imidia
European combined excellence in diabetes research

Innovative Medicines Initiative

IMIDIA

IMPROVING BETA-CELL FUNCTION AND IDENTIFICATION OF DIAGNOSTIC BIOMARKERS
FOR TREATMENT MONITORING IN DIABETES

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efpia

DIABETES
Definition

Diabetes is a metabolic disease characterized by higher than normal blood glucose levels (hyperglycemia) in the fasting state and/or after meals

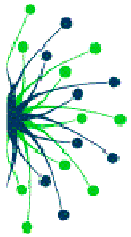
Type 1 and type 2 diabetes are the two main types of diabetes

Type 1 diabetes

- 10 à 15 % of diabetic patients
- Destruction of β cells (autoimmune process)
- Onset in young subjects
- Main feature: weight loss polyphagia, polyuria, asthenia, glycosuria
- Imperatively requires insulin therapy

Type 2 diabetes

- 85 à 90 % of diabetic patients
- No destruction of β cells but a decrease in functional β cells mass
- Onset during maturity and in the elderly
- Very progressive
- In theory insulin therapy is not required



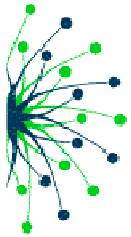
Micro (retinopathy, nephropathy)- and macro-angiopathic complications (cardio and cerebro vascular diseases) → Life span ↘

Diabetes – a pandemic disease of the 21st century

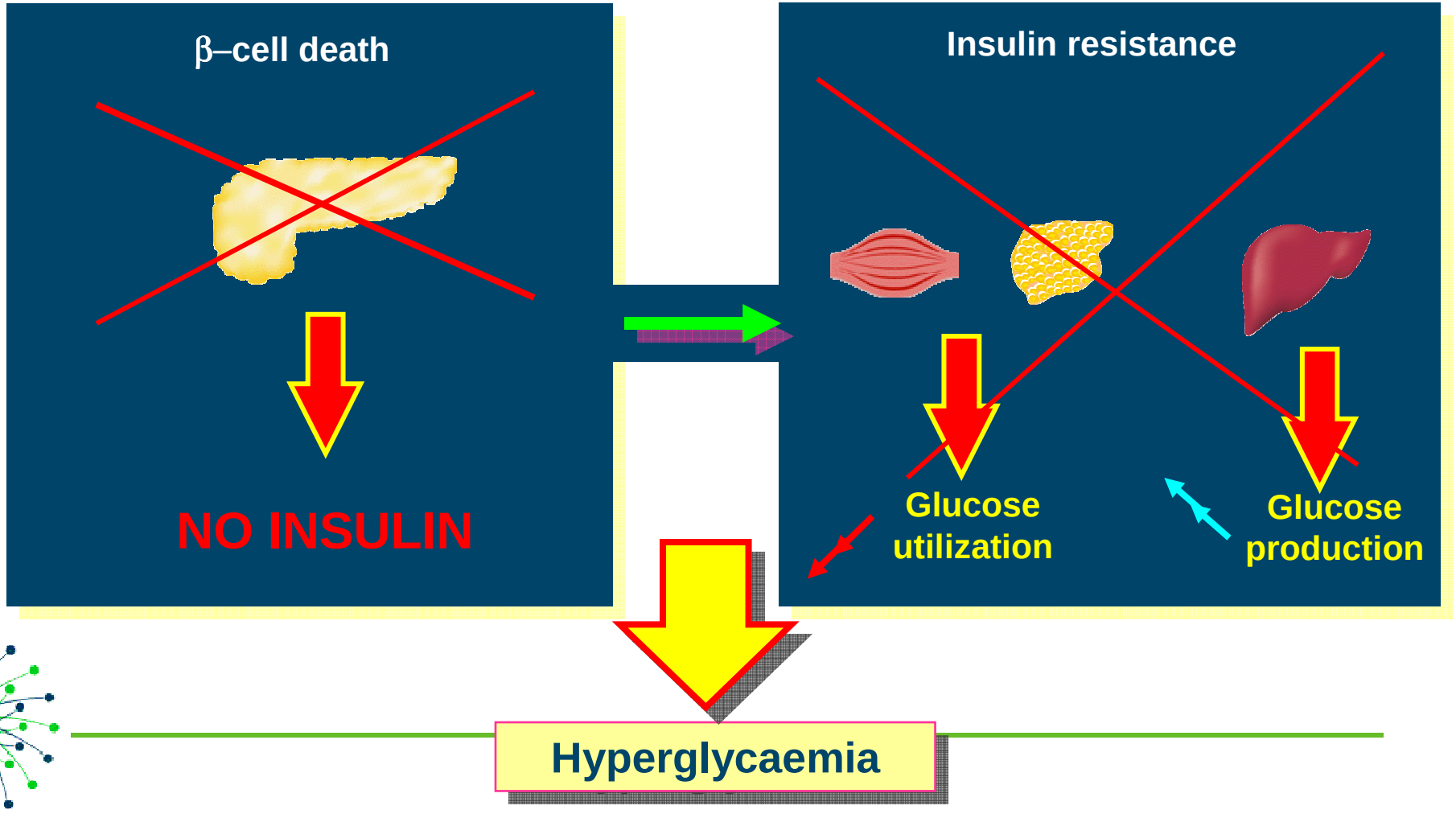
- Number of patients:
  - 2010: 285 million people worldwide
  - 2030: 439 million people worldwide

    (in particular spreading to the younger population)

