

讲义

Health care

医疗保健

Wonder drugs

灵丹妙药

Big **pharma** is warming to the potential of artificial intelligence

大型制药公司开始重视人工智能的潜力

选自：The Economist July 15th 2023 edition Business

Paul Hudson, boss of **Sanofi**, is **brandishing** an iPhone. He is keen to show off the French drugmaker's new artificial-intelligence (AI) APP, plai. It **draws on** more than 1bn data points to provide "**snackable**" information, from warnings about low stocks of a drug to questions for a meeting with an ad agency or suggestions to set up **clinical-trial** sites that could **expedite** drug approvals. Like Netflix recommendations, plai delivers "**nudges**", as Mr Hudson calls them, that are useful at that moment in time. He jokes that plai **broke even** in about four hours, and says the cost is "**peanuts**" compared with the \$300m-400m that big consultancies charge for a project to **curate** a big company's data. One in ten of Sanofi's 80,000 staff uses it every day.

赛诺菲公司的老板保罗·哈德森（Paul Hudson）正挥舞着一部 iPhone。他热衷于展示这家法国制药公司的新型人工智能（AI）应用程序 plai。它利用超过 10 亿个数据点提供“简单易懂”的信息，从药物库存过低的警告，到与广告公司会面的问题，再到建立可能加快药物审批的临床试验基地的建议。就像 Netflix 的推荐一样，plai 提供哈德森先生所谓的“提示”，这些提示在当时是有用的。他开玩笑说，plai 在大约四个小时内就实现了收支平衡，并表示与大型咨询公司作为一家大公司的数据整理项目收取的 3-4 亿美元相比，plai 的成本“微不足道”。赛诺菲公司的 8 万名员工中，每十人中就有一人每天使用它。

【词汇】

1. **pharma** /'fɑ:rmə/ n. [uncountable] pharmaceutical (= medical drugs) companies as an industry 制药公司
2. **brandish** /'brændɪʃ/ v. to hold or wave something, especially a weapon, in an aggressive or excited way 挑衅地挥舞，激动地挥舞

例：He appeared in the lounge brandishing a knife.

他挥舞着一把小刀，出现在休息室里。

3. **snackable** /'snækəbəl/ adj. designed to be read, viewed, or otherwise engaged with briefly and easily 快餐化的，意为简单易懂的

例：These days videos are often less than a minute long so that they're snackable and appeal to a younger audience.

这些日常视频往往不到一分钟，所以简单易懂，可以吸引更年轻的观众。

4. **clinical-trial** n. a rigorously controlled test of a new drug or a new invasive medical device on human subjects 临床试验

例：She bought a small plot of land to build a house on.

她买了一小块地盖房子。

5. **expedite** /'ekspədaɪt/ v. GRE GMAT 专八 托福 to make a process happen more quickly 加快；加速

例：We have developed rapid order processing to expedite deliveries to customers.

我们已开发了快速处理订单的方法以便迅速将货物交给顾客。

6. **nudge** /nʌdʒ/ n. GRE 专八 something that encourages or persuades someone to do something in a gentle way, or the act of doing this 说服；提醒

7. **peanut** /'pi:nʌt/ n. 考研 专八 a very small amount of money 很少的钱

例：He gets paid peanuts for doing that job.

他干那件工作报酬很低。

8. **curate** /kjʊ'reɪt/ v. to collect, select and present information or items such as pictures, video, music, etc. for people to use or enjoy, using your professional or expert knowledge 策划；整理；管理

例：People curate their network to show they are successful.

人们精心打造自己的网络，以表现出自己的成功。

【特殊名称】

1. **wonder drug** : a drug usually newly discovered that elicits a dramatic positive response in a patient's condition 特效药；灵丹妙药；神奇之药

2. **Sanofi** : headquartered in France, the world's fourth-largest pharmaceutical company. Sanofi is dedicated to the research, development, production and marketing of pharmaceutical products. 赛诺菲（世界第四大的制药企业）

【词组】

1. **warm to** : to become more interested in or enthusiastic about something 对…更加感兴趣（或热衷）

例：The speaker was now warming to her theme.

