Innovative Medicines Initiative

Addressing the challenges of diabetes and its complications:

The IMI Diabetes Platform

EACPT 2013 Congress – 29 August – CICG Geneva

Bernd Jablonka
Sanofi

Challenges of Diabetes Treatment

- **Novel targets / therapeutic approaches**
  - **Identification of novel genes or cellular pathways that are involved in:**
    - **Pancreatic beta-cell regeneration / degeneration, proliferation / apoptosis and demise**
    - **Glucose uptake of insulin target cells**
  - **Transplantation of human pancreatic beta-cells**

- **Tools for accelerated access to novel therapies**
  - **Validated biomarkers to predict**
    - **onset of diabetes and / or diabetic complications and disease progression**
    - **response to therapeutic intervention**
    - **prevention or reduction of diabetes and / or diabetic complications**
  - **Validated non-invasive imaging probes / techniques for clinical use**
    - **to assess in vivo beta-cell function and mass**
    - **to monitor disease progression and treatment response**
  - **Novel models adequately reproducing diabetes & diabetic complications in men**
    - **Characterization of existing and development of novel animal models to better investigate key pathogenic mechanisms and predict outcomes of therapeutic interventions in the clinical setting**

The IMI Diabetes Platform

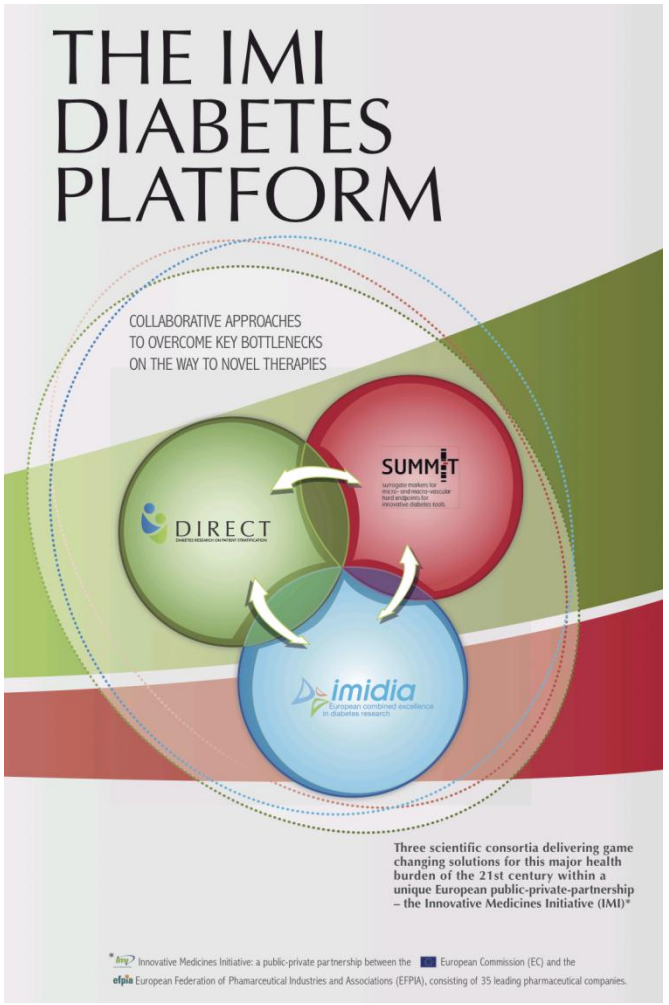
- Lack of understanding disease development and heterogeneity
- Lack of tools for disease monitoring
- Lack of biomarkers predictive for disease development and progression, treatment response and disease complications
- Lack of novel therapeutic targets / therapies

No company or academic institute or traditional scientific network can solve hurdles of such complexity alone

IMIDIA – DIRECT – SUMMIT:

Bringing together experts from academia, industry and biotech to generate novel approaches for diabetes research and treatment in a unique collaborative European Public-Private-Partnership (PPP)

