



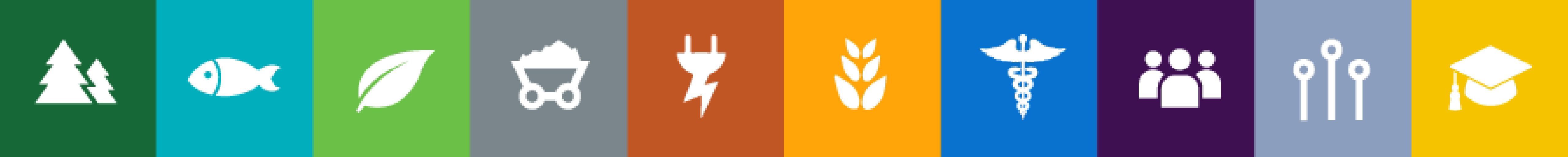
20TH ANNUAL **PRIVACY & SECURITY** CONFERENCE

Genetic Privacy & Genomic Driven Medicine – “Big Pharma Would Like Your DNA”

- Erwin Malzer, Healthcare Transformation Advocate
- Dr. Catalina Lopez-Correa, Chief Scientific Officer & Vice-President Sectors, Genome BC
- Dr. Martin Dawes, Chief Scientific Officer & Co-Founder, GenXys Health Care Systems
- Dr. Rob Fraser, President & CEO, Molecular You

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Genetic Privacy and Genomic Driven Medicine

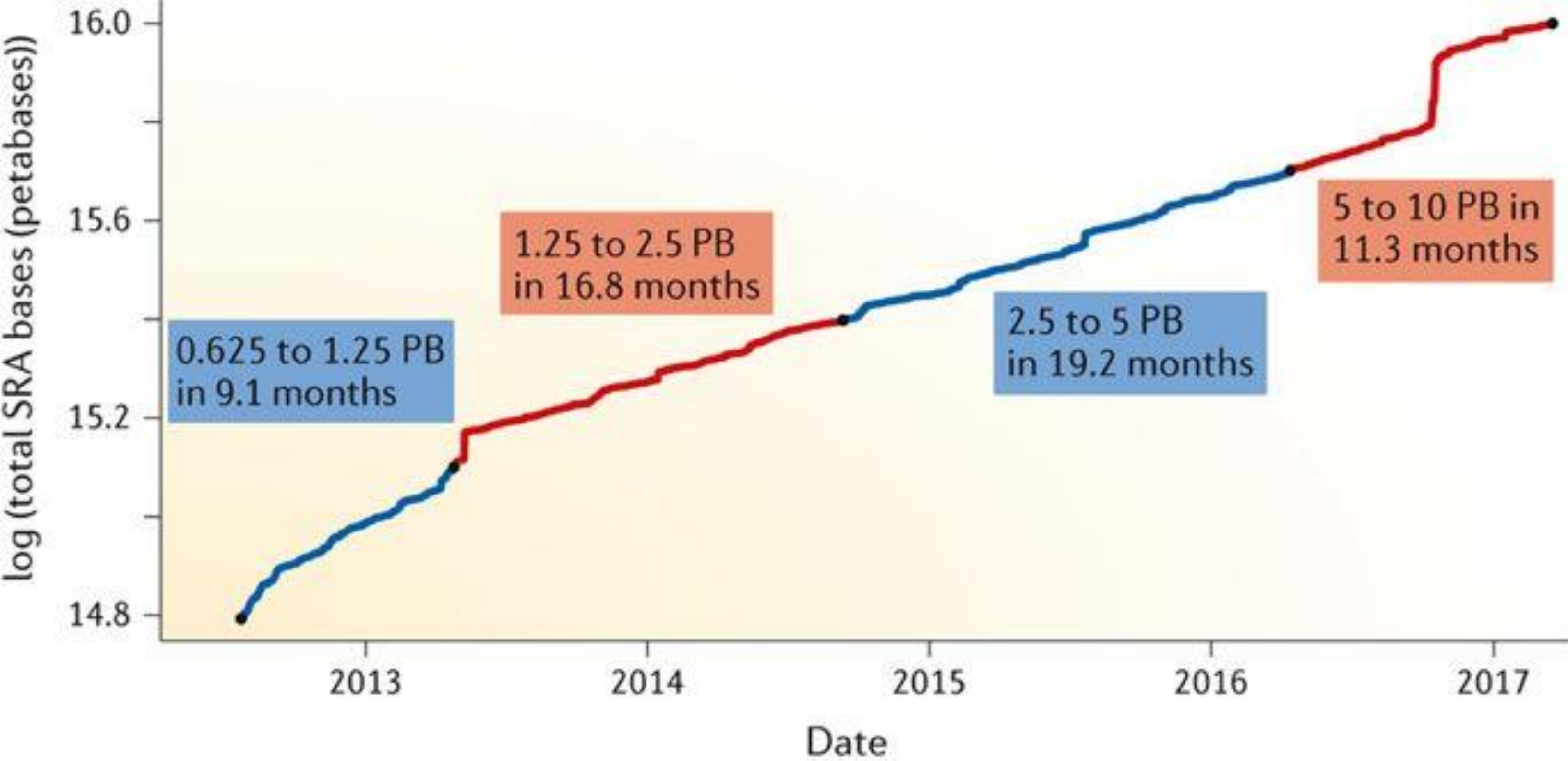
"Big Pharma Would Like Your DNA"