演讲者就她的主题越讲越起劲。

2. **draw on** : to use a supply of something that is available to you 凭借；利用；动用

例：It draws on various laboratory studies.

它利用了各种实验室研究。

3. **break even** : (a company or piece of business) to earn just enough money to pay for its costs 收支相抵

例：The airline hopes to break even next year and return to profit the following year.

该航空公司希望来年盈亏平衡，并在随后一年重新开始盈利。

【长难句】

It draws on more than 1bn data points to provide “snackable” information, from warnings about low stocks of a drug to questions for a meeting with an ad agency or suggestions to set up clinical-trial sites that could expedite drug approvals.

句子主干部分为 It draws on more than 1bn data points, 意为：它利用超过 10 亿个数据点

to provide “snackable” information 为目的状语，意为：提供“简单易懂”的信息

from warnings to questions or suggestions 为状语，说明信息的范围，意为：从警告到问题再到建议

about low stocks of a drug 为后置定语，修饰限定 warnings, 意为：药物库存过低的（警告）

for a meeting with an ad agency 为后置定语，修饰限定 questions, 意为：与广告公司会面的（问题）

to set up clinical-trial sites 为后置定语，修饰限定 suggestions, 意为：建立临床试验基地的（建议）

that could expedite drug approvals 是定语从句，修饰限定 clinical-trial sites, 意为：可能加快药物审批的（临床试验基地）

AI is not new in drugmaking. Biotech firms have been tinkering with it for years. Now interest from big pharma is growing. Last year Emma Walmsley, chief executive of GSK, said it could improve the productivity of research and development, the industry's most profound challenge. Moderna recently described itself as “laser-focused” on AI. Sanofi is “all in”. Morgan Stanley, an investment bank, reckons that within a decade the pharmaceutical industry may be spending \$50bn a year on AI to speed up drug

人工智能在制药领域并不新鲜。多年来，生物技术公司一直在尝试使用它。现在，大型制药公司对它的兴趣与日俱增。去年，葛兰素史克公司（GSK）首席执行官艾玛·沃姆斯利（Emma Walmsley）说，人工智能可以提高研发效率，这是制药行业面临的最严峻挑战。莫德纳公司最近称自己“专注于”人工智能。赛诺菲则是“全力以赴”。投资银行摩根士丹利（Morgan Stanley）估计，十年内，制药业每年可能会在人工智能上投入

development.

500 亿美元，以加快药物研发。

【词汇】

1. **tinker** /'tɪŋkər/ v. GMAT 专八 to make small changes to something in order to repair or improve it, especially in a way that may not be helpful 摆弄；修补

例：Give my husband an old motorbike to tinker with and he's as happy as the day is long.

给我丈夫一辆老式摩托车鼓捣，他会很高兴的。

2. **laser-focused** adj. giving 100 percent of your attention to the task you've prioritized in the present moment 聚焦；精神高度集中的

例：We will continue to stay laser-focused on product innovation.

我们将继续专注于产品创新。

3. **pharmaceutical** /,fɑːrmə'suːtɪkl/ adj. GRE GMAT 考研 专八 雅思 connected with making and selling medical drugs 制药的；配药的；卖药的

例：The guideline detailed measures to innovate market access in the pharmaceutical and health sectors.

该指导意见详细规定了创新医药卫生行业市场准入的措施。

【特殊名称】

1. **GSK** : GlaxoSmithKline plc, the world's third-largest pharmaceutical, biotechnology, and healthcare company headquartered in London, United Kingdom (after Johnson & Johnson and Pfizer in terms of turnover). 葛兰素史克(全球第三大的制药、生物以及卫生保健公司)

2. **Moderna** : Moderna Inc. is a biotechnology company that develops medicines based on messenger ribonucleic acid (mRNA), a single-stranded molecule that transfers genetic information to the cellular machinery responsible for making proteins that help to sustain life. 莫德纳公司

