

Plenary Session 1

- Title : **Opening the echo chamber – Perspectives on curing diabetes**
- Creators : Peter Senior – Lorenzo Piemonti – Jon Odorico
- Hosts : Peter Senior – Sarah Cross
- Questions to panellists :
What do patients with diabetes really want?
Can (could) this be met by islet, pancreas, stem cell replacement?
What are patients with diabetes building for themselves?
How should we compare the different options ?
Can clinical trial results be generalized to all patients with type 1 diabetes ?
Who should be recruited to clinical trials ?
- Why you should attend : The opening plenary session will take the format of a « talk show », in which patients with diabetes and their advocates will challenge specialists in beta-cell replacement with their own perspectives, and attempt to open the « echo chamber » in which congress-dwelling clinicians tend to hear and repeat the same « self-evident truths ».
- What you will learn :
- ◆ What is the true burden of diabetes on patients and their families
 - ◆ What are the strengths and weaknesses of transplant options compared to the artificial pancreas
 - ◆ What are the knowledge gaps that should be addressed by future research

State-of-the-art Symposium 1

Title : **Organ preservation out of the box**

Creators : Gabriel Oniscu – Wayne Hawthorne – Lionel Badet

Lectures :
Sorting criteria for the marginal pancreas: waste or recondition ?
Normothermic regional perfusion of pancreas and islet donors
Hypothermic oxygenated machine perfusion in pancreas/islet transplantation
Oxygen persufflation : a feasible and efficient technique for pancreas reconditioning ?

Why you should attend : There are significant developments in the field of organ reconditioning that have shown excellent early results and may lead to improved organ utilization. Pancreas perfusion has lagged behind and there have been limited advances with a significant impact on clinical practice – until now !

What you will learn :

- ◆ Which pancreases should be considered for reconditioning
- ◆ What are the reconditioning techniques and how they perform
- ◆ How can we assess the impact of pancreas reconditioning

State-of-the-art Symposium 2

- Title : **Biotechnology shapes the future for beta cell replacement therapy**
- Creators : Hanne Scholz – Ekaterine Berishvili – Giuseppe Orlando
- Lectures :
Islet on a chip
Bioengineering approach to immunosuppression-free islet transplantation
Generation of insulin-producing organoids
- Why you should attend : Regenerative medicine is a rapidly emerging interdisciplinary field in the vast domain of biotechnology, focusing on repairing or replacing damaged tissues. It holds the promise of revolutionizing patient care, in particular for type 1 diabetes, in the 21st century.
- What you will learn :
- ◆ What is the state-of-the-art in bioengineering strategies for type 1 diabetes
 - ◆ How can biotechnology produce functional insulin-secreting constructs
 - ◆ How can bioengineering alleviate immune responses to beta-cells

Plenary Session 2

- Title : **Hypes and hopes of the artificial pancreas**
- Creators : Thierry Berney – Peter Senior – Pierre-Yves Benhamou
- Lectures :
Current automated insulin delivery systems : what do they really achieve ?
Patient-driven R&D : why-how-what ?
What will it take to address uncontrolled diabetes with closed-loop technology ?
Risk-benefit assessment of beta-cell replacement vs automated insulin delivery systems
- Why you should attend : As automated insulin delivery (AID) devices are about to hit the market, it is timely to review what they are actually able to achieve and how they compare with current biological beta cell replacement therapies.
- What you will learn :
- ◆ What is the current state-of-the-art in automated insulin delivery systems
 - ◆ What are the technological issues to solve or improve
 - ◆ How does AID benchmark against beta-cell replacement therapies

State-of-the-art Symposium 3

Title : **Letter to the (gene) editor**

Creators : Shane Grey – Nathan Zammit – Jon Odorico

Lectures :
Genome editing made easy (« Genome editing for dummies » ?)
Will gene editing carry pig islets to the clinic ?
Can genome editing produce "universal human cells" for transplantation ?