Dr. Catalina Lopez-Correa MD PhD
Chief Scientific Officer and VP Sectors

Victoria, February 8th 2019



Genomic data is growing fast



Universal Declaration of Human Rights 1948 (BM Knoppers)

Sharing Data

Benefits resulting from any scientific research and its applications should be shared with society as a whole and within the international community, in particular with developing countries.

Article 15 (1)

Right to Science

Everyone has the right freely to **participate** in the cultural life of the community to enjoy the arts and to **share in scientific advancements and its benefits**

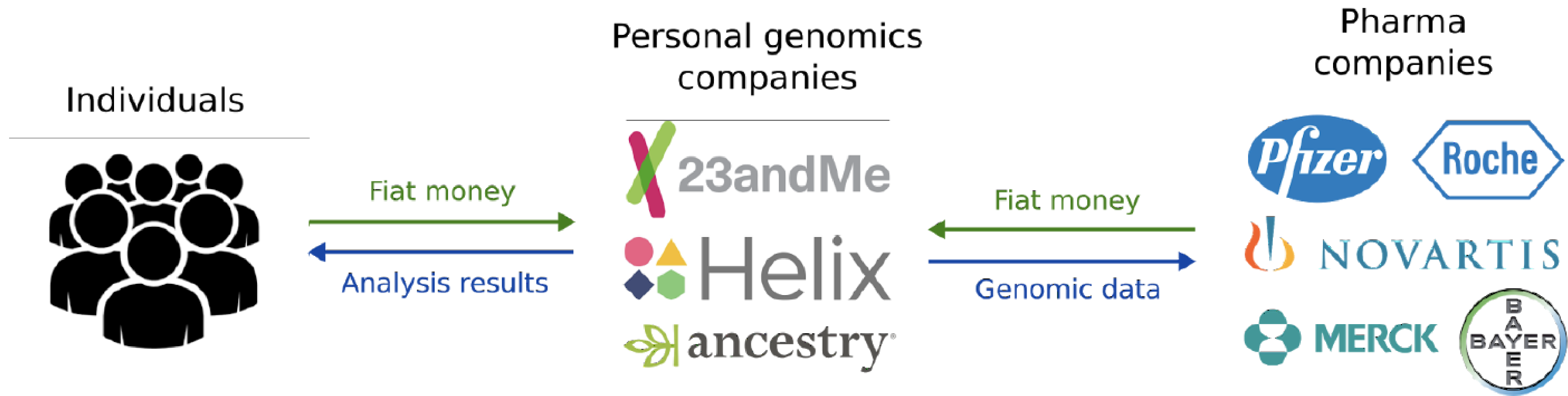
Article 27 (1)

Right to Recognition

Everyone has the right to the protection of moral and material interest resulting from any scientific, literary or artistic production of which he is the author

Article 27 (2)

A new model for genomic data sharing



Block chain genomics





Genome
British Columbia

Leading ▶ Investing ▶ Connecting



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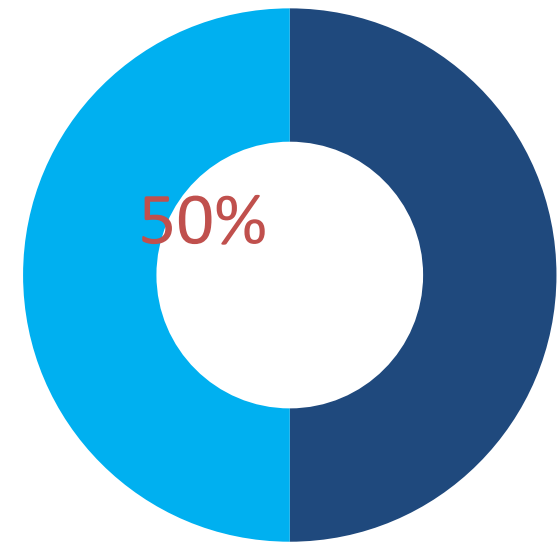
604.675.1035



