophilus influenzae type a (Hia) disease in Canadian Indigenous communities

Lay summary: Haemophilus influenzae type a (Hia) has recently been recognized as an important cause of severe invasive disease in Canadian First Nations and Inuit, as well as in Alaskan Native populations, with the highest rates reported in young children. It is critical to understand at what age children acquire protective antibody in order to develop specific policy for prevention of this infection, including immunization with a new vaccine under development. The objective is to study plasma antibody concentrations in children of various ages. Previously, 116 plasma samples were received and analyzed. IgG, IgM, and IgA antibodies specific to Hia capsular polysaccharide were quantified using ELISA optimized in the research laboratory at the Northern Ontario School of Medicine to study age-dependence of antibody concentrations. The initial requested sample size was estimated based on our preliminary data collected in adults. The additional samples requested will further strengthen the statistical impact of our results. The methodology for analyzing the new samples will be the same and will include analysis of antibody functional activity using serum bactericidal assay.

4. Dr. Philipp Lange (University of British Columbia, Vancouver, BC) – specimens granted. ***(9 mononuclear cell samples and 15 plasma samples from ALL patients)***
Proteins and their modification in childhood cancer.

   Lay summary: Previously requested an additional 10 peripheral blood and bone marrow mononuclear cells as well as plasma from T-ALL or B-ALL patients and also requested to expand the project to include 20 AML patients. Another request was made to collect CSF, FFPE, plasma, and tissue from neuroblastoma, brain cancer, and control patients consisting of 10-20 patients each respectively. The research project aims to use proteomic techniques to detect specific differences between normal cells and cancer cells. Before the powerful technologies can be applied to a large scale study, the project hopes to validate the applicability to pediatric patient specimen to identify the optimal specimen technically and ethically.

5. BRAvE. Gregor Reid, Chris Maxwell, James Lim, Kirk Schultz and Philipp Lange (University of British Columbia, Vancouver, BC)- specimens granted. (***5 tissue samples)***
Personalize Molecular Characterization.

   Lay summary: The aims for this study are to procure viable HR tumor tissues, B- and T- acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML) bone marrow and PDX samples available through BCCH BioBank. The requested samples will include those obtained at diagnosis and, if available in the BioBank, later points during therapy; this will enable assessment of the robustness of original targetable lesions and identification of new targets arising during treatment. We will extract DNA and RNA as per standard protocols and perform targeted sequencing for selected genomic alterations (e.g., single-nucleotide variant, INDELS, fusion mutations) and gene expression changes known to be associated with pediatric cancers.

6. Dr. Tom-Blydt-Hansen (University of British Columbia, Vancouver, BC)-specimens granted. (***120 urine samples, 14 buffy coat samples, 12 plasma samples, and 3 peripheral blood mononuclear cell samples)***
Enhanced immune monitoring in pediatric kidney transplant recipients.

   Lay summary: Urinary biomarkers such as CXCL10 have been validated for their ability to predict acute rejection, but not tested yet for clinical utility. These markers must improve on the existing framework for clinical decision-making to be useful as clinical tools. For the diagnosis of rejection, they must be superior to existing surveillance at indicating a need for biopsy, such that they may reduce the requirement for biopsy surveillance. To address the efficacy of urinary biomarkers, an adapted clinical trial design is required. The interpretation of a biomarker level will be made in the context of existing clinical information. The biopsy result will be used to determine the accuracy with which rejection is predicted. Prior to conducting a clinical trial, preliminary data is needed to guide trial design. We propose a pilot feasibility study to establish the groundwork for a definitive clinical trial in children

with kidney transplantation to test the hypothesis that real-time, enhanced monitoring with urine biomarkers is superior to standard monitoring for identifying risk of rejection.

7. Dr. Tom-Blydt-Hansen (University of British Columbia, Vancouver, BC) - specimens granted. ***(25 urine samples)***
Pharmacometabolomics in Pediatric Transplant Recipients and Relationship for Myophenylate Mofetil Pharmacokinetics and Pharmacogenomics.

   Lay summary: Mycophenolate Mofetil (MMF) was approved by the FDA as an immunosuppressant to prevent transplant rejection. Therapeutic drug monitoring is recommended for optimal dose adjustment, however checking the drug level in the blood is not reliable and PK (pharmacokinetic) testing is invasive and impractical for sequential monitoring. Consequently, our objective is to develop a better clinical tool for accurate MMF therapeutic drug monitoring in children, and with the goal to alleviate drug toxicity and improve allograft outcome. We will identify urinary metabolite profiles that are correlated with MMF therapeutic drug exposure and develop a predictive equation to be tested for non-invasive clinical monitoring.

