Coronavirus Variants Rapid Response Network



Réseau de réponse rapide aux variants du coronavirus

CoVaRR-Net Biobank: Supporting CITF projects

Pandemic Preparedness Biobanking

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CITF Meeting - March 8-9, 2023, Vancouver BC

Land Acknowledgement

The Ottawa Hospital acknowledges it is located upon the traditional and unceded territory of the Algonquin people. We have the privilege and responsibility to serve First Nations, Métis and Inuit of many backgrounds and from many treaty lands and to demonstrate respect for Indigenous people's contributions and culture. We also acknowledge traditional knowledge and healing developed over countless generations.

"O Canada, our home on native land..."



Biobank Leadership Team







Dr. James Robblee University of Ottawa Heart Institute Co-Director









Dr. Angela M. Crawley OHRI Director



Dr. Amy Hsu Bruyère Research Institute Director



Dr. Raphael Saginur OHRI **Co-Director**



Dr. Curtis Cooper OHRI **Clinical Associate Director**



Dr. Don Vinh McGill University **Clinical Associate Director**



Nikita Rayne MSc OHRI Manager



Dr. Guillaume Bourque McGill University Associate Director

CoVaRR-Net Biobank Aims

To facilitate **rapid** research by coordinating access of resources across multiple Canadian sites to meet the needs of the emergency and build upon this initiative for the future.







Biobank supporting CITF-funded studies



		CoVaRR-Net Biobank Catalogue								Total
		Site	Ottawa	Ottawa	Ottawa	Ottawa	Ottawa	Ottawa	Toronto	
		Study Name	CV-McG	LEFT	SSO	FUSION	VISID	VIP	CV-Gom*	7
2		Theme	hospitalization	long-covid	surveillance	case registry	immunodeficiency	cancer	surveillance	broad
2 CoVaRR-Net Sites 7 Studies 2,204 Participants 23,210		Study Status	complete	complete	in progress	in progress	in progress	in progress	in progress	in progress
		Participant Registration (closed/target #)	closed	closed	closed	open	100	?	150	open
		Participants	65	70	1181	500	56	199	133	2204
7		Samples	137	210	3037	-	250	76	197	3907
Studies	Š	Aliquots of 10 ⁷ cells	626	958	14005	-	671	130	2920	19310
	PB	Distributed aliquots	234	91	72	-	174	-	274	845
		Number of Projects that have accessed PBMCs	1	1	1	-	1	-	3	7
2,204	_	Samples	325	210	3060	500	216	69	219	4599
Participants	Bma	Aliquots of 1-2 mL	1393	1053	16922	3000	894	264	3719	27245
	Plai	Distributed aliquots	348	84	1410	-	167	-	1501	3510
		Number of Projects that have accessed Plasma	1	1	2	-	1	-	7	12
23,210		Samples	520	210	4811	-	190	69	-	5800
Samples	Ę	Aliquots of 1-2 mL	5200	792	11387	-	499	460	-	18338
	Ser	Distributed aliquots	172	268	4307	-	1	-	-	4748
		Number of Projects that have accessed Serum	1	2	1	-	1	-	-	5
75,296	bg	Samples of dry blood spot	36	142	7358	-	-	496	30	8062
Aliquots	0q	Samples of whole blood on ACD	-	-	-	-	-	-	-	
	hole	Distributed samples	18	90	3394	-	-	-	24	3526
	≥	Number of Projects that have accessed DBS	1	1	1	-	-	-	1	4
12,801		Samples in salivette container	-	-	601	-	-	-	241	842
Distributed	N, S	Aliquots of 0.5 mL	-	-	1673	-	-	-	668	2341
	Sal	Distributed aliquots	-	-	-	-	-	-	172	172
		Number of Projects that have accessed Saliva	-	-	-	-	-	-	1	1
13		Associated Analytical Data								
Projects Supported		Visits with Serology	190	194	4811	-	168	144	186	5693
		Visits with SARS-CoV-2 saliva-based PCR test	-	-	6008	-	-	-	-	
		Visits with Immune Cell Phenotyping	137	pending	pending	-	174	pending	pending	311
					-					

CoVaRR-Net Biobank & Data Platform – CoVaRR-Net (covarrnet.ca)