Ultimate goal of faster development of better medicines for diabetes care



Concept and Goals

For further information see: www.imidia.org

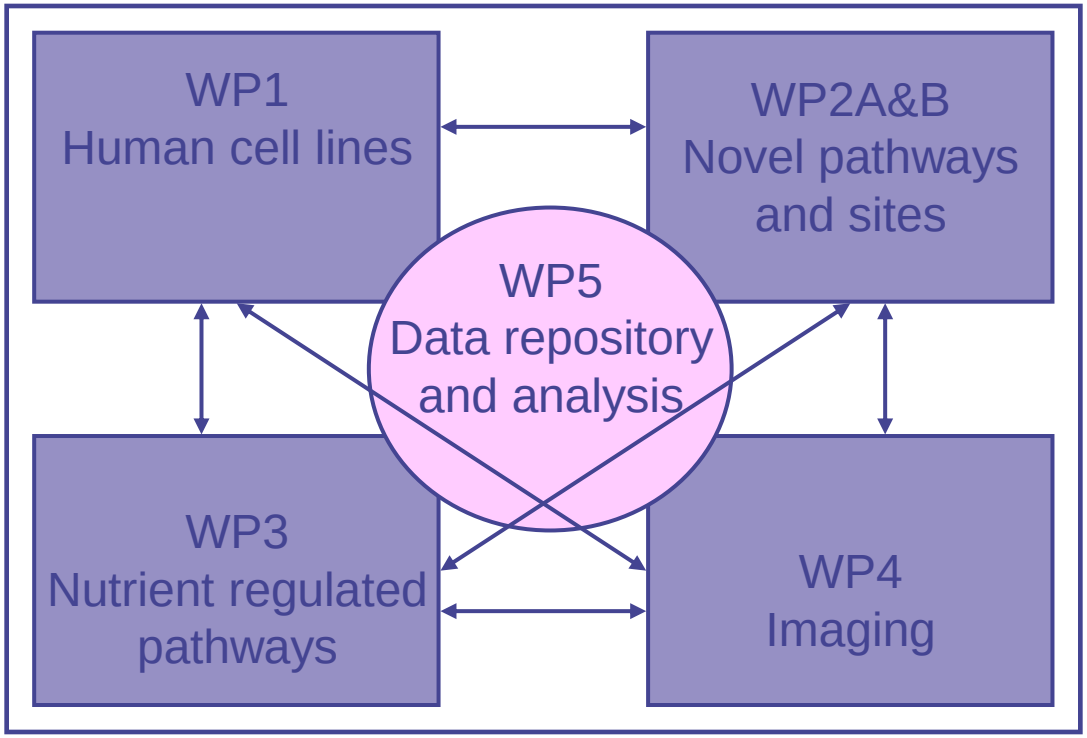
The IMIDIA consortium is working towards developing innovative approaches to shift the management of diabetes from symptomatic to beta-cell focused treatment

- **Innovative tools to**
  - study human pancreatic beta-cells development, function, survival and modulation by potential therapeutic compounds
  - perform *in vivo* beta-cell imaging
- **Biomarkers to**
  - assess diagnosis and prognosis of beta-cells failure
  - monitor diabetes progression and treatment success
- **Information regarding**
  - novel pathways that control beta-cells proliferation, differentiation and apoptosis
  - the role of nutrient-regulated pathways that control beta-cells mass and function

- **The overall goal is:**
  - to develop new approaches to assess, predict or prevent pancreatic beta-cells demise
  - to restore normal beta-cells mass and function for the treatment of diabetes patients

Organisation of Project Activities

The IMIDIA consortium is organized into five interacting work packages as described below



Concept and Goals

For further information see: www.direct-diabetes.org

The DIRECT consortium is working towards developing a personalized medicines approach for the treatment of type 2 diabetes with existing or novel therapies

