

ARTIFICIAL SYNTHESIS OF INSULIN

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Group 118

HISTORICAL QUESTION



Frederic G. Banting



Charles F. Best

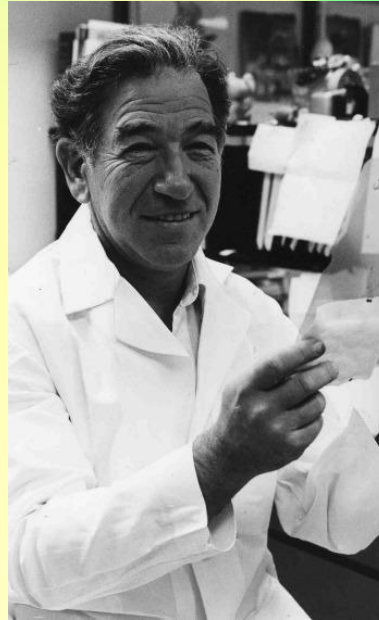
In 1921 Canadian scientists Frederic G. Banting and Charles F. Best successfully purified insulin from a dog's pancreas. Over the years scientists made continual improvements in producing insulin.

- In 1936 researchers found a way to make insulin with a slower release in the blood thanks for protamine.
- In 1950 researchers produced a type of insulin that acted slightly faster and does not remain in the bloodstream as long.
- In the 1970s, researchers began to try and produce an insulin that more mimicked how the body's natural insulin worked.
- In the 1980s, researchers used genetic engineering to manufacture a human insulin.

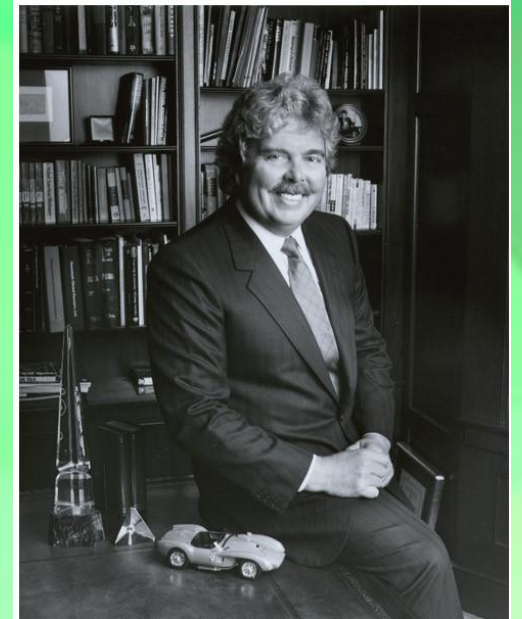


INSULINE AND GENETIC ENGEERING

- In 1982 thanks for work of biochemists Stanley Cohen and Herbert Boyer was produced a human insulin that became the first approved genetically engineered pharmaceutical product.
- Human insulin is grown in the lab inside Escherichia coli.
- Recombinant DNA is a technology scientists developed that made it possible to insert a human gene into the genetic material of a common bacterium.