Updated: February 2023 6

CITF-Funded Studies – Immune response assessment

	Stop the Spread Ottawa SSO	COVID-19 Vaccine Immunogenicity and Safety ImmunoDeficient Patients Study VISID	Vaccine Immunity in Populations with Immunological Cancers VIP	
Purpose	Longitudinal analysis of immunity in surveillance and Covid-19 convalescence through vaccination and hybrid immunity.	Assess COVID-19 vaccine immunogenicity and safety the immune compromised.	Assess antibody and cell mediate immunity in hematologic malignancy.	
Principal Investigators	Drs. Marc-André Langlois and Curtis Cooper	Dr. Juthaporn Cowan	Dr. C. Arianne Buchan	
Participants	1181	56	199	
Samples	19,882	656	710	
Distributed aliquots	9183	342	0	

Biological material resources and utilization



Biobank Inventory Management System

- State of the art, highly configurable, outof-the box inventory management system
 - Ability to handle various sample types and study designs
 - Linkable with other data systems
- Accessible for biobanks without BIMS ~\$14,000/year for 5 seat increments (cost-sharing, depending on need)



aliisaHeiskanen



Supporting CITF projects

Pandemic Reparedness Biobanking

A Federated System of Biobanks

- Federated model to share materials and data
 - CoVaRR-Net Biobank facilitates open, fair and rapid exchange between researchers
- Each partner biobank maintains autonomy
 - Partner biobanks can retain custody over the materials and data they collect and store
 - Privacy is honoured through a strict de-identified process





Canadian COVID-19 Biobank and Data Alliance A CoVaRR-Net initiative



Alliance canadienne des **biobanques et données** COVID-19

Une initiative du réseau CoVaRR-Net

<u>Ontario</u>

- CoVaRR-Net Biobank
- University of Toronto COVID-19 Biobank
- University Health Network COVID-19 Biobank
- Sunnybrook COVID-19 Biobank
- Baycrest Centre

British Columbia

British Columbia (BCBN) COVID-19 Biobank Network

<u>Québec</u>

• Biobanque québécoise de la COVID-19 (BQC19)

<u>Alberta</u>

Canadian BioSample Repository

Newfoundland & Labrador

• Memorial University

Nova Scotia

• Dalhousie University

<u>National</u>

<u>Pediatric Outcome imProvement through</u>
 <u>CO</u>ordination of <u>Research Networks</u> (POPCORN)



Quality Assurance

1) Standard Operating Procedures (SOPs)

- Promote consistency across biobank partners
- Ensure compliance of guidelines
- Facilitate training of personnel

2) Quality Control

 Perform routine tests to assess samples quality/integrity

3) Sample and Data Auditing

- Review biobank procedures
- Harmonize biobank practices
- Ensure database accurately reflects patient information

4) Follow-up

 Obtain feedback from researchers regarding sample access process and quality of samples



CoVaRR-Net Data Platform - Metabase



CoVaRR-Net Biobank Sample and Data Distribution Process

Request	 Researcher search catalogue and complete application
Review	 Scientific Review Panel review application Research Ethics and Access Officer evaluate contracts (i.e. UDBMTA)
Select	 Biobank Coordinator selects samples from inventory Biobank Technician retrieves samples
Ship	 Biobank Technician and Coordinator ships samples and transfers data Biobank Coordinator follow-up with Researcher

Research Ethics

- Ready-to-use research ethics protocol avoids delays to research
- CoVaRR-Net Research Ethics
 - ▶ provincial, multi-jurisdictional: model → Clinical Trials Ontario protocol (approved 2021)
 - CoVaRR-Net-initiated collection of diverse biospecimens
 - Secondary use, adult and pediatric
- Revised TCPS2 2022
 - Single ethics review for minimal risk research across Canada!!!
 - Secondary use
 - Overcome provincial border barriers



Universal Data and Biological Materials Transfer Agreement (UDBMTA)

Draft University of Ottawa Ottawa Hospital Research Institute	External Review 17 institutions	Fully Executed 30+ institutions signed	Implementation	
April	Nov	April		
2021	2021	2022		

- Contractual agreement pre-established, ready-to-use, avoiding delays
- Facilitates multidisciplinary, multi-institutional, collaborative research
- RAPID exchange of samples, data and reagents
- Manages privacy, sample/data custody, secondary use consent, intellectual property