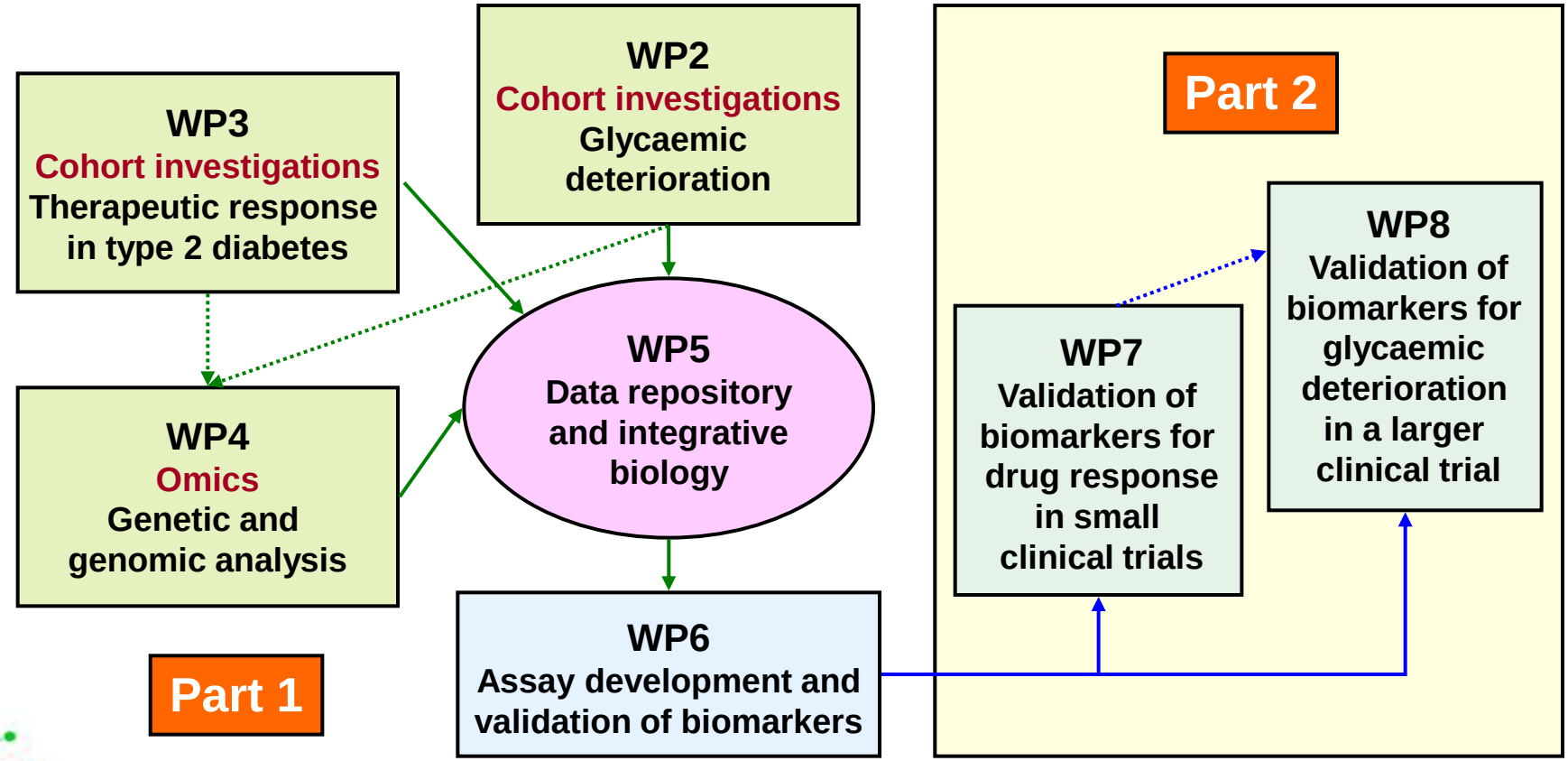
- **Complete phenotyping of**
  - patients with rapid or slow glycaemic deterioration (extremes)
  - extreme glycaemic response vs. non-responders to therapeutic intervention

  in already well-characterized subjects from large cohorts available throughout Europe
- **Identification of**
  - biomarker for subtypes with rapid diabetes development and progression
  - biomarkers for altered response to diabetes treatments
  - surrogate response biomarkers that reflect the underlying disease progression based on transcriptional and functional genomics, proteomics, lipidomics and metabolomics
- **Validation of biomarker candidates as surrogate markers in**
  - a large intervention trial for the delay progression of diabetes or pre-diabetes

    or
  - smaller trials for therapeutic response

Organisation of Project Activities

The DIRECT consortium is organized into seven interacting work packages as described below



