

《英语活页选》

基因科技传奇专辑 (5)

外刊网络专递

英语时文传真

器官移植

Transfer of Organs

刘星雨 译注



- 器官移植现状
- 器官来源
- 移植中的排斥
- 移植的社会问题

北京大学出版社

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前 言

19世纪60年代奥地利学者孟德尔根据豌豆杂交实验首次提出遗传因子概念;1909年丹麦植物学家和遗传学家约翰逊第一次提出基因这个名词;1944年三位美国科学家分离出细菌的DNA(脱氧核糖核酸),并发现DNA携带生命遗传物质的分子;1969年科学家成功地分离出第一个基因;1990年10月国际人类基因组计划正式启动;2000年成功地绘制了人类基因组工作框架图;2001年2月12日中、美、日、德、法、英等六国科学家联合公布了人类基因组图谱及初步分析结果。从以上大事记,人们不难看出被誉为“生命科学”的基因及基因组研究已经取得突飞猛进的发展。

为了使广大读者对基因和与之有关的学科能有一个概括的了解,并学习相关的英语知识,我们特意编写了这套丛书。它们是:《基因——生命之本》《人类基因组计划》《操作DNA,操作生命的未来》《第四次医学革命——基因治疗》《揭开癌症的秘密》《器官移植》。《基因——生命之本》:介绍了基因与人类健康、人体发育和人类行为的关系。《人类基因组计划》:简单介绍人类基因组计划和相关的知识,并简述人类基因组计划将给人类带来什么。《操作DNA,操作生命的未来》:专门介绍转基因技术,该项技术在农业和医学研究中的应用,以及对人类健康、生态、环境和生物伦理学的影响。《第四次医学革命——基因治疗》:综合介绍科学家从疾病的根源异常基因来医治各种顽症的尝试和失败,并预言这场革命将在未来的三四十年来彻底改变医学界。《揭开癌症的秘密》:寻找致癌基因,叩开癌症之门。通过本书可以对医学界的抗癌之战有一个综合的了解。《器官移植》:概述器官移植的现状,重点介绍科学家对于基因移植方法的种种探索。

我们衷心希望广大读者能够喜欢这套丛书并从中受益。

Contents

Chapter 1 Summary	2
1.1 Summary	2
1.2 Tissue Transplants	10
1.3 The Transplant Experience	18
1.4 Organs for Transplantation in Singapore	28
Chapter 2 Organ Source	42
2.1 Organ Transplant Shortages: A Matter of Life and Death	42
2.2 Saviors	50
2.3 Researchers Develop Gene Transfer Methods to Treat Inflammatory Diseases	62
Chapter 3 Sample	66
3.1 My Kidney Transplant Experience	66
3.2 Combined Kidney and Pancreatic Transplantation	78
Chapter 4 Rejection	84
4.1 Immune System	84
4.2 Rejecting Rejection	102
4.3 Gene Therapy Prevents Transplant Failure Complication in Animal Model	108
Chapter 5 Social issues	112
5.1 Social Issues of the Organ Transplantation	112
5.2 Human Organ Transplantation: the Role of Law	124
5.3 The Rationing of Transplantable Organs: A Troubled Lineup	142
Chapter 6 Faq	154
6.1 Common Questions and Myths About Donation	154
6.2 Faqs on Liver Transplantation	166

目 录

第一章 概述	3
1.1 器官移植概述	3
1.2 组织移植	11
1.3 器官移植的经过	19
1.4 器官移植在新加坡	29
第二章 器官来源	43
2.1 移植器官的短缺:生死攸关的大事	43
2.2 救星	51
2.3 研究者逐步探索解决疑难病症的基因移植方法	63
第三章 案例	67
3.1 我的肾脏移植经历	67
3.2 肾脏胰腺联合移植	79
第四章 移植中的排斥	85
4.1 免疫系统	85
4.2 如何抑制器官移植中的排斥反应	103
4.3 基因治疗防止了动物移植模拟中出现的失败并发症	109
第五章 移植的社会问题	113
5.1 器官移植的社会问题	113
5.2 人的器官移植:法律的作用	125
5.3 器官移植的定量分配:一个令人不安的形势	143
第六章 常见问题	155
6.1 关于捐献的常见问题及一些传说	155
6.2 肝脏移植常见问题	167