11.0 PI Driven Studies

#	Study Name	PI	Services Provided	Sample Processing	Storage
1	SLED	Dr. Dina Panagiotopolous & Dr. Megan Levings	Receiving, labeling, recording, & processing the specimen Long-term storage	Serum Plasma Buffy Coat PBMC	- 80°C Liquid Nitrogen
2	Adult SLED	Dr. Jan Dutz	Receiving, labeling, recording, and processing the specimen Long-term storage	Serum Plasma Buffy Coat PBMC	- 80°C Liquid Nitrogen
3	Epilepsy & Genomics (EpGen)	Dr. Michelle Demos & Dr. Mary Connolly	Receiving, labeling, recording, and aliquoting the specimen Long-term storage	DNA Extraction	- 80°C
4	CAUSES	Dr. Jan Friedman	Receiving, labeling, recording, and aliquoting the specimen Long-term storage	Storage of whole Blood	- 80°C
5	SWAVE-U (study closed)	Dr. Jefferson Terry	Consenting patients and delivering the placenta to Anatomical Pathology	None	Store in the BioBank box in AP
6	mTOR (study closed)	Dr. Rebecca Deyell	Receiving, labeling, recording, and processing the specimen	Protein Lysate (PBMC)	Temporary storage only (-80°C)
7	UST1D (study closed)	Dr. Jan Dutz	Receiving, labeling, recording, and processing the specimens Long-term storage	Serum Plasma PBMC Whole blood	- 80°C Liquid Nitrogen
8	Genome wide assessment of genetic alterations in pediatric acute leukemia (LBRWN)	Dr. Lindsay Brown	Consenting and data collection	None	None

#	Study Name	PI	Services Provided	Sample Processing	Storage
9	Understanding the risk of sudden death in families: cascade screening in CPVT (CARDIO)	Dr. Shubhayan Sanatani	Coordinating the collection of patient blood samples to FTA blood spot cards Long-term storage	Blood spot card DNA extractions	Room Temp - 80°C
10	TREASuRE (study closed)	Dr. Suzanne Vercauteren	Consenting	None	None
11	Vitamin B12 status in South-Asian and European pregnant women and their newborns (study closed)	Dr. Hilary Vallance	Labeling, recording, storage	None	- 80°C
12	Broady Lab	Dr. Raewyn Broady	Labeling, recording, storage	None	Liquid Nitrogen
13	Levings Lab (study closed)	Dr. Megan Levings	Labeling, recording, storage	None	Liquid Nitrogen
14	A randomized controlled pilot study to examine the effects of goal-directed fluid therapy on post-operative outcomes in children undergoing scoliosis repair (study closed)	Dr. Zoe Brown	Labeling, recording, storage	None	- 80°C
15	Kingella Kingae (study closed)	Dr. Ghada Al-Rawahi	Identifying eligible patients, deliver kits, consent patients	None	None
16	Overcoming the barriers to successful immune therapy for acute leukemia	Dr. Gregor Reid (Dr. Nina Rolf)	Consenting	None	None
17	PedVas	Dr Kelly Brown	Aliquoting, labeling, recording, Long-term storage	None	- 80°C Liquid Nitrogen Room Temp.

#	Study Name	PI	Services Provided	Sample Processing	Storage
18	AKI (study closed)	Dr. Cherry Mammen	Processing, aliquoting, labeling, recording, storage	Urine (aliquoting)	- 80°C
19	EoE	Dr. Edmond Chan	Labeling, recording, storage	Freezing Tissue Whole Blood Plasma PAX gene	- 80°C
20	TED (study closed)	Dr. Linda Casey	Consenting and coordinating	None	None
21	POG cf DNA	Dr. Ryan Morin	Processing	Plasma Buffy Coat	- 80°C
22	BC-SICR	Dr. Srinivas Murthy	Labeling, recording, storage & processing	Whole blood aliquoting PBMC Plasma DNA	- 80°C Liquid Nitrogen
23	CAN-TBI Sub study	Dr. William Panenka	Labeling, recording & processing Long-term storage	Plasma PBMC	- 80°C Liquid Nitrogen
24	CROPS	Dr. Jan Dutz and Dr. Kevan Jacobson	Labeling, recording, storage & processing	Serum Plasma PAX gene PBMC	- 80°C Liquid Nitrogen
25	iPSC	Dr. Francis Lynn	Labeling, recording, storage & processing	PBMC	Liquid Nitrogen
26	Rheumatology	Dr. David Cabral and Dr. Kelly Brown	Labeling, recording, storage & processing	Whole blood aliquot Plasma PBMC	- 80°C Liquid Nitrogen
27	ABLE-Glyconet (study closed)	Dr. Kirk Schultz	Consenting and coordinating	None	None
28	SPACEY (study closed)	Dr. Sian Spacey	Labeling, recording, storage & processing	Whole Blood DNA extractions	- 80°C
29	VIRTUUS	Dr. Tom Blydt-Hansen	Labeling, recording, storage & processing	Urine (supernatant, cell pellet)	- 80°C
30	PROFYLE	Dr. Rebecca Deyell	Labeling, recording, storage & processing	Urine (supernatant, cell pellet) Freezing Tissue Plasma Buffy coat PBMC	- 80°C