SUMMIT
surrogate markers for micro- and macro-vascular hard endpoints for innovative diabetes tools

Concept and Goals

For further information see: www.imi-summit.eu

imi

The SUMMIT consortium is working towards developing innovative approaches to make clinical trial testing of novel medications in diabetic vascular complications shorter and more efficient. The major focus is on diabetic nephropathy, diabetic retinopathy and cardio-vascular disease in type 2 diabetes patients

Susceptibility markers predicting diabetic micro- and macro-vascular complications

- **Identification of genetic markers / biomarkers / non-invasive markers that can be used to:**
  - **Identify diabetes patients at risk of vascular complications**
  - **Monitor progression, reduction or prevention of vascular complications and / or response to therapy**
  - **Serve as useful surrogate endpoints in clinical trials, which are accepted by regulatory agencies**
- **Develop animal models better reproducing diabetic complications in men, novel cardio-vascular imaging technologies and *in-silico* modeling tools for preclinical research**

efpia

SUMMIT
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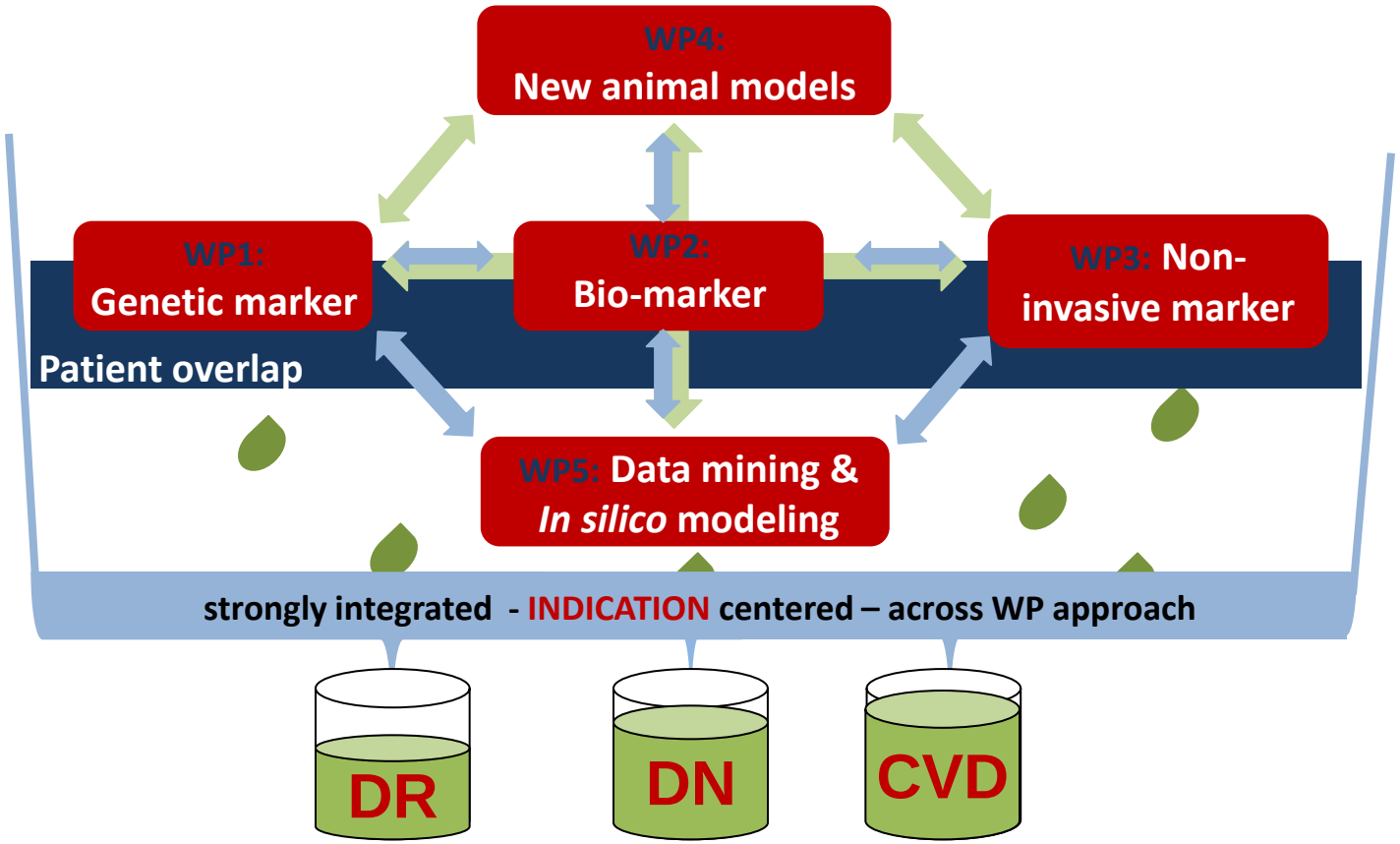
Organisation of Project Activities