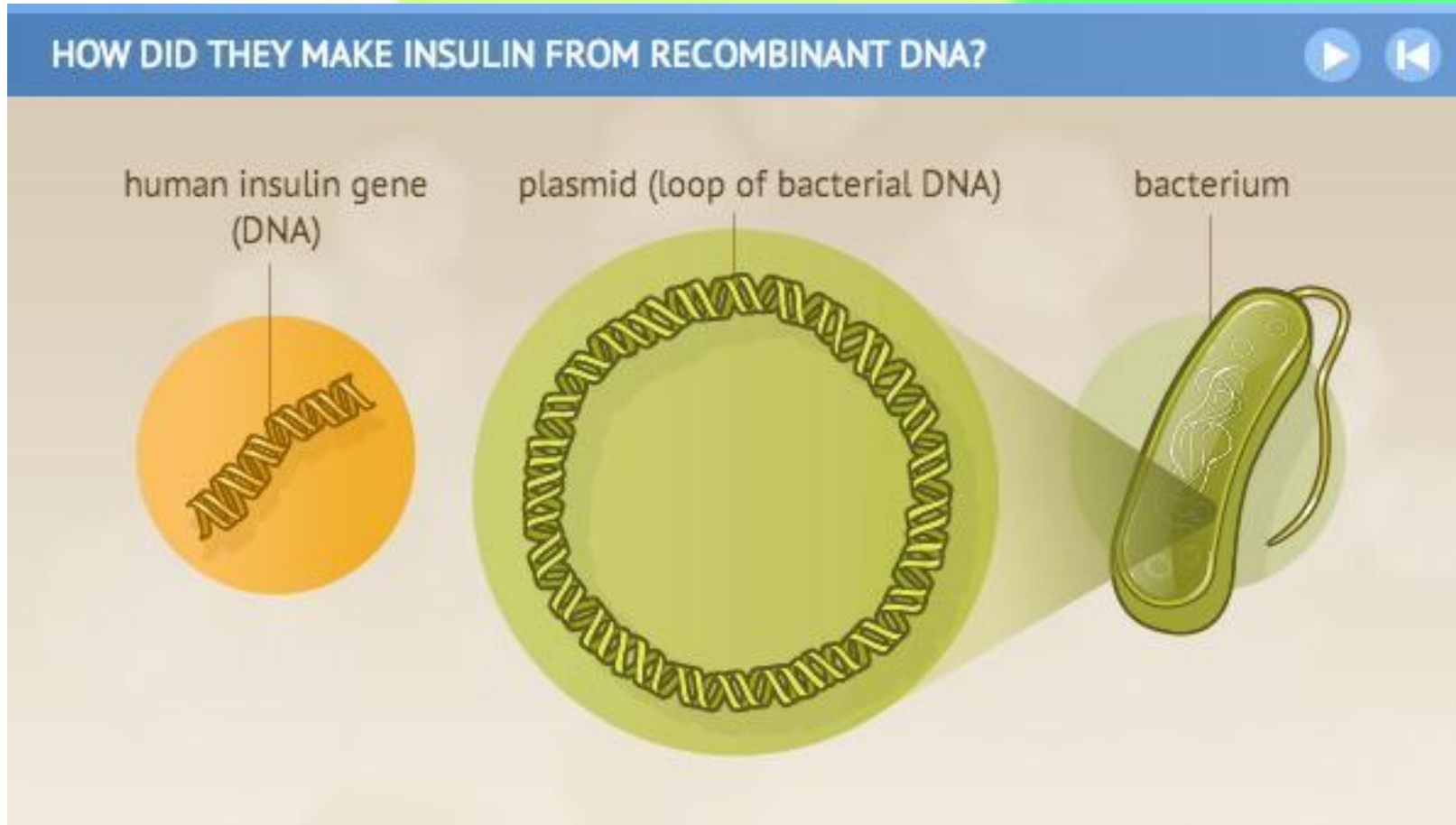
Stanley Cohen



Herbert Boyer