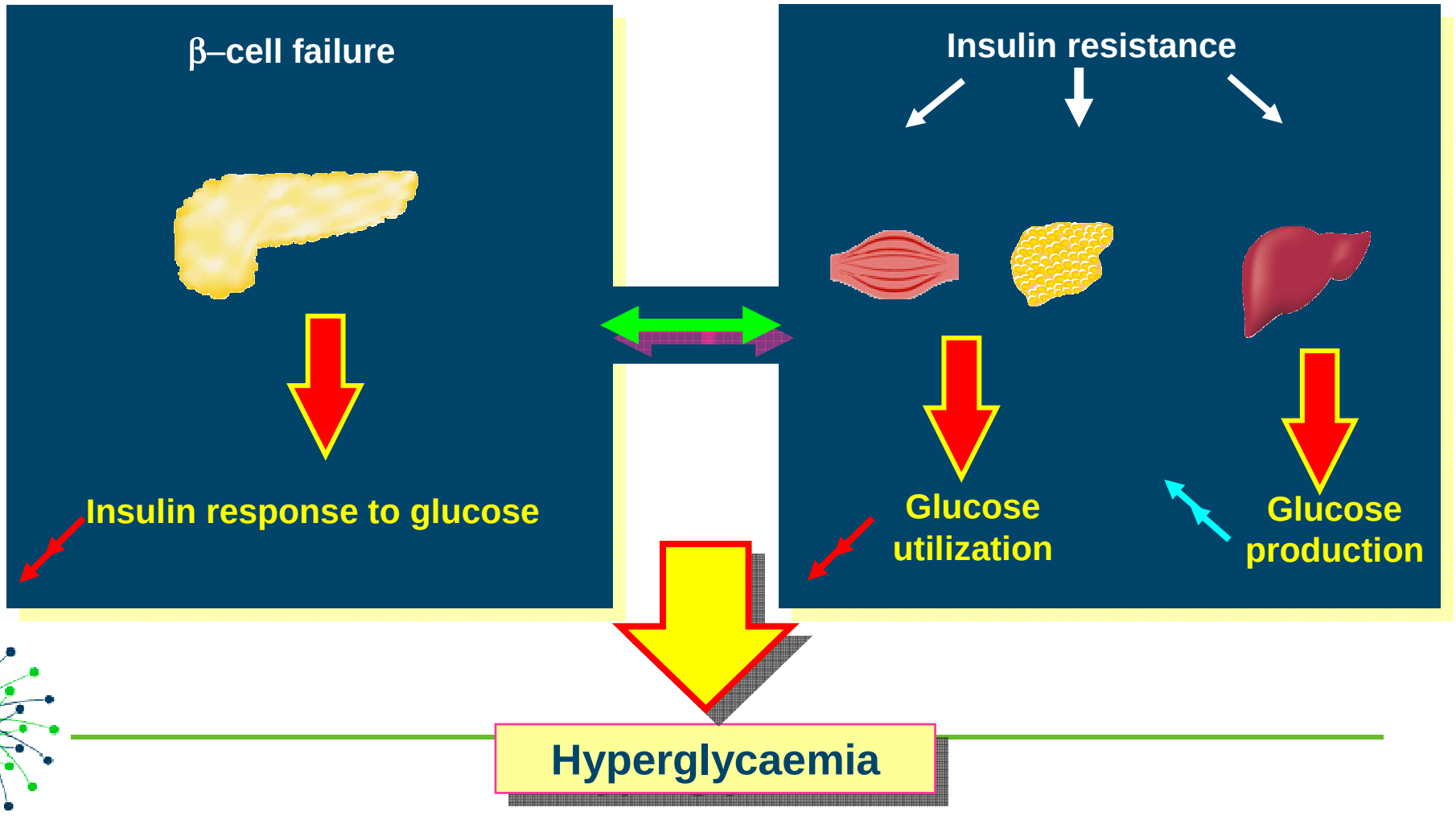
- Pancreatic ß-cells:
  - A complete or relative decrease in insulin secretion by pancreatic beta-cells underlies the development of, respectively, type 1 and type 2 diabetes.



PATHOPHYSIOLOGY OF TYPE 1 DIABETES
A SCHEMATIC REPRESENTATION

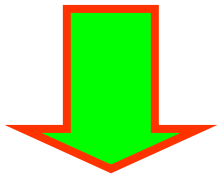


PATHOPHYSIOLOGY OF TYPE 2 DIABETES
A SCHEMATIC REPRESENTATION

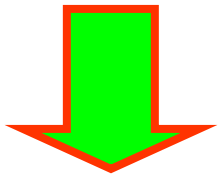


THE AIMS OF TREATMENT OF TYPE 2 DIABETES

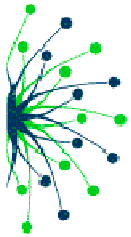
To prevent early death and improve quality of life



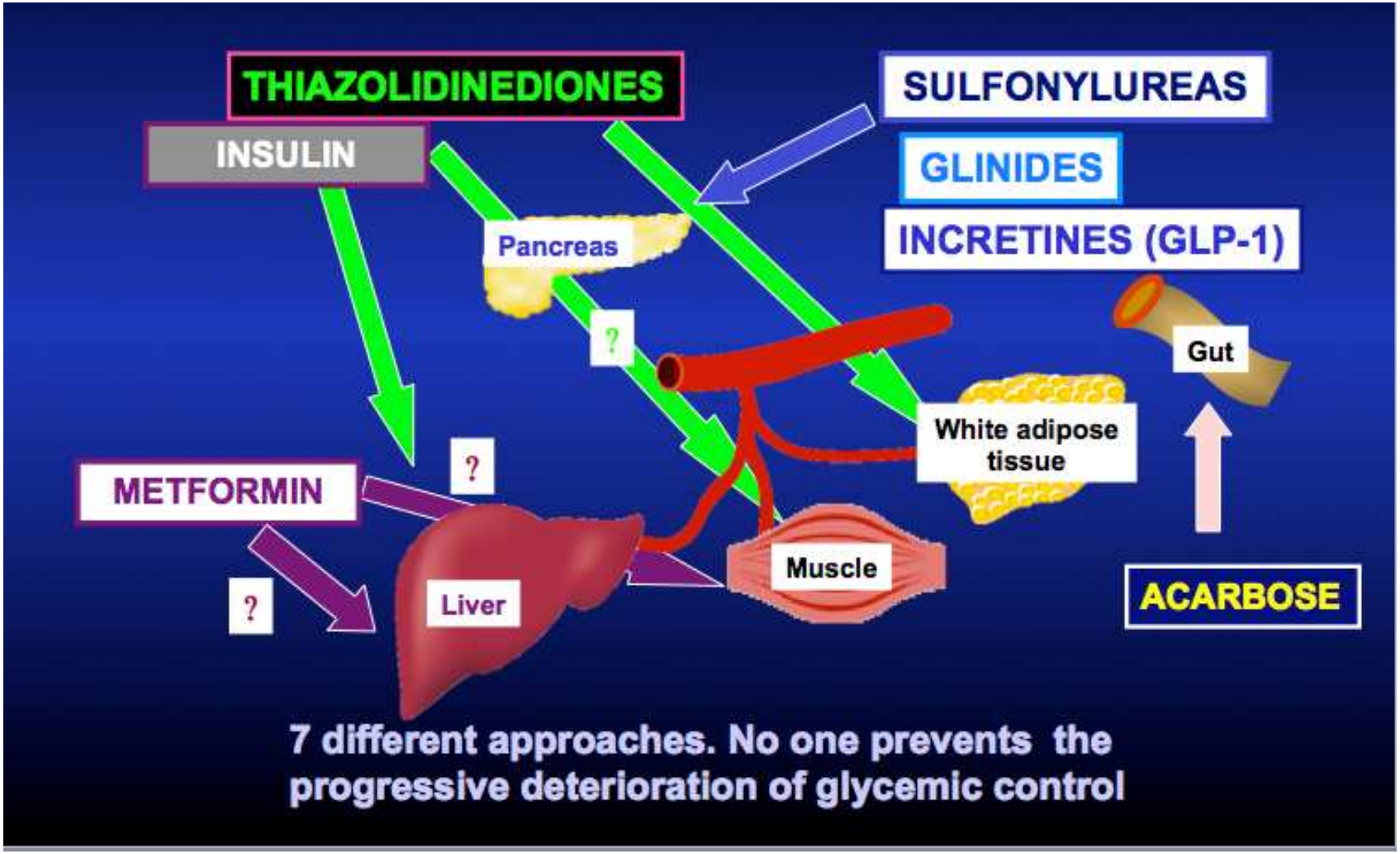
To prevent micro- and macro vascular complications



