CNN News Highlights — Bringing Back the Wolly Mammoth

1) extinct	2) hereditary	3) genome	4) modify
5) molecular engineers	6) physiology	7) revolutionary	8) strands

Your body contains 37.2 trillion cells and within each is a copy of a code consisting of more than twenty thousand genes and billions of _____ of DNA. This code is your _____ and it determines everything that makes you… you.
What if you could _____ that code, bring back _____ species, eliminate _____ diseases? That is precisely what _____ and geneticists around the world are working on.
Genes are what we get and we're stuck with them and the environment is the only thing we can change and there's kind of a limit to how much you can do. But now, if we can change our genes, too, we're really in much closer to total control of our biology and _____.
George Church is one of many, using a _____ gene-editing technique called CRISPR-Cas9, which allows you to modify DNA sequences.

1) bacteria	2) CAS proteins	3) geneticists	4) precisely	5) storing	6) target

CRISPR is a way that you can design and _____ a particular part of your genome and change it to something else, or you can delete a gene. You can make all sorts of edits very _____.
CRISPR is kind of like having the find/delete/replace function for DNA. No one actually invented the process. It happens naturally. Scientists discovered that _____ alter their DNA to defend against viruses, essentially _____ part of a virus so they can identify, target and attack the virus if it comes back. Researchers realize the tools bacteria use to do this were _____, nature's genetic scissors. _____ are now using these proteins to make their own targeted changes to DNA.

1) agriculture	2) alter	3) cloning	4) invasive
5) malaria	6) messing with	7) subtle	8) tweaking

Scientists have been _____ genomes for years. So what's the big deal with CRISPR?
This is dramatically different. I mean, it's like 10,000 times easier. This can be used in _____, where you can change any plant or animal. It can be used to eliminate _____ species. What's most exciting about CRISPR is our ability to _____ long-standing epidemics like _____ and HIV.
And that could potentially save millions of lives.
So here we grow human cells, elephant cells. We can do _____ procedures.
It turns out that you can make pretty big things by _____ small strands of DNA. By making changes to the DNA of the Asian elephant, researchers in Church's lab are working to bring the woolly mammoth back to life.
The difference between a woolly mammoth and Asian elephant is actually quite _____ at the DNA level.

1) cell	2) down the road	3) in your eyes	4) Jurassic Park	5) paint this picture	6) wildest

When am I going to see a woolly mammoth like in _____?
Right. So an actual, full woolly mammoth I think is still a few years _____. We can just change one gene and then the next gene and then soon we have thousands of genes that are changed. The elephant cell will have the exact same DNA sequence as the woolly mammoth _____.
_____ of what the future looks like as a result of CRISPR _____?
I suppose the _____ description would be that you have some 150-year-old people that look like they're 20-year-olds riding on a mammoth. Is that wild enough?

1) designer babies	2) edit	3) embryos	4) focus	5) moral and ethical boundary	6) not without controversy

But CRISPR is _____. If you can make a mammoth, consider what you can do with a person's DNA?
For the first time, scientists in China use CRISPER to _____ the genomes of human _____.
People fear CRISPR could lead to _____. How do we prevent that from happening?
We shouldn't be playing. We should be engineering and I think that's what we are doing.
Where do you think the _____ is?
Safety. I think safety is number one. Just like any new technology or new drug, we should try to make it as safe as possible. If we don't do anything, then people are definitely going to die of malaria next year. A lot of people are going to die of HIV if we don't do something.
If we _____ on why it's useful, then that changes the conversation to, you know, what's the alternative?

Translation

您的身體包含 37.2 萬億個細胞，每個細胞內都有一份由超過
兩萬個基因和數十億條 DNA 鏈。 這個代碼就是你的基因組，它決定了讓你成為……你的一切。
如果你能修改那個基因代碼，讓滅絕的物種複活，消除遺傳性疾病，那會是怎樣的狀況？ 這正是世界各地的分子工程師和遺傳學家正在努力的方向。

基因是我們遺傳來的，我們擺脫不了，環境是我們唯一可以改變的東西，你能做的是很有限度。 但現在，如果我們也能改變我們的基因，我們就真的更接近於完全控制我們的生物學和生理學。

George Church 是眾多專家其中之一，他使用一種革命性基因編輯技術叫 CRISPR-Cas9，可以讓人修改 DNA 序列。

CRISPR 是一種你可以設計和鎖定你的身體某一特定基因組為目標來將其改變或是除去某一基因的方法。 你可以非常精確地進行各種基因編輯。

CRISPR 有點像 DNA 的查找/刪除/替換功能。 實際上沒有人發明這一過程。 它自然發生。 科學家們發現，細菌會改變它們的 DNA 以抵禦病毒，本質上是儲存病毒的一部分，這樣它們就可以在病毒捲土重來時識別、瞄準和攻擊它。 研究人員意識到細菌用來做到這一點的工具是 Cas 蛋白，這是大自然的基因剪刀。 遺傳學家現在正在使用這些蛋白質對 DNA 進行他們自己的目標改變。

多年來，科學家們一直在基因組上做實驗。 那麼 CRISPR 有什麼了不得的地方呢？

這有著戲劇性的不同。 我的意思是，它要容易上 10,000 倍。 這可以用於農業，你可以改變任何植物或動物。 它可用於消除入侵物種。 CRISPR 最令人興奮的是我們能夠改變瘧疾和 HIV 等長期存在的流行病。