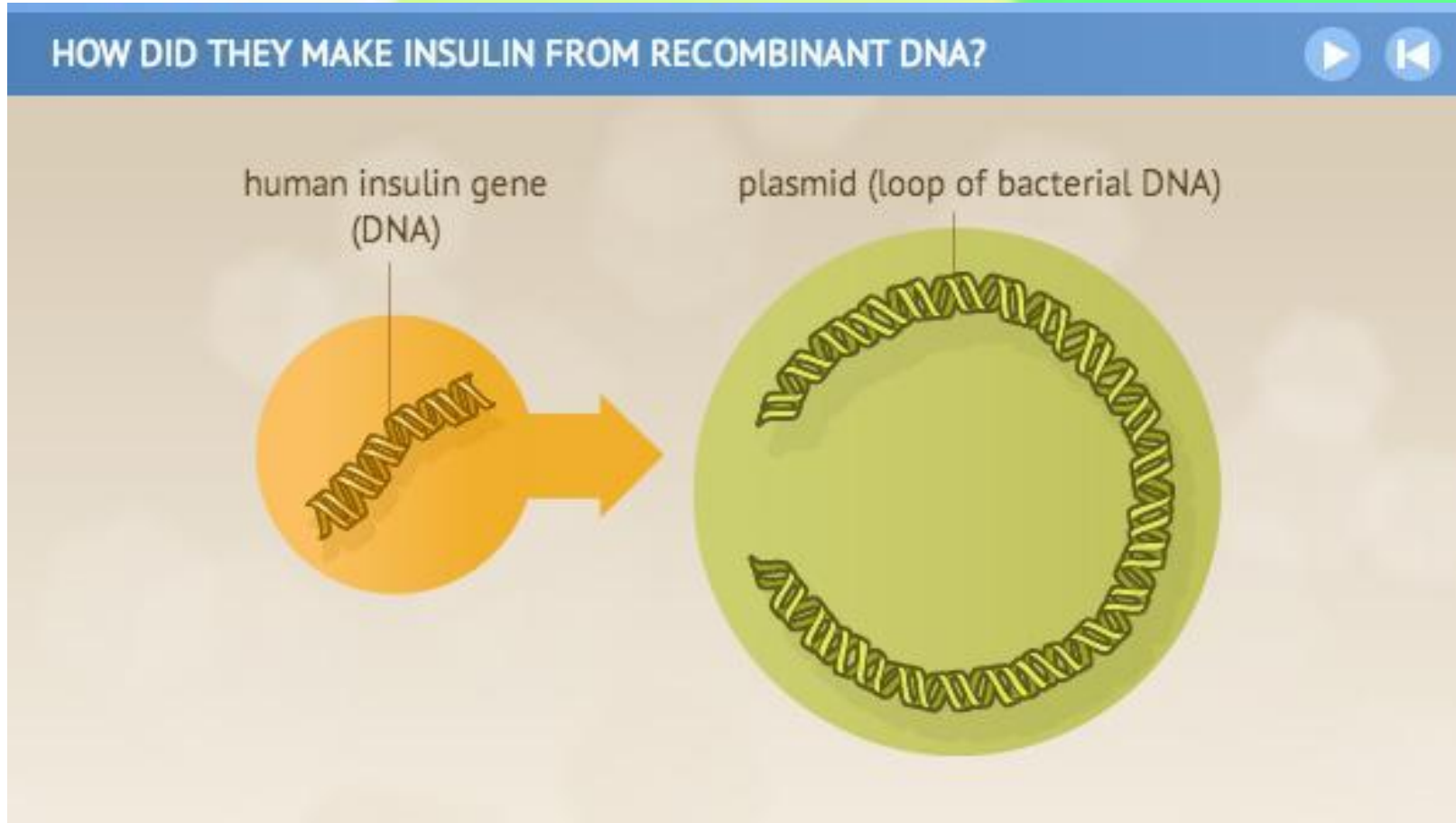
SYNTHESIS OF INSULIN FROM RECOMBINANT DNA