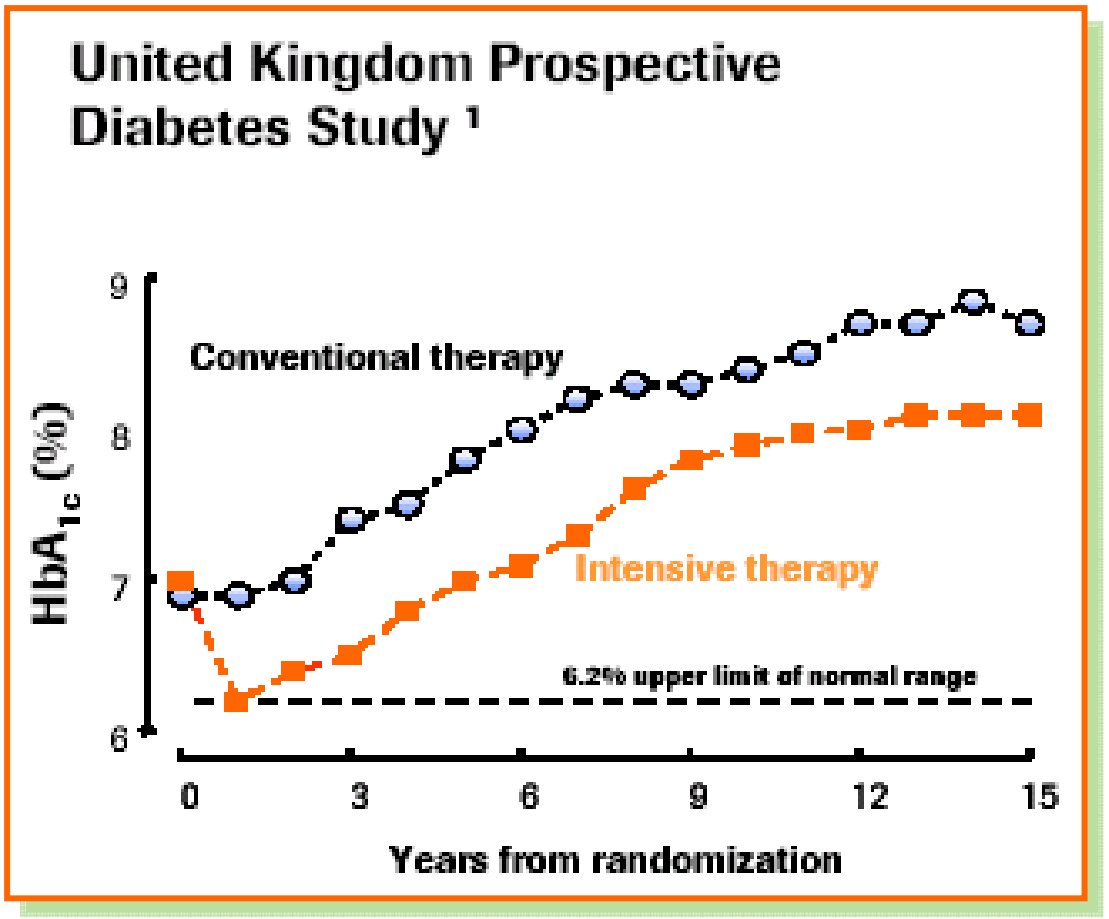
Optimal glycaemic control



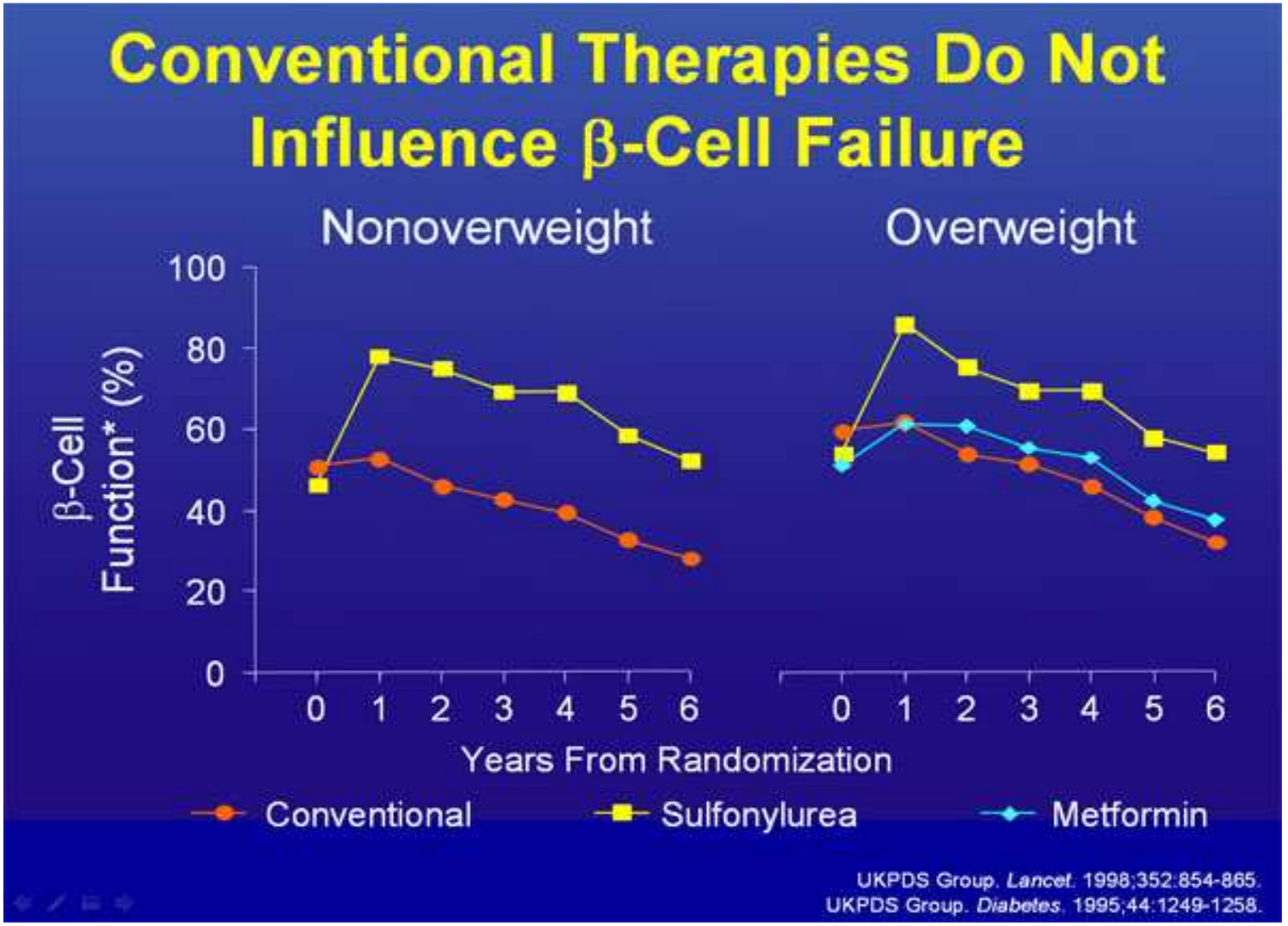
MAIN AGENTS USED IN THE TREATMENT OF TYPE 2 DIABETES



PROGRESSIVE DETERIORATION OF GLYCEMIC CONTROL IN TYPE 2 DIABETES