Moderna 公司是一家生物技术公司，致力于开发基于信使核糖核酸（mRNA）的药物。

Most of the **buzz** revolves around AIs trained on biological data that could improve the **hit-and-miss** process of drug discovery. Drugs can take a decade to emerge, cost billions of dollars and succeed only 10% of

大多数热议都围绕着基于生物数据进行训练的人工智能展开，这些人工智能可以改善药物发现中的试错过程。药物可能需要十年才能问世，耗资数十亿美元，而且

the time. Even a small improvement in speed and efficiency would be hugely valuable. But scientists have struggled to **tame** biological big data with conventional statistical tools. Machine learning makes it possible to **sift** through piles of information, from clinical patient data and **genome sequences** to images of body scans. Last year DeepMind, an AI lab that is part of Google, made a breakthrough using its AlphaFold system to predict the structure of almost all proteins, which may one day help identify which molecules have **therapeutic potential**.

只有 10% 的成功率。即使是速度和效率的微小提高也将具有的巨大价值。但科学家们一直在努力用传统的统计工具来驯服生物大数据。机器学习能够筛选包括临床患者数据、基因组序列和身体扫描图像等大量信息。去年，谷歌旗下的人工智能实验室 DeepMind 利用其 AlphaFold 系统预测了几乎所有蛋白质的结构，取得了突破性进展，这可能有朝一日有助于识别哪些分子具有治疗潜力。

【词汇】

- buzz** /bʌz/ n. 六级 考研 雅思 the sound of people talking, especially in an excited way 唧唧喳喳的谈话声
例：You are always in the middle of any negative buzz around the office.
办公室里有负面的谈论，你总是参与其中。
- hit-and-miss** /ˌhɪt ən ˈmɪs/ adj. not done in a careful or planned way and therefore not likely to be successful 时好时坏的；碰巧的；有时成功有时不成功的
例：The trains are often late, so getting to work on time is very much a hit-and-miss affair.
火车经常晚点，因此准时上班成了一件碰运气的事。
- tame** /teɪm/ v. 四级 考研 to make an emotion, an organization, a situation, etc., less powerful or easier to control 驯化；驯服；使易于控制
例：Regulators try to tame the unruly parts of an important industry.
监管部门努力驯服一个重要行业中不守规矩的角色。
- sift** /sɪft/ v. 六级 GRE 考研 separate something from a group of things 区分；挑选；精选
例：She looked quickly through the papers, sifting out from the pile anything that looked interesting.
她很快地翻了一下那摞文件，把所有看着有趣的东西都拣了出来。
- therapeutic** /ˌθerəˈpiːtɪk/ adj. GRE GMAT 专八 helping to treat an illness 治疗的；医疗的；治病的
例：Our therapeutic style offers release from stored tensions, traumas, and grief.
我们的治疗方式意在解除蓄积的压力、创伤和悲痛。

【词组】

- revolve around** : to have somebody/something as the main interest or subject 围绕；以…为中心；将…作为主要

兴趣（或主题）

例：His whole life revolves around surfing.

他一生都在做与冲浪相关的事。

【特殊名称】

1. **genome sequence** : the sequence of all the genes that make up an organism, including all the nucleotides on a DNA molecule. 基因组序列：指一个生物体的全部基因组成的序列，包括 DNA 分子上的所有核苷酸。

【长难句】

Last year DeepMind, an AI lab that is part of Google, made a breakthrough using its AlphaFold system to predict the structure of almost all proteins, which may one day help identify which molecules have therapeutic potential.

句子主干部分为 DeepMind made a breakthrough, 意为：DeepMind 取得了突破性进展

Last year 为时间状语，意为：去年

an AI lab that is part of Google 为同位语，解释说明 DeepMind，意为：谷歌旗下的人工智能实验室 DeepMind

其中，that is part of Google 为定语从句，修饰限定 AI lab，意为：谷歌旗下的（人工智能实验室）

using its AlphaFold system 为方式状语，意为：利用其 AlphaFold 系统

to predict the structure of almost all proteins 为目的状语，意为：预测了几乎所有蛋白质的结构

which may one day help identify which molecules have therapeutic potential 为非限制性定语从句，附加说明

breakthrough, 意为：（这个突破性进展）可能有朝一日有助于识别哪些分子具有治疗潜力

Though only around a dozen drugs in development have so far involved the use of AI, the list may grow rapidly—especially for simple molecules with **properties** that are relatively easy to predict. In the case of these more **straightforward** chemistries, the future of medicine is looking ever more like a **computational** problem.