内容简介

器官移植可以为身患严重疾病或面临死亡的人提供过健康生活的机会。移植器官的短缺却是一大难题。这种器官能否长在牲畜身上或在实验室里培育？研究者们对于解决疑难病症的基因移植方法正在进行有趣地探索。

Chapter 1 Summary

1.1 Summary

Transplantation, Medical, transfer of organs or tissues from one individual to another. Over 19,000 organ transplants a year are performed in the United States. Organ transplants offer individuals who might otherwise face serious disability or death the opportunity to lead more fully functioning lives.

The kidney was the first organ to be transplanted successfully in humans. Transplantation of a single kidney can restore kidney function to a person whose kidneys are no longer able to support life because of chronic renal failure. Heart and liver transplants are performed when a person's own organs are irreparably damaged, such as by a heart attack or cirrhosis^① of the liver, a progressive disease in which the liver cells are destroyed. Lung transplants are performed on persons with severe lung disease. Bone marrow^② (see Bone) transplants are used in the treatment of leukemia, a cancer of the blood-forming organs, and Hodgkin's disease that is resistant to conventional therapy^③. The cornea (the clear covering of the eye) is transplanted to cure blindness. The pancreas has been transplant-

第一章 概述

1.1 器官移植概述

医学上,移植指的是器官或组织从一个个体的一个位置转移到另一个位置或者转移到另一个个体。在美国,每年要进行1.9万多例器官移植手术。器官移植为那些或者身患严重疾病或者面临死亡的人提供过上更健康的生活机会。

肾是第一例在人身上成功实现移植的器官。通过肾移植,可以使那些慢性肾功能衰竭的人恢复肾功能,重新获得生存的力量。当一个人自己的心和肝遭到不可挽回的破坏,例如,心脏病发作或肝硬化(一种慢性肝病,肝细胞遭到破坏),才会对他实施心脏和肝移植手术。肺移植手术实施于那些有严重肺疾病的人。骨髓移植被用于白血病、造血器官癌症、霍季森氏病的医治。角膜移植应

① cirrhosis

[ˈsɪrəʊsɪs] *n.* a degenerative disease in an organ of the body, esp. the liver [医]硬化

② marrow [ˈmærou] *n.* the soft, vascular, fatty tissue that fills the cavities of most bones 髓, 骨髓

③ therapy [ˈθerəpi] *n.* the treatment of disease or of any physical or mental disorder by medical or physical means 治疗

ed in an attempt to restore insulin^① production to persons with diabetes mellitus.

The most successful transplants are those of kidneys and corneas, but liver transplants are becoming increasingly common. Transplants of the heart and bone marrow are done with some success but are performed only at medical centers that specialize in these surgeries. Combined heart-lung transplants have also had some good long-term results.

1.1.1 Transplant Rejection

In most types of transplants, the difficulties that arise are due to rejection of the new organ by the recipient's immune system. Each person's tissues bear a unique set of substances called antigens. One person's antigens^② are generally considered foreign by another person's immune^③ system. Thus, when organs and tissues are transplanted from one person to another, the recipient's immune system mounts^④ an attack against the antigens on the transplant.