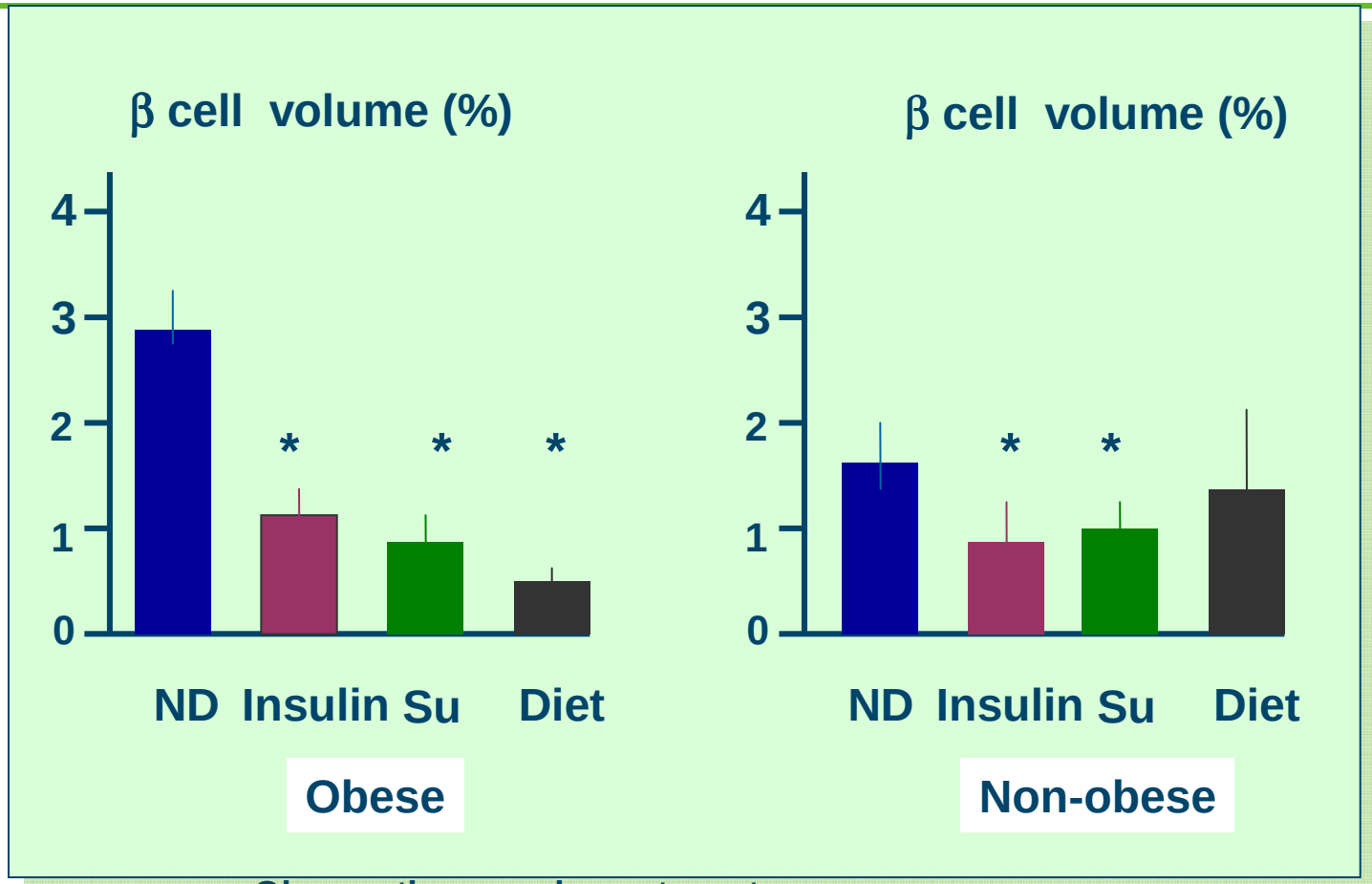


Conventional Therapies Do Not Influence β-Cell Failure



UKPDS Group. *Lancet*. 1998;352:854-865.
UKPDS Group. *Diabetes*. 1995;44:1249-1258.