www.genomebc.ca

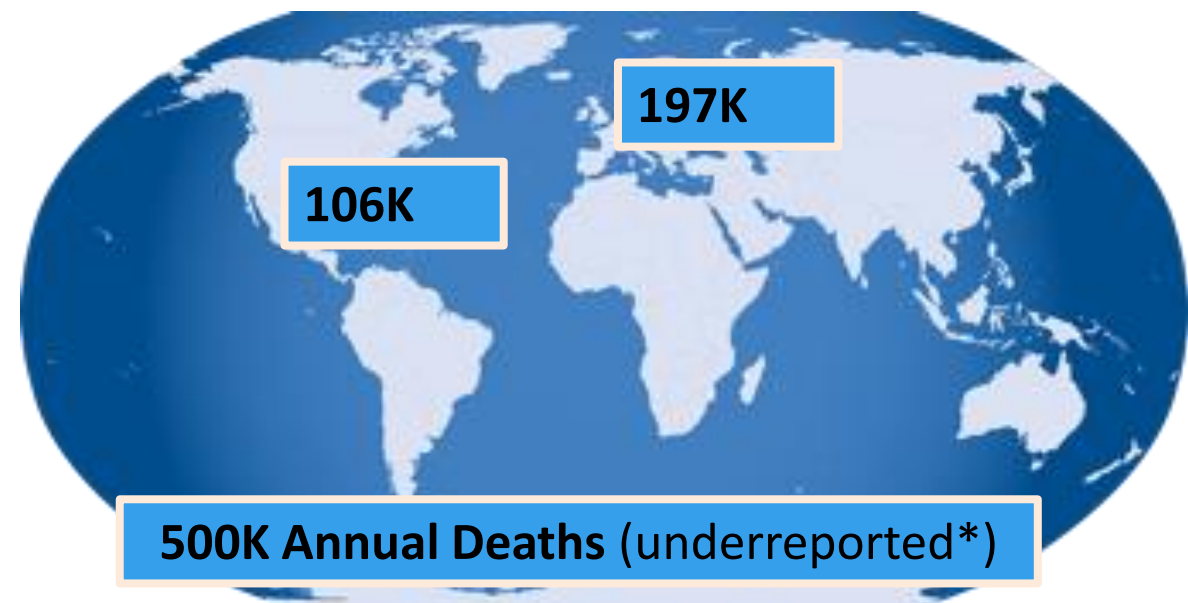
Medications are often ineffective, can cause harm and substantial costs

Professionals and People want to know what they can prescribe or take



50% of prescribed Medications are **ineffective**

Deaths by Adverse Drug Events



500,000 deaths annually

12% of ER visits

5% of hospitalizations

10% of direct healthcare costs

\$30 billion

is the cost of ADR in US per year

- One in 10 high risk patients have an ADR per year
- The average cost will be \$400 in the community and \$6,000 in the hospital