尽管迄今为止只有十几种在研药物使用了人工智能，但这一数字可能会迅速增长——尤其是那些具有相对容易预测性质的简单分子。对于这些更简单的化学物质，医学的未来看起来越来越像一个计算问题。

【词汇】

1. **property** /'prɒ:pərti/ n. 四级 GMAT 考研 a quality or characteristic that something has 性质；特性

2. **straightforward** /,streɪt'fɔ:rwɜ:d/ adj. 六级 高考 考研 easy to do or to understand; not complicated 简单的；易懂的；不复杂的

例：The answer to this question is deceptively straightforward.

这个问题的答案不像看上去那么简单。

3. **computational** /ˌkɑːmpju'teɪʃənəl/ adj. using or connected with computers 使用计算机的；与计算机有关的

例：Students may pursue research in any aspect of computational linguistics.

学生可以在计算机语言学的任何方面进行研究。

Jim Weatherall, who **oversees** data science and AI at **AstraZeneca**, says the technology is used in 70% of the British firm's small molecules in development. Using a technique called "**reinforcement learning**", AstraZeneca's AI is constantly **tweaking** its molecular suggestions and playing out how a tweaked molecule might react. Ali Mortazavi, boss of E-therapeutics, a biotech startup in London, says that knowing the sequences of all the genes in, say, the liver, lets his firm use software to design **RNA** molecules (which are more complex but, owing to their links to DNA, predictably so). AI algorithms then predict the activity of the molecules, which can stop the function of any disease-causing gene.

阿斯利康公司（AstraZeneca）数据科学和人工智能负责人吉姆·韦瑟尔表示，该英国公司 70% 的在研小分子都采用了这项技术。利用一种名为“强化学习”的技术，阿斯利康的人工智能不断调整其分子建议，并模拟调整后的分子可能产生的反应。伦敦一家生物技术初创公司 E-therapeutics 的老板阿里·莫塔扎维表示，通过了解肝脏等器官中所有基因的序列，他的公司可以利用软件设计 RNA 分子（这些分子更加复杂，但由于与 DNA 有关联，因此可以预测）。然后，人工智能算法会预测这些分子的活性，从而阻止任何致病基因的功能。

【词汇】

1. **oversee** /ˌəʊvər'siː/ v. **雅思** to watch somebody/something and make sure that a job or an activity is done correctly 监督；监视

例：Call in an architect or surveyor to oversee the work.

找个建筑师或监理员来监工。

2. **tweak** /twiːk/ v. to make slight changes to a machine, system, etc. to improve it 稍稍调整

例：I think you'll have to tweak these figures a little before you show them to the boss.

我想你得略微改动一下这些数字再让老板过目。

【特殊名称】

1. **AstraZeneca** : AstraZeneca plc is a British-Swedish multinational pharmaceutical and biologics company

headquartered in London, United Kingdom. It is the world's seventh-largest pharmaceutical company measured by 2012 prescription drug sales and has operations in over 100 countries. 阿斯特捷利康制药公司

阿斯利康公司 (AstraZeneca plc) 是一家英国和瑞典合资的跨国制药和生物制剂公司，总部位于英国伦敦。按 2012 年处方药销售额计算，它是世界第七大制药公司，业务遍及 100 多个国家。

2. **reinforcement learning** : a field in machine learning that emphasizes how to act based on the environment to maximize the expected benefits. It is inspired by the theory of behaviorism in psychology, which is how an organism, stimulated by rewards or punishments given by the environment, gradually develops an expectation of the stimulus and produces habitual behaviors that maximize benefits. 强化学习

