Why is CRISPR important- what can we expect in the future

Diane Singhroy, PhD.
Knowledge Ecology International
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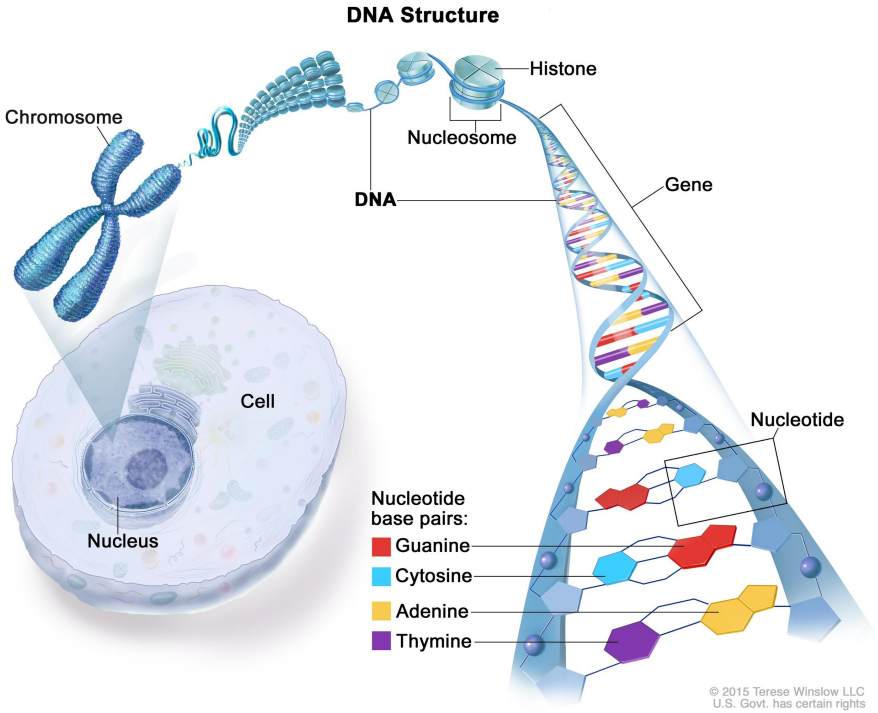
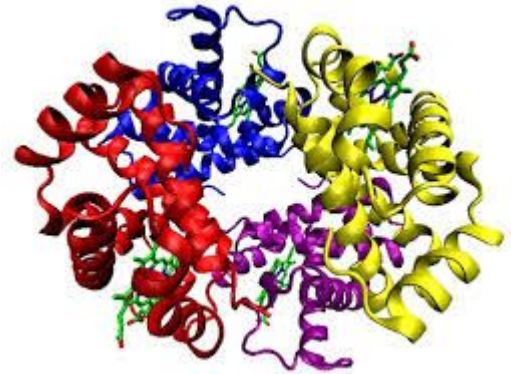
Our genes make us who we are





