

新闻：克隆猪有望成为人体器官移植的供应者 PDF转换可能丢失图片或格式，建议阅读原文

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Five cloned piglets, genetically modified so that their organs are much less likely to be rejected by a human donor recipient, have been born in the US.

More than 62,000 people in the US alone are waiting to receive donated hearts, lungs, livers, kidneys and pancreases. The number of human donors falls far short of demand. Pig organs are of a similar size to human organs, and some scientists hope they might be used to help meet the shortfall. But previous attempts to transplant unaltered pig tissue into humans have failed, due to immune rejection of the tissue.

在美国已诞生了5只基因改良的克隆小猪，这使得它们的器官在植入人体时产生排异反应的可能性大为缩小。仅仅在美国就有6.2万多人正在等待被捐献出的心脏、肺、肝脏、肾脏和胰脏，器官捐献者的人数远远满足不了要求。猪的器官大小与人的器官相似，一些科学家希望它们可用于弥补器官短缺问题。但是，由于种间组织免疫系统的相互排异反应，从前那些用未经改良的猪器官做的移植试验都失败了。

The five piglets, born on Christmas Day, lack a gene for an enzyme that adds a sugar to the surface of pig cells. The sugar would trigger a patient's immune system into launching an immediate attack. "This advance provides a near-time solution for overcoming the shortage of human organs for transplants, as well as insulin-producing cells to cure diabetes," says David Ayares, vice president of research at PPL Therapeutics, US division, where the pigs were created. "This is the

key gene for overcoming the early stage of rejection." 圣诞节出生的这5只小猪,缺少一种使猪的细胞表面加上某种糖类物质的酶的基因。正是这种糖引发病人的免疫系统立即产生免疫排异反应。培育出这些小猪的PPL医疗公司美国分部的研究项目副总裁大卫阿亚里斯说:"这项科研进展及时解决了目前所面临的人体器官移植来源短缺问题,以及治疗糖尿病所需的生产胰岛素的细胞。这是个解决早期排异反应的关键基因。"

However, scientists warn that much more work is necessary before organs from copies of the pigs could be transplanted into humans. Human genes will need to be added, to prevent rejection of the organ in the long-term. There are also concerns that pig viruses could infect organ recipients. Cloning techniques were vital to the production of the pigs. Genes can only be knocked out in a single cell. Cloning of these single cells then allowed the creation of a whole animal in which the gene was knocked out in every cell. But the PPL researchers have succeeded in knocking out only one copy of the gene for the enzyme, called alpha 1 , 3 galactosyl transferase. The team will now attempt to knock out both copies of the gene. 但是,科学家们提醒说,在由克隆猪所提供的器官能够顺利植入人体以前,还有很多必需的工作要做。可能会需要再加上人体的基因以使这些器官能够长期免于排异反应。猪的病毒对接受器官的人的感染,也是个值得关注的问题。克隆技术是培育这些猪的关键。基因的去掉只有在单个细胞中才能进行。克隆这些单细胞然后再将其培育成一只完整的动物,这样动物身上的每个细胞中的这种基因就都被去除了。但是,PPL医疗公司的研究人员只是成功地去除了产生这种叫 1,3半乳糖转移酶的基

因的一个副本。他们在试图将这个基因的两个副本都去除。"There will also be other genes we will incorporate into our program," Ayares says. "We don't think that one gene is going to produce an organ that's going to be the end-all for transplantation. We're going to have to add two to three human genes as well." The team will also conduct tests to investigate whether so-called porcine endogenous retroviruses (PERVs) from the pigs could infect human cells in culture. But Ayares hopes that organs created from PPL pigs could be transplanted into patients within five years. "But although a lot of the stem cell work is very exciting, we're still very far off being able to grow an organ in a culture dish," says Julia Greenstein of Immerge Bio Therapeutics in Charlestown, US, who is working on creating similar knock-out pigs with researchers at the University of Missouri. 阿亚里斯说:"我们的项目也会包括其他基因,我们觉得掌握一个基因培育的器官并不能彻底解决器官移植面临的所有问题。我们得再加入两到三个人类基因的研究。" 该小组还将通过实验验证是否猪身上的内生性逆转滤过性病毒(一种致癌病毒)会在移植培育过程中感染到人身上。但阿亚里斯希望在5年内PPL医疗公司培育的器官能够被移植到人身上。 就职美国查尔斯城浸没生物医疗公司的朱利娅格林斯坦,正在密苏里大学和同事们从事着类似的研究,即培育去除某种基因的小猪。她说:"尽管干细胞研究的许多工作令人非常激动,但在培养器中成功地培育出器官还为时过早。 100Test 下载频道开通,各类考试题目直接下载。详细请访问 [www.100test.com](http://www.100test.com)