

## PL-1.2

# From Transplantation to Organ and Tissue Biofabrication

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End-stage diseases lead to permanent organ failure and can occur in all ages. Organ transplantation often appear as a single option to save the patient's life and represents the current standard of care for chronic end-stage disease of many organs. Transplantation of a new organ improves not only the life expectancy but also the quality of life of the patient. However, the main problem in transplantation remains donor organ shortage. Often patients are dying on a waiting list, because not enough organs are available through donation to meet the increasing demand.

To overcome this situation, since years alternative approaches have been intensively investigated by the researchers. The usage of animal organs for human transplantation may solve the problem of organ shortage. However, organ rejection still remain the main problem for xenogenic transplantation. Animal breeding using gene therapy, represent on-going efforts to knock-out from xenogenic tissue the epitopes responsible for hyper-acute rejection.

The past decade's rapid advancement in cell biology and bioengineering opened new perspectives for treatment of end-stage diseases. On one hand, the efforts are made towards stimulation of endogenous repair mechanisms and tissue regeneration. On the other hand, the idea of biofabrication of new organs is currently pursued by scientists, engineers and physicians. Active research in the field of biocompatibility and tissue engineering will give the possibility to restore damaged or diseased tissues in vivo and create living tissue and organ replacements.