31	PRISM	Dr. Vilte Barakauskas	Storage, coordinating	None	- 80°C
32	P²RISM	Dr. Kate Chipperfield	Consenting, coordinating, labeling, recording & storage	Plasma	- 80°C
33	PRIMED	Dr. Vikram Sabhaney	Labeling, recording, storage & processing	Tempus Plasma Serum Urine (supernatant)	- 80°C
34	OncNut	Dr. Paul Rogers	Labeling, recording & storage	Whole Blood	- 80°C
35	Biobank for Skin and Adipose Tissue	Dr. Sarah Hedtrich	Consenting and coordinating	None	4°C
36	CUDDLE	Dr. Wee-Shian Chan	Consenting and Coordinating	None	None

12.0 Key Performance Indicators (KPI)

	Key Performance Indicators	January 1, 2015 – March 31, 2016	April 1, 2016 – March 31, 2017	April 1, 2017 – March 31, 2018	April 1, 2018 – March 31, 2019	April 1, 2019 – March 31, 2020
1	# of participants recruited	402 per year (+ carry-over from CCBR) 27 per month	310 per year 26 per month	417 per year 35 per month	334 per year 28 per month	240 per year 20 per month
2	# of requests for specimens from general biobank	4 per year 0.2 per month	7 per year 0.6 per month	12 per year 1.2 per month	14 per year 1.2 per month	14 per year 1.2 per month
3	# of PI driven research projects supported (cumulative, some studies continue to store samples despite being closed)	17	23	29	29	36
4	# of aliquots released from General BioBank (per year)	51	485	305	624	467
5	Sample QC (two methods) i) Mononuclear cells *Recovery* *Viability* ii) DNA *A260/280* *A280/230*	 62% 75% 1.84 1.93	 90% 85% 1.86 2.20	 83.3% 96.3% 1.84 1.73	 59.3%* 73.4%* 1.84 1.90	 N/A* N/A* 1.84 1.64
6	# of successful grants for BCCHB specific projects (per year)	1	4	1	4	1
7	# of successful grants/awards that proposed using BCCHB (per year)	2	1	3	3	4
8	# of publications with BCCHB specimens/data (per year)	1	1	2	4	3
9	# of conference presentations/posters (per year)	7	4	1	3	4

*Recovery and viability were self-reported by researchers on fewer released mononuclear cells than in previous years, and could not be accurately measured from a significantly smaller sample size.

13.0 BioBank Lifetime Utilization

Clinic	# of Participants Consented*	Sample Types	Aliquots Accrued	Aliquots Available	Aliquots Released	% Utilization
ENT	165	Buffy Coat	1	1	0	
		Cell Culture	13	11	2	
		DNA	102	102	0	
		Fluid from Swab	1	1	0	
		Frozen Tissue Block	756	661	95	
		Mononuclear Cells	2103	1615	488	
		Plasma	334	115	219	
		RNA	154	154	0	
		Serum	45	32	13	
		Whole Blood	32	16	16	
		Total Aliquots	**3541**	**2708**	**833**	23.52%
Gastroenterology	110	Buffy Coat	4	3	1	
		Fluid from Swab	29	27	2	
		Frozen Tissue Block	128	109	19	
		Plasma	99	89	10	
		Whole Blood	56	39	17	
		Total Aliquots	**316**	**267**	**49**	15.51%
Hematology	94	Buffy Coat	22	22	0	
		Cerebrospinal Fluid, Supernatant	25	25	0	
		Mononuclear Cells	325	319	6	
		Plasma	170	144	26	
		Serum	51	35	16	
		Urine	3	3	0	
		Whole Blood	29	29	0	
		Total Aliquots	**625**	**577**	**48**	7.68%
Mental Health (OCD)	107	Fluid from Swab	346	346	0	
		Plasma	5	5	0	
		Saliva	49	6	43	
		Total Aliquots	**400**	**357**	**43**	10.75%
Multi-Organ Transplant	119	Buffy Coat	105	81	24	
		Frozen Cell Pellet	1	1	0	
		Frozen Tissue Block	7	5	2	