STEP 1



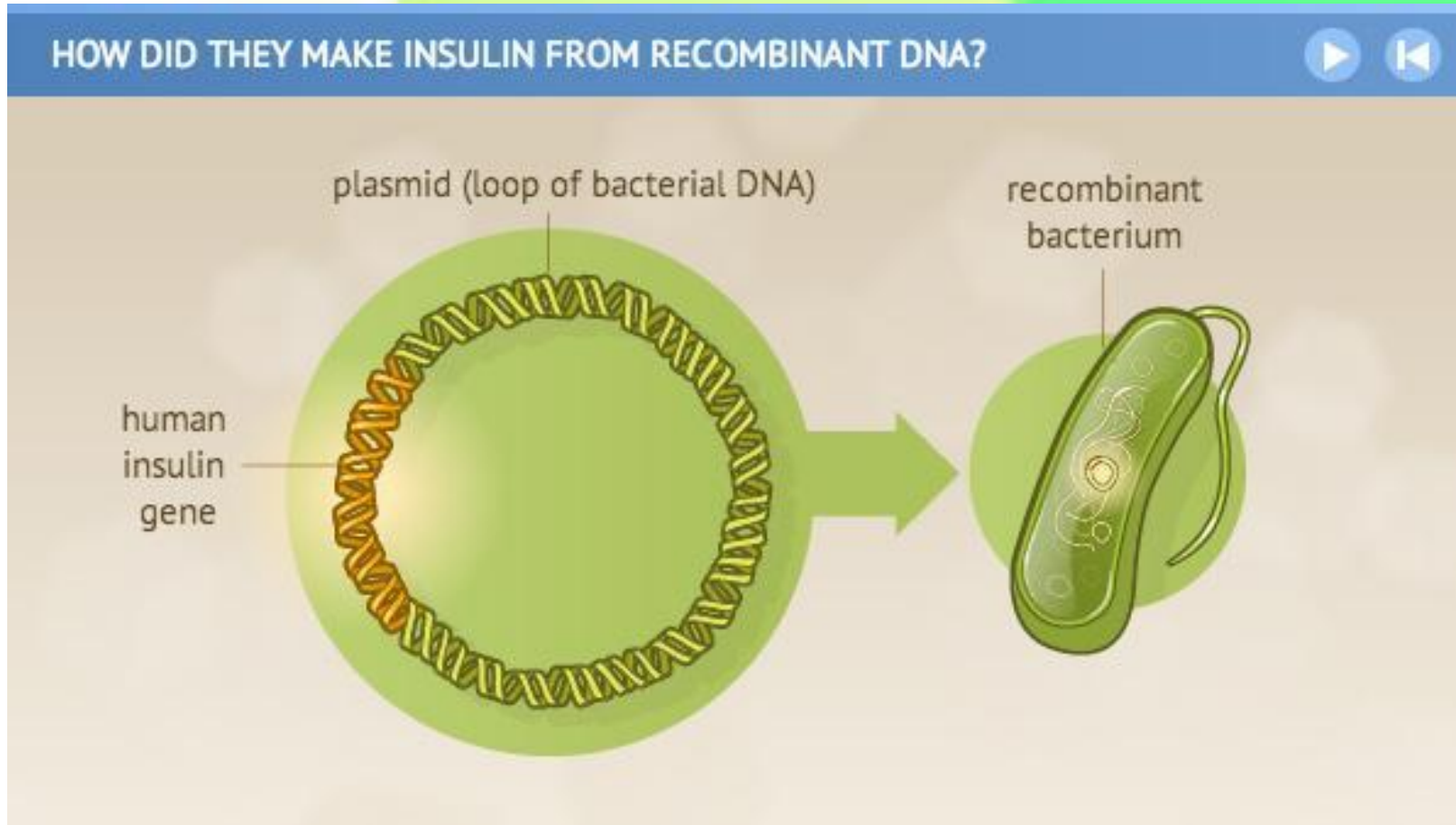
Scientists built the human insulin gene in the laboratory.

