

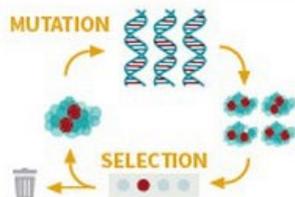
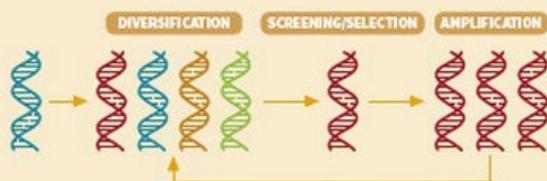
This year 2018, after 26 years of working with this methodology, I am proud that your researchers were chosen among those awarded with the chemistry Nobel prize. The American [George Smith](#) received the Chemistry Nobel Prize, who in 1985 invented this methodology and the British [Gregory Winter](#) who remarkably contributed to its development. The other half of the Chemistry Nobel Prize of this year was awarded to the American [Frances H. Arnold](#) (fifth woman to receive the Chemistry Nobel Prize) and who in 1993 made the first directed evolution of enzymes which are proteins catalyzing chemical reactions. Since then, the methods have been refined which are usually used to develop new catalyzers.

The Academy emphasizes that with her work the awardees have undertaken the control of evolution and have used it for better benefit of humanity. Enzymes produced by means of directed evolution are used to manufacture any type of products, from biofuel to drugs. Antibodies evolved by means of phage display may cure autoimmune diseases and, in some cases, cure metastatic tumors.

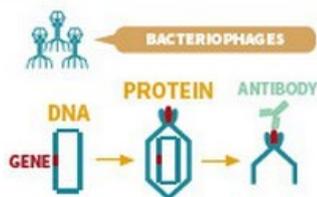
Many are the pharmaceutical products useful for men that have been developed with this methodology and represent a simple and economical way of improving the affinity among interactions of proteins greatly used in life sciences.

# 2018 NOBEL PRIZE IN CHEMISTRY

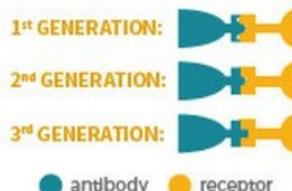
The Nobel Prize In Chemistry 2018 was awarded to **Frances H Arnold, George P Smith and Sir Gregory P Winter** for their use of directed evolution to produce new enzymes and antibodies.



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>



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