Genomics on a mission: A pan-Canadian approach to fight COVID-19

In the fight against COVID-19, genomics data is one of the strongest tools we can deploy towards short-term containment and long-term health-care response and management. When the virus broke out in early 2020, it quickly became clear that a coordinated national effort was needed to generate, share and scale up COVID-19 sequencing activities across Canada focusing on the virus and host genomes.

Genome Canada activated our community immediately, with rapid time to impact. We launched the Canadian COVID Genomics Network (CanCOGeN) in April 2020, building on 20 years of investment in genomics in Canada, ongoing collaborations and existing infrastructure.

CanCOGeN is committed to generating accessible and usable genomics data to inform public health and policy decisions, as well as to guide treatment and vaccine development.

Who’s involved?

CanCOGeN is a Genome Canada-led consortium of Canadian federal, provincial and regional public health authorities and their healthcare partners, academia, industry, hospitals, research institutes and large-scale sequencing centres. This coordinated pan-Canadian approach aligns us with global sequencing efforts and enables the sharing of knowledge, discoveries and best practices internationally.

[Click on map for names and links to all CanCOGeN partners.]
Impact on Canadians

**Why we study the virus**
Genomics-based tracking and analysis of the evolving traits of the COVID-19 virus across Canada provides critical information for:

- Public health and policy decisions
- Testing and tracing strategies
- Virus detection and surveillance methods
- Vaccine development and effectiveness
- Drug discovery and effectiveness of treatment
- Understanding susceptibility, disease severity and clinical outcomes

**Why we study the hosts**
Sequencing the genomes of COVID-19 infected individuals (“hosts”) and identifying the underlying genetic factors that contribute to disease response helps us understand:

- People’s susceptibility to the virus
- Clinical variability in disease severity
- The complex interaction between pathogen and host
- Why some people get infected and not others
- Why the virus affects people differently
- Why some infected people are asymptomatic

**Different clinical presentations of COVID-19 in hosts**

Building future readiness and models
In addition to providing critical information to guide the current public health and policy response to COVID-19, CanCOGeN is now providing real-time data for outbreak analysis. Further, we are poised to use the data to study cases of reinfection as well as to support post-vaccination surveillance. Beyond COVID-19, CanCOGeN is helping build the capacity and infrastructure for a much-needed national genomics and health data platform to prepare Canada for potential new pandemics.

CanCOGeN by the numbers

- **$40M** in federal funding
- **24-month** project
- **Up to 150K** virus genomes to be sequenced
- **Up to 10K** host genomes to be sequenced
- **2** implementation committees
- **8+** sub-committees and groups working on data sharing, capacity building, ethics and more
- **3** large HostSeq sequencing centers participating
- **57** principal investigators and clinicians being recruited* to contribute COVID-19 patients and cohorts
- **25K+** viruses sequenced* through VirusSeq
- **67** patient sequences completed* through HostSeq
- **4** new papers published*—and more on the way
- **1** international collaboration with COG-UK*—and more to come

*as of December 2020

Read the latest news on CanCOGeN at [www.genomecanada.ca/cancogen](http://www.genomecanada.ca/cancogen)

WANT TO GET INVOLVED? HAVE ADDITIONAL QUESTIONS?
Contact Catalina Lopez-Correa, Executive Director of CanCOGeN at clopez@genomecanada.ca