STEP 2



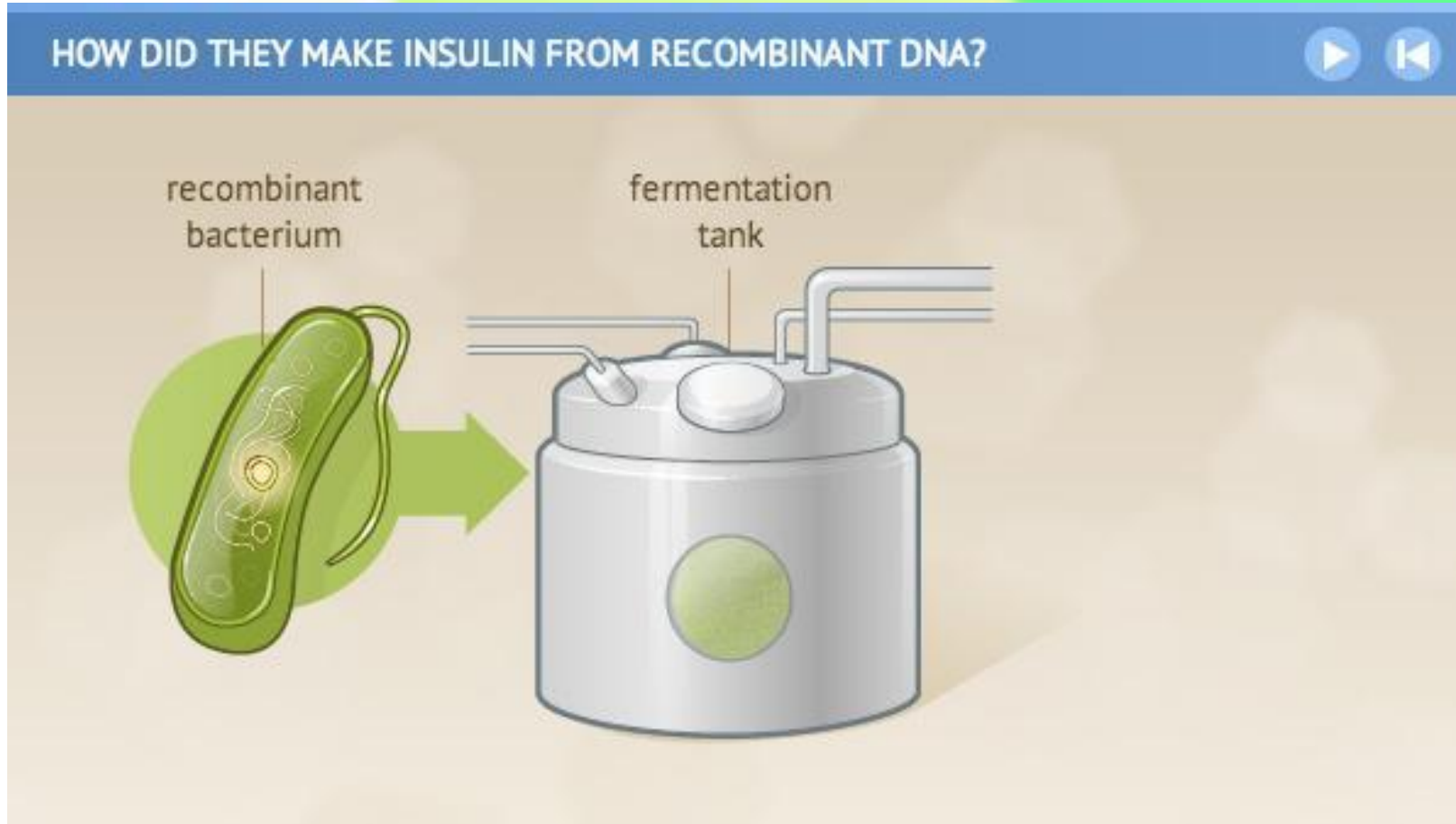
Then they remove a loop of bacterial DNA known as a plasmid and insert the human insulin gene into the plasmid.

