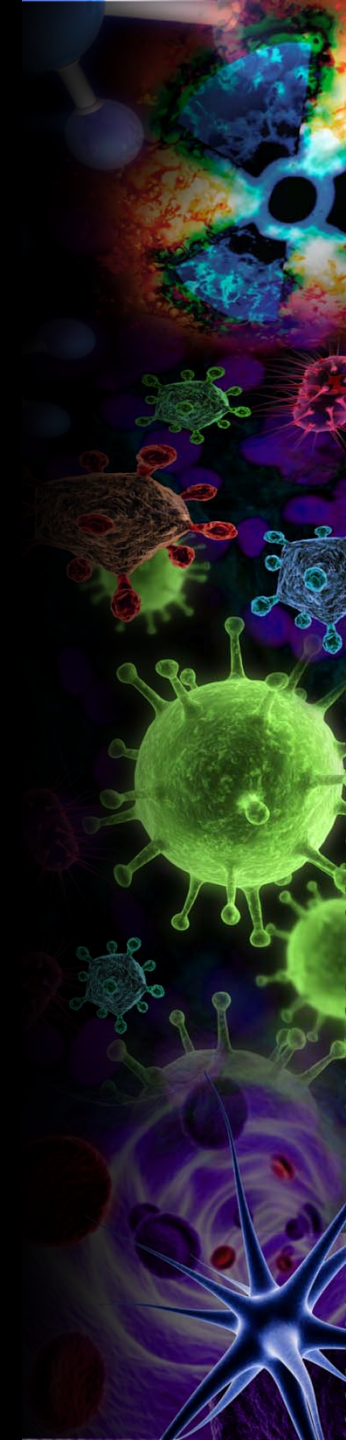


**Our challenges take  
place in a rapidly  
changing world**

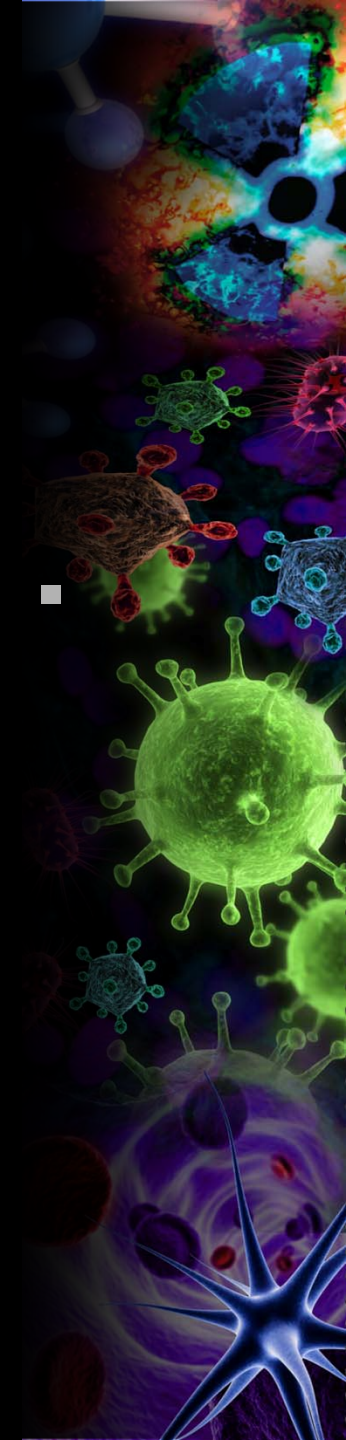
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Name this country . . .

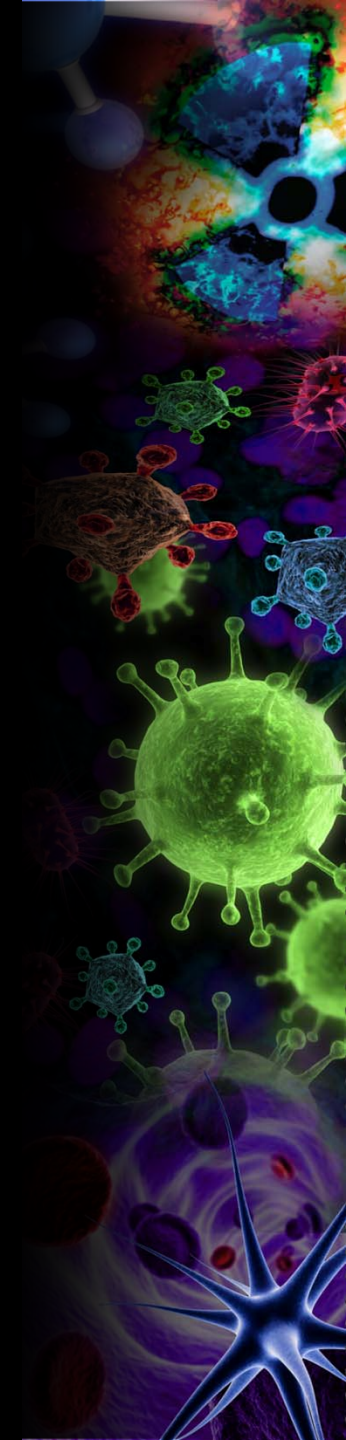


2009

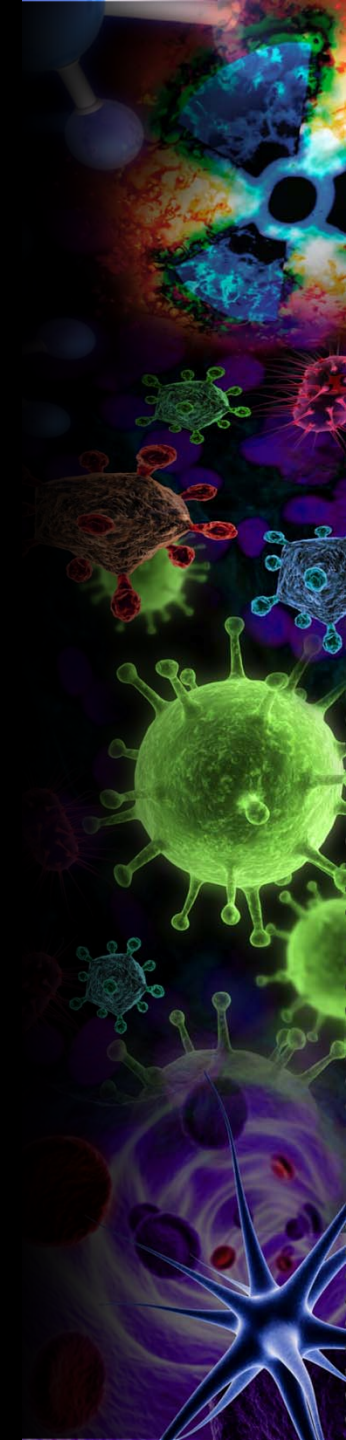
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- Richest in the World
- Largest Military
- Center of world business and finance
- Strongest education system
- World center of innovation and invention
- Currency the world standard of value
- Highest standard of living