强化学习是机器学习中的一个领域，强调如何基于环境而行动，以取得最大化的预期利益。其灵感来源于心理学中的行为主义理论，即有机体如何在环境给予的奖励或惩罚的刺激下，逐步形成对刺激的预期，产生能获得最大利益的习惯性行为。

3. **RNA** : a chemical present in all living cells; like DNA it is a type of nucleic acid 核糖核酸

Euan Ashley of Stanford University points to another AI application. “Knowledge graphs” are a kind of database that stores data about genes, proteins, diseases and drugs, as well as the biological **pathways** that connect them. They, too, can help identify new targets for drug development. “Generative” AI, meanwhile, is being trialled for suggesting entirely new chemical and biological structures for testing, just as Chatgpt can **ingest** text on the internet and **spit out** a new poem or essay. Beyond drug discovery, AIs like plai could help with the **perennial** problem of efficiency in a heavily regulated and labour-intensive sector.

斯坦福大学的尤安·阿什利指出了人工智能的另一种应用。“知识图谱”是一种数据库，存储有关基因、蛋白质、疾病和药物的数据，以及连接它们的生物通路。它们也可以帮助识别药物研发的新靶点。与此同时，“生成式”人工智能正在进行试验，以提出全新的化学和生物结构供测试，就像 Chatgpt 可以从互联网上获取文本，然后写出新的诗歌或文章一样。除了药物研发之外，像 plai 这样的人工智能还能帮助解决这个监管严格、劳动密集型行业长期存在的效率问题。

【词汇】

1. **pathway** /'pæθweɪ/ n. **考研** a route formed by a chain of nerve cells along which electrical signals travel from one part of the body to another 通路
2. **ingest** /ɪn'dʒest/ v. **GRE GMAT** to take food, drugs, etc. into your body, usually by swallowing 摄入；食入；吸收

例：Nowadays newspapers, magazines, television and the Internet are producing far more information than we can absorb, which seduces us into ingesting too much, just like food.

在现今这个时代，报纸、杂志、电视、网络都在制造大量信息，这些信息引诱着我们不断去摄取，即使我们早已“吃饱了”。

3. **perennial** /pə'reniəl/ adj. GRE GMAT 雅思 托福 continuing for a very long time; happening again and again 长久的；持续的；反复出现的

例：Colonialism in different forms is a perennial theme of history.

不同形式的殖民主义是历史的永恒主题。

【词组】

1. **spit out** : to say something out 说出；讲出

例：Finally he decided to spit out what was really on his mind.

最后，他还是决定倾吐他真正想问的话。

Some pharma bosses worry that generative AIs' tendency to make stuff up could send researchers down **blind alleys**. More **apocalyptically**, Mr Hudson says half of the pharma CEOs he talks to about AI fear, like many people, the **existential** threats it poses. For his part, he foresees the next industrial revolution, not a robot **uprising**.

一些制药公司的老板担心，生成式人工智能胡编乱造的特性可能会让研究人员走向死胡同。更具末日启示性的是，哈德森先生说，在他接触过的制药公司首席执行官中，有一半人和许多人一样，担心人工智能会对他们的生存造成威胁。就他而言，他预见的是下一次工业革命，而不是机器人起义。

【词汇】

1. **apocalyptic** /ə,pə:kə'liptɪk/ adj. GRE GMAT describing very serious damage and destruction in past or future events 描述（历史）大动乱的；预示（未来）大灾变的

例：...a gloomy and apocalyptic vision of a world hastening toward ruin.

...一种世界正加速走向毁灭的阴郁和末日启示的想法。

2. **existential** /,egzɪ'stenʃl/ adj. 专八 connected with human existence 关于人类存在的；与人类存在有关的

例：And climate change is an existential threat.

