

# BIOBANKING THE HETEROGENEITY OF DIABETES. ANDREA LAURENZI, CHIARA MOLINARI, AMELIA CARETTO AND MARINA SCAVINI

## State-of-art and future development/perspectives of the research area at international level (max 2000 characters):

Biobanks are an important resource for biomedical research including chronic diseases, such as diabetes and its long-term complications. Biobanks focusing on a specific disease combine either collection of cross-sectional or longitudinal biological samples and clinical data. Although many biobank do include samples of patients with diabetes, there are no biobanks dedicated to diabetes as the consequence of either endocrine or exocrine pancreatic disease.

## Actual lines of research (as is) of the Diabetes Research Institute (max 2000 characters):

DRI-Vax project: longitudinal collection of serum and blood samples from patients with either type 1 or type 2 diabetes before and after vaccinations against SARS-CoV-2

Diabetes and Pregnancy: collection of serum and blood of women with gestational diabetes or pregestational diabetes accessing the Diabetes and Pregnancy clinic of the San Raffaele Hospital; furthermore we are participating to the MUSA project, a multicenter Italian project to estimate prevalence and predictors of MODY2 in women with hyperglycemia in pregnancy

T1DToDC project: cross-sectional collection of blood samples of patients with documented type 1 diabetes aiming to generate antigen-specific immunotherapy to halt autoimmunity in patients with type 1 diabetes

## Strengths of the research area (as is) of the Diabetes Research Institute (max 2000 characters):

The strengths of this research area of the Diabetes Research Institute are the DRI Biobank (BioDRI) and the Diabetes Outpatient Clinic of the San Raffaele Hospital.

BioDRI is a biobank, i.e., a non-profit service unit collecting, processing, storing and distributing human biological samples and related data, from healthy subjects and patients with diseases of the pancreas. BIODRI was established in 2019, with sample collection started in mid-2020. Furthermore, BioDRI is part of BBMRI-ERIC, a European research infrastructure for biobanking, facilitating sharing of samples within the participating biobanks.

The Adult Diabetes Outpatient Clinic of the San Raffaele Hospital has been operational since the early '80s, and cares for over 1,500 patients with type 1 diabetes, 4,000 patients with type 2 diabetes, and numerous patients with less common forms of diabetes, including gestational diabetes, monogenic diabetes syndromes, diseases of the exocrine pancreas, and drug- or chemical-induced diabetes. The clinic has a long-term collaboration with the Diabetes Pediatric Outpatient Clinic for the transition of adolescent patients with type 1 and other forms of diabetes.

## Weaknesses of the research area (as is) of the Diabetes Research Institute (max 2000 characters):

First, the long-term sustainability of BioDRI in terms of the costs of maintaining an rapidly growing collection of biological samples and supporting dedicated staff for sample processing and data entry. To strengthen the sustainability of the BioDRI it is vital to secure short-term and long-term funding from institutions and individual investigators.

Second, future of the Adult Diabetes Outpatient Clinic in times where there are plans to shift diabetes care (although mainly for type 2 diabetes patients) outside the hospital domain to the general practitioner/family practice groups. To maintain a large patient population accessible to this project we will be required to devise collaboration networks with future hubs for diabetes care, capitalizing on the role that our Institution had in training Endocrinologists and Diabetes specialist active in the area.

## Short-medium term OSR/UniSR goals (0-18 months): milestones and deliverables (max 1000 characters):

Protocol for recruitment of different patient populations, including the establishment of a network for the recruitment of patients with the less common forms of diabetes who are of interest for DRI researchers. Availability of a simple relational database for study management, allowing data extraction and transfer to the BioDRI database, and recruitment of the first 200 patients with type 1 diabetes.

## Medium term OSR/UniSR goals (18-36 months): milestones and deliverables (max 1000 characters):

Recruitment of additional 400 patients with type 1 diabetes and 150 patients with less common forms of diabetes.

## Long term OSR/UniSR goals (36-60 months): milestones and deliverables (max 1000 characters):

Recruitment of additional 400 patients with type 1 diabetes and 150 patients with less common forms of diabetes.

## Investments of the Diabetes Research Institute (e.g. personnel, space, technology) to achieve the short-medium-long term goals (max 2000 characters):

Personnel: a dedicated research nurse who will contact patients enrolled by the investigators in the Adult Diabetes Outpatient Clinic, collect relevant data and biological samples

Space: a dedicated space for patients' interviews, blood draws and records keeping

Technology: tools for the assessment of diabetic neuropathy