# England.

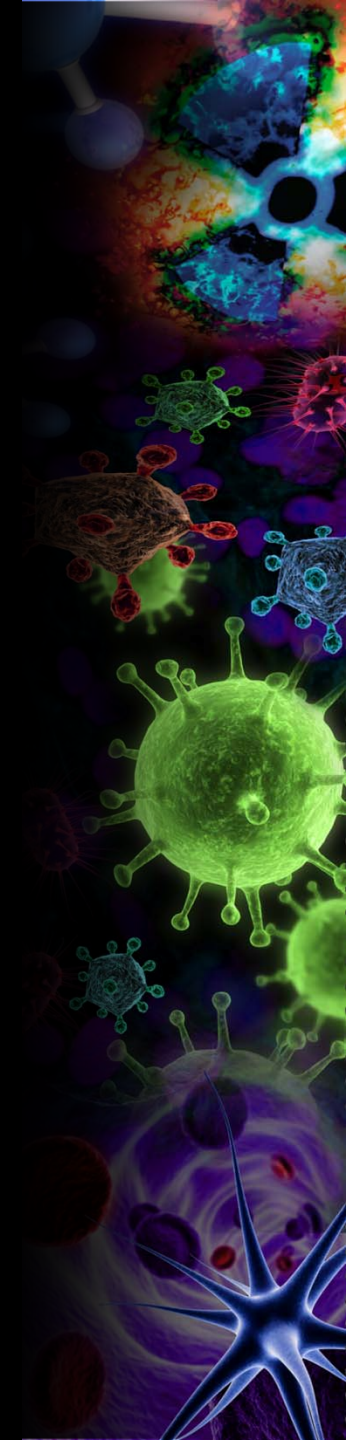


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In 1900.

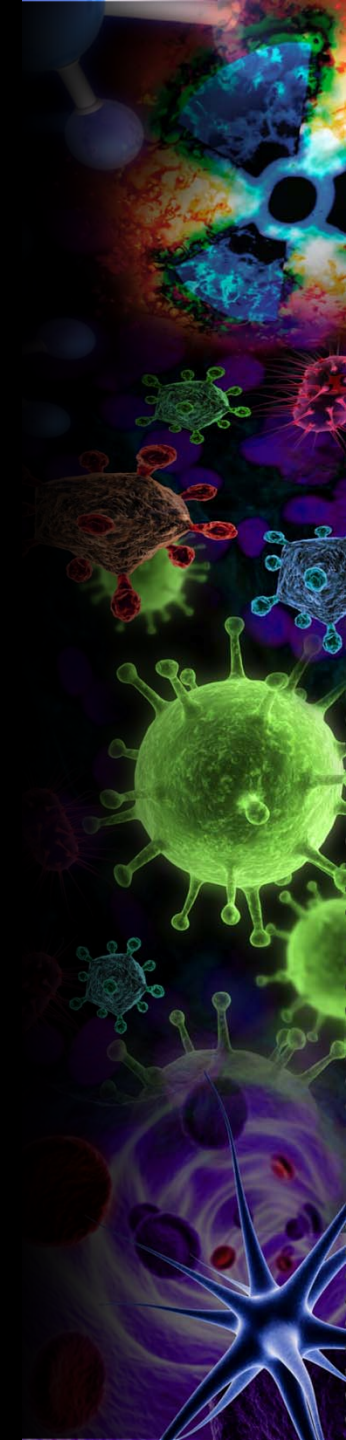


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Did you know . . .



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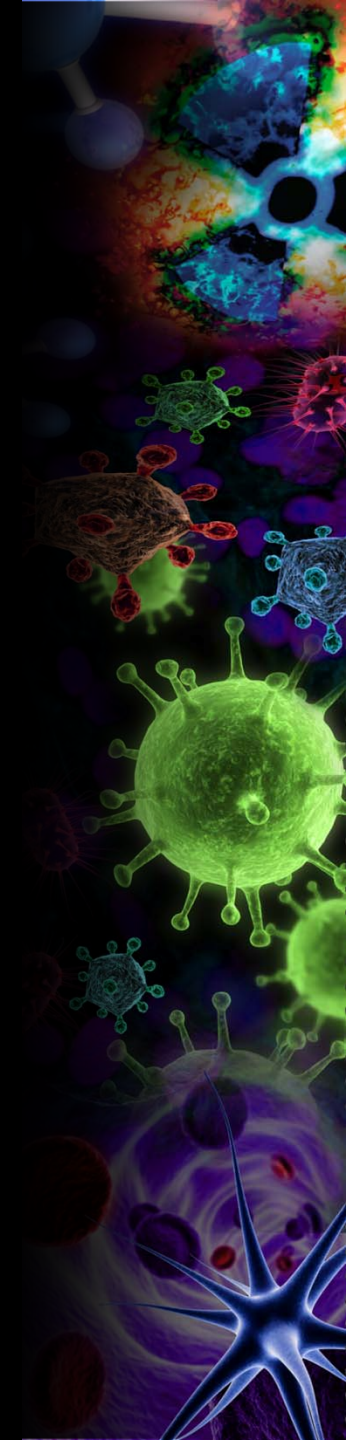
In 2006, the amount of new  
technical information  
doubled  
every 2 years.

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It's predicted to double  
every 72 hours by 2010.



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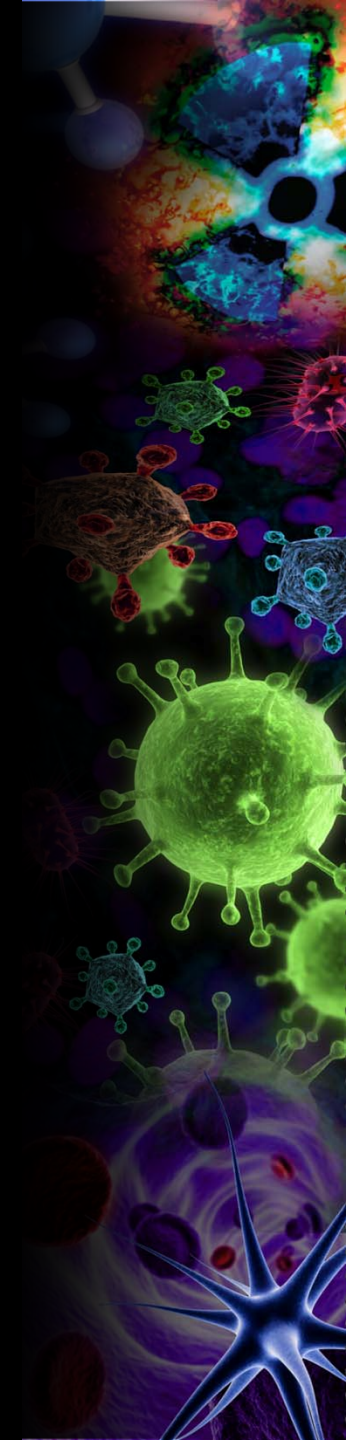
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We are living in  
*exponential*  
times.