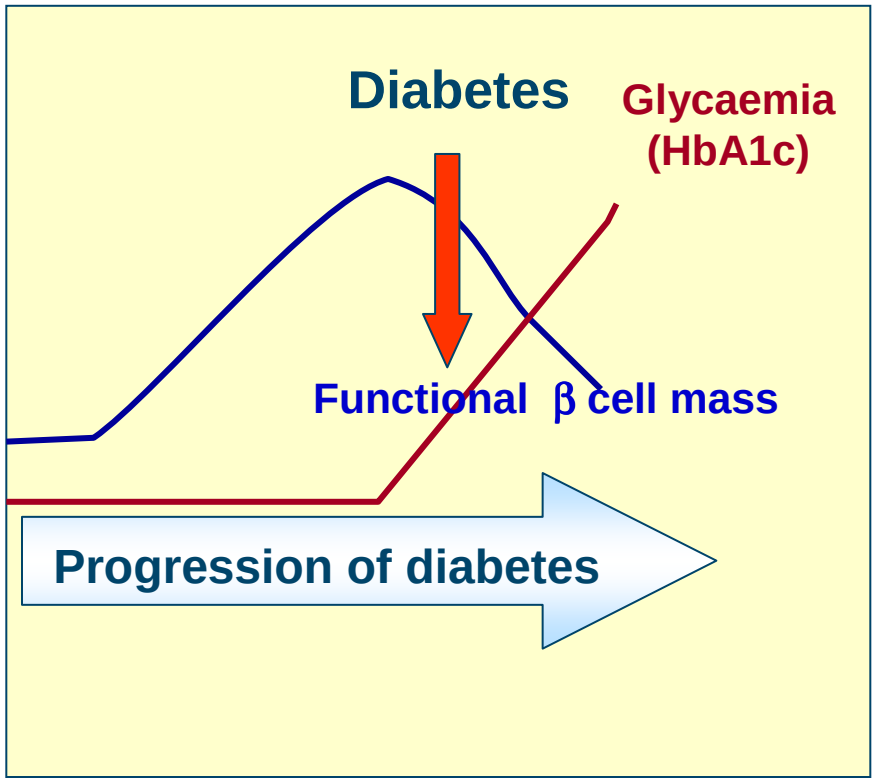
β-CELL MASS IN DIABETIC AND NON DIABETIC SUBJECTS

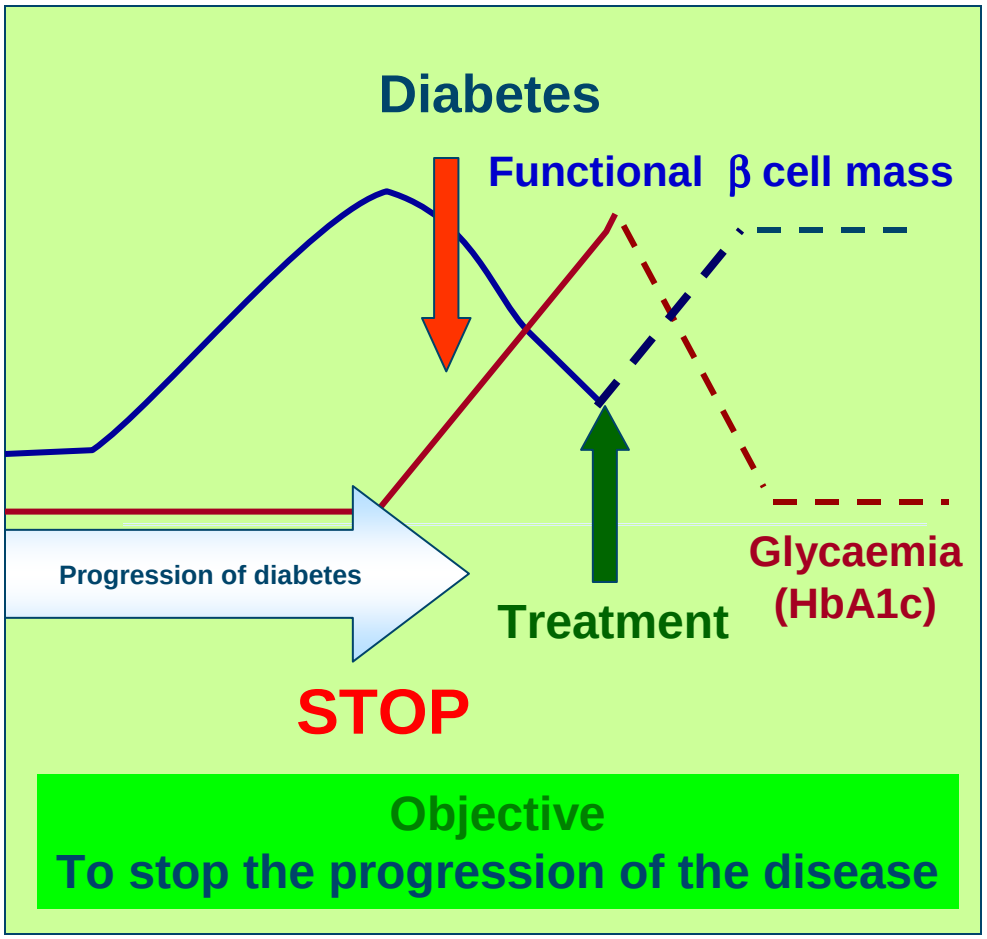


- Observations made post-mortem
- No information on the time-course of the β cell mass

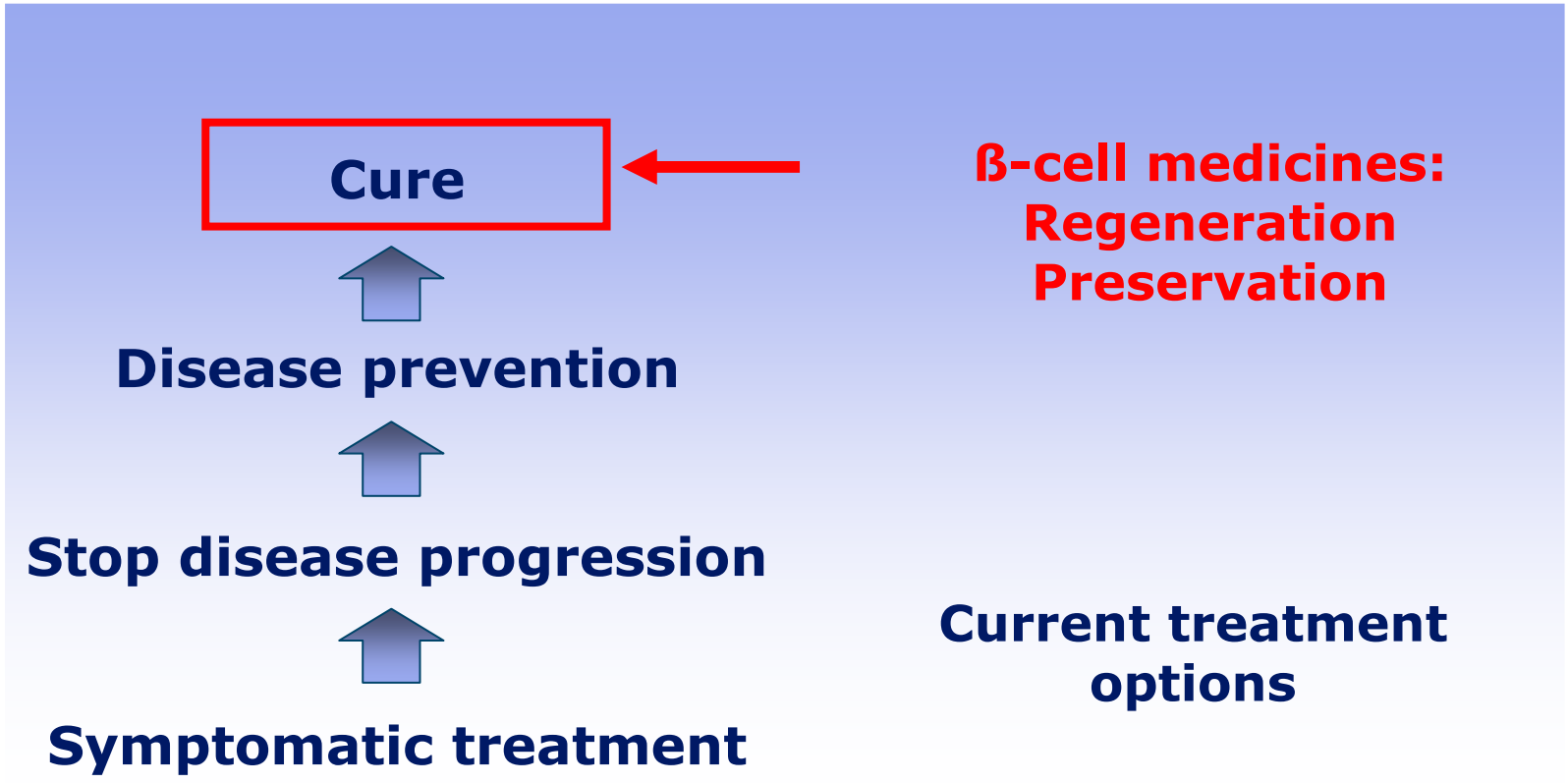
The requirement of non-invasive methods for the measurement of β cell mass

Relationship between functional β cell mass and glycemic control during the progression of diabetes



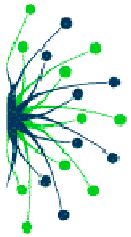


A Paradigm Shift in Diabetes Therapy: from symptomatic Treatment to Cure



IMIDIA will adress key bottlenecks for the development of these new theraphies

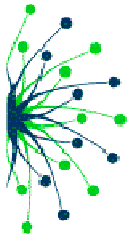
- Novel tools for the study of:
  - human beta-cell development, function and survival;
  - human beta-cell functional modulation by potential therapeutic compounds;
  - in vivo beta-cell imaging.