STEP 3



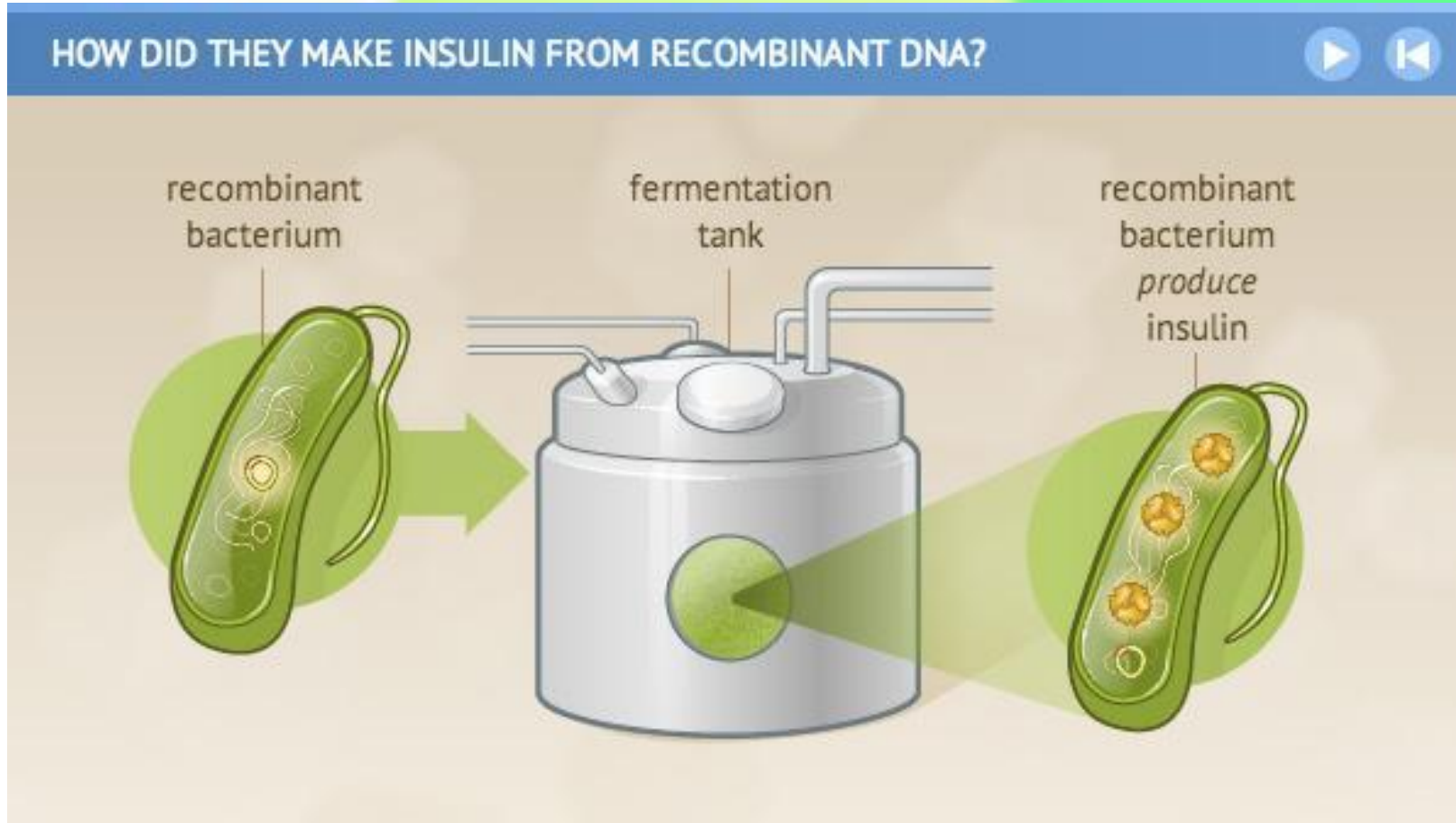
Scientists return the plasmid to the bacteria...