Why you should attend : Genome editing is revolutionizing biological research and genome editing approaches are applicable to many aspects of beta cell replacement. Beta cell replacement therapies likely to benefit from genome engineering include human xenogeneic islets and stem cell-derived beta cells.

What you will learn :

- ◆ How does genome editing works
- ◆ How can genome editing be used to modify xenogeneic donors
- ◆ How can genome editing be used to modify stem cells

State-of-the-art Symposium 4

- Title : **Type 2 diabetes : a surgical disease ?**
- Creators : Thierry Berney – François Pattou – Raja Kandaswamy
- Lectures :
Phenotypic variability in type 2 diabetes
Bariatric surgery : reviving the failing beta cells in type 2 diabetes
Pancreas transplantation : replacing the failing beta cells in type 2 diabetes
- Why you should attend : In the current epidemics of type 2 diabetes, pancreas transplantation and bariatric surgery are emerging as paradigm-challenging therapeutic approaches.
- What you will learn :
- ◆ Are bariatric surgery and pancreas transplantation competing or complementary approaches
 - ◆ Why bariatric surgery or pancreas transplantation works and for which patients
 - ◆ What are the selection criteria for bariatric surgery or pancreas transplantation in type 2 diabetes

State-of-the-art Symposium 5

- Title : **Immunosuppression tailored for beta cell replacement**
- Creators : Diego Cantarovich – Raja Kandaswamy – Olivier Thauvat
- Speakers :
Metabolic Instruction of Immunity: immunometabolism and beta cell replacement
Targeting CTLA4 to minimize CNIs in pancreas or islet transplantation
New immunosuppressive drugs : what's in the pipeline ?
Tolerance induction in beta cell replacement
- Why you should attend : Most (if not all) immunosuppressive drugs currently used in solid organ transplantation are ill-adapted to recipients of beta cell transplants because they are either directly toxic to the graft and/or have major interferences with glycemic control.
- What you will learn :
- ◆ How drugs impacting glucose metabolism impact the immune response
 - ◆ What is the potential of new immunosuppressive drugs for beta-cell replacement
 - ◆ How long will it take to induce tolerance to allogenic beta cells?

State-of-the-art Symposium 6

- Title : **Keeping an eye on beta cells: biomarkers to monitor pancreas and islet grafts**
- Creators : Olivier Thaunat – Shane Grey – Diego Cantarovich
- Speakers :
Imaging beta cells in vivo
Alternate transplantation sites to monitor islet histology
Immune monitoring to diagnose rejection and diabetes recurrence
Genomics of beta cell death
- Why you should attend : In contrast to other types of solid organ transplantation, there is no reliable tool available to monitor graft function after islet or pancreas transplantation. Our inability to evaluate engrafted beta cell mass and to detect early recurrence of T1D and/or rejection strongly affects mits pancreas and islet graft survival.
- What you will learn :
- ◆ What are the available tools to evaluate the transplanted beta cell mass
 - ◆ What are the available tools to monitor autoimmune and allo-immune responses to transplanted beta cells
 - ◆ How to combine assays for optimal follow-up of allogeneic beta cells recipients

Plenary Session 3

- Title : **Beta cell grafts for all**
- Creators : Lorenzo Piemonti – Wayne Hawthorne – Nathan Zammit
- Speakers : Organ manufacturing by interspecies blastocyst complementation
Islet 3-D bioprinting
iPSCs : the optimal source of non-rejecting beta cells ?
Re-imagining the beta cell
- Why you should attend : No field in health sciences has generated more interest than beta cell replacement in fostering progress in regenerative medicine and new technologies. These approaches bear the potential to render the need for currently used islet or pancreas allografts obsolete.
- What you will learn :
- ◆ What are the cutting edge approaches to the generation of insulin-producing tissue
 - ◆ How close we are to « infinite » sources of transplantable insulin-producing cells
 - ◆ How close we are to beta cell replacement without immunosuppression