外教社大学生拓展阅读系列

总主编 冯庆华 刘全福

科技新视野

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外教社

英汉对照

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前　言

为帮助在校大学生和英语爱好者提高英语阅读水平及英汉翻译能力，我社隆重推出了这套具有一定规模的英汉对照“外教社大学生拓展阅读系列”。该丛书由上海外国语大学冯庆华教授担任总主编，各分册编者均为上海外国语大学在读博士及硕士研究生。本丛书共10册，分别为《健康新概念》、《社会多棱镜》、《文苑风景线》、《影视百花园》、《科技新视野》、《都市流行风》、《人生启示录》、《人物风云榜》、《音乐新时空》、《体坛万花筒》。与同类出版物相比，“外教社大学生拓展阅读系列”具有如下特点：一是题材广泛，几乎囊括了与人们生活息息相关的诸多方面的内容，这样既可拓宽读者的视野，又能使其熟悉并掌握各种体裁的英语表达形式；二是内容新颖，选材多出自新近出版或更新的英文报刊书籍或网页，如此定位确保了语言材料的鲜活性和地道性，从而使读者在吸收新知的同时也可领略到贴近时代与现实生活的崭新表现手法；三是可读性强，所选近300篇文章可谓篇篇独具风格，或短或长，均不乏妙趣，细细品味，蕴涵于字里行间的精言妙义常令人不禁释然或哑然，所谓“益智”、“怡情”，二者原来可以兼得。

本丛书既是一个有机的系列，也即各分册从整体上向读者展示出一面异彩纷呈的英语世界的多棱镜，同时每一分册又自成一体，各自以其丰富的内容为我们呈现出一个个色彩斑斓的万花筒。这样，读者既可分而购之，观其一隅，亦可尽收囊中，览尽精彩，若再有心细者，携一套“外教社大学生拓展阅读系列”以飨友人，那更是得体不过的事了。

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Genetic Engineering

Genetic engineering is the alteration of an organism's genetic, or hereditary, material to eliminate undesirable characteristics or to produce desirable new ones. Genetic engineering is used to increase plant and animal food production; to diagnose disease, improve medical treatment, and produce vaccines and other useful drugs; and to help dispose of industrial wastes. Included in genetic engineering techniques are the selective breeding of plants and animals, hybridization (reproduction between different strains or species), and recombinant deoxyribonucleic acid (DNA).

Selective Breeding

The first genetic engineering technique, still used today, was the selective breeding of plants and animals, usually for increased food production. In selective breeding, only those plants or animals with desirable characteristics are chosen for further breeding. Corn has been selectively bred for increased kernel size and number and for nutritional content for about 7,000 years. More recently, selective breeding of wheat and rice to produce higher yields has helped supply the world's ever-increasing need for food.

Cattle and pigs were first domesticated about 8,000 years ago and through selective breeding have become main sources of animal food for humans. Dogs and horses have been selectively bred for thousands of years for work and recreational purposes, resulting in more than 130 different dog breeds and 100 different horse breeds.

Hybridization

Hybridization (cross-breeding) may involve combining different strains of a species (that is, members of the same species with different characteristics) or members of different species in an effort to combine the most desirable characteristics of both. For at

基因工程

基因工程指的是对有机体基因或遗传物质的改变，其目的在于消除不良特征或产生新的优良特征。基因工程用来增加动植物食品产量、诊断疾病、提高医疗水平、生产疫苗和其他有效的药物，此外，它还可以用于处理工业废料。基因工程技术包括动植物选种育种、杂交（不同血缘和品种之间的繁殖）以及脱氧核糖核酸（DNA）的细胞重组。

选种育种

今天仍在运用的首项基因工程技术是动植物的选种育种，其目的通常是为了提高食品的产量。在选种育种技术中，只有那些具备优良特征的动植物才被选中继续培育。为增加颗粒体积及数量并提高其营养含量的谷物选种育种技术已有大约7,000年的历史。更近一些时候，为提高产量而进行的小麦和稻谷选种育种技术已满足了世界上日益增长的食物需求。