Liver and pancreas transplants present additional risk of rejection because of the difficulty of reconnecting the many ducts and blood vessels leading into and out of the transplanted organ. Transplants may also fail because of viral infections that can occur when

用于治愈失明。胰移植被尝试应用于恢复糖①insulin [ˈinsjulin]
n. a protein hormone
secreted by the islets of
Langerhans, in the

尿病人的胰岛素分泌功能。

最成功的移植当属肾和角膜的移植,肝
移植也变得越来越普遍。心和骨髓移植也取
得了一些成功,但是只是在专门研究这类外
科的医学中心实施。心肺联合移植也获得了一些长期的有效成果。

pancreas, which helps
the body use sugar and
other carbohydrates 胰
岛素②antigen
[ˈæntɪdʒən] n. a pro-
tein, toxin, or other
substance of high
molecular weight, to
which the body reacts
by producing antibod-
ies [免疫]抗原
③immune [ɪˈmjʊn]
adj. protected against
something disagreeable
or harmful 免疫的
④mount [maʊnt] vt.
to go up; ascend;
climb; to mount stairs
开始(攻击)着手

1.1.1 移植中的排斥

在大多数类型的移植中,困难来自于接
受移植者免疫系统对新器官的排斥。每个人
的组织中拥有一套独特的叫做抗原的物质。
一个人的抗原通常被另一个人的免疫系统认
为是外来的,因此,当一个人的器官或组织移
植到另一个人的身上时,接受者的免疫系统
就会对移植过来的抗原产生排斥。

肝和胰的移植则有更大的风险,这是由
于要实现被移植器官与受体之间的众多导管
和血管的连接非常困难。即使在受体免疫系

the recipient's immune system has been suppressed. Such infections cause many transplants to fail and sometimes result in the death of the recipient.

The problem of immune rejection is greatly lessened^① when the organ comes from a close relative, who is more likely to have the same tissue antigens as the recipient. However, recent research has found unexpectedly high rates of success with kidney transplants from unrelated living donors. The three-year survival rate of organs obtained from spouses or friends averaged 85 percent, compared with a 90 percent survival rate of organs from twins and an 82 percent survival rate of those from parents.

1.1.2 Organ Sources

Although kidney and liver transplants may be taken from a living donor, most transplant organs are obtained from cadaver donors (that is, dead bodies) immediately after death. About 3,000 transplant organs were obtained from living donors and about 16,000 transplant organs from cadaver donors in the United States in 1994. The need for transplants, however, far outstrips^② the number of donor organs available. At the end of 1994 over 37,000 people were on the waiting list for organ transplants.

Because of the shortage of organs from human donors, re-

统被抑制的情况下,由于滤过性毒菌引起的传染也会导致移植失败,有时会引起接受移植者的死亡。

当捐赠者与接受移植者具有较近的血缘关系时,由于捐赠者与接受移植者拥有同样的抗原,免疫排斥现象将会大大减少。然而,最近的研究表明,来自无血缘关系的捐赠者的肾的移植的成功率远比人们想象中的高。以肾移植的三年成活率来看,来自配偶或朋友的平均为 85%,而来自双胞胎的是 90%,来自父母的是 82%。

①lessen ['lesn] v. to make less; decrease 减少、减轻
②outstrip [aʊt'strip] vt to go at a faster pace than; get ahead of 胜过,优于

1.1.2 器官来源

虽然肝和肾移植所用的器官也许是从活着的捐赠者身上取来的,但是绝大多数移植的器官都是从死去的捐赠者身上获得的(在他们死去时立即取出)。1994 年,美国的移植手术中,约 3000 例是从活着的捐赠者身上获得器官,而从死去的捐赠者身上获取器官的是 1.6 万例。然而,需要捐赠器官的数量远远超过目前能提供的捐赠的数量。1994 年底,约 3.7 万人在等候进行器官移植。

由于人类捐赠者的数量不足,研究者多

searchers have been attempting for many years to find ways of using organs transplanted from animals as replacements for human organs. Such transplants between two different species are known as xenotransplants^①. The few attempts at xenotransplanting entire animal organs into humans so far have failed. In 1984 "Baby Fae," a child born with a malformed heart, survived for three weeks after receiving a transplanted baboon^② heart. More recently, two men survived several weeks after receiving transplanted baboon livers

In December 1995 a man with acquired immune deficiency syndrome (AIDS) received a bone marrow transplant from a baboon. Because baboons are resistant to human immunodeficiency virus (HIV), which is the cause of AIDS, doctors hoped the baboon cells would help restore the recipient's immune system. Five months after the transplant, the recipient was alive and doing well, but there was not yet evidence that the baboon cells had helped his immune system.