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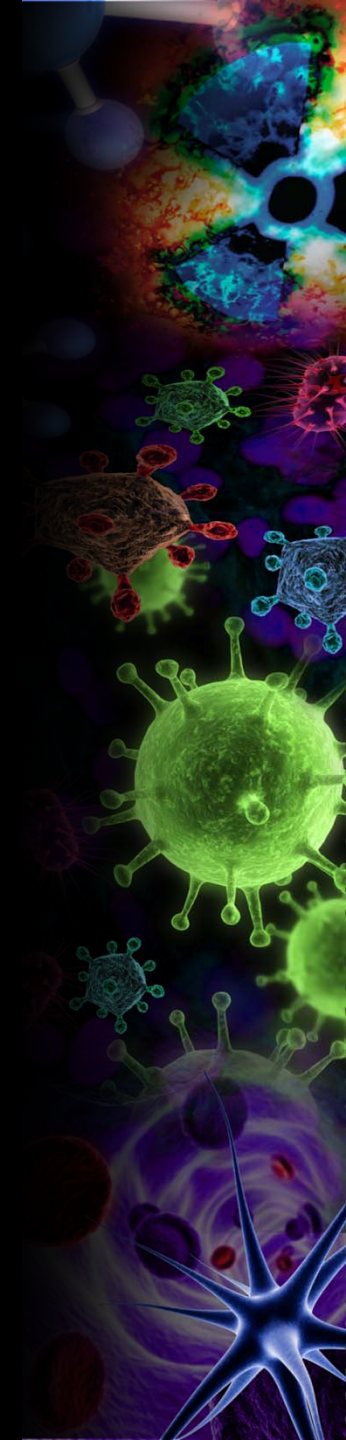


H. Influenzae was the first  
bacterial genome  
sequenced, in **1995**

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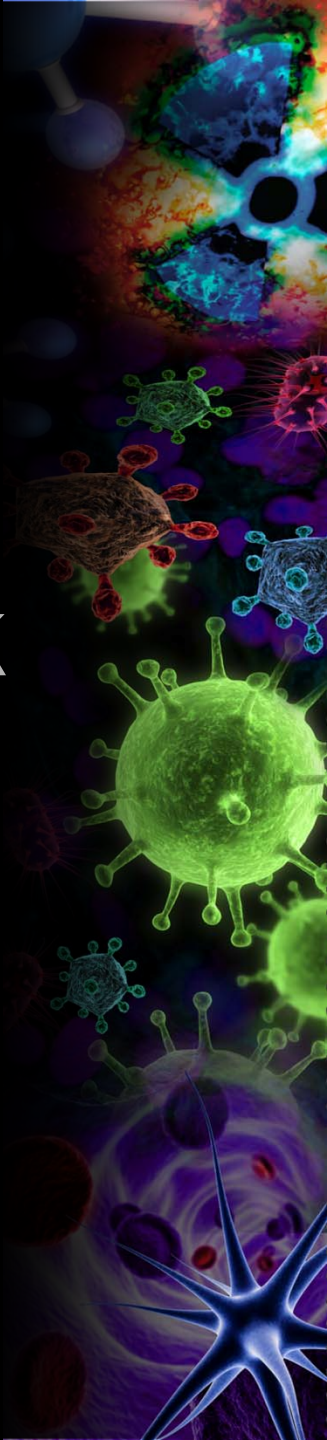


The Human Genome was  
sequenced in 2003; it took  
**10 years and \$3 billion**

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In 2007 the genome of  
James Watson (co-  
discoverer of DNA) was  
sequenced; it took  
**2 months and \$1 million**

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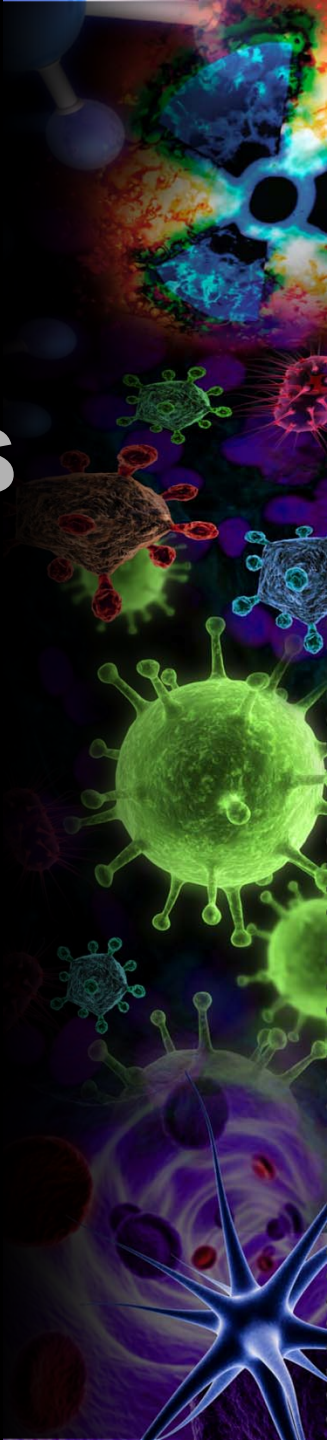


In 2009, private companies  
can be hired to sequence  
your personal genome for  
**\$20K in 4 weeks.**

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The **\$1000** genome is imminent, and it is projected to become a common diagnostic procedure.

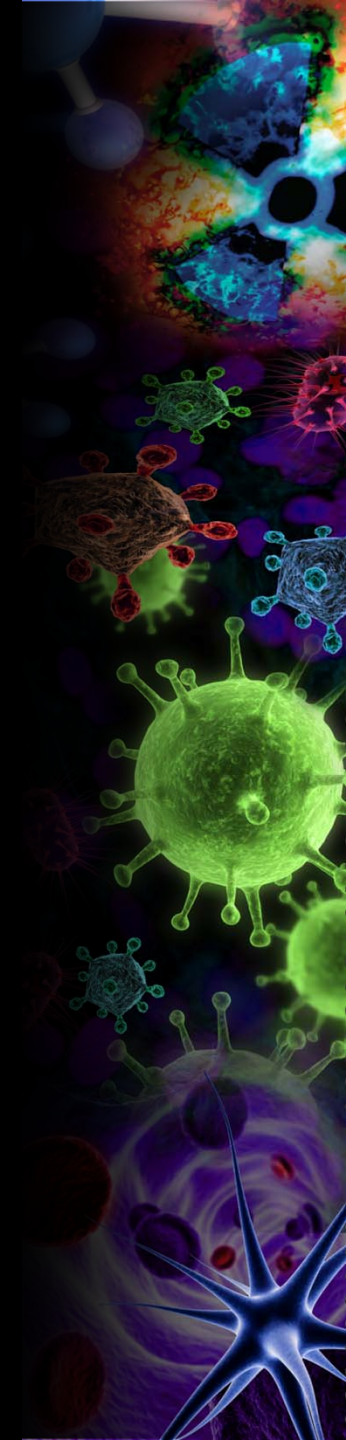
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Did you know . . .



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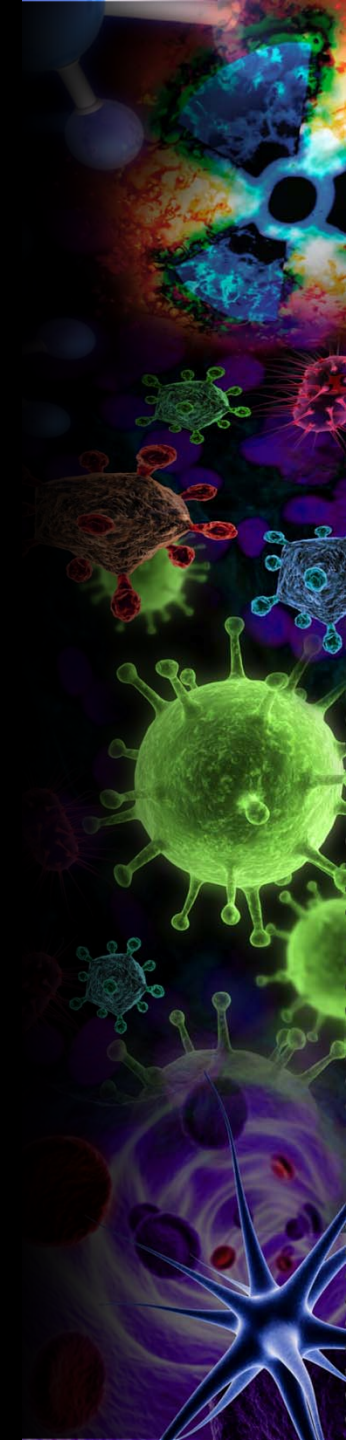
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# According to former Secretary of Education Richard Riley . . .