The users want to know what they can prescribe or take

Cases / Martin Dawes / Depression / Options

Conditions Medications Options

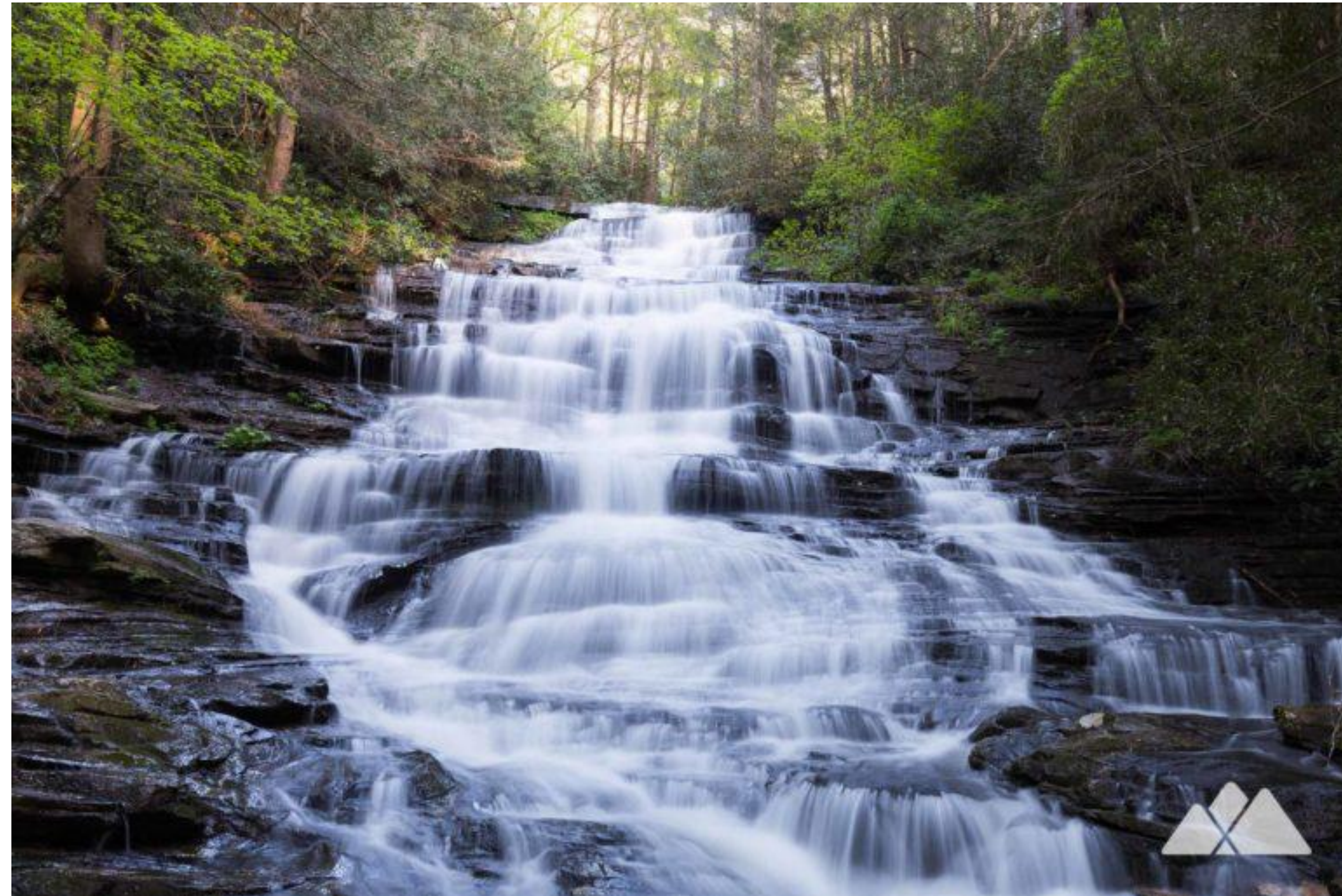
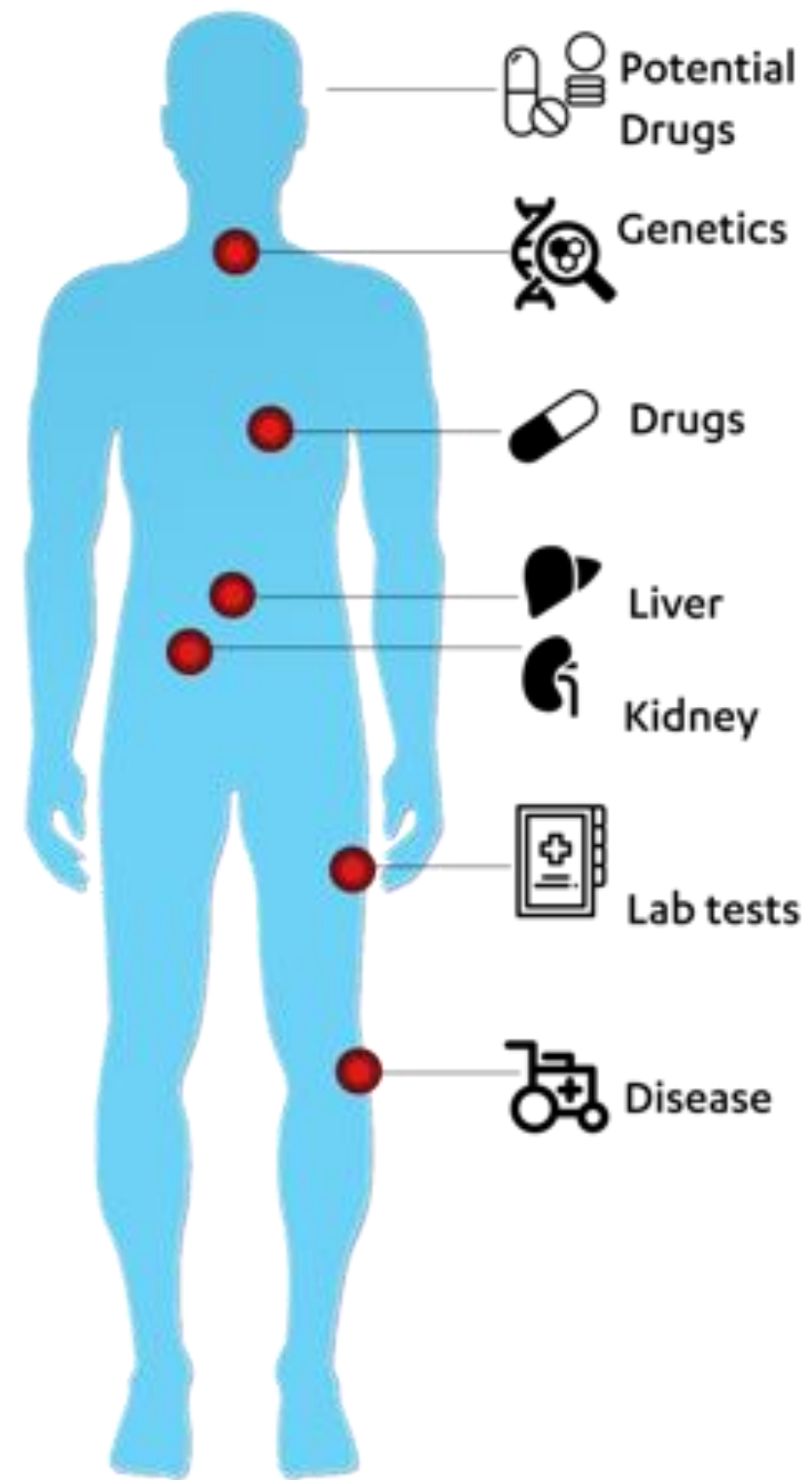
Patient