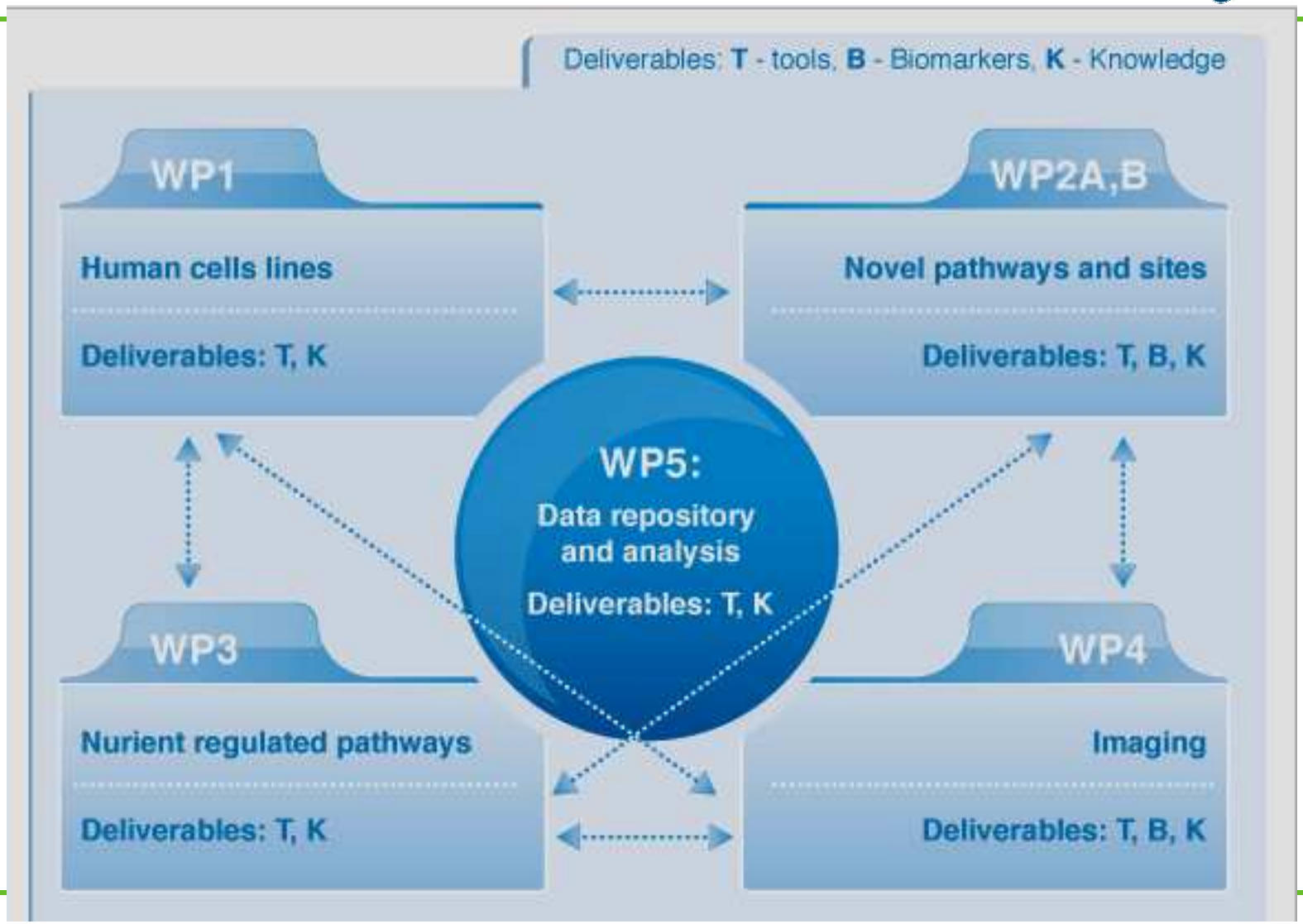
IMIDIA will adress key bottlenecks for the development of these new theraphies

- Biomarkers:
  - for the diagnosis and prognosis of beta-cell failure;
  - for monitoring diabetes progression and treatment.

- Knowledge:
  - on novel pathways and sites that control beta-cell proliferation, differentiation and apoptosis,
  - on the role of nutrient-regulated pathways in controlling beta-cell mass and function.



Integrated approach

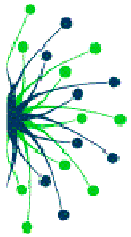


Expected Outcome – I:

- Disease relevant human islet cell lines:
  - will lead to better models for the development and assessment of diabetes therapies.

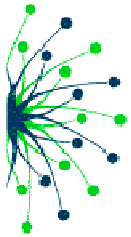
- Beta islet cell precursor isolation and purification:
  - will help understanding the birth of beta-cells to help find methods for beta-cell regeneration in diabetes.

- A Systems Biology approach of beta-cell demise in type 2 diabetes:
  - will provide better understanding of the beta-cell pathogenesis;
  - will deliver biomarker candidates for diagnosis, prognosis and assessment of therapeutic efficacy.



Expected Outcome – II:

- A network and technology allowing the isolation of human islet cells from surgical specimen of diabetic and non-diabetic patients.
- Unraveling key pathways and sites that control GLP-1 trophic actions on beta-cells.
- New and unique imaging technologies and novel probes for earlier and better monitoring of beta cell function and mass in humans.

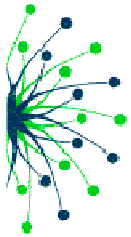


Benefit to the patient:

