# Clinical labs at a crossroads Why we need a unified clinical-grade genomics database **Jordan Lerner-Ellis**

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# Our proposal to OGI...

To create Canada's unified, openaccess, clinical- grade genetic database --using a commonly shared platform and designed to hold all types of information related to human gene variants and their relationship to rare and common diseases

## Our major goal...

Moving collaboration to a whole new level for research + patient care

Lab directors - with clinicians, GCs, bioinformaticians, scientific community

To greatly expand quality, scale, scope of our work

### Very positive responses from community about our project...

Endorsements, collaborators, excellent feedback from "friendly" peer reviewers

Thanks to many in this room for letters of support

#### Status quo not an option...

Data scattered across institutions Protocols, procedures vary widely Weak phenotypic information Errors, inconsistencies too common

#### Our successes - a mixed blessing

Next-gen technologies Demand for whole-exome/genome Mapping of non-coding DNA Personalized medicine Rising consumer expectations

Relentless pressure will continue for faster, more accurate analysis, interpretation, reporting

# Not just a Canadian challenge...

Major US project led by Harvard's Heidi Rehm Building on existing ClinVar database Has won wide acceptance among US labs Support for our project - inc. GeneInsight® Adds strong resources to Cdn project

## Supporting and participating labs



#### Three main aims...

Design variant assessment procedures Extract and transfer data Set up access and dissemination

#### The existing challenges...

Complexity of Novel Variant Assessment Need for outside expertise Eliminating misclassifications State of translational research Lack of physician training, experience Regulatory approvals

# **Role of bioinformatics and IT...**

Build system for variant interpretation Define ontologies, structured phenotype data Extract de-identified variant knowledge Develop product to facilitate public access

## **Selected Elements of the NVA Procedure**

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## What is GeneInsight?

GeneInsight <sup>®</sup> I Lab	Users	GeneInsight	Admin				Use	er Guide   S	Admin,		_
Variant List 🗃 🛛 p. Ser 41 delins As 🗃 📄 p. Leu 8T rpfs X 1 🛛							Varian	1t	Repor	t	
Variant Details: XG1 *12 [c.21delG (p.Leu8TrpfsX13)]										<<	
Gene: XG1 (XD1, XD2)											
Transcript: NM_020469.2 [7 Exons, Coding 17]											
Allele: *12											
Variant: *12 [c.21delG (p.Leu8TrpfsX13)]											
Gene Region: Exon 1											
Interp. Summary: Pathogenic Mild (XD1) Resistant (XD2)											
Interp. Status: Content Approved by M.L. Admin on 09/11/2012 Revision Approved by M.L. Admin on 09/11/2012											•
Edit Variant											
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Full Details Frequency Notes References Interpretation Interp.	History As	sessments Sea	q. Alignments	5							
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Status Content Approved by M.L. Admin on 09/11/2012 07:31 PM. Revision Approved by M.L. Admin on 09/11/2012 07:31 PM. Reason(s) For Update											^
New Evidence											11
Interpretations Category/Inher./Excl. Diseases/D	ruas										
Pathogenic Mild X1 Disease (RECESSIVE)	lug s										
Variant Interpretation											
The Leu8fs variant (also referred to as the *12 allele) has been identif 2010). This variant is also present in 1/8600 European American chron causing.											
Category/Inher./Excl. Diseases/D	rugs										
Resistant X2 Drug											
Variant Interpretation											H
The Leu8fs variant (also referred to as the *12 allele) has been shown were homozygous for the Leu8fs variant did not show a reduction in s				cohort study o	f individuals v	vith X1 Dise	ase (Data	et al 2011	l). Individu	als who	v

# A Canadian GeneInsight instance, we will give you a login!

No limit to number of users

Ensure users do not use the data beyond its intended use Ability to share data within other labs using the system, including those in the United States

Each lab will need to make their own decision on whether they are comfortable sharing data with the Canadian installation

Incent labs to share, in a share and share alike fashion Pull ClinVar data into GeneInsight so it becomes accessible through the system

We will also support pushing data into ClinVar for labs who are open to releasing data to the public

Thank you!

#### Please complete out short survey