Drug History None of the above	+
Medical History History of seizures	+
Age (years) 60	+
Genetics - CYP2C19 Poor metabolizer	+
Genetics - CYP2D6 Poor metabolizer	+
Lab: eGFR (ml/min) Mildly Reduced Function (64)	+
Hepatic Impairment Scale (Child-Pugh) Mild (A). Elevation in liver enzyme levels	+
Hydrochlorothiazide, Metformin, Rabeprazole	

Medication Options

SSRI OR NDRI OR NaSSA OR RIMA	
Citalopram (SSRI) Not included as an option due to CYP2C19 status and hepatic function Interactions: Rabeprazole, Metformin, Hydrochlorothiazide	+
Escitalopram (SSRI) Not included as an option due to CYP2C19 status and hepatic function Interactions: Hydrochlorothiazide, Metformin The risk or severity of hyponatremia can be increased when Escitalopram is combined with Hydrochlorothiazide. The risk or severity of hypoglycemia can be increased when Escitalopram is combined with Metformin.	-
Fluoxetine (SSRI) Initial Dose 10 mg PO daily Maximum Dose 40 mg PO per day Dose adjusted for hepatic function Interactions: Hydrochlorothiazide, Rabeprazole	\$
Fluvoxamine (SSRI) Initial Dose 25 mg PO daily Maximum Dose 300 mg PO per day Initial dose adjusted for CYP2D6 status Dosing Note: For doses >150 mg, divide 2 times per day Interactions: Rabeprazole, Metformin	\$
Sertraline (SSRI) Initial Dose 25 mg PO daily Titration Increase daily dose at 2 week intervals Maximum Dose 200 mg PO per day Initial dose adjusted for CYP2C19 status Titration interval adjusted for hepatic function Interactions: Hydrochlorothiazide	\$
Bupropion is not included as an option due to current use, contraindications or previous trial	

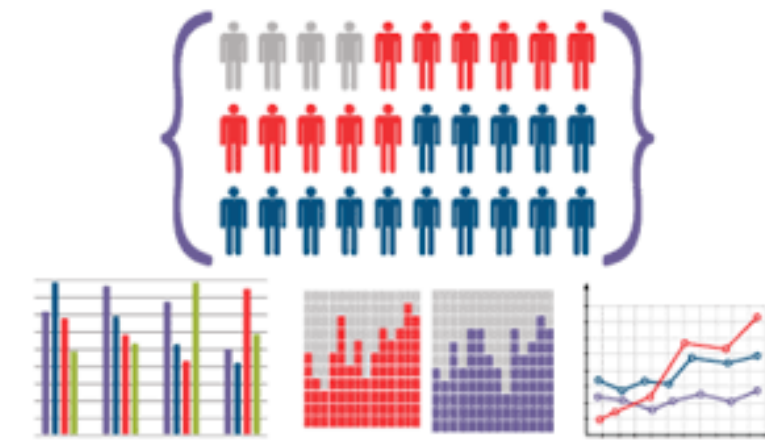
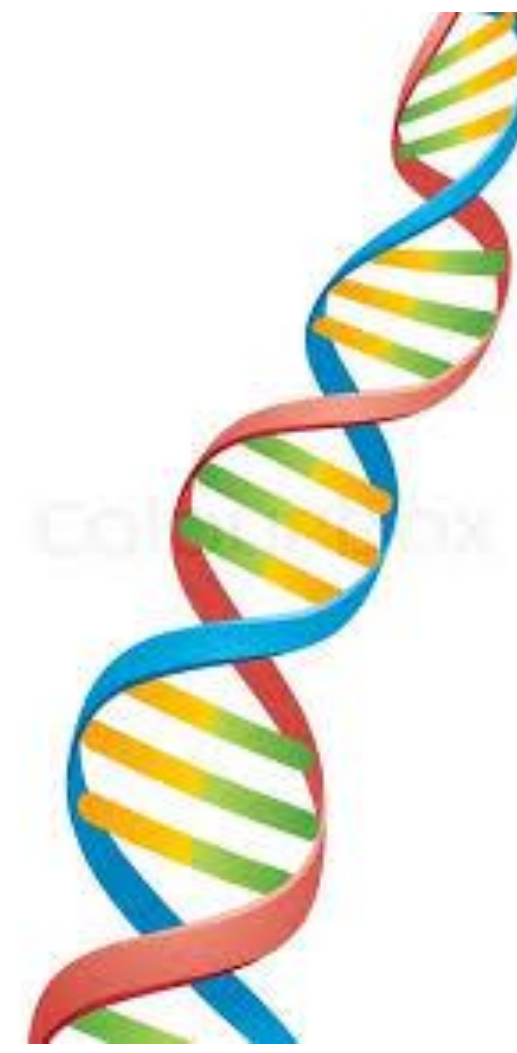
Academy Meets Deluge of Data



Outcome Data

Move from formal trials on unrepresentative patients to “Real” world trials

A change that will transform health care – where every person is part of the discovery and owns that.