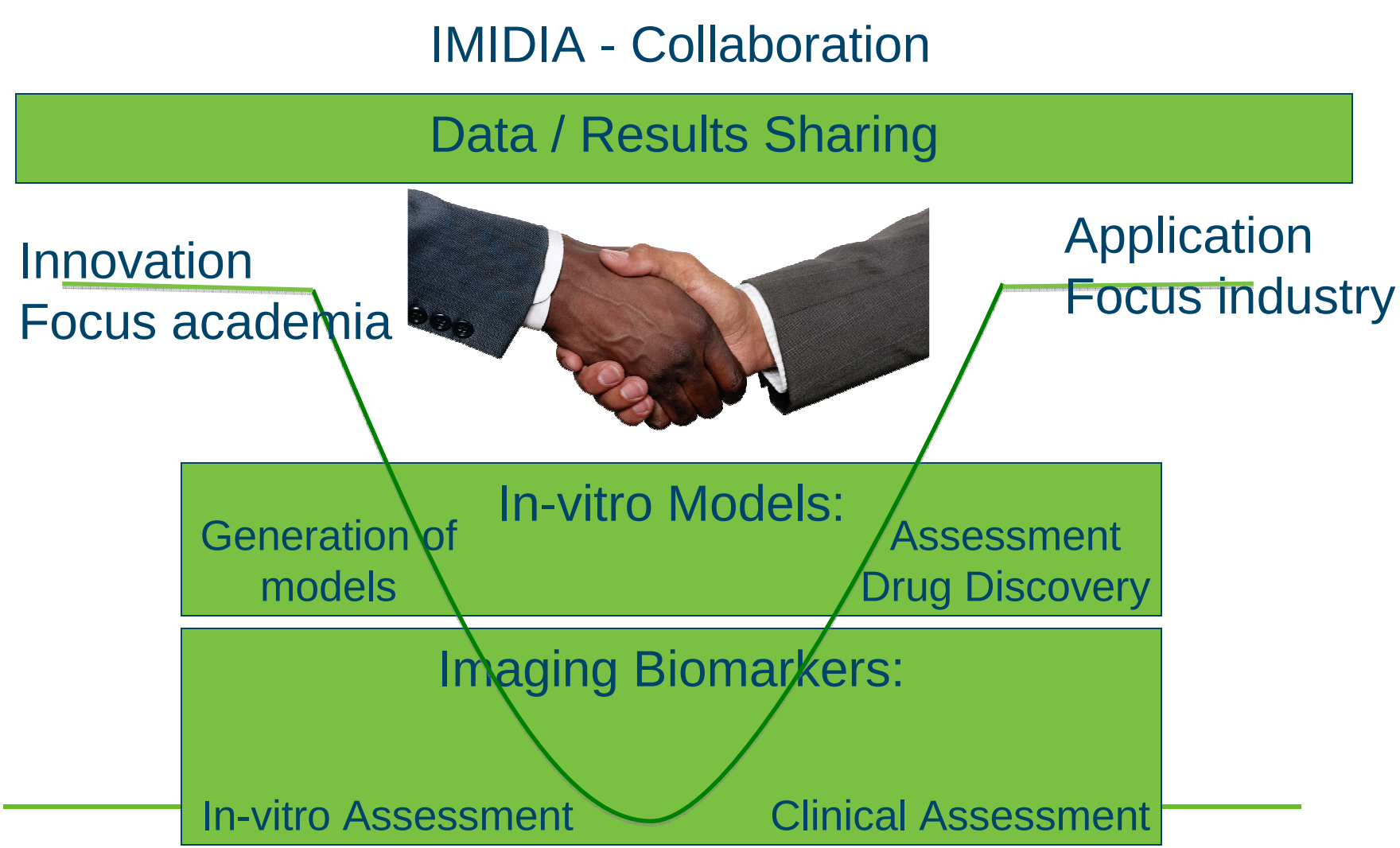
To monitor specific disease progression and enable improved disease management.

To pave the way for the development of ß cell focused theraphies via:

- Better biomarkers to monitor therapy benefit in patients
- Better disease centric in-vitro and in-vivo models
- Better understanding to enable focused therapeutic approaches



IMIDIA: Collaboration (Sustainable win-win)



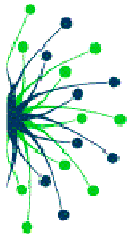
Results/achievements so far: 4 months into the project

Tools:

- Evaluation of first version of in-vitro models
- Data acquistion process for Systems Biology established
- Biorepository Harmonization Initiated
- Synthesis of first Imaging Molecules Candidates initiated

Biomarker:

- Human assesment study in preparation



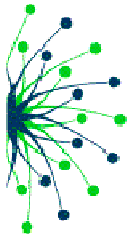
Time and money

Financing

- IMI funding: € 7.074.760
- EFPIA contribution, mainly in kind: € 15.081.800
- Other contributions (e.g. unfunded act., act. in the USA) € 3.750.920
- Total project cost: € 25.907.480

Timing:

- Starting date: 01. Feb. 2010
- Duration: 5 years



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Landscape*

Leadership team

Sanofi-Aventis Deutschland	W. Kramer
Servier	A. Ktorza
University of Lausanne	B. Thorens

Participants

- AstraZeneca Pharmaceuticals
- Boehringer Ingelheim Pharma
- CEA /Institut d'imagerie Biomédicale
- CNRS UMR 7091
- CNRS-University Paris Diderot
- Dresden University of Technology
- F. Hoffmann-La Roche
- Hannover Medical School (MHH)
- Imperial College London
- INSERM U845
- Lilly Deutschland
- Novo Nordisk A/S
- Novartis Institutes
- SARL ENDOCELLS
- Swiss Institute of Bioinformatics
- University of Geneva
- University of Pisa
- Vrije Universiteit Brussel

View all participants

*Location of key scientific contacts in Europe

Press Release Issued 14/06/10

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Innovative Medicines Initiative

Launch of IMIDIA

An Innovative Medicines Initiative Project for Diabetes

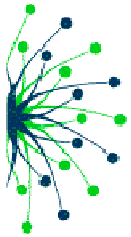
Academia, biotech and the pharmaceutical industry have joined forces to fight diabetes.

Frankfurt, Germany / Lausanne, Switzerland / Paris, France - June 14, 2010.