imi

The SUMMIT consortium is organized into five interacting work packages as described below



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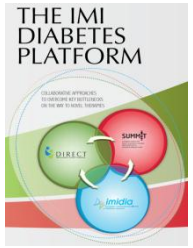
The IMI Diabetes Platform: Facts



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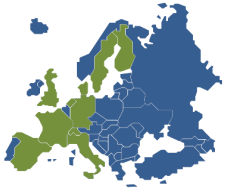
European combined excellence in diabetes research

DIRECT
DIABETES RESEARCH ON PATIENT STRATIFICATION



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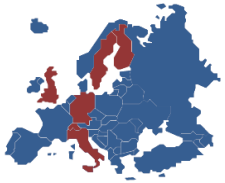

	IMPROVING BETA-CELL FUNCTION AND IDENTIFICATION OF DIAGNOSTIC BIOMARKERS FOR BETTER TREATMENT	DIABETES RESEARCH ON PATIENT STRATIFICATION	SURROGATE MARKERS FOR MICRO- AND MACROVASCULAR HARD ENDPOINTS FOR INNOVATIVE DIABETES TOOLS
START DATE	01/02/2010	01/02/2012	01/11/2009
DURATION	60 months	84 months	60 months
NO. PART.*	21 (12/8/1)	25 (21/4/0)	26 (19/6/1)
RES. EFPIA	16.7 Mio	16.5 Mio	14.1 Mio
FUNDING IMI	7.1 Mio	21.4 Mio	14.0 Mio
RES. ACADEMIA	2.1 Mio	5.2 Mio	4.5 Mio
TOTAL BUDGET	**25.9 Mio**	**43.1 Mio**	**32.6 Mio**
	www.imidia.org	www.direct-diabetes.org	www.imi-summit.eu

*** Academia / Pharma / Small and Medium-sized Enterprises**

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Benefit for the Diabetes Patient

- **Disease heterogeneity**
  - Early classification of pre-diabetes patients at high risk for T2D development
  - Improved prognosis of glycaemic deterioration after onset of T2D
  - Early identification of diabetes patients at risk for micro- and macro-vascular complications
- **Therapeutic implications**
  - Early therapeutic intervention in pre-diabetes patients and individual therapy after diagnosis of diabetes
  - Better control of blood glucose levels
  - Faster access to novel treatments for diabetes and / or diabetic vascular complications beyond glucose lowering therapy
  - Reliable monitoring of disease progression using novel biomarkers and improved imaging probes/technologies
- **Future treatment opportunities**
  - Novel therapeutic targets through extended pathway knowledge
  - Novel biomarkers for diagnosis and prognosis of beta-cell failure
  - Reliable monitoring of disease progression using novel biomarkers and improved imaging technologies
  - Novel therapies to slow down disease progression
  - Vision to ultimately find a cure for diabetes

