Personalized Medicine
A Canadian Funding Perspective

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CIHR’s Institutes

- Health Services and Policy Research
- Circulatory and Respiratory Health
- Aboriginal Peoples’ Health
- Cancer Research
- Musculoskeletal Health and Arthritis
- Nutrition, Metabolism and Diabetes
- Neurosciences, Mental Health and Addiction
- Human Development, Child and Youth Health
- Population and Public Health
- Healthy Aging
- Gender and Health
- Infection and Immunity
- Genetics
• Virtual networks of researchers and funding partners, led by Scientific Directors
• Provide platforms for strategic focus in key areas of health research
CIHR’s Budget

- Total Annual Budget of ~$1 Billion
Canada’s Strategy for Patient-Oriented Research - Bridging the Gap

- Bridging the Gap between Research and Outcomes

**Valley 1**
- Basic Biomedical Research
- Epigenetics

**Valley 2**
- Clinical Science & Knowledge
- Research Networks (Mental health etc.)
- Clinical Practice & Health Decision Making
- Community-based Primary Heath-care
- Patient-Oriented Research Support Units

**Translational Continuum**
- Personalized Medicine

**Epigenetics**
As defined by the Personalized Medicine Working Group (Health Canada):

Personalized medicine refers to the tailoring of preventative, diagnostic or therapeutic interventions to the characteristics of an individual or population.

It does not mean the creation of health interventions targeted directly to an individual, but rather that the scientific advancements that underpin personalized medicine provide the ability to classify individuals into sub-populations based on their susceptibility to a disease, or response to a specific treatment.

This can allow for prevention/intervention strategies and earlier and/or targeted interventions to improve health outcomes.
Health Care in Canada is Provincially Based
- 4 provinces have identified PM as a priority
  - British Columbia
  - Alberta
  - Ontario
  - Quebec
Together with partners more than $200 million over a 5 year period will be invested to accelerate Personalized Medicine in Canada.
Building a National Framework

Evidence
- CIHR-Genome Canada Funding Opportunities
- Pediatric cancer consortium
- Rare disease consortium

Regulatory and Policy Challenge
- Health Canada and provincial regulators engagement

National Structure
- SPOR networks-clinical trials
- Networking initiatives in Canada
- National Framework/Consortium

Outreach
- Community-Based Primary Health Care Innovation Teams - CIHR Signature Initiative

Data
- Data Harmonization/eHealth data
- Computational Biology
- National Asset Map
CHIR – Genome Canada Partnership

- A central partner for CIHR in funding genomic personalized medicine

- 6 Regional Genome Centres
- 5 Science and Technology Innovation Centres
- 5 key areas – Agriculture, Fish & Aquaculture, Forestry, Environment and Human Health
- Over 160 projects - $2 Billion investment over 12 years
Genomics and Personalized Health
Launched in 2012: $67.5 M ($135 M)

Large Scale Research Projects ($5 + $5 M)
- Demonstrate how omics-based research and technology can contribute to a more evidence-based approach to health
- Applications must demonstrate high potential for attaining eventual clinical utility and/or practical applicability

Large Scale GE³LS Projects
Canadian Epigenetics Environment and Health Research Consortium ($39 M)
  • Epigenome Centres ($15 M)
  • Emerging Team Projects ($24 M)

Drug Safety and Effectiveness Network ($20 M)

Community Based Primary Health Care ($25 M)

Canadian Alzheimer’s Initiative ($25 M)

Bioinformatics and Computational Biology ($6.25 M)

Rare Diseases Emerging Teams ($14.5 M)
Objective: To rapidly identify genes responsible for rare genetic disorders that affect children in Canada and throughout the world.

- Childhood high grade glioma
- Diffuse intrinsic pontine glioma
- ACTH Resistance
- Hermansky-Pudlak like
- Hawk Junction Microcephaly
- Perrault-Syndrome
- Severe Combined Immunodeficiency

- AD Retinitis Pigmentosa
- Hadju-Cheney Syndrome
- Metaphyseal dysplasia, maxillary hypoplasia

- Leber Congenital Amaurosis
- Floating Harbor syndrome
- French Canadian Joubert syndrome
- Chudley McCullough syndrome
- Weaver syndrome
- Hyper IgM
- Meaglecephaly Capillary Malformation
- Nager syndrome

- Microcephaly Capillary Malformation
- Mandibulofacial dysostosis with Microcephaly
- Jeune-Joubert syndrome
- Short stature, cataracts, peripheral neuropathy
- Intestinal pseudo-obstruction with sick sinus
Next Steps
Funded in 2012: $29 M

Mitigate Late Effects in Childhood Cancer ($12 M)
- Multidisciplinary teams address major late effects of treatment, through stratification, reducing toxicity leading to enhanced survivorship, Quality of Life

Rare Diseases Emerging Teams ($17 M)
- To enhance our understanding of the fundamental biology of these diseases, foster the application of that knowledge to the clinic or to populations (group 1), and/or address major health services/policy/economic/ ethical, legal or social issues challenges (group 2)
Personalized Health Innovation

Next Steps

- Personalized Medicine Stakeholders Consortium
- Personalized Medicine SPOR Network
- International Collaborations
## Personalized Medicine Stakeholders Consortium

<table>
<thead>
<tr>
<th>Sector</th>
<th>Organizations</th>
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<tbody>
<tr>
<td>Funding Agencies</td>
<td>CIHR IRSC, GenomeCanada, cgdm, FORGE Canada, Health Canada, Santé Canada, IHE</td>
</tr>
<tr>
<td>Public Sector</td>
<td>FORGE Canada, Pediatric Cancer Network, BCPMI, IGNITE, Centre de Pharmacogénomique</td>
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<tr>
<td>Public-Private Partnerships</td>
<td>best, SGC, cdrd, The Centre for Drug Research and Development</td>
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<tr>
<td>Private Sector</td>
<td>AstraZeneca, BIOTECanada, PROTEOCYTE Diagnostics, AMGEN, Shire, Sanofi, Alexion Pharmaceutica, Pfizer, Roche, Genentech</td>
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</tbody>
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**Global Reach**

**EURO BIO FORUM**
A unique forum for research funders and performers in Personalised Medicine

**Canada**
On 31 January 2012 the Canadian government announced a multimillion dollar investment to support funding of...
More...

**Austria**
As part of the Structural Programme COMET (Competence Centres), the Austrian Federal Government, together with the...
More...

**Belgium**
In Belgium there exists no specific research programme on Personalised Medicine. Individual projects in this area...
More...

**Bioclusters and Regions**
Many high-profile scientific regions are scattered around Europe. The challenge is to trigger closer collaboration...
More...

**Bioinformatics**
Bioinformatics will be one of the important drivers of both health research and health care. For Personalised...
More...

**Communication**
Personalised Medicine requires collaboration among different disciplines, and acceptance of...
More...

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**International Rare Disease Research Consortium (IRDiRC)**

**IHEC**
International Human Epigenome Consortium

**International Cancer Genome Consortium**

**ERA-NET** *(Personalized Medicine?)*
Dankeschön

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