Genetic Privacy and Genomic Driven Medicine "Big Pharma Would Like Your DNA"

Rob Fraser, PhD
President & CEO

**molecular
you**

More data in the past 2 years than in the entire previous history of the human race.

For most, if not all, commercial firms, data is the critical capital input to tomorrow's economy

Big Data

Continuum of Care

- Target what matters
- Measure what changes
- Optimize actions
- Healthy Longevity



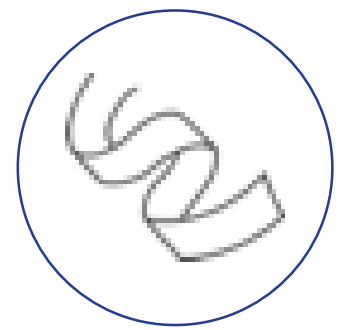
A group of hikers is seen from behind, walking along a narrow dirt trail on a steep, vegetated mountain slope. The hikers are wearing various outdoor gear, including backpacks and hats. The background shows a vast, hazy mountain range under a blue sky with light clouds. A semi-transparent dark blue rectangular box is overlaid on the right side of the image, containing white text.

70-90%
of your health
status is
related to
lifestyle

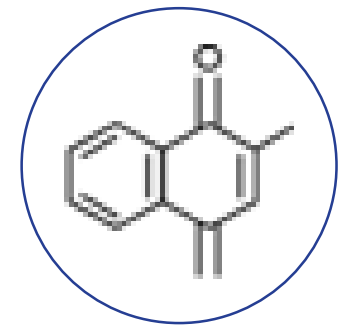
What might happen?



Genetics



Proteins



Metabolites



Environmental exposures

What is happening Now!



Who Owns Personal Health Data

EU General Data Protection Regulation
GDPR



Canada: the information in the medical record belongs to the patient.

- The physical record belongs to the person or organization responsible for its creation

European GDPR: does not explicitly give us an answer on personal data ownership

- Data subjects should be in control of their personal data.

Real Risks To Data Sharing?

“...much more than a medical device; it is a one-way portal into a world where corporations have access to the innermost contents of your cells and where insurers and pharmaceutical firms and marketers might know more about your body than you know yourself.”

Charles Seife

“Genetic Information that you share with others could be used against your interests. You should be careful about sharing your Genetic Information with others.”

23&Me

Bill S-201

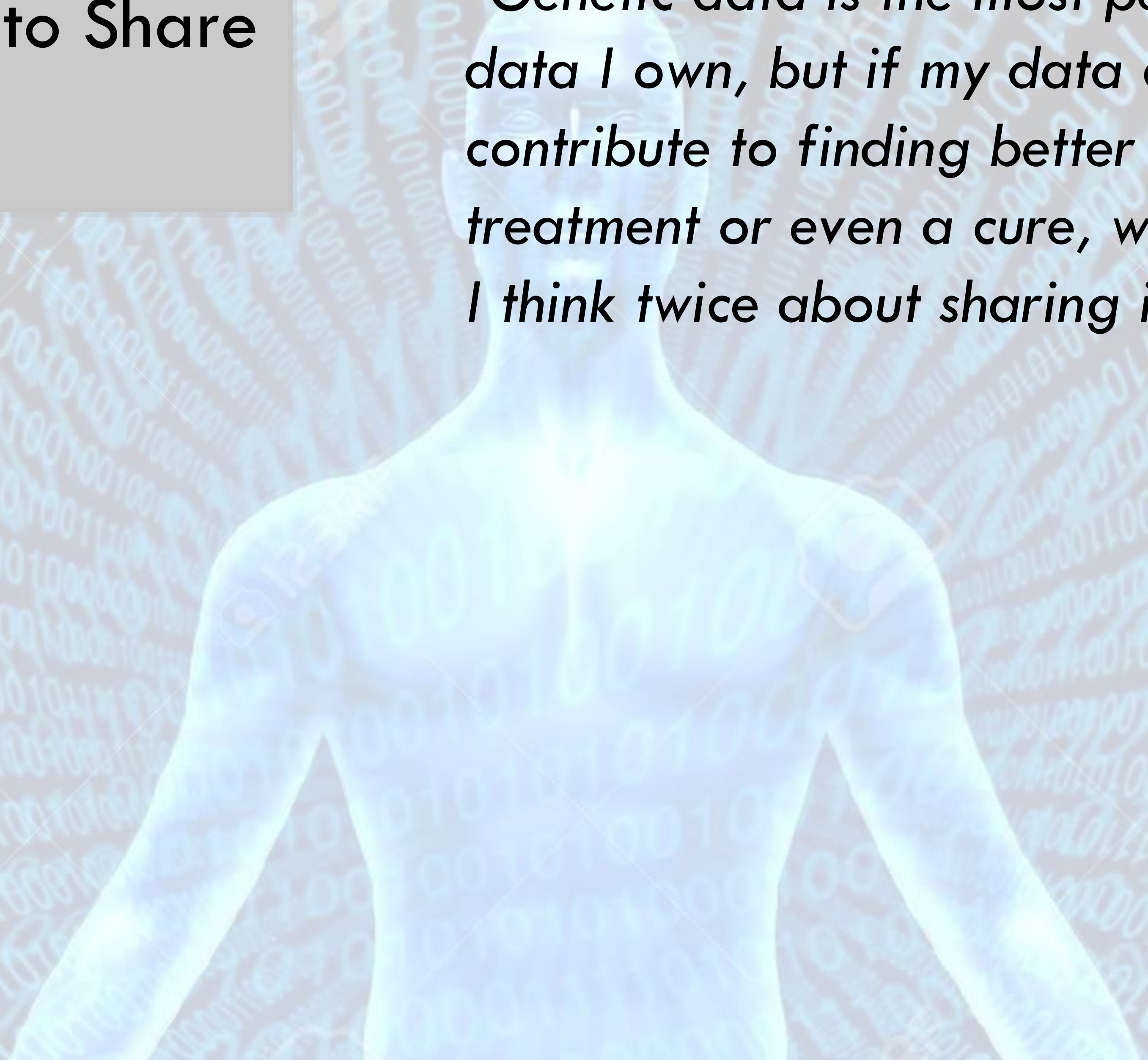
An Act to Prohibit and Prevent Genetic Discrimination