Can only be achieved through large collaborations among public and private partners across borders and institutions

Results from IMI Diabetes Projects

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European combined excellence in diabetes research

- Generation of human pancreatic beta-cell lines
- Unique bio-repository of human pancreatic beta-cell samples
- Novel biomarker modules corresponding to diabetic phenotypes
- Visualization of insulin turnover in the pancreatic beta-cell

DIRECT
DIABETES RESEARCH ON PATIENT STRATIFICATION

- Biomarkers evaluation of retrospective samples of type 2 diabetes patients

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surrogate markers for micro- and macro-vascular hard endpoints for innovative diabetes tools

- Biological insight and translational opportunities from genetic and non-genetic analysis of samples from type 1 and 2 diabetes patient with nephropathy
- Novel findings in genetics and …omics of type 2 diabetes patients with cardiovascular disease
- Improved animal models for replicating diabetes vascular complications
- Imaging of vascular complications

22 September, 2013 – Llull Hall: 13:30 – 17:00 hours
Gran Via exhibition centre, Fira Barcelona, Spain

49 EASD BARCELONA 2013

Joint symposium on the occasion of the 49th EASD Annual meeting

Opening a new chapter in diabetes research: recent results from the IMI diabetes consortia SUMMIT, IMIDIA & DIRECT

SUMMIT · imidia · DIRECT

Programme

13:30 **Introduction & welcome** (*M Mark, SUMMIT - W Kramer, IMIDIA – H Rütten, DIRECT*)
13:35 **Welcome by EASD** (*A Boulton, President EASD*)
13:45 **IMI Address** (*M Goldman, Executive Director Innovative Medicines Initiative*)
13:55 **Collaborative discovery in diabetes research: the IMI DIABETES PLATFORM** (*M Mark*)

14:05 SUMMIT – approaching diabetic complications (*Chair: L Groop, M Mark*)
Objectives & opportunities (*M Mark*)
Diabetic nephropathy in type 1 & 2 diabetes – biological insights and translational opportunities from genetic & non-genetic biomarker analysis / Animal models: better replicating diabetes complications (*M McCarthy, M Gomez*)
Cardiovascular disease in type 2 diabetes – novel findings in genetics & …omics / Making vascular complications visible (*H Colhoun , J Nilsson*)
Next steps & goals (*L Groop*)

15:15 Coffee break

15:30 imidia – pancreatic ß-cell: the key to diabetes (*Chair: W Kramer*)
Objectives & opportunities (*B Thorens*)
Generation & characterization of human pancreatic ß-cell lines suited for drug discovery research (*R Scharfmann*)
Creation of a unique biorepository of human pancreatic ß-cell samples (*A Schulte*)
Bioinformatical identification of novel biomarker modules corresponding to diabetic phenotypes (*M Ibberson*)
Visualization of insulin turnover in the pancreatic ß-cell (*M Solimena*)
Next steps & goals (*A Ktorza*)

16:30 DIRECT – personalized medicines in type 2 diabetes (*Chair: H Rütten, E Pearson*)
Objectives & opportunities (*H Rütten*)
First results from retrospective sample analysis (*E Pearson*)
Next steps & goals (*E Pearson*)

17:00 End of meeting

Change of treatment paradigms
3 collaborative European Public Private Partnerships will present their latest research on the pancreatic ß-cell, personalized medicine in type 2 diabetes and late stage diabetic complications.
Under the umbrella of the Innovative Medicines Initiative (IMI, www.imi.europa.eu) these research partnerships bring together leading experts from numerous academic institutions, pharmaceutical companies and biotechs to jointly overcome key bottlenecks in today's drug development process on the way to
- *better monitor, treat and prevent severe micro- and macrovascular diabetic complications*
- *slow down disease progression and ultimately find a cure for diabetes*
- *better understand diabetes heterogeneity for determining best treatment options for each patient.*

Together they constitute the IMI Diabetes Platform, one of the most holistic discovery approaches in diabetes research to date.