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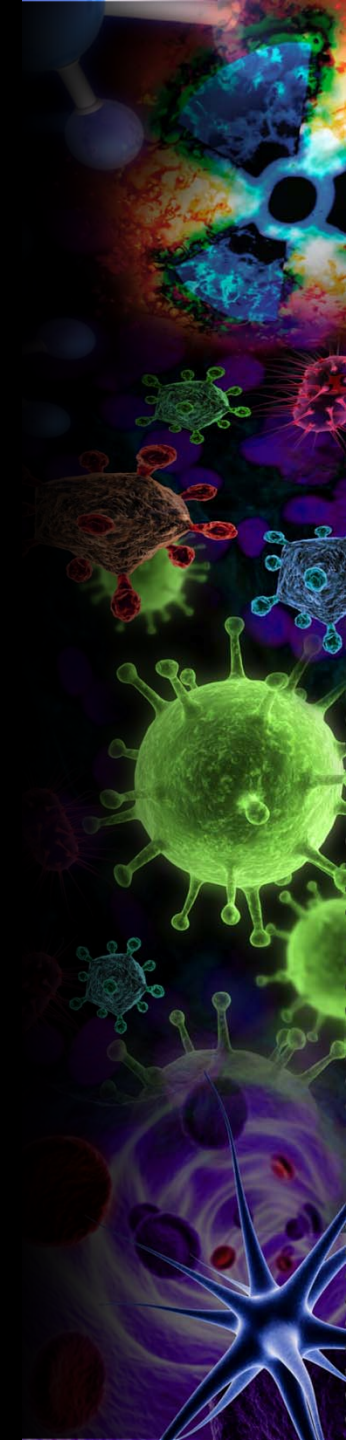


The top 10 in-demand  
jobs in 2010  
**didn't exist**  
in 2004.

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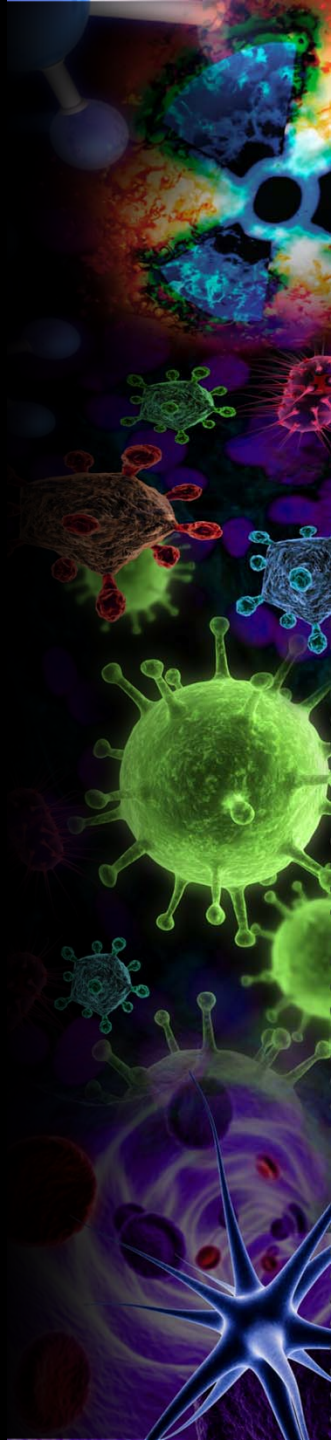


We are currently preparing  
students for  
jobs that don't yet exist . . .

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The background of the slide is a dark, vertical strip on the right side containing various colorful, glowing microscopic organisms and cells. These include a large, multi-colored cell at the top, several green and purple spherical viruses with spikes, and a blue, star-shaped organism at the bottom. The rest of the slide is black.

Using technologies that  
haven't been invented . . .

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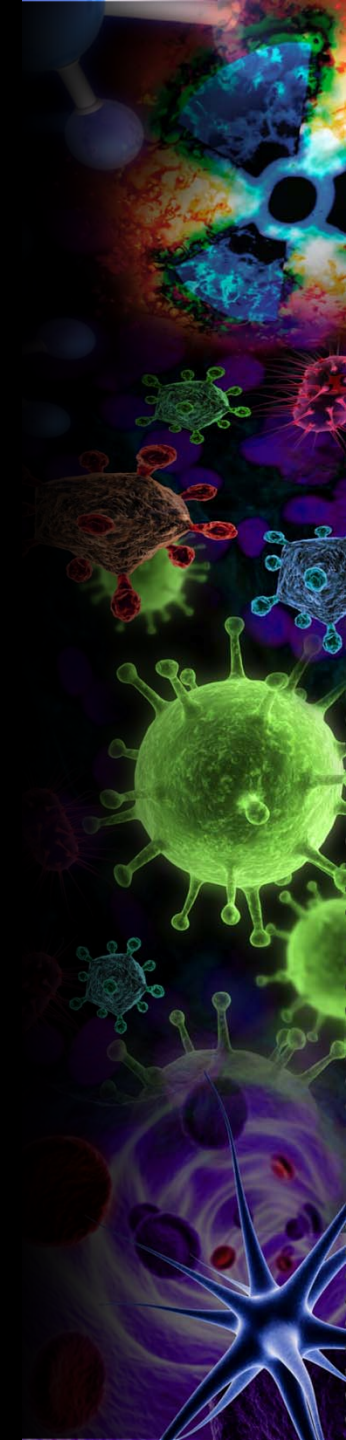
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In order to solve  
**problems we don't even  
know are problems yet.**

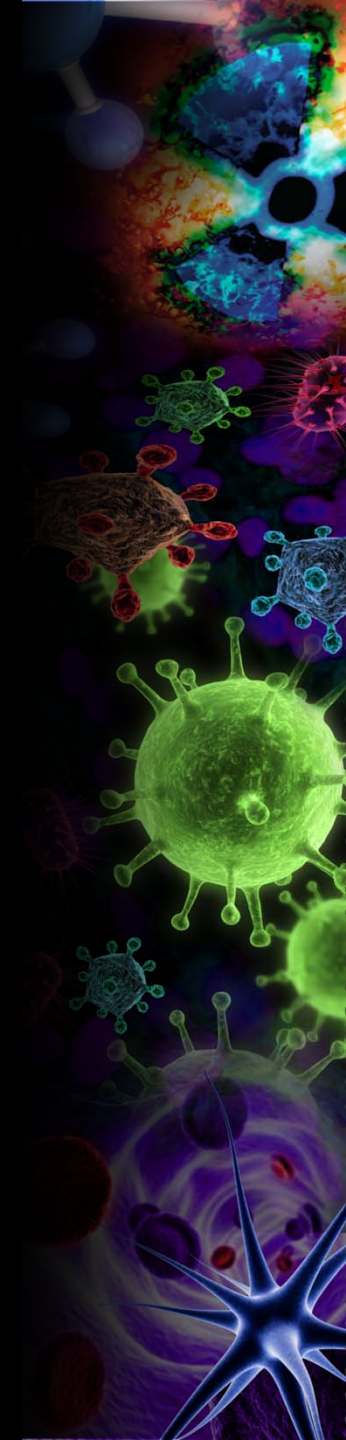
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# Did You Know . . .



