Tohoku Medical Megabank Project
A National Challenge to Realize Personalized Medicine

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ToMMo’s Work at a Glance

- **Tohoku Medical Megabank Project (TMM)** has started as a part of national reconstruction program from the disaster in 2011.
  - Long term support of residence in Tsunami suffered area
  - Support community medicine by establishing next generation medical systems
  - Increase recruitment of medical professionals to the damaged area

**Tohoku Medical Megabank Project**

- Large scale genome cohort & Integrated biobank
- Personalized healthcare
ToMMo’s Work at a Glance

- **Rebuild community medicine on the Pacific coast**
  - Young Doctors’ rotation between area hospitals and university laboratories

- **Survey of health status of the suffered area (Cohort Study)**
  - Two types of cohort studies (Long-term health studies)
  - Set-up seven assessment centers (community support center) in Miyagi Prefecture
  - Support of victims by telephones and interviews
  - Collecting biospecimens and data for biobank

- **Construct Biobank for the cutting-edge research**
  - Store the biospecimens and data from cohort studies
  - Set-up the system for sample distribution and data-sharing

- **Analyze genome and omics data for the personalized medicine and healthcare**
  - Sequence the DNA of cohort participants
  - Analyze sequenced data and construct genome reference panel by using supercomputer
Residents Cohort and Birth & Three Generation Cohort

- **Community / Residents Cohort (Miyagi and Iwate)**
  Recruit 80,000 residents from coastal areas in Miyagi and Iwate provinces
  Recruit through joint session with health check by local government and use of seven regional support centers in the area

- **Birth & Three Generation Cohort (Miyagi)**
  Recruit 70,000 people including offspring, parental and grandparental generations
  Establish a collaborative relationship with maternity hospitals for the recruitment of expectant mothers

At March 31, 2016, we have finished recruit of 84,000 participants for Resident Cohort and at March 31, 2017, we have finished recruit of more than 73,000 for the Birth and Three Generation Cohort.
Characteristics of TMM <Cohort & Biobank>

■ One of the biggest cohort study in Japan, three generation cohort from a birth first in the world
  ■ 150,000 people scale
  ■ Ostensive healthy people, based on longitudinal cohort
  ■ Including more than 20,000 pedigrees
    <Three generation from a birth> Birthree Cohort

■ One of the three major biobank in Japan
  ■ 3,000,000 sample tubes from 150,000 people
  ■ Integrated data from analytical studies (genome-omics)
  ■ Distribution and data-sharing
Characteristics of TMM <Genome, Omics, & RoR>

- Around 4,000 WGS and 30,000 Array Analysis
  - Found 37 million SNVs
  - Construct reference panel and design the ethnic array
  - 30,000 imputed sequences

- Omics Analysis
  - Opened 5,000 metabolome analysis data
  - Analyzed more than 10,000 people metabolome

- Return of Genomic Results, on the research context
  - Returning secondary findings
  - Planning to return the multifactorial diseases’ risks
Our View on things to be shared

- As one of the biggest cohort study and three major biobank in Japan
  - How to maintain the large-scale cohort for a long-term
  - How the findings should be returned to the participants and community
- As the cohort study with pedigree
  - How the trio study does progress
  - How the sensitive results should be treated
- Omics Analysis, Return of Genomic Results on the research context

Norway – As Promising Partner

Much in common, much can be compared
The first collaboration Case

We will welcome a postdoctoral researcher from NTNU (Norwegian University of Science and Technology)

- Prof Atsushi Hozawa, Assoc Prof Naoki Nakaya as supervisors
- Collaborate on epidemiological study
People in ToMMo

ToMMo has more than 380 members including GMRC / TCF
GMRC: Genome Medical Research Coordinator
TCF: ToMMo Clinical Fellow

Thank you for your help and cooperation!