Expected participation
The symposium is set-up to attract a wide audience. Diabetes researchers, clinicians, patient organizations, health care providers, politicians and decision makers are all encouraged to attend.

Contact:
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The IMI diabetes projects receive support from the Innovative Medicines Initiative, resources which are composed of financial contribution from the European Union's FP7 and EFPIA companies' in kind contribution.

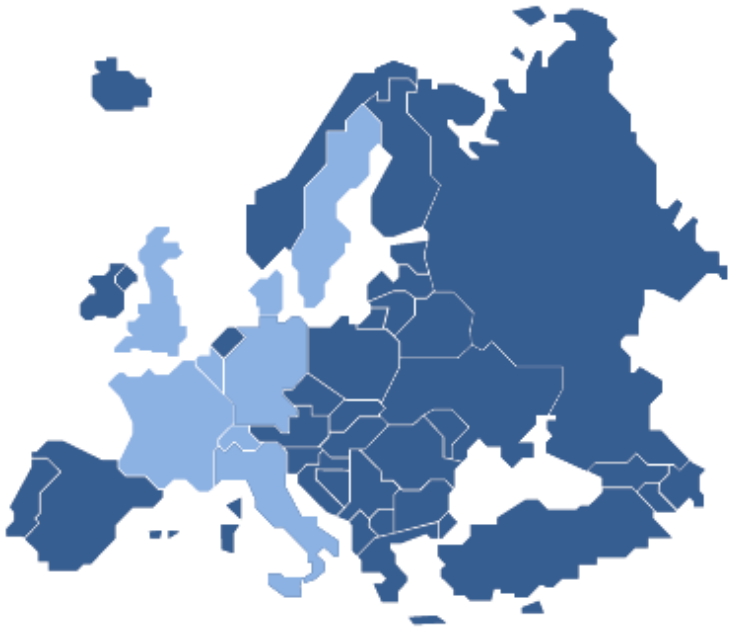
On behalf of the IMI Consortia IMIDIA, DIRECT and SUMMIT

Thank you for your attention !

Backups

Participants and EU Countries

Sanofi-Aventis Deutschland GmbH (Coordinator)
Servier (Co-coordinator)
Université de Lausanne (Academic Lead)