STEP 4



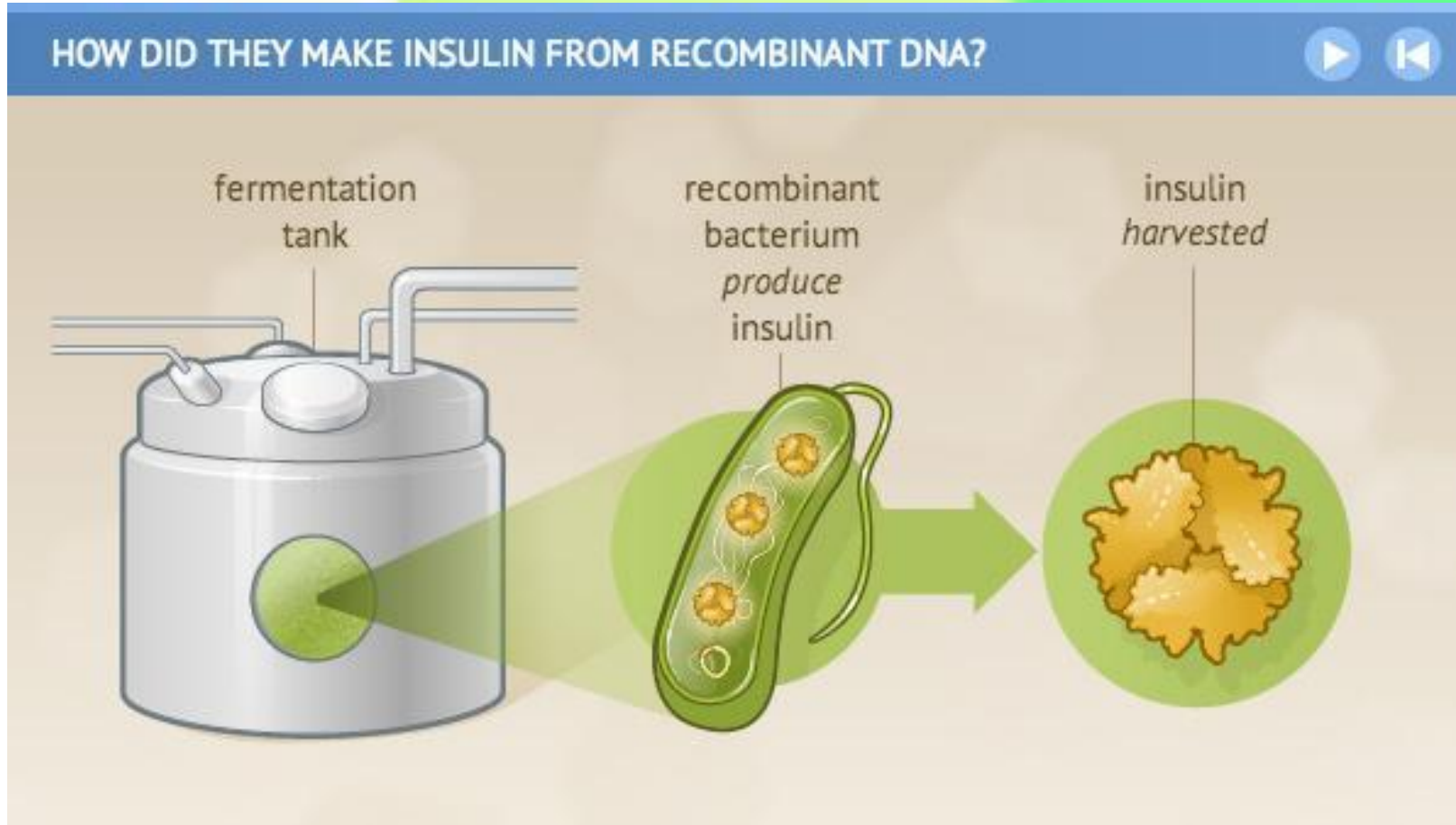
And put the «recombinant» bacteria in large termination tanks.