牛和猪于8,000年前就开始被人驯养，经过选种育种，它们已经成为人类主要的动物食品来源。用于劳作和消遣的狗和马的选种培育也有数千年的历史了，其结果狗的品种达到了130多个，马的品种也在100个以上。

杂交

杂交（交叉育种）可以是一个品种不同血统（即具有不同特征的同一个品种的不同成员）的结合，也可以是不同品种成员之间的结合，其目的在于把双方最优良的特征结合起来。在至少

least 3,000 years, female horses have been bred with male donkeys to produce mules, and male horses have been bred with female donkeys to produce hinnies, for use as work animals.

Recombinant DNA

In recent decades, genetic engineering has been revolutionized by a technique known as recombinant DNA, or gene splicing, which scientists use to directly alter genetic material. Genes consist of segments of the molecule DNA. In recombinant DNA, one or more genes of an organism are introduced to a second organism. If the second organism incorporates the new DNA into its own genetic material, recombined DNA results. Specific genes direct an organism's characteristics through the formation of proteins such as enzymes and hormones. Proteins perform vital functions — for example, enzymes initiate many of the chemical reactions that take place within an organism, and hormones regulate various processes, such as growth, metabolism, and reproduction. The introduction of new genes into an organism using recombinant DNA technology essentially alters the characteristics of the organism by changing its protein makeup. In humans, recombinant DNA is the basis of gene therapy, in which genes within cells are manipulated in order to produce new proteins that change the function of the cells.

Patenting Recombinant DNA Products

It takes an average of seven to nine years and an investment of about $55 million to develop, test, and market a new genetically engineered product. Because of this great cost, companies have sought to patent the results of their discoveries. In 1980 the Patent and Trademark Office of the U. S. Department of Commerce issued its first patent on an organism that had been produced with recombinant DNA. The patent was for a so-called oil-eating bacterium that could be used in the bioremediation (cleaning up by natural means) of oil spills from ships and storage tanks. Since then, hundreds of patents have been granted for genetically altered bacteria, viruses, and plants. In 1988 the first patent was issued on a transgenic animal, a strain of laboratory mice whose

3,000 年的时间里，母马和公驴以及公马和母驴一直被用来进行杂交，从而产生出骡子这种用于劳作的动物。

重组 DNA

最近几十年，基因工程通过一种称为重组 DNA 或基因拼接的技术发生了重大的变革，这一技术被科学家用来直接改变遗传物质。基因由分子的 DNA 片段构成，在重组 DNA 技术中，一种有机体的一个或更多的基因被引入另一个有机体，假如第二个有机体将新的 DNA 并入自己的遗传物质，即会产生重新组合的 DNA。特殊的基因通过酶、荷尔蒙之类的蛋白质的形成来引导有机体的特征。蛋白质发挥着极其重要的作用，例如，酶可以引发产生于有机体内部的许多化学反应，而荷尔蒙则对生长、新陈代谢和繁殖等各种过程进行调节。运用重组 DNA 技术将新的基因引入有机体，可以通过改变蛋白质的结构使有机体的特征得到根本的改变。在人体中，重组 DNA 是基因治疗的基础，在这种治疗方法中，细胞内部的基因受到控制，从而产生能够改变细胞功能的新的蛋白质。

重组 DNA 产品专利申请

要对一种新的基因工程产品进行开发、试验并推向市场平均需要 7 至 9 年的时间以及大约5,500万美元的投入。由于这一巨大的投入，各公司已寻求为自己的发现成果申请专利。1980 年，美国商务部专利与商标局颁布了首项运用重组 DNA 技术产生的生物产品专利。该专利是一种所谓的石油吞食细菌，它可以用来对从油船和储油罐溢出的石油进行生物治理（通过自然方式清除）。从那时开始，几百项转基因细菌、转基因病毒和转基因植物方面的专利申请获得批准。1988 年，首项转基因动物专利公布，那是一群实验室里的老鼠，它们的细胞被改变

cells were engineered to contain a cancer-predisposing gene. The mice are used to test low doses of suspected carcinogens, or cancer-causing substances, and to test the effectiveness of anticancer therapies.