Another source of xenotransplants is the pig. Pigs are easy to raise, and their organs are similar in size to those of humans. Heart valves^③ from pigs have been used for years as replacements for worn-out or diseased human heart valves. Recently, pig brain cells have been injected into the brain of people with Parkinson's disease to

年来一直在尝试使用动物的器官来代替人的

器官进行移植。这种在人与动物之间的器官

移植被称为异种移植。迄今为止,仅有的几

例异种移植的尝试都以失败而告终。1984

年,一个天生心脏畸形的婴孩法易,在接受狒

狒的心脏的移植手术,存活三周之后死亡了。

最近,两个人在接受来自狒狒的肝脏的移植

的手术之后,活了几个星期。

① xenotransplant
[zenəu'transplɑnt] *vt.*
xeno 表示“陌生人”,
“外国人”,“外来
的”。异种移植
② baboon [bə'bu:zn]
n. any of various
large, fierce, short-
tailed Old World mon-
keys [动]狒狒
③ valve [vælv] *n.*
any of the leaves of a
folding door (心脏)瓣
膜

1995年12月,一名患有获得性免疫功能丧失综合症(AIDS,艾滋病)的人接受了来自狒狒的骨髓移植。由于狒狒有对人类免疫缺陷病毒(HIV,引起艾滋病的病因)的抵抗力,医生们希望狒狒的细胞能够帮助恢复接受移植者的免疫系统。移植手术进行之后五个星期,该接受移植者仍然活得很好,但是并没有迹象表明狒狒的细胞对他的免疫系统有帮助。

另一个异种移植的器官来源是猪。猪容易养,而且它们的器官与人的大小相近。猪的心瓣膜多年前就被作为老化的或是患病的人类心瓣膜的替代物。最近,猪的脑细胞被注入帕金森综合症患者的脑中,以代替被疾

replace brain cells destroyed by the disease.

Although xenotransplants offer a promising source of transplant organs, much research remains to be done on how to prevent transplant rejection. Scientists have recently taken a new approach to this problem by altering pig genes to produce generations of genetically engineered pigs with organs more like human organs and thus less likely to be rejected in human recipients.

Despite their promise, xenotransplants are highly controversial because of the concern that they may spread deadly animal viruses into the human population. Although primates such as baboons are among the most promising organ donors because they are closely related to humans, they are known to carry undiscovered viruses that can be transmitted^① to humans. Pigs are considered to be safer donors since they are less likely than primates to harbor viruses that might cause human disease.

[From:微软光盘: encarta 98]

1.2 Tissue Transplants

Skin. Most skin grafting is with autografts; the special indication for skin allograft in severely burned patients has been men-

病破坏的脑细胞。

尽管异种移植为器官移植提供了一个有前途的器官来源,但目前的研究仍停留在如何防止移植排斥。最近,科学家提出了解决这一问题的新方法。通过遗传工程方法,改变猪的基因,产生与人拥有更相似的器官的新一代猪,这样,就可以减少被人类受体排斥的可能性。

①transmit
[trænʒ'mɪt] vt. to
hand down to others by
heredity, inheritance,
etc. 遗传,传播

尽管前途美好,但是由于可能导致致命的动物病毒传播到人类种群,异种移植仍处于激烈争论之中。像狒狒之类的灵长目动物,由于同人类具有较近的亲缘关系,成为最有希望的异种移植供体。但是,它们携带有尚未发现的病毒,可能会被转移到人类体内。而猪被认为是更安全的供体,因为它们不大可能像灵长目动物那样携带能让人感染疾病的病毒。

1.2 组织移植

皮肤:大多数皮肤移植是通过自体移植皮肤实现的;对严重烧伤患者的同种皮肤