High-Throughput Metabolomic Biomarker Measures in Diverse Ancestries
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Principal Investigators (alphabetical)
● Adam Butterworth, University of Cambridge
● Andre Brunoni, Universidade de São Paulo
● Arash Etemadi, National Cancer Institute, NIH
● Hakon Hakonarson, Center for Applied Genomics, Children’s Hospital of Philadelphia

Team Members
● Patrick Sleiman (CHOP)
Background

- Chronic diseases impose a high burden on the health system.
- Health outcomes can be significantly improved through early diagnosis and intervention.
- Early diagnosis often unavailable particularly for individuals in low and middle income countries and minority populations in high income countries.
- Metabolic profiling represents a highly-scalable model for risk prediction and prevention.
  - Because of its relatively low cost, it offers a route to individualized medicine for these populations.
Aims

- **Aim 1: Develop Organizational Structure for Metabolomics:**
  - a strategy for coordinated metabolic screening and clinical implementation for all of the IHCC.
- **Aim 2a: Generate Metabolic Profiles on 5,000 Individuals with Genetic and/or Health Outcome Data.**
- **Aim 2b: Analyses of association between metabolic metabolite levels (such as lipid profiles) and genetic data**
Nightingale Health Blood Biomarkers

- NMR-based (Nuclear Magnetic Resonance spectroscopy) platform
- 228 biomarkers
- 100µl of plasma or serum
### High-Throughput Metabolomic Biomarker Measures in Diverse Ancestries

#### Participating Cohorts

<table>
<thead>
<tr>
<th>Cohort Name</th>
<th>Study samples</th>
<th>Principal Investigator/Lead(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Asian Cohorts (BELIEVE)</td>
<td>1,500 samples of South Asian ancestry from Dhaka, Bangladesh</td>
<td>Adam Butterworth</td>
</tr>
<tr>
<td>ELSA-Brasil</td>
<td>1,000 samples from Brazilian civil servants</td>
<td>Andre Brunoni</td>
</tr>
<tr>
<td>Golestan Cohort Study</td>
<td>1,000 samples from Northeast Iranian general population</td>
<td>Arash Etemadi</td>
</tr>
<tr>
<td>Children’s Hospital of Philadelphia (CHOP)</td>
<td>1,500 samples of African American children</td>
<td>Hakon Hakonarson</td>
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</tbody>
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Project expansion

- The project is developed with the intention of scaling-up beyond the 4 initial pilot studies.
- Potential to combine with several other IHCC cohort using the same platform:
  - UK Biobank
  - Mexico City Study
  - UK Blood Donors Cohort
  - Kadoorie Biobank
Commercial break!

- An example of IHCC role in inclusiveness
- **Tune in tomorrow!**
  - **Panel:** LMIC/LRC/LRS Cohorts' Outlook on Resource Gaps and Barriers
  - **Session Time:** 14:00 – 14:50 UTC
Cohort-specific outcomes

- Diabetes (South Asian Cohorts)
- Ischemic heart disease (Golestan Cohort Study)
- Autoimmune/autoinflammatory disease (CHOP)
Timeline

- December 2020: All 5,000 samples shipped
- May 2021: All samples analyzed and ready to be released
- July 2021: Project-specific analyses finalized
- September 2021: IHCC report and recommendations
- Upon completion of analysis, data will be made available to all IHCC cohort members
Thank you!

Tune in tomorrow!
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