		Mononuclear Cells	360	352	8	
		Plasma	1214	1209	5	
		Urine	74	60	14	
		Urine, Supernatant	1549	1317	232	
		Whole Blood	3	3	0	
		Total Aliquots	**3313**	**3028**	**285**	8.60%
Neurology	339	Buffy Coat	9	9	0	
		Cerebrospinal Fluid	107	107	0	
		DNA	65	65	0	
		Frozen Tissue Block	15	15	0	
		Mononuclear Cells	46	41	5	
		Plasma	145	64	81	
		Serum	6	3	3	
		Urine, Supernatant	8	8	0	
		Whole Blood	243	234	9	
		Total Aliquots	**644**	**546**	**98**	15.22%
Oncology	410	Buffy Coat	158	158	0	
		Cerebrospinal Fluid	13	12	1	
		Fixed Tissue Block	14	14	0	
		Frozen Cell Pellet	24	22	2	
		Frozen Tissue Block	234	195	39	
		Mononuclear Cells	3384	3165	219	
		Plasma	2998	2765	233	
		Pleural Fluid, Cells	3	3	0	
		Pleural Fluid, Supernatant	7	7	0	
		RNA	1	1	0	
		Serum	16	14	2	
		Stem Cells	364	332	32	
		Urine, Supernatant	3	3	0	
		Whole Blood	37	34	3	
		Total Aliquots	**7737**	**7196**	**541**	6.99%
Orthopedic	39	Frozen Tissue Block	4		4	
		Mononuclear Cells	2	2	0	
		Plasma	8	8	0	
		Urine, Supernatant	259	259	0	
		Total Aliquots	**273**	**269**	**4**	1.47%
Rheumatology	24	Buffy Coat	9	9		

		Cerebrospinal Fluid	20	20		
		Frozen Tissue Block	2	2		
		Mononuclear Cells	28	28		
		Plasma	72	72		
		Whole Blood	11	11		
		Total Aliquots	**142**	**142**	**0**	0.00%
Other BCCH Clinics	44	DNA	21	21	0	
		Mononuclear Cells	232	230	2	
		Buffy Coat	13	11	2	
		Plasma	225	220	5	
		Serum	14	11	3	
		Frozen Tissue Block	67	56	11	
		RNA	14	14	0	
		Saliva	1	0	1	
		Cerebrospinal Fluid	85	85	0	
		Fluid from Swab	12	12	0	
		Whole Blood	80	29	51	
		Stem Cells	23	23	0	
		Urine, Supernatant	142	126	16	
		Total Aliquots	**929**	**838**	**91**	9.80%
Women's	382	Frozen Tissue Block	1108	1108	0	
		Mononuclear Cells	**190**	**190**	**0**	
		Plasma	419	414	5	
		Serum	126	126	0	
		Whole Blood	53	53	0	
		Buffy Coat	5	5	0	
		Total Aliquots	**1901**	**1896**	**5**	0.26%
NICU**	36	Frozen Tissue	20	20	**0**	
		Mononuclear Cells	43	43	0	
		Plasma	210	210	0	
		Total Aliquots	**273**	**273**	**0**	0.00%

*Only participants who received full formal consent were considered to be recruited participants in the April 2019 - March 2020 Annual Report.

**Indicates a new clinic and we would not anticipate utilization at this stage.

14.0 BCCHB Publications

No new publications from the BCCHB this year.

Dr. Vercauteren is editor on a special pediatric edition of Biopreservation and Biobanking which is due to be published in the fall of 2020. The BCCHB will have a number of papers in this journal and writing is in progress at this time.

Publications Acknowledging the BCCHB

The following peer-reviewed publications have acknowledged the BCCHB for the utilization of general biobank specimens and clinical data in their research.

Lam AJ, MacDonald KN, Pesenacker AM, Juvet SC, Morishita KA, Bressler B, Pan JG, Sidhu SS, Rioux JD, Levings MK, iGenoMed Consortium. Innate control of tissue-reparative human regulatory T cells. *The Journal of Immunology*. 2019 Apr 15;202(8):2195-209.

Masud S, Greenman J, Mulpuri K, Hasan MR, Goldfarb DM, Tilley P, Gadkar VJ, Al-Rawahi GN. Asymptomatic Pharyngeal Carriage of Kingella kingae Among Young Children in Vancouver, British Columbia, Canada. *The Pediatric infectious disease journal.* 2019 Oct 1;38(10):990-3.