气候变化是对生存的威胁。

3. **uprising** /'ʌpraɪzɪŋ/ n. 专八 雅思 a situation in which a group of people join together in order to fight against the

people who are in power 起义；暴动；造反

【词组】

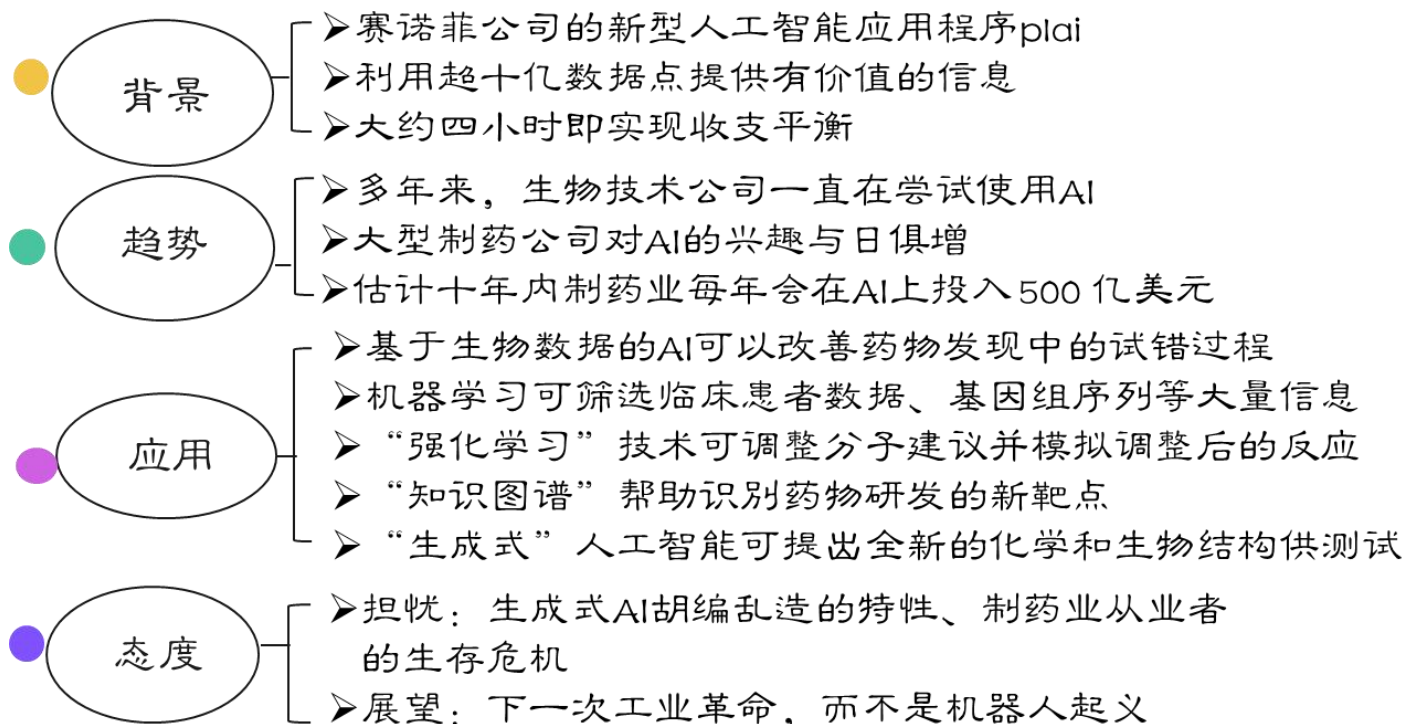
1. **blind alley** : a way of doing something that seems useful at first, but does not produce useful results, like following a path that suddenly stops 行不通的方法；死胡同

例：Other observers may begin to wonder whether the National Curriculum in England, which since 2014 has made grammar such a central part of its English programme, might have gone down a blind alley.

一些观察人士可能会开始怀疑，自 2014 年以来一直将语法作为其英语课程核心部分的英国国家课程是否已经走进了死胡同。

总结

1) 文章架构



2) 同义替换

✓ 简单的；容易的

simple

especially for simple molecules

尤其是简单分子

easy

with properties that are relatively easy to predict

那些具有相对容易预测性质的

straightforward

In the case of these more straightforward chemistries

对于这些更简单的化学物质

其他： simple/brief/plain

例：The game is supposed to be simple for anyone to play.