Controversies

Public reaction to the use of recombinant DNA in genetic engineering has been mixed. The production of medicines through the use of genetically altered organisms has generally been welcomed. However, critics of recombinant DNA fear that the *pathogenic*, or disease-producing, organisms used in some recombinant DNA experiments might develop extremely infectious forms that could cause worldwide epidemics. In an effort to prevent such an occurrence, the National Institutes of Health (NIH) in the United States has established regulations restricting the types of recombinant DNA experiments that can be performed using such pathogens. In Canada, recombinant DNA products are regulated by various government departments, including Agriculture and Agri-Food Canada, Health Canada, Fisheries and Oceans Canada, and Environment Canada.

Animal rights groups have argued that the production of transgenic animals is harmful to other animals. Genetically engineered fish raise problems if they interbreed with other fish that have not been genetically altered. Some experts fear that this process may change the characteristics of wild fish in unpredictable ways. A related concern is that engineered fish may compete with wild fish for food and replace wild fish in some areas.

The use of genetically engineered bovine somatotropin (BST) to increase the milk yield of dairy cows is particularly controversial. Some critics question the safety of BST for both the cows that are injected with it and the humans who drink the resulting milk. In the United States, a large percentage of dairy cows are treated with BST, but in Canada, BST cannot legally be sold. Scientists at Health Canada rejected the legalization of BST in 1999 based on evidence that BST causes health problems for cows. In particular, the Canadian scientists found that BST increases a cow's likelihood of developing mastitis, or infection of the udder, and it also makes

后含有一种能对肿瘤进行预先处理的基因。这些老鼠被用于测试低剂量的可疑致癌物，此外还被用来测试抗癌治疗方法的效果。

争议

公众对基因工程中重组 DNA 技术的运用反应不一。利用转基因生物生产的药物受到了人们的广泛欢迎，然而 DNA 重组技术的批评者担心，某些重组 DNA 实验中使用的致病有机体可能会产生引发世界范围流行病的传染性极强的细菌形态。为尽量防止此类事件的产生，美国全国卫生研究所（NIH）已经制定出规则，以限制那些可能使用此类病原体的实验类型。在加拿大，重组 DNA 技术产品要受到许多政府部门的控制，这些部门包括加拿大农业食品部、加拿大卫生部、加拿大渔业海洋部以及加拿大环境部。

动物权益保护团体争辩说，转基因动物的产生会危害其他动物。如果与其他未经转基因的鱼类进行杂交，转基因鱼类会引起种种问题。有些专家担心，这一过程会以难以预料的方式改变野生鱼类的特征。另一种类似的担心是，转基因鱼类会与野生鱼类争食，从而取代野生鱼类。

对于利用改变基因的牛生长激素（BST）来提高牛奶产量的做法争论尤其激烈。有些批评者对给奶牛注射 BST 以及人类饮用由此而产生的牛奶的安全性均表示质疑。在美国，很大一部分奶牛都进行过 BST 处理，而在加拿大，BST 产品则不能合法出售。1999 年，加拿大卫生部的科学家否决了 BST 的合法性，其依据是 BST 会给奶牛带来健康问题。加拿大科学家尤其发现，BST 会增加奶牛患乳腺炎或乳腺感染的可能性，此外它

cows more susceptible to infertility and lameness. Nevertheless, the scientists consider the milk obtained from cows injected with BST to be safe for human consumption.