A New Mantra for Canadian Academic Biobanks



Trailblazing for Pandemic Preparedness

No time for complacency: The CoVaRR-Net Biobank is an essential element of laboratory preparedness for infectious disease outbreaks

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Developing a pandemic preparedness model of biobanking

• Phase 1:

- Covid-19 pandemic: mostly investigator-driven biobanking
- Workflow: support project, manage applications for sample/data access

• Phase 2:

- National biobanking approach <u>Requires sustainable funding</u>
- Biobank-initiated sample/data collection
 - National surveillance research by academics
 - Continue to support investigator-driven studies
 - Support clinical trials and industry

Annual Preparedness Mandate

- Sampling Canadians:
 - Intentional sampling, longitudinal
 - ▶ Hubs: \approx 1000/yr; Nodes: \approx 500/yr
 - Include vulnerable/under-served populations, disease specific, etc.
- Incentives: Compensation for meeting target sample (cost/per sample)
 - Funds to support technicians, clinical team (pt/FTE), materials and equipment, etc.



Preparedness Biobanking

a) maintain ongoing operations

b) carry out prioritized post-pandemic activities

c) establish pandemic preparedness operations and innovations



Preparedness Biobanking – 5 year draft plan

- Ongoing support for Highly Qualified Personnel (HQP), materials and facility user fees
- Years 1-2:
 - Support biobanks for disease sequalae studies: post-Covid syndrome, vulnerable populations, large cohorts
 - Establish Alliance governance, equipment, certification of sites, training, harmonization
 - Connect biobank hubs/node databases to the Alliance Metabase
- Years 2-4: Implement baseline operations
 - Compensation of biobank sites and study participants
- Year 5:

► Adapt to the rise and fall of emerging pathogens (baseline operations → surge capacity operations)

Showcase collaborative biobanking PILOT STUDIES

- 1. Demonstrate the similarities and strengths for data across biobanks and test procedures for access.
- 2. Highlight the resource value of shared inventory (e.g., post-Covid syndrome specimens and associated data).
- 3. Link Wastewater signals to biological markers, geographically for SARS-CoV-2.



Biobanking – A Complement to Public Health





Alliance canadienne des **biobanques et données** COVID-19 *Une initiative du réseau CoVaRR-Net*



Agence de la santé publique du Canada



- Existing Public Health (PH) infrastructure is important for surveillance and response functionality
 - Provincial PH labs and National Microbiology Laboratory
 - Agenda to serve and protect health of population
- Academic biobanking:
 - Highly differentiated *surge capacity*
 - Agenda of discovery and knowledge sharing
 - Complementary & collaborative with PH to enhance and hasten response

Funding provided by:



COVID-19GROUPE DE TRAVAILIMMUNITYSUR L'IMMUNITÉTASK FORCEFACE À LA COVID-19



Please send us your questions/feedback/input!

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Baseline Operations → **Surge Capacity Operations**

Baseline

- <u>\$\$\$ Sustainable, long-term funds</u>
- Maintain ongoing rapid research through sharing of data and biological materials
- Support biobanking of studies for key cohorts and networks
- Observe health of Canadians by collecting longitudinal samples and data
- Characterize samples and data sets
- Regular data uploads to the Metabase
- Conduct ethical biobanking with expert guidance

Emergency

- <u>\$\$ Supplemental funds</u>
- Initiated by surge capacity of emerging pathogens
- Increase target sampling and more rapid sharing of data and biological materials
- Shuffling of prioritization of characterization
- Frequent data uploads to the Metabase

Funding Sources of Alliance biobanks Provincial, Federal, time-limited

- CoVaRR-Net CIHR Operating Grant renewed 2022 - 2024 (1yr of funds) Bridge? Long-term?
- Fonds de recherche du Québec Santé/ Ministère de la Santé et des Services Sociaux/Public Health Agency of Canada (PHAC) (-March 2023?)
- Canadian Foundation for Innovation Exceptional Opportunities Fund
- Alberta Health Services
- POPCORN CIHR

- University Health Network Biobank support and Clinical Trial: Pandemic Response Biobank for Coronavirus Samples (PRESERVE)
- UBC Faculty of Medicine Strategic Investment Fund, UBC Faculty of Medicine donors and Genome BC
- Canadian Immunization Research Network
 (CIRN)
- Covid-19 Immunization Task Force (-March 2023)
- Investigator funds (end of grant term)