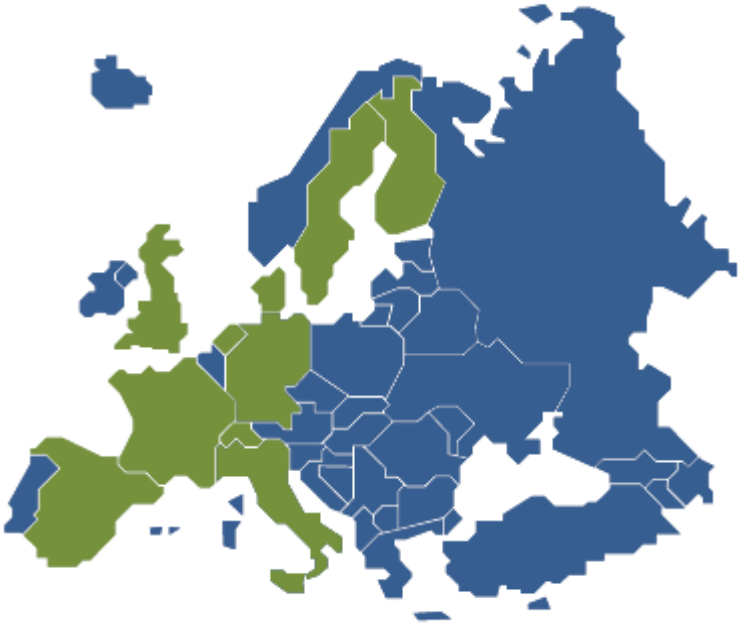


The IMI diabetes project IMIDIA was launched on February 01, 2010

AstraZeneca
Boehringer Ingelheim
Centre National de la Recherche Scientifique
Commissariat à l'Energie Atomique
Endocells Sàrl
Imperial College London
Institut Suisse de Bioinformatique
Institut National de la Santé et de la Recherche Médicale
Eli Lilly
Medizinische Hochschule Hannover
Novartis
Novo Nordisk
Roche
Technische Universität Dresden
Universita di Pisa
Université Paris Diderot-Paris 7
Université de Genève
Vrije Universiteit Brussel

Participants and EU Countries

Sanofi-Aventis Deutschland GmbH (Coordinator)
Eli Lilly (Co-coordinator)
University of Dundee (Academic Lead)



The IMI diabetes project DIRECT was launched on February 01, 2012

University of Bath
Consiglio Nazionale delle Ricerche
Technical University of Denmark
Eberhard Karls Universitaet Tuebingen
Helmholtz Zentrum München – Deutsches Forschungszentrum für Gesundheit u. Umwelt GmbH
Consorci Institut D'Investigacions Biomediques August Pi i Sunyer
Imperial College London
Kungliga Tekniska Högskolan
University of Lille- CNRS
Leiden University Medical Center
University of Copenhagen
University of Eastern Finland
Lunds Universitet
University of Newcastle upon Tyne
University of Exeter
Université de Genève
University of Oxford
Universitaet Ulm
VU University Medical Center
Novo Nordisk A/S
Servier
Lille University Hospital

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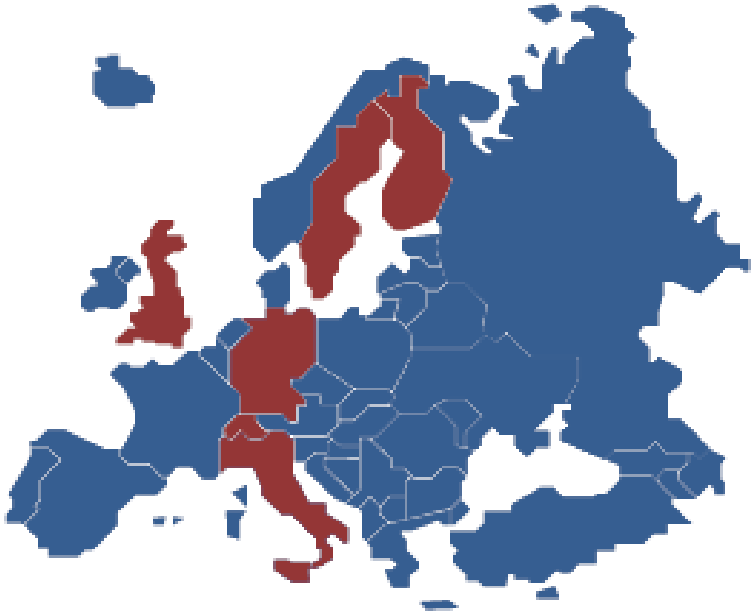
University of Dundee (Academic Co-Lead)



The IMI diabetes project SUMMIT was launched on November 01, 2009

AstraZeneca
Biocomputing Platforms Ltd
F. Hoffmann-La Roche Ltd
Folkhälsan, Helsinki
Helmholtz Zentrum Muenchen
Instituto di Ricerche Farmacologiche "Mario Negri"
Karolinska Institute
Pfizer
Sanofi-Aventis Deutschland GmbH
University of Cambridge
University of Dundee
University of Exeter
University of Gothenburg
National Institute for Health and Welfare, Finland
University of Eastern Finland
University of Oxford
Università degli Studi di Padova
Università degli Studi di Pavia
Università di Pisa
Università Cattolica del Sacro Cuore, Rome
University of Turku
University of Edinburgh
Università di Firenze

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