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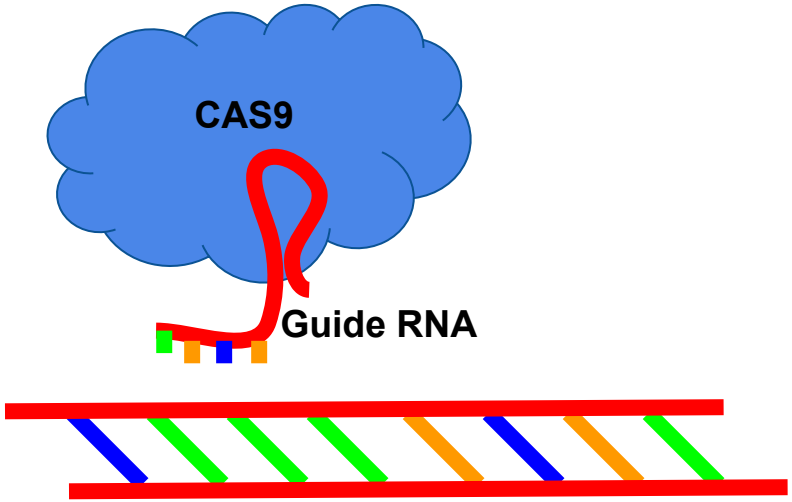
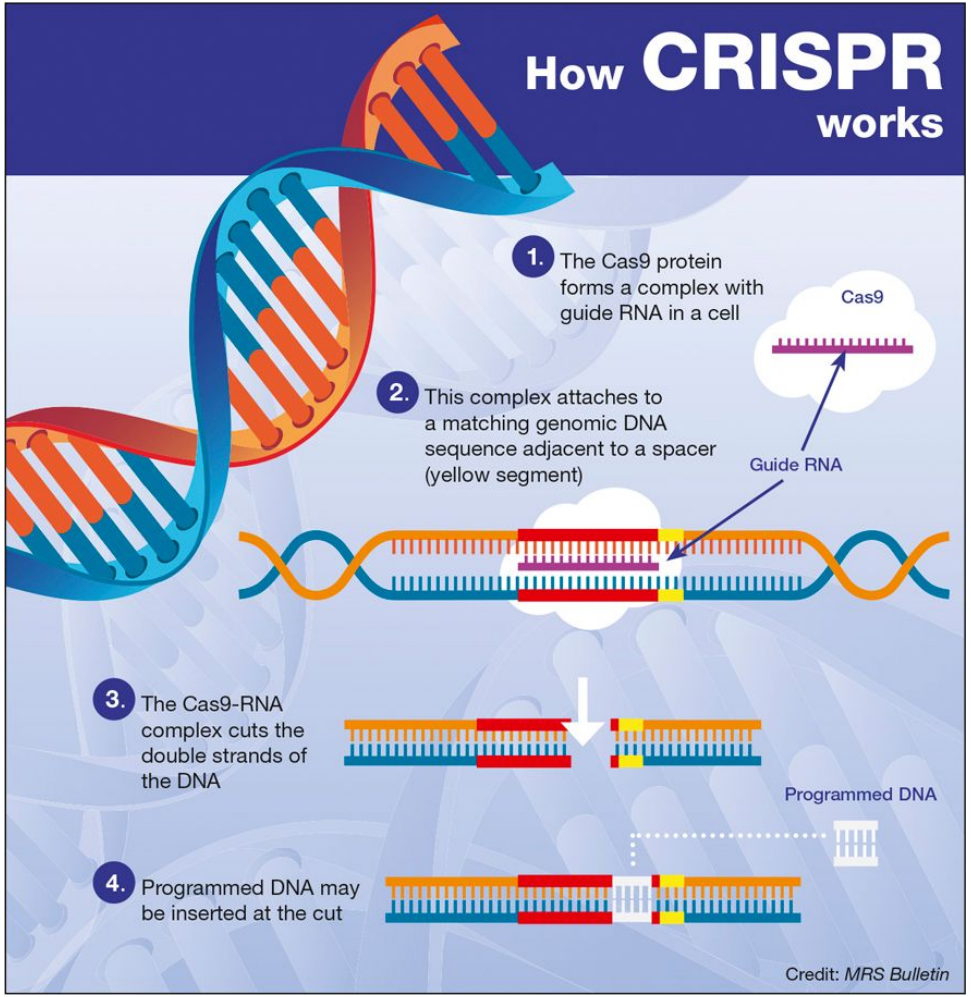
CRISPR/CAS9





(Ball, Cambridge. 2016)

Why is CRISPR such a game changer?

- Time (weeks to years)
- Precision
- Versatility
- Cheaper (thousands to hundreds$$)

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What can we do with CRISPR Technology?

- Develop newer better CRISPR
- Delivery mechanism
- RESEARCH genes
- Gene editing in genetic disease
- Somatic vs Germline
- Libraries, screens
- Food industry
- Gene editing of plants/ crops

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Current applications

- Engineer mosquitoes to become resistant to malaria. his resistance is even passed to subsequent generations when the engineered mosquitoes mate with ‘normal’ (wild type) mosquitoes.
- Cut out pieces of the embedded viral genome of HIV forever silencing the virus. Trying to apply this to hepatitis B virus, human papillomavirus, and herpes virus
- Knock out porcine endogenous retroviruses, making future transplants with porcine organs much safer,
- When CRISPR is combined with current molecular tools such as high throughput functional screens, for example, CRISPR-cas9 can be adapted to comprehensively identify new cancer drug targets.

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CRISPR in Clinical Trials

- First in human use of CRISPR occurred in China, in October 2016 to treat lung Cancer. A gene in immune cells was switched off, using CRISPR, to make it resistant to cancer immunosuppression strategies.

- By May 2017 there was 20 trials, including on HPV, CAR T

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Thank you

diane.singhroy@keionline.org

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