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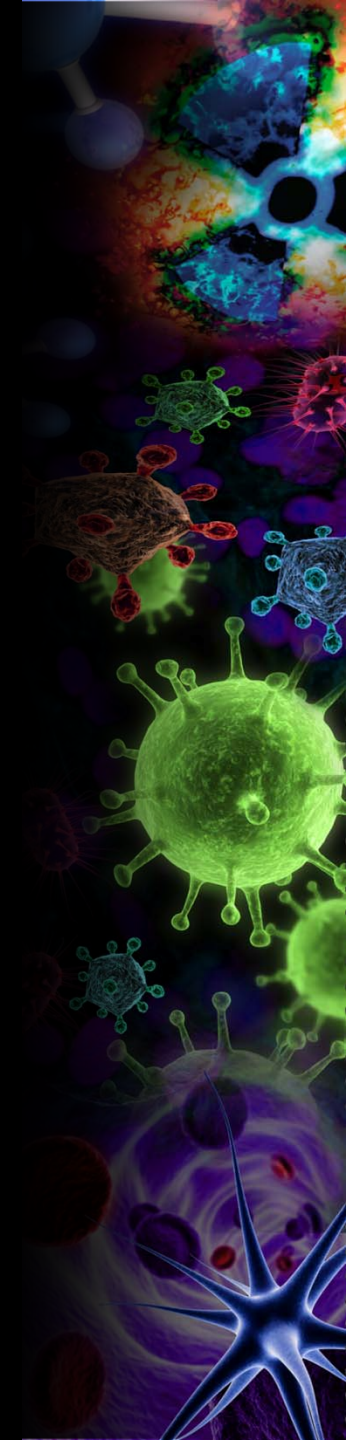
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The **25%** of the population  
in China with the highest  
IQ's . . .

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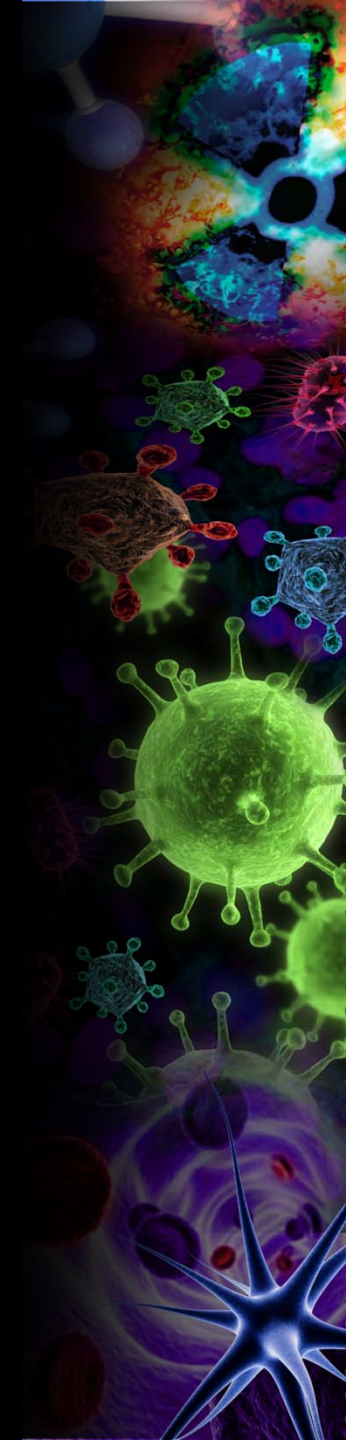


Is greater than the  
**total population**  
of North America.

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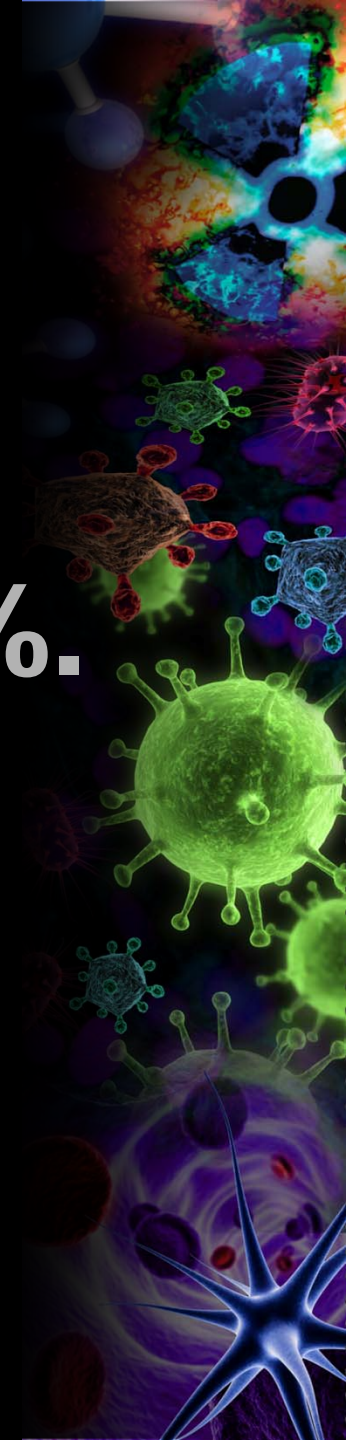