這可能會挽救數百萬人的生命。

在這裏我們培養人類細胞，大象細胞。 我們可以做無性繁殖程序。

結果顯示證明，你可以通過調整 DNA 鏈 來製造相當大的東西。 藉著改變亞洲象的 DNA，Church 實驗室的研究人員正在努力讓長毛象復活。

長毛象和亞洲象之間 DNA 方面上的差異實際上是非常微小。

我什麼時候才能看到侏羅紀公園裡的長毛象？

對。 所以我認為真正長毛象還需要幾年的時間。 我們可以
改變一個基因，然後改變下一個基因，很快我們就會有成千上萬的基因被改變。 這隻大象的細胞將具有與長毛象細胞完全相同的 DNA 序列。

描繪一下您眼中 CRISPR 帶來的未來是什麼樣子？

我想最瘋狂的描述是你有一些 150 歲的人看起來像是 20 歲的人騎著長毛象。 這夠瘋狂吧？

但 CRISPR 並非沒有爭議。 如果你能造出一頭長毛象，想想你能用一個人類的 DNA 來做什麼？

中國科學家首次使用 CRISPER 編輯人類胚胎基因組。
人們擔心 CRISPR 可能會用來設計嬰兒。 我們如何防止這種情況發生？

我們不應該隨便做這方面的實驗。 我們應該進行工程設計，我認為這就是我們正在做的事情。

你認為道德和倫理的界限在哪裡？

安全。 我認為安全是第一位的。 就像任何新技術或新藥一樣，我們應該盡量使其安全。 如果我們什麼都不做，那麼明年人們肯定會死於瘧疾。 如果我們不採取措施，很多人將死於 HIV。

如果我們聚焦在它為什麼有用，那麼對話就會變成，你知道，還有什麼選項？

You can access this activity here:

https://linguadox.com/2023/03/07/cnn-news-highlights-bringing-back-the-wooly-mammoth/

Answers

1) extinct	2) hereditary	3) genome	4) modify
5) molecular engineers	6) physiology	7) revolutionary	8) strands

Your body contains 37.2 trillion cells and within each is a copy of a code consisting of more than twenty thousand genes and billions of 8) strands of DNA. This code is your 3) genome and it determines everything that makes you… you.
What if you could 4) modify that code, bring back 1) extinct species, eliminate 2) hereditary diseases? That is precisely what 5) molecular engineers and geneticists around the world are working on.
Genes are what we get and we're stuck with them and the environment is the only thing we can change and there's kind of a limit to how much you can do. But now, if we can change our genes, too, we're really in much closer to total control of our biology and 6) physiology.
George Church is one of many, using a 7) revolutionary gene-editing technique called CRISPR-Cas9, which allows you to modify DNA sequences.

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CRISPR is a way that you can design and 6) target a particular part of your genome and change it to something else, or you can delete a gene. You can make all sorts of edits very 4) precisely.
CRISPR is kind of like having the find/delete/replace function for DNA. No one actually invented the process. It happens naturally. Scientists discovered that 1) bacteria alter their DNA to defend against viruses, essentially 5) storing part of a virus so they can identify, target and attack the virus if it comes back. Researchers realize the tools bacteria use to do this were 2) CAS proteins, nature's genetic scissors. 3) Geneticists are now using these proteins to make their own targeted changes to DNA.

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5) malaria	6) messing with	7) subtle	8) tweaking

Scientists have been 6) messing with genomes for years. So what's the big deal with CRISPR?
This is dramatically different. I mean, it's like 10,000 times easier. This can be used in 1) agriculture, where you can change any plant or animal. It can be used to eliminate 4) invasive species. What's most exciting about CRISPR is our ability to 2) alter long-standing epidemics like 5) malaria and HIV.
And that could potentially save millions of lives.
So here we grow human cells, elephant cells. We can do 3) cloning procedures.
It turns out that you can make pretty big things by 8) tweaking small strands of DNA. By making changes to the DNA of the Asian elephant, researchers in Church's lab are working to bring the woolly mammoth back to life.
The difference between a woolly mammoth and Asian elephant is actually quite 7) subtle at the DNA level.

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When am I going to see a woolly mammoth like in 4) Jurassic Park?
Right. So an actual, full woolly mammoth I think is still a few years 2) down the road. We can just change one gene and then the next gene and then soon we have thousands of genes that are changed. The elephant cell will have the exact same DNA sequence as the woolly mammoth 1) cell.
5) Paint this picture of what the future looks like as a result of CRISPR 3) in your eyes?
I suppose the 6) wildest description would be that you have some 150-year-old people that look like they're 20-year-olds riding on a mammoth. Is that wild enough?

1) designer babies	2) edit	3) embryos	4) focus	5) moral and ethical boundary	6) not without controversy

But CRISPR is 6) not without controversy. If you can make a mammoth, consider what you can do with a person's DNA?
For the first time, scientists in China use CRISPER to 2) edit the genomes of human 3) embryos.
People fear CRISPR could lead to 1) designer babies. How do we prevent that from happening?
We shouldn't be playing. We should be engineering and I think that's what we are doing.
Where do you think the 5) moral and ethical boundary is?
Safety. I think safety is number one. Just like any new technology or new drug, we should try to make it as safe as possible. If we don't do anything, then people are definitely going to die of malaria next year. A lot of people are going to die of HIV if we don't do something.
If we 4) focus on why it's useful, then that changes the conversation to, you know, what's the alternative?