Transgenic plants also present controversial issues. Allergens can be transferred from one food crop to another through genetic engineering. In an attempt to increase the nutritional value of soybeans, a genetic engineering firm experimentally transferred into soybean plants a Brazil-nut gene that produces a nutritious protein. However, when a study found that the genetically engineered soybeans caused an allergic reaction in people sensitive to Brazil nuts, the project was canceled.

Environmentalists fear that the transgenic plants may interbreed with weeds, producing weeds with unwanted characteristics, such as resistance to herbicides. An example of such interbreeding has been demonstrated in experiments involving transgenic oilseed rape. Environmentalists also argue that, due to natural selection, insects quickly develop resistance to plants that have been engineered to incorporate biological pesticides.

Opponents of genetic engineering warn that the use of genetically modified food crops could result in unforeseen problems. They point to a 1999 study that found that genetically modified corn produced pollen that killed monarch butterfly caterpillars in the laboratory. Although the study results were preliminary, as a precaution the Environmental Protection Agency (EPA) established new regulations in January 2000 to reduce potential risks posed by the corn crop. Among the new rules, the EPA has asked farmers to plant unmodified corn crops around the edges of genetically engineered corn fields in order to create a buffer that may prevent toxic pollen from blowing into butterfly habitats.

Many European and developing nations have voiced concern about the health and environmental risks associated with imported genetically modified food crops from the United States and other countries. In early 2000, 130 nations devised the Protocol of Biosafety. Once ratified, the treaty will require exporting nations to notify importers when products contain genetically modified organisms, including seeds, food crops, cattle, and fruit trees.

还会使奶牛更容易患上不育症和跛脚病。但尽管如此，科学家却认为，人类饮用注射过 BST 的奶牛产出的牛奶是安全的。

转基因植物同样也引起了有争议的问题。通过基因技术处理，变应原会从一种粮食作物转移到另一种粮食作物。在试图提高大豆营养价值所做的尝试中，一家基因工程公司通过实验将一种能够产生营养蛋白的巴西坚果的基因移入了大豆植株。然而，一项研究发现，经过基因处理的大豆在对巴西坚果过敏的人群中引起了过敏反应，于是该项目即被取消。

环境污染问题专家担心，转基因植物会与野草进行杂交，从而使杂草产生对除草剂具有抗药性等有害特征。这种杂交的例子之一表现在转基因油菜的实验中。环境污染问题专家还争论说，由于自然选择方面的原因，昆虫对那些通过基因处理而获得生物杀虫剂作用的植物会很快产生耐药性。

基因工程的反对者警告说，食用转基因粮食作物会引起难以预料的问题。他们指出，1999 年的一项研究发现，转基因玉米在实验室中产生了杀死黑脉金斑蝶幼虫的花粉。虽然研究结果尚处于初始阶段，但作为一种预防措施，美国环境保护署(EPA)于 2000 年 1 月制定了新的规则，以减少由玉米作物造成的潜在危险。在这些新规则中，EPA 已要求农民在转基因玉米地边沿种上未经基因处理的玉米作物，从而形成一个缓冲带，以防止有毒花粉吹到蝴蝶栖息地。

许多欧洲国家和发展中国家已发出呼吁，对那些与从美国及其他国家进口的粮食作物有关的健康与环境危险表示关注。2000 年初，130 多个国家制订出了生物研究安全协议，一经认可，该协议将要求出口国家通知进口国家产品中含有转基因生物类型，包括种子、粮食作物、牲畜和果树。

Some critics object to the patenting of genetically altered organisms because it makes the organisms the property of particular companies. For example, Costa Rica has enacted laws to prohibit the patenting of genes of native Costa Rican species by drug companies in other countries. To date, no laws are in place in the United States and Canada regulating the use of cloning technology, and some people fear the prospect of human cloning. If this technology remains unregulated, critics fear that it will provide the ability to create an "improved" human being with characteristics predetermined according to a scientist's particular bias.

-- Microsoft Encarta Encyclopedia 2002