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Sculpting the genome and beyond: novel tools for DNA and RNA targeting

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Stellingen behorende bij het proefschrift

Sculpting the Genome and Beyond

1. CRISPR effectors are the tool to manipulate nucleic acids. (*this thesis*)
2. The endogenous DNA repair mechanisms can be directed and exploited by specific genome editing strategies. (*