Deep Genomics
Decode the genome, create life changing therapies

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CEO AND FOUNDER, DEEP GENOMICS
COFOUNDER, VECTOR INSTITUTE FOR ARTIFICIAL INTELLIGENCE
PROFESSOR, ENGINEERING & MEDICINE, UNIVERSITY OF TORONTO
Deep Genomics team, Bocce Ball, October 2021

Team in place to execute our mission

Amanda Kay PhD
Chief Business Officer

gnome
ETL
Harvard University
Pfizer
synlogic

Amit Deshwar PhD
Sen Dir Predictive Systems

Google

Brendan Frey PhD FRSC
Founder & CEO

Ferd Massari MD
Chief Medical Officer

Matt Cahill MBA JD PhD
Head of Finance, Bus. Ops

University of Toronto
University of Cambridge

Jeffrey Brown PhD
Head of Preclinical Res.

Voyager
Bristol Myers Squibb
WAVE
Axlion

Tal Zaks
moderna
gerenciamento

Tessa
SpaceX

Jennifer Cook
Genentech

Steve Jurvetson
Future

Yann LeCun
facebook

Adam D’Augelli
true Ventures

Alex Morgan
Khosla Ventures

Brendan Frey
Matt Cahill

Elena Viboch
SoftBank

Maryanna Saenko
FUTURE

Tom Hughes
NAVITOR
RNA therapies: Medicines are digital information

CCCAAATGCACTCCTGG
Programming the best RNA therapies for almost any gene in any genetic condition
A digital framework for untangling complexity

DIGITAL GENETIC TARGET
DIGITAL RNA THERAPY
DIGITAL RNA BIOLOGY
Discovering Spinraza for Spinal Muscular Atrophy - in one afternoon on a computer

**PREDICTED EXON TARGETS**
- Top 10% - SMN2 EXON 7
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 50%

**PREDICTED THERAPIES**
- SPINRAZA
  - TCACTTTTCATAATGCTGG

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**CANDIDATE EXONS**

**Target Predictor**

**2000 THERAPIES**
- SMN2 EXON 7

**Therapy Predictor**

**DIFFERENT THERAPIES**
Discovering novel complex disease targets using exome or genome sequencing data

Exome or Genome Data → DG Variant Effect Predictors + Phenotype Association → Protective Variants → DG SBO Predictors

SBO Therapeutic
Our digital AI Workbench predicts drug discovery outcomes up front

TRADITIONAL APPROACH - SEQUENTIALLY DERISK - EXPERIMENTAL TRIAL & ERROR - BESPOKE

DEEP GENOMICS’ ADVANTAGE:

PREDICTION AT SCALE - DERISK ALL UP FRONT - ITERATIVE LEARNING
Data driven prediction, positive feedback loops, and exponential growth

**Train Predictors & Create New AI**
- 40 machine learning predictors
- **Causal** prediction

**Predict Targets & Therapies at Scale**
- 2 BILLION predictions
  - Every gene
  - 300,000 pathogenic variants
  - 200,000,000 RNA therapies

**Generate Data**
- 1 MILLION efficacy and safety datapoints
  - 250 genes
  - 20,000 RNA therapies

**Develop Therapies**
- 10 preclinical today
- 4 partnered
- 4 in clinic by 2024
Tackling complexity - Our digital AI Workbench unlocks targets across the spectrum of genetic types
Predictors drive portfolio productivity, and we have 40 of them

**EXAMPLE APPLICATIONS**
- Identify novel targets
- Design therapies
- Predict safety and toxicity
- Identify new patient populations
- Predict drug properties

**SBO PREDICTORS**
- Protein restoration
- Protein expression Increase
- Protein knockdown

**PREDICTOR**

**IMPACT**
- Variant causes pathology by loss of exon inclusion
- SBO restores protein by exon inclusion
AI Workbench and “plug-and-play” SBO technology powers high-value, low risk therapies

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DG Portfolio: At tipping point to significant clinical expansion
Company goals to mid-2024

**TARGETS WITH PATENTED LEADS**
Complex and Mendelian

**GENES ScreenED**
60 complex, 40 Mendelian
Enabled by AI and robotics

**EXPAND PARTNERSHIPS**
Broaden pipeline, access non-dilutive funding

**PRECLINICAL PROGRAMS**
Internal, partners, CRO

**PREDICTORS**
Expand AI for complex disease, SBO effect and SBO safety

**PROGRAMS IN THE CLINIC**

- 28
- 80
- 4
Key question for Canadian genomics community

Some big datasets are exponentially better than others - which datasets should public money be used to generate?

1. Good: Genome sequencing produces high quality data
2. Proof points from industry: Biotechs request sequencing money, demonstrate their capacity to use it, then GC signs a cheque with the understanding that the data is public.
3. Input from Industry: Council of Canadian Biotech Entrepreneurs - a committee to help identify big genomics datasets of strategic value to Canada