This enactment prohibits any person from requiring an individual to undergo a genetic test or disclose the results of a genetic test as a condition of providing goods or services to, entering into or continuing a contract or agreement with, or offering specific conditions in a contract or agreement with, the individual. Exceptions are provided for health care practitioners and researchers. The enactment provides individuals with other protections related to genetic testing and test results.



We Want to Share Our Data

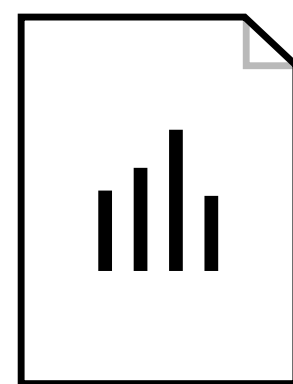
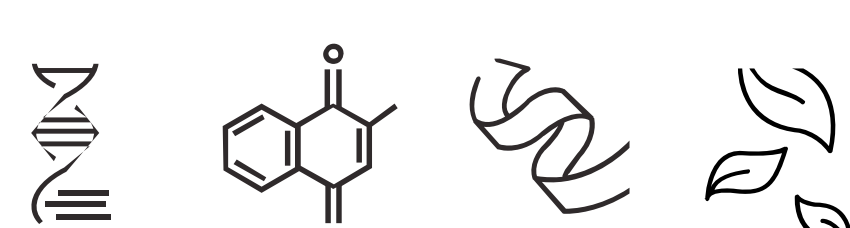
“Genetic data is the most personal data I own, but if my data can contribute to finding better treatment or even a cure, why should I think twice about sharing it?”



