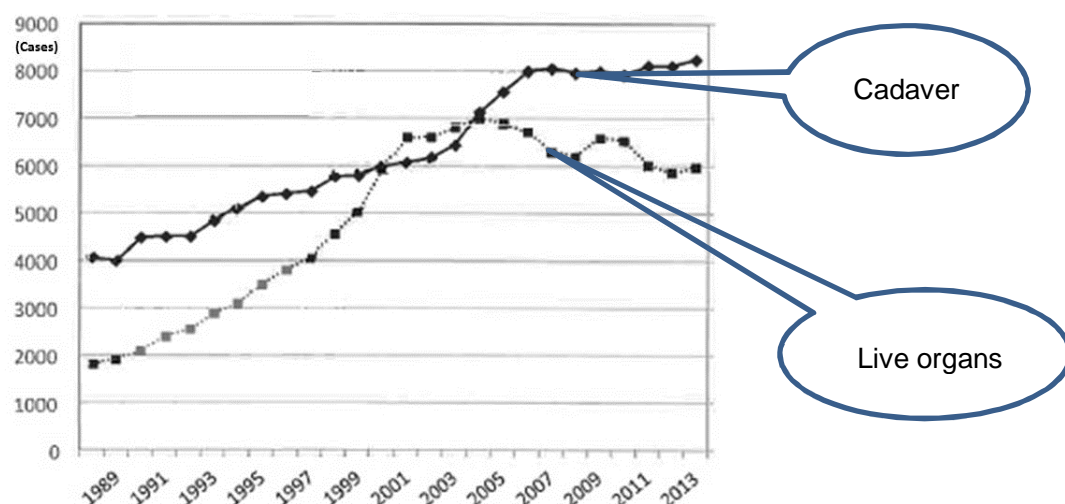


## Why now is the era of researching for the transplantable organ fabrication?

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I have already referred why we launched the department at Keio. Let me introduce the examples of clinical organ transplantation trends in the US as below table where the brain death and live organ donations have been commonly accepted as it represents the most advanced country (OPTN: National reports. <http://optn.transplant.Hrsa.gov/latestData/step2.asp?>).



The following five measures have been taken into consideration for the patients waiting for the organ transplants in the US.

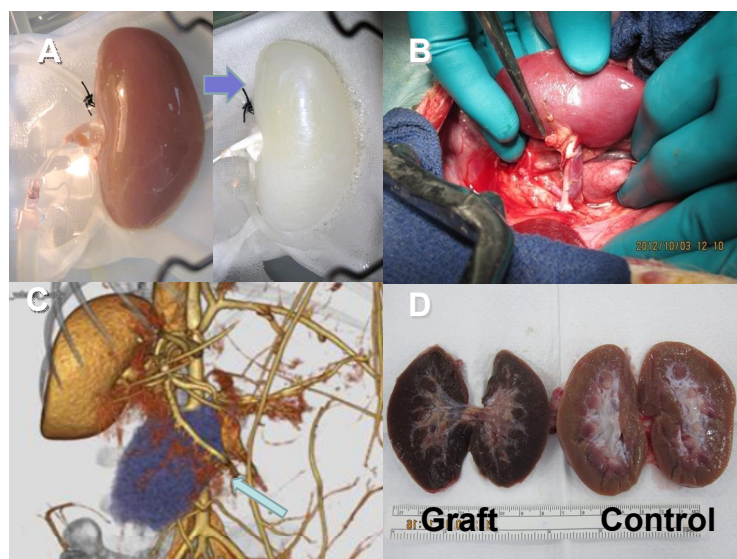
The revisions made by UAGA in 1987 are: 1. The patients' will can be confirmed without the presence of witnesses. 2. There is no need to acquire the authorization from the family by the organ coordinating team if the patients declare their willingness in writing. 3. It is called "Routine inquiry" which means that the hospital staff reconfirms of the will for organ donation from the patients or their families when hospitalized. 4. It is called "Required request" which means that the hospital staff legally consults with the family regarding organ donation regardless the patient's interest when he or she dies (including brain death). 5. When the hospital staff judges in a rational way that the patient or the family has no intention to deny the donation of organs, it is allowed to donate organs without consent from the patient or the family.

Please pay attention to the transition of the changes in the US on the above table again. The tendency differs from those of Japan. It started mainly from brain death transplantation in line with the abrupt increase in live organs due to the shortage of transplantable organs. However, the increase trend in live organ transplantation has stopped around the year 2000 with 6000 cases a year. On the other hand, despite the continuous efforts made for the organized organ transplants derived from brain death, the number of cases has been flat since the year 2006. It is needless to say that enormous amount of efforts has been made by the people involved in live and brain death organ transplantation.

It is natural that we should develop treatments which won't require for organ transplantation in 10 to 20 years of time. Also it is clear that we need to push forward the research for fabricating "Transplantable organs" by ourselves.

My focus is as follows; The development of clone pigs and focus on an "in vivo bioreactor", where human stem cells can transdifferentiate in their organogenesis. The scaffold-based organ regeneration, where human progenitor cells can develop in vitro. Using these technologies, I am aiming at making the transplantable organ without donors based on bioethics.

#### The fabricated renal Grafting using Porcine decellularized kidney



A: Decellularized porcine kidney    B: Transplanted scaffold-based kidney graft  
 C: Angio-CT finding after 10 POD    D: Morphological findings of the transplanted graft

( Kobayashi E. Jin to Touseki 2014 )

The door is always open for the ambitious researchers.