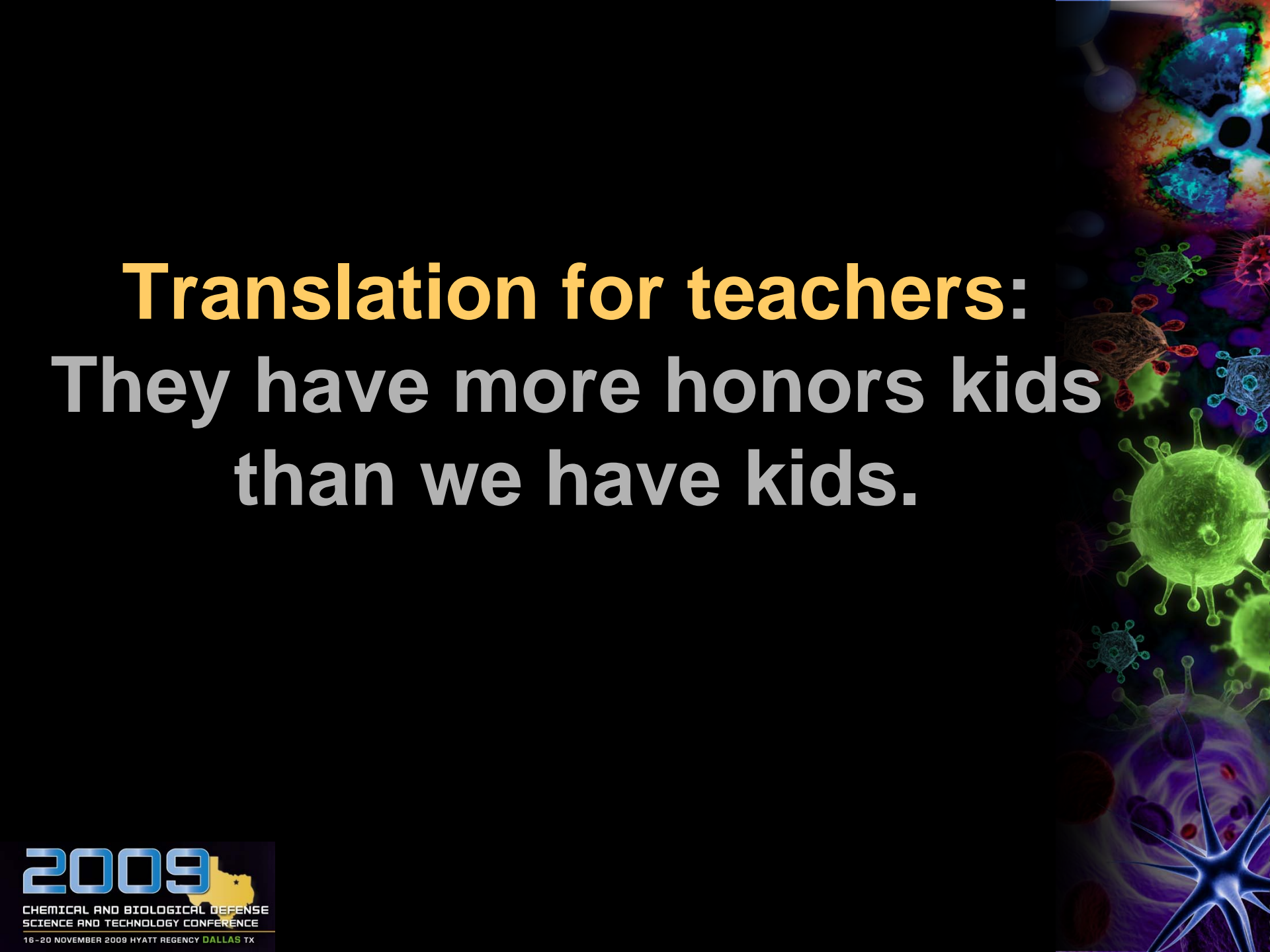
In India, it's the top 28%.

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The background of the slide is a dark, vibrant collage of various microscopic organisms and cells. On the right side, there are several large, detailed structures: a blue and green cell-like structure at the top, a large green spherical virus with many protruding spikes in the middle, and a purple, multi-lobed structure at the bottom. Other smaller, colorful organisms are scattered throughout the scene.

**Translation for teachers:**  
They have more honors kids  
than we have kids.

**2009**

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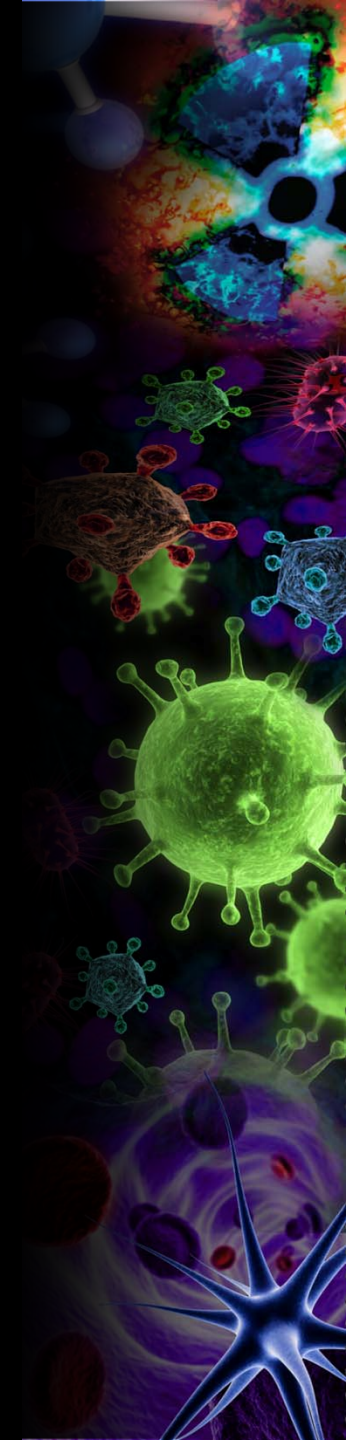
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If you're  
**one in a million**  
in China . . .

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There are  
1,300 people just like you.

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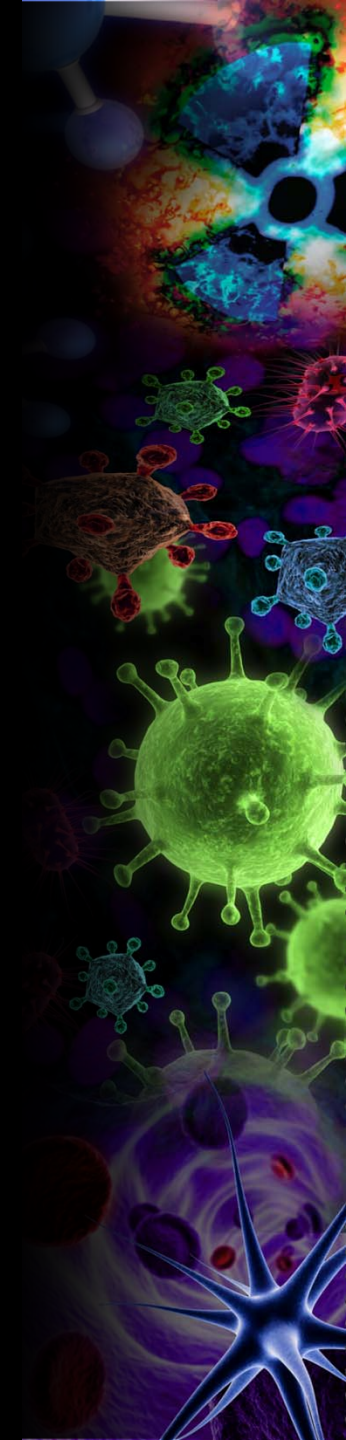
In India, there are **1,100**  
people just like you.

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Sometimes size  
*does*  
matter.

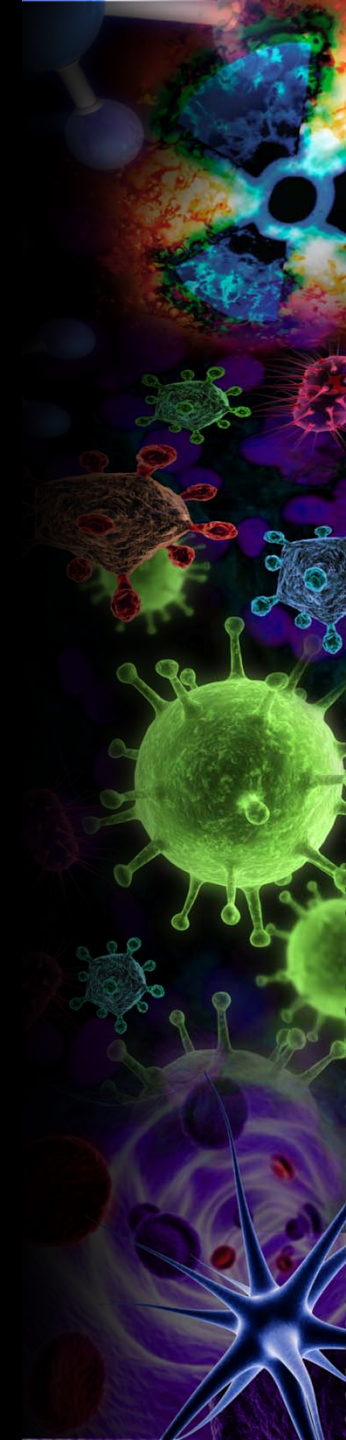


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The computer in your  
cell phone today is a  
**million times cheaper...**

