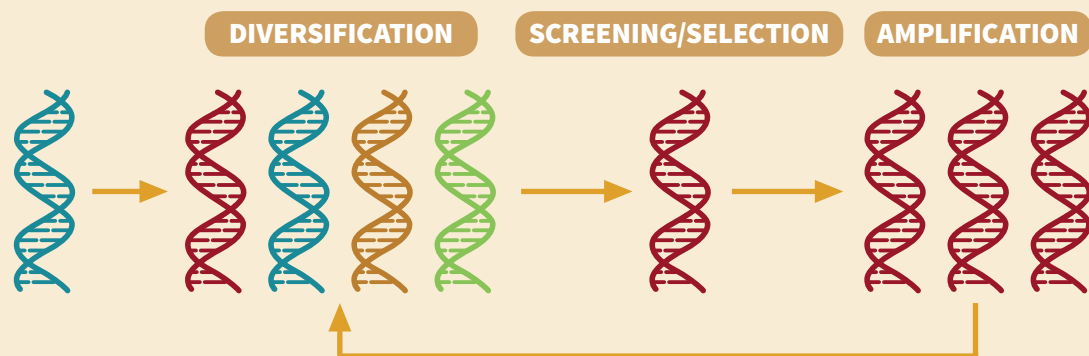


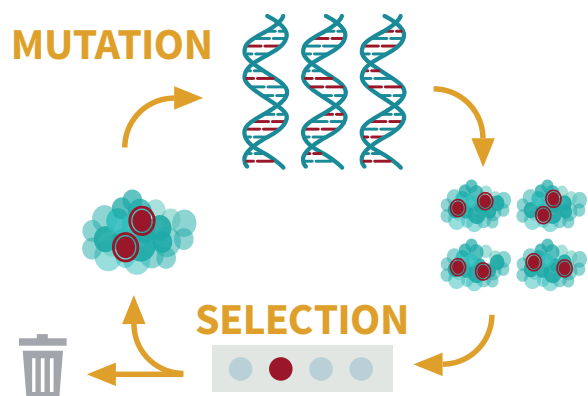
# 2018 NOBEL PRIZE IN CHEMISTRY



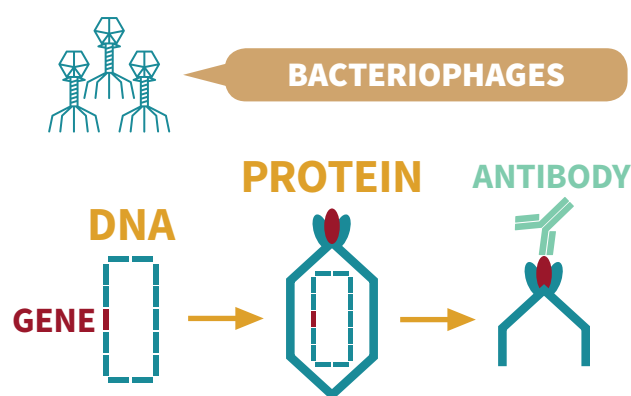
The Nobel Prize in Chemistry 2018 was awarded to **Frances H Arnold**, **George P Smith** and **Sir Gregory P Winter** for their use of directed evolution to produce new enzymes and antibodies.



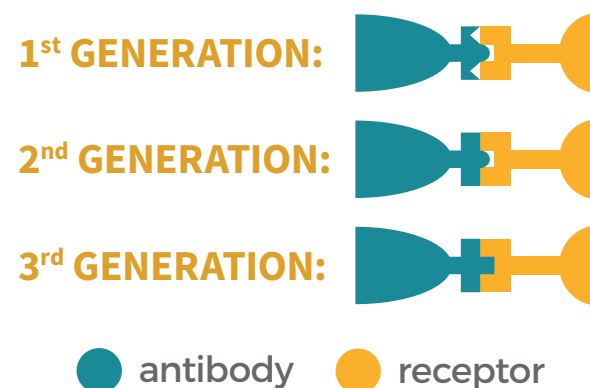
Directed evolution allows chemists to speed up the evolution process in the laboratory. Using it, enzymes can be tailored to catalyse reactions better, or catalyse new ones. Proteins can be made more selective for targets, leading to useful medicines.



**Arnold** pioneered directed evolution of enzymes. She created random changes in an enzyme's DNA, then selected the variant that was most effective in a certain role.



**Smith** used bacteriophages (viruses that infect bacteria). He realised that if a gene was added to phage DNA, the protein it produces could be identified on the phage surface.



**Winter** genetically tweaked phages to produce antibodies on their surface. Through directed evolution, he made antibodies with stronger attachments to their targets.



## WHY DOES THIS RESEARCH MATTER?

Custom enzymes produced via directed evolution are now used in the production of biofuels and medicines, while evolved antibodies can be used against autoimmune diseases and metastatic cancer.

Nobel Prize in Chemistry press release: <https://www.nobelprize.org/uploads/2018/10/press-chemistry2018.pdf>