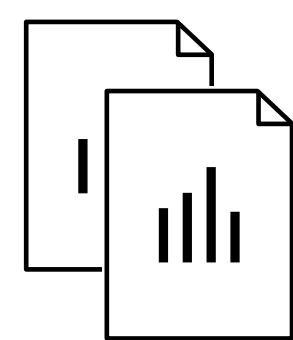
A New Currency: Personal Health Data



Individual Data, Individual Control

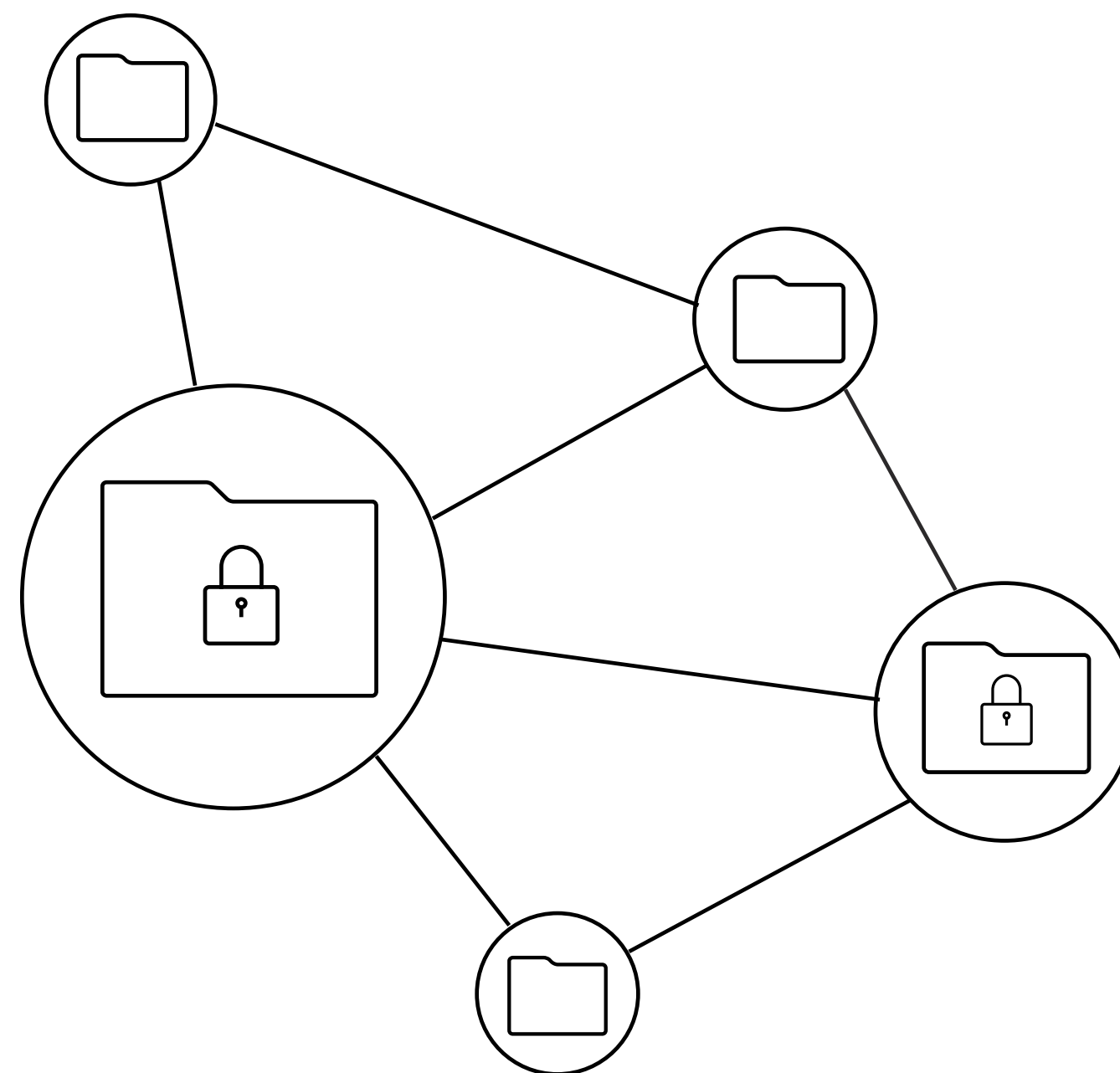


Molecular You
health data



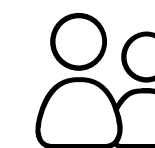
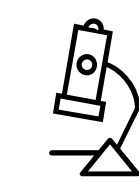
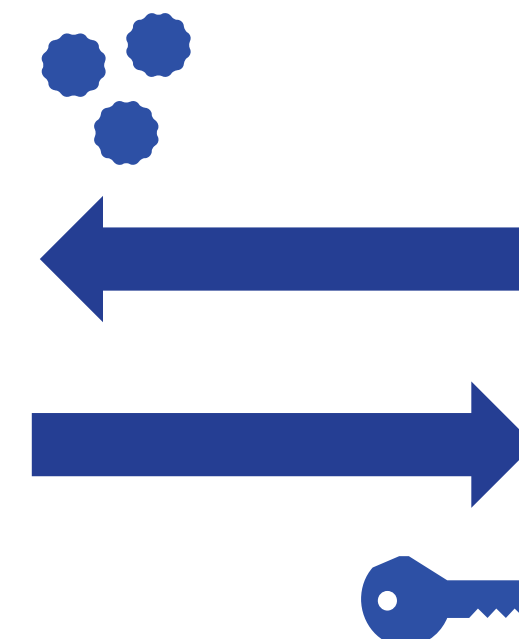
Personal blockchain wallet
holds all individual data

Private key keeps data safe



Securely consent to use of data by signing
with private key

Receive rewards for use of data in
research





Personalized Health: The Future is Now!

Rob Fraser, PhD
President & CEO
Molecular You

molecular
you



20TH ANNUAL PRIVACY & SECURITY CONFERENCE

Looking Back and Leading Forward in a Digital World

PRE-CONFERENCE EDUCATIONAL SESSIONS: FEBRUARY 6, 2019 | CONFERENCE: FEBRUARY 7-8, 2019

VICTORIA CONFERENCE CENTRE | VICTORIA | BRITISH COLUMBIA



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Ministry of
Citizens' Services