How did CRISPR’s discovery transform genetic research?

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CRISPR as two components. The first is essentially a cellular scalpel that cuts DNA. The other consists of RNA, the molecule most often used to transmit biological information throughout the genome. It serves as a guide, leading the scalpel on a search past thousands of genes until it finds and fixes itself to the precise string of nucleotides it needs to cut. It has been clear at least since Louis Pasteur did some of his earliest experiments into the germ theory of disease, in the nineteenth century, that the immune systems of humans and other vertebrates are capable of adapting to new threats. But few scientists had considered the possibility that single bacterial cells could defend themselves in the same way.

It didn’t take Harvard biologist Feng Zhang or other scientists long to realize that, if nature could turn these molecules into the genetic equivalent of a global positioning system, so could we. Researchers soon learned how to create synthetic versions of the RNA guides and program them to deliver their cargo to virtually any cell. Once the enzyme locks onto the matching DNA sequence, it can cut and paste nucleotides with the precision we have come to expect from the search-and-replace function of a word processor. “This was a finding of mind-boggling importance,” Zhang told me. “And it set off a cascade of experiments that have transformed genetic research.”

Read full, original post: The Gene Hackers