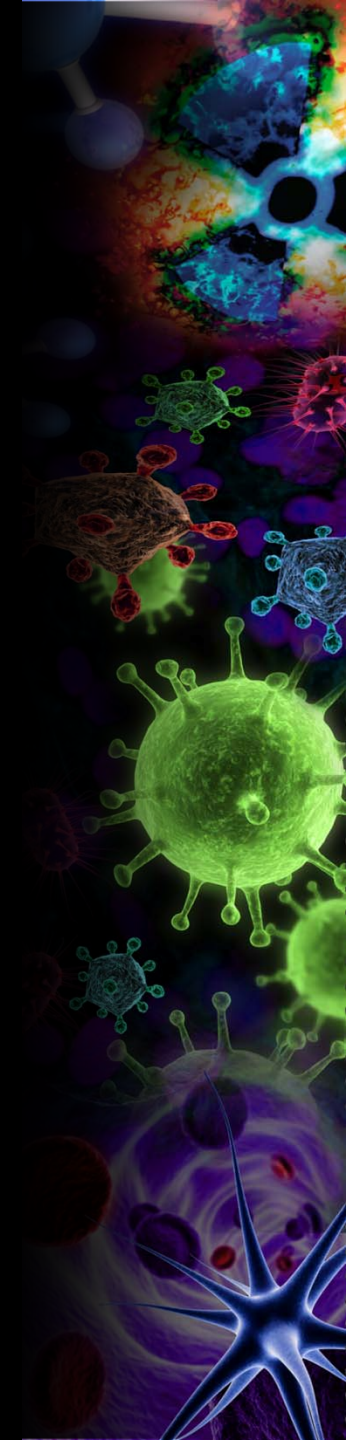


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And a thousand times  
more powerful...



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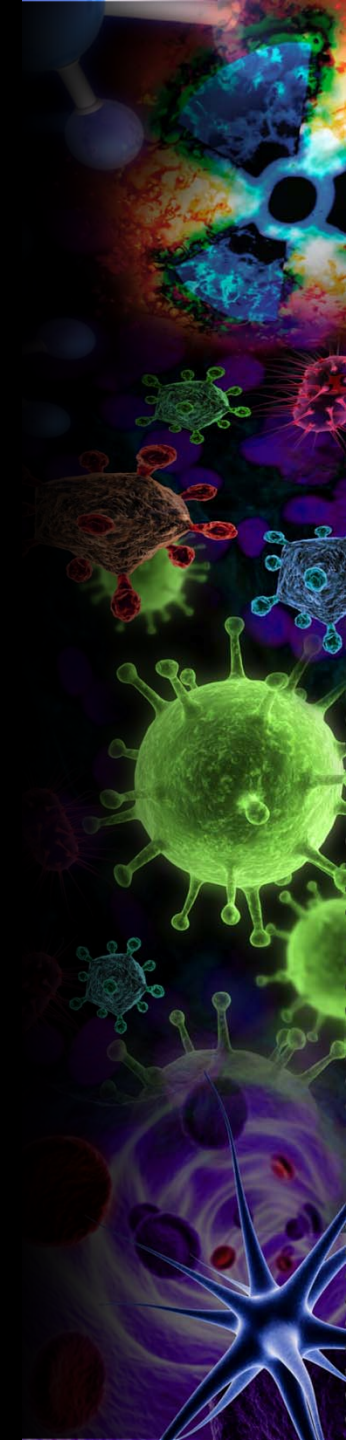
And about a  
**hundred thousand times**  
**smaller...**

Than the one computer  
at MIT in 1965

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Predictions are that by 2013 a  
supercomputer will be built  
that exceeds the computation  
capability of the  
**Human Brain . . . .**

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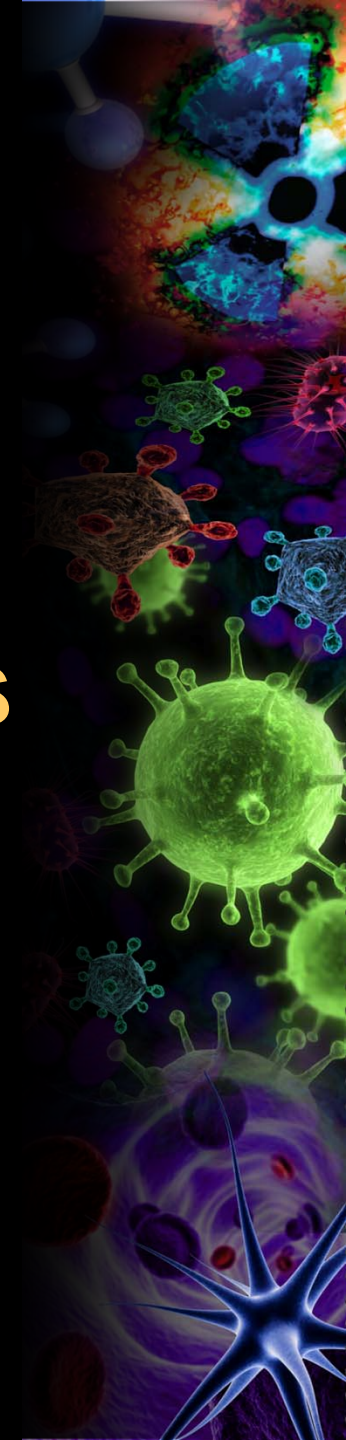
Wikipedia was launched in  
2001.

It now has **13 million articles**  
in more than 200 languages

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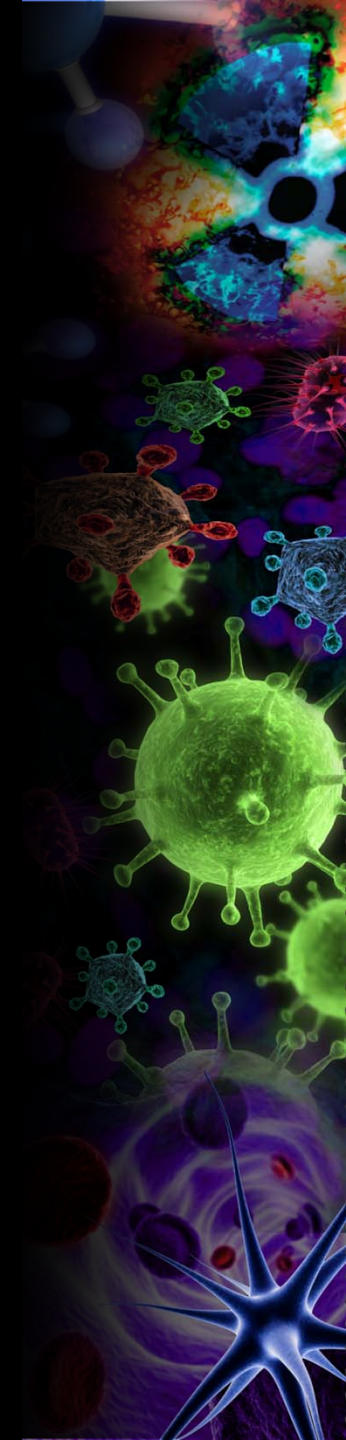
**Cisco's Nexus 7000 data  
switch could move all of  
Wikipedia in...**