STEP 5



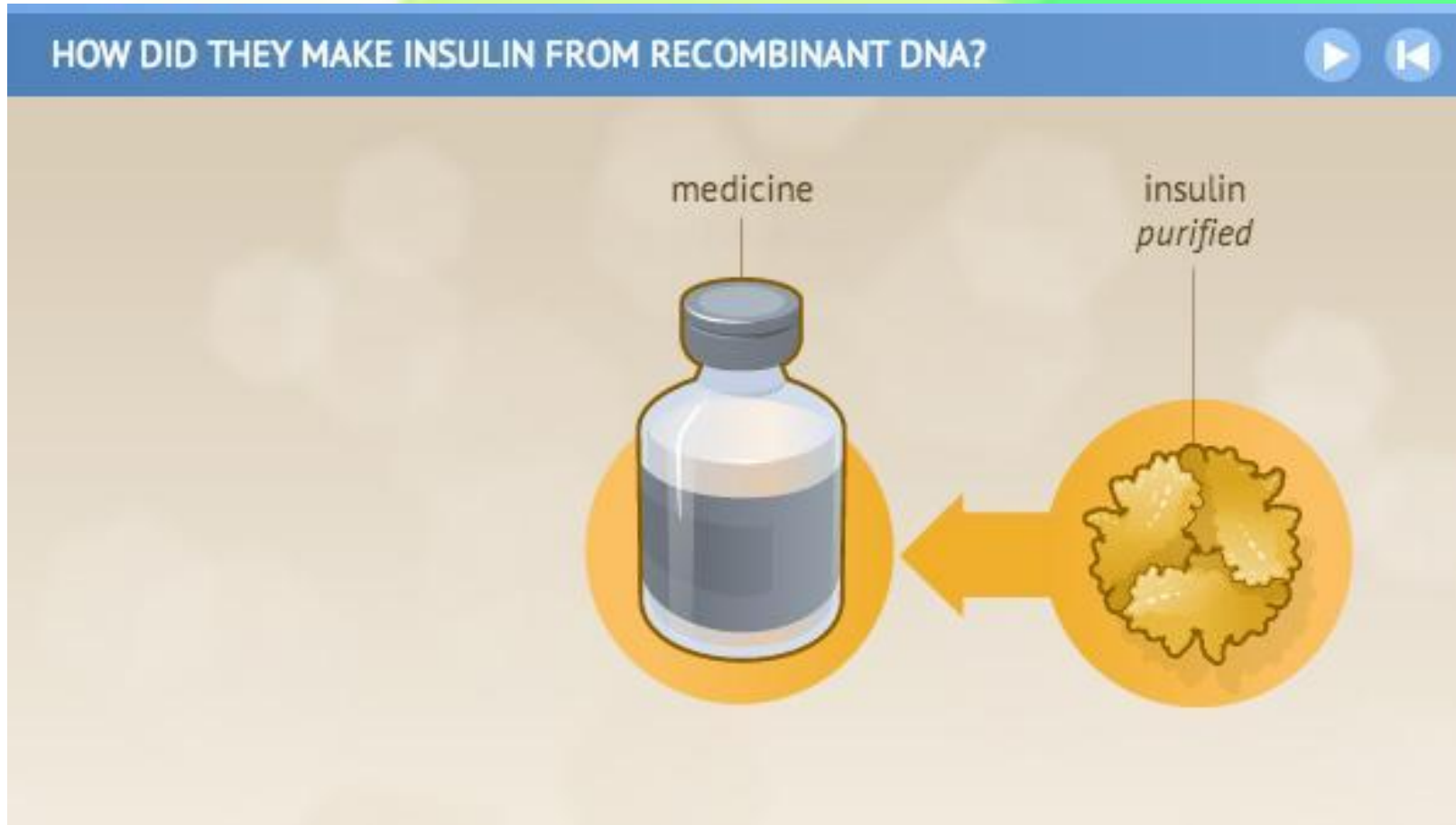
There the recombinant bacteria use the gene to begin producing human insulin.

STEP 6



Scientists harvest the insulin from the bacteria...

STEP 7



And purify the substance for use as a medicine for people.