该游戏对于任何人都应该很简单。

✓ 提供

provide

It draws on more than 1bn data points to provide “snackable” information

它利用超过 10 亿个数据点提供“简单易懂”的信息

deliver

Like Netflix recommendations, plai delivers “nudges”

就像 Netflix 的推荐一样，plai 提供“提示”

其他：offer/supply/afford

例：The hotel offers excellent facilities for families.

本旅馆提供适合家庭的优良设施。

3) 一词多义

✓ buzz

- ✓ 文章原句：Most of the buzz revolves around AIs trained on biological data 大多数热议都围绕着基于生物数据进行训练的人工智能展开

✓ 释义：

① **the sound of people talking, especially in an excited way** 唧唧喳喳的谈话声

You are always in the middle of any negative buzz around the office.

办公室里负面的谈论，你总是参与其中。

② **a continuous sound like the one that a bee, a buzzer or other electronic device makes** 嗡嗡声；蜂鸣声

The air was alive with the buzz of bees and dragonflies.

空中有蜜蜂和蜻蜓的嗡嗡声，生气勃勃。

③ **a strong feeling of pleasure, excitement or achievement** (愉快、兴奋或成就的) 强烈情感

You can sense the creative buzz in the city.

在城市里可以感觉到创造的热情。

④ **news that people tell each other that may or may not be true** 传闻；谣传

The buzz is that Matt is in Scotland. Have you heard anything?

据说马特在苏格兰。你有没有听说？

✓ **property**

✓ 文章原句：simple molecules with properties that are relatively easy to predict

那些具有相对容易预测性质的简单分子

✓ 释义：

① **a quality or characteristic that something has** 性质；特性

The difference occurs because of local variation in soil properties.

之所以出现这种差异，是因为土壤特性的局部变化。

② **a thing or things that are owned by somebody; a possession or possessions** 所有物；财产；财物

Be careful not to damage other people's property.

小心别损及别人的财物。

③ **land and buildings** 不动产；房地产

The price of property has risen enormously.

房地产的价格大幅上升了。

④ **a building or buildings and the surrounding land** 房屋及院落；庄园；房地产

Once the tenants have left, the property will be put on the market.

一旦房客离开，这处房子就会在市场上出售。

4) 仿写训练

✓ 描述引起兴趣的事物

✓ 文章原句：

AI is not new in drugmaking. Biotech firms have been tinkering with it for years. Now interest from big pharma is growing. Last year Emma Walmsley, chief executive of GSK, said it could improve the productivity of research and development, the industry's most profound challenge.

✓ 句型：

... is not new in在...领域并不新鲜

... have been tinkering with it for years. ...一直在尝试使用它

Now interest from ... is growing. 现在...对它的兴趣与日俱增。

✓ 仿写示例：

Big data is not new in the enterprise world. Market research and risk management have been tinkering with it for years. Now, interest from production optimization is growing. With big data technology, companies can get real-time insights into various parameters and data from the production process to optimize the production process, improve productivity and product quality.

✓ 仿写作业——描述引起娱乐领域兴趣的 VR

虚拟现实在娱乐领域并不新鲜。

游戏行业和影视行业一直在尝试使用它。

现在，演出行业对它的兴趣与日俱增。

虚拟现实在演唱会中的应用越来越受欢迎。虚拟现实演唱会是一种通过 VR 技术实现的形式，用户可以通过 VR 头戴式设备观看演唱会并参与到演唱会中。

5) 主题词总结

| 今日主题——制药 | |
|-----------------------------|------|
| 1. pharma | 制药公司 |
| 2. drugmaker | 制药公司 |
| 3. clinical-trial | 临床试验 |
| 4. drug approval | 药物审批 |
| 5. research and development | 研发 |
| 6. pharmaceutical industry | 制药业 |
| 7. drug discovery | 药物发现 |
| 8. genome sequence | 基因序列 |