Demos MK, Guella I, McKenzie MB, Buerki SE, Evans DM, Toyota EB, Boelman C, Huh LL, Datta A, Michoulas A, Selby K. Diagnostic yield and treatment impact of targeted exome sequencing in early-onset epilepsy. *Frontiers in neurology.* 2019;10:434.

Research Activities

The BCCHB has conducted a large number of focus groups and workshops as listed below as part Dr. Vercauteren' s public engagement interest.

December 2nd, 2019: e-consent focus group – approximately 20 kids, teens, and parents all participated in a focus group so that the BCCHB could gather opinions and generate discussion around our electronic consent prototype. The information gathered was used to improve the platform prior to REB submission.

15.0 Grants (awarded in 2019/2020)

BC Children's Hospital Research Institute Clinical Research Support Grant. Principal Investigator; $25,000; *Multimedia e-consenting platform for biobanking and other research (e-Consent).*

16.0 Presentations (2019/2020)

International Presentations:

- Vercauteren, S. (November 2019). *Pitching Biobanking* International Society of Biological and Environmental Repositories (ISBER) Regional Meeting, Minneapolis, MN, USA.
- Shih, J. (November 2019). *Giving Patients, the Public, and Health-Care Providers a Voice in Pediatric Mental Health Biobanking.* International Society of Biological and Environmental Repositories (ISBER) Regional Meeting, Minneapolis, MN, USA.
- Muir, P. (November 2019). *Determining Quality of Biobanked Placenta Tissue Specimens.* International Society of Biological and Environmental Repositories (ISBER) Regional Meeting, Minneapolis, MN, USA.

Local Presentations:

- Vercauteren, S. (June 2019). *Innovative Consenting Methods in Pediatric Biobanking.* Research Ethics Board Meeting, Kelowna, BC.
- Vercauteren, S., Velenosi, A. (September 2019). *BC Children's Hospital BioBank*. Hem/Onc/BMT Rounds.
- Vercauteren, S., Velenosi, A. (September 2019*). Small Samples, Big Impact: Supporting the BCCH BioBank and Translational Research.* Surgical Suite Grand Rounds.
- Dittrick, M., Velenosi, A. (October 2019). *Innovative Consenting Methods in Pediatric Biobanking.* Clinical Research Ethics Symposium, UBC.

17.0 Communication

Our YouTube video about the BCCHB has been viewed 2,770 times.

Website: www.bcchbiobank.ca
YouTube: https://www.youtube.com/channel/UCS1LxeGRJTRiejLRXw9heMw

BCCHB Newsletter: Fall 2019, Spring 2020

18.0 Financials

Full financial details for financial year ending March 2020:

	Q1	Q2	Q3	Q4	Grand total
Opening Balance ($)	**244,667**	**191,343**	**141,876**	**103,932**	**244,667**
Total Revenue ($)	**21,849**	**47,124**	**31,836**	**77,101**	**177,910**
Total Salaries ($)	**71,800**	**69,691**	**64,168**	**60,459**	**266,118**
Total Operating Expenses ($)	**3,373**	**26,900**	**5,613**	**13,325**	**49,210**
Total Expenses ($)	**75,173**	**96,591**	**69,780**	**73,784**	**315,328**
Unexpended Balance ($)	**191,343**	**141,876**	**103,932**	**107,249**	**107,249**

Comment on Financial status:

All operating expenses and salaries now need to be paid for from the UBC income account and the CD theme grant account.

A comparison of predicted and actual expenditure and income is shown below:

Expenditure

	FY2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	Total (up 2018/19)
Actual	142,172	818,846	474,664	680,428	291,442	365,338	315,328	3,088,218
Predicted	978,500	290,000	313,000	592,500	433,200	415,000	311,897	3,334,097

Income

	FY2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	Total (up 2018/19)
Actual	565	10,395	48,536	79,476	117,966	97,371	177,910	472,219
Predicted	0	16,000	35,000	70,000	100,000	140,000	135,000	496,000

19.0 Abbreviations

BCCH – BC Children's Hospital
BCWH – BC Women's Hospital
PHSA – Provincial Health Services Authority
UBC – University of British Columbia
WHRI – Women's Health Research Institute
REB – Research Ethics Board

20.0 Sign Off

Report compiled for the BCCH BioBank by:

Veronica Chow, Ashton Ellis, Vi Nguyen, Diana Farhat

Report reviewed by:

Suzanne Vercauteren, BCCH BioBank Director

Approved by:

BCCH BioBank Oversight Committee

Report signed off on behalf of the BCCH BioBank Oversight Committee by:

Suzanne Vercauteren, BCCH BioBank Director

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Name Date