Further information

- www.imidia.org
- Email: info [AT] imidia.org

www.imi.europa.eu



IMIDIA

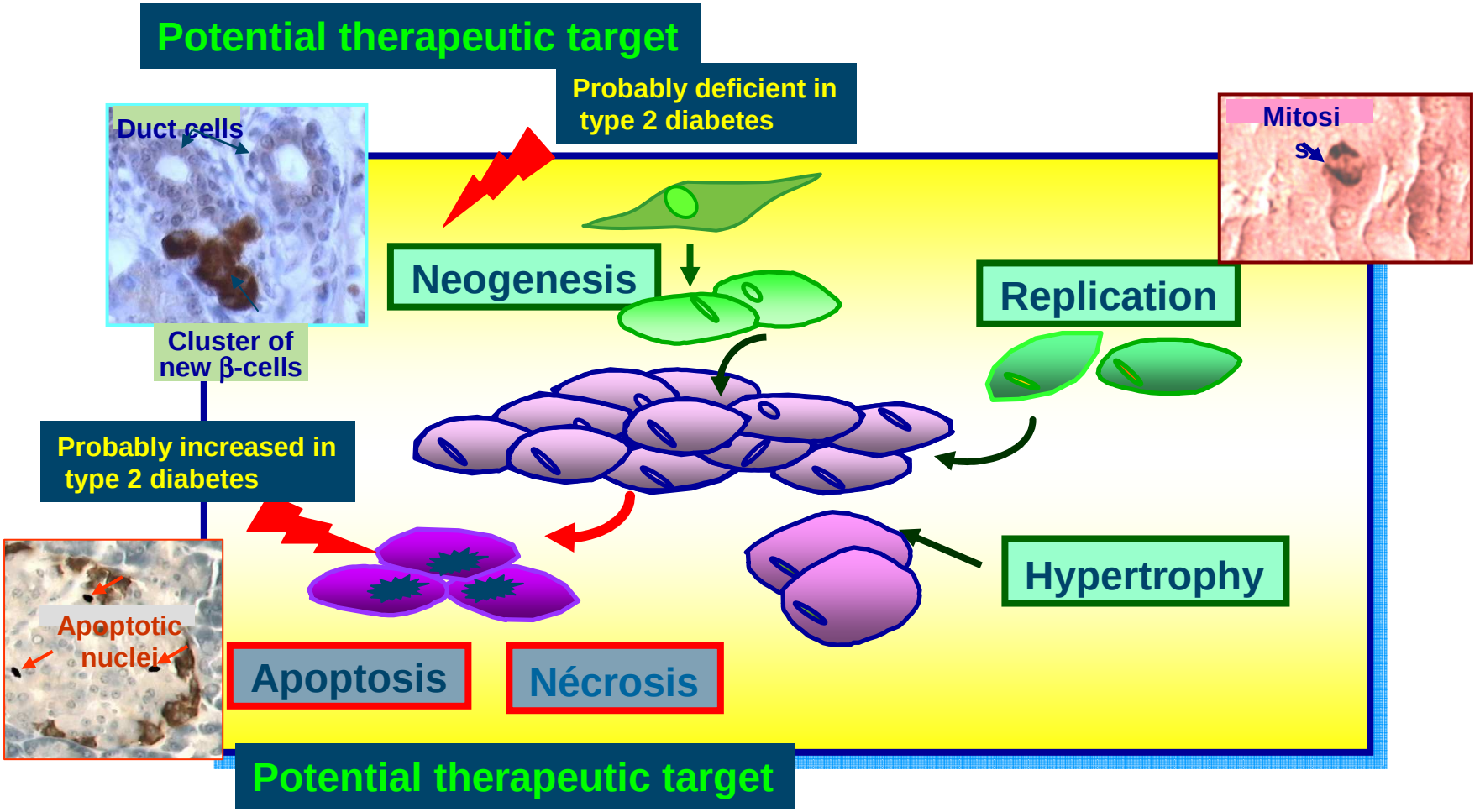
Improving β-cell Function and Identification of Diagnostic Biomarkers For Treatment Monitoring in Diabetes

- Type 1 and type 2 diabetes impose a huge burden to welfare systems
- Relative or complete decrease in insulin secretion underlies the development of type 1 and type 2 diabetes
- Limited therapeutic options ← Limited knowledge β-cell biology (function, survival, pathophysiology)
- Lack of biomarkers for prognostic of β-cell failure

The IMIDIA project

- New tools for the study of human β-cell development function and survival
- Biomarkers
- Knowledge of novel pathways and sites that control β-cell development, function and survival
- Non-Invasive Imaging of the Human Endocrine Pancreas

CONTROL OF BETA-CELL MASS



EXPECTED MAIN COMPETITIVE ADVANTAGE

Close interaction between academic teams, pharmaceutical companies and SMEs

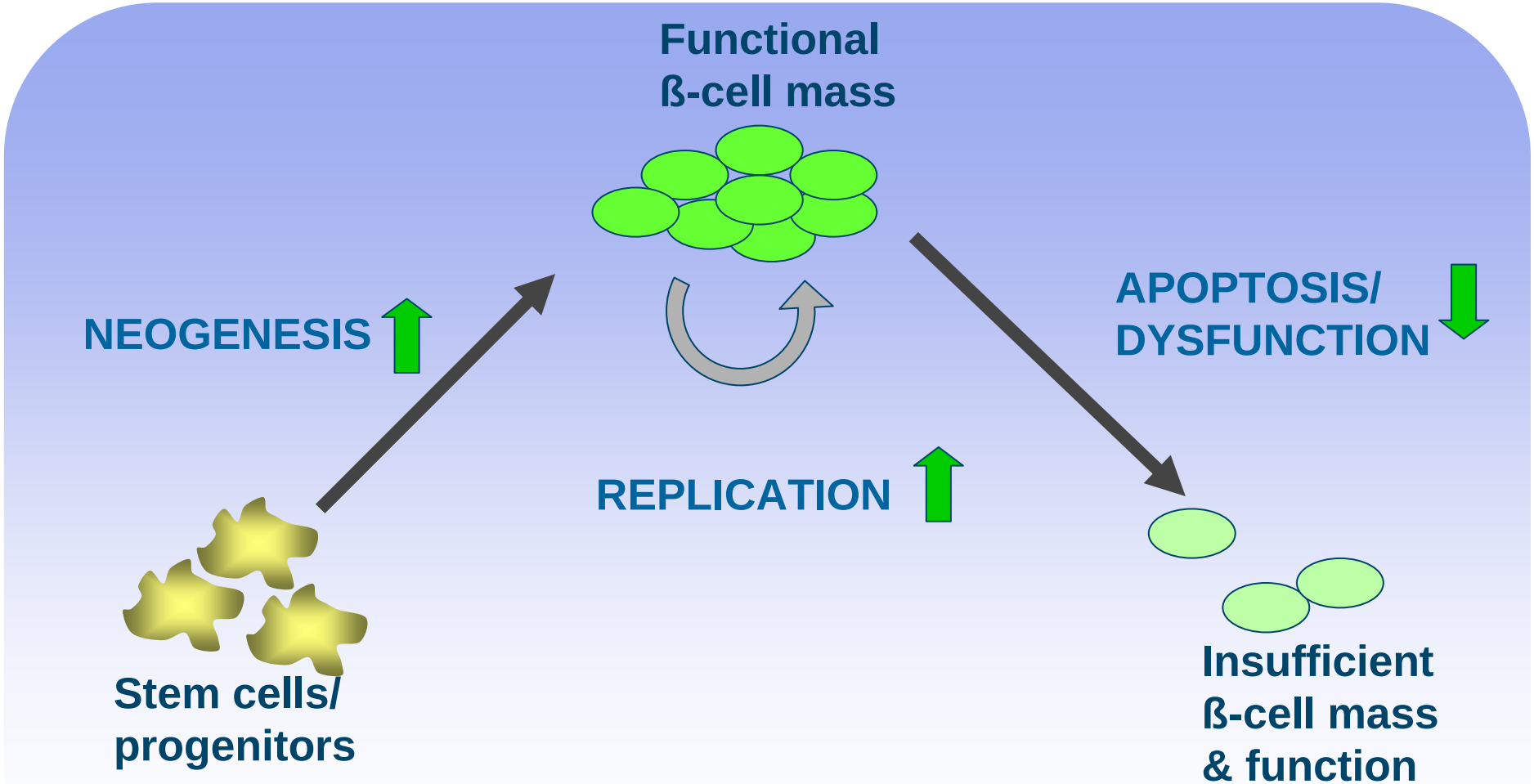
Unique conjunction of expertise and will form a strong basis for a successful enterprise

Improvement of industrial competitiveness and Public Health in Europe

- Content advantage
  - All results transparent to all project participants during the project
  - “Validation” of new technologies / tools from academia during the project by participating industry
- Time advantage

Access to generated IP within the project “foreground” for “research use”

The Path to innovative Diabetes Therapies: enhancing functional ß-Cell Mass



Scientific key questions
Tools & Technologies

➡ **IMIDIA**