**.001 seconds**

**2009**

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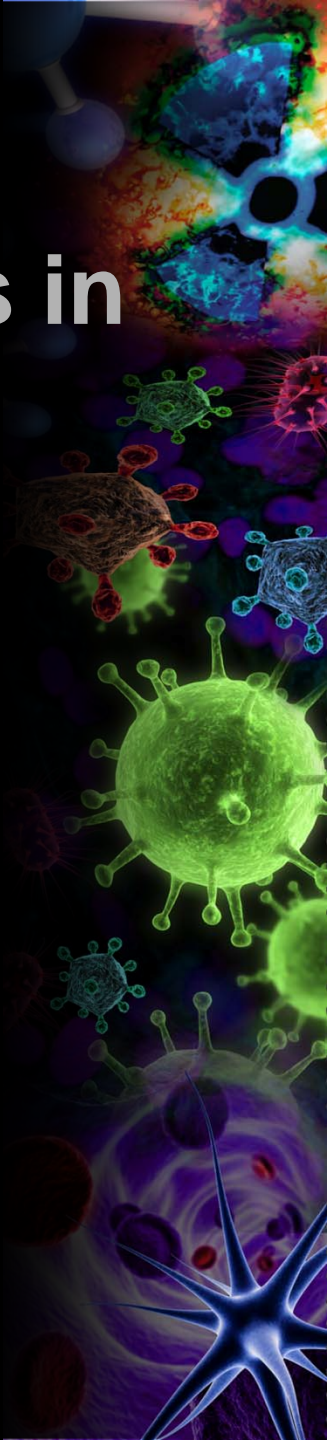
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**In 1982, the number of DNA bases in  
the GenBank database was  
1 million.**

**In 2009, it is 100 billion...**

**and has been doubling  
every 18 months.**



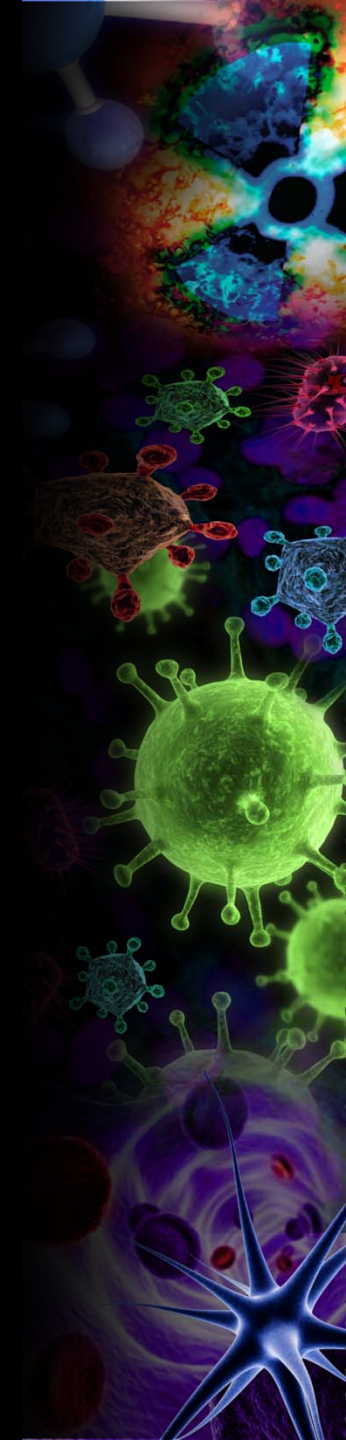
The first gene was  
synthesized in 1972.

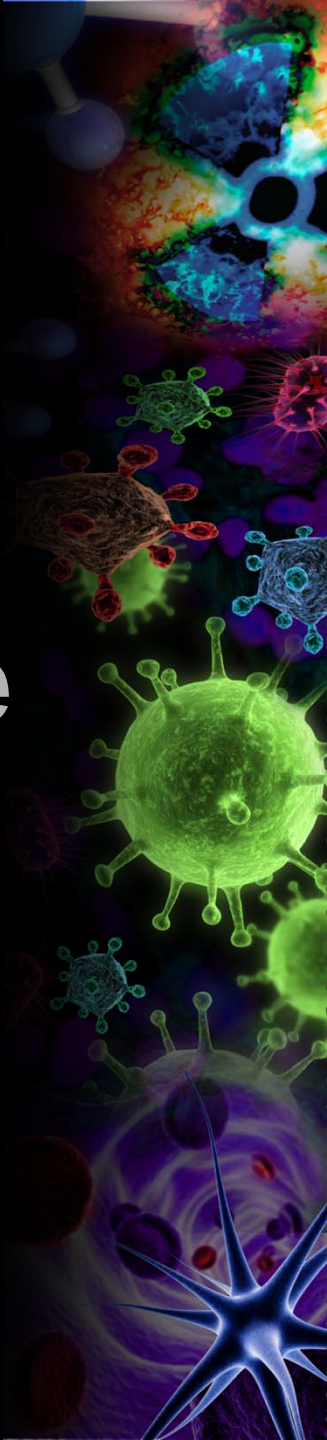
Today you can have genes  
synthesized for  
**39 cents / base pair**

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In 2006, a patent application was filed for the **first synthetic organism.**

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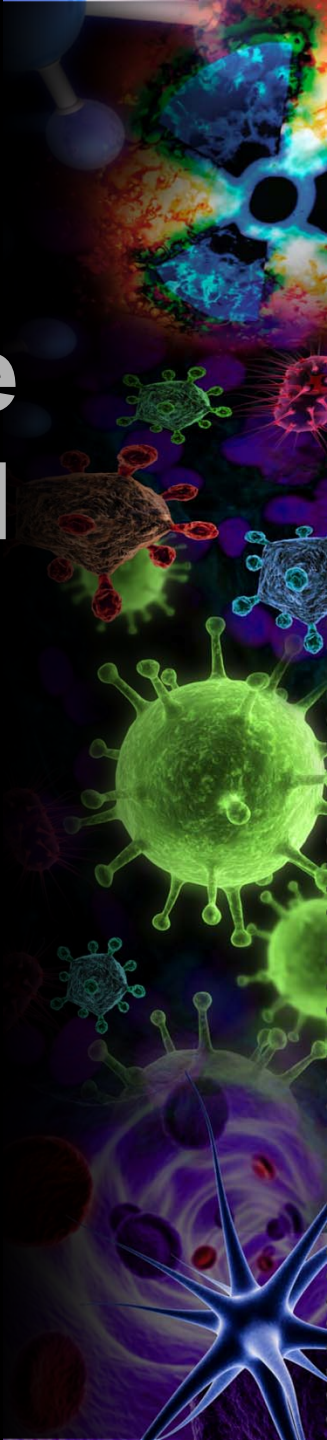
**In 1983, Huntington's disease was the first disease mapped to a defect in a single gene.**

**By 2009, 6,000 diseases have been mapped to defects in single genes.**

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**Novel materials**

**Nanotubes**

**Programmable matter**

**Complex fluids**

**Metamaterials**

**Synthetic biology**

**Claytronics**

**Quantum wells**

**Metal organic**

**frameworks**

**Metabolomics**

**HPC**

**modeling**

**Shape-changing**

**molecules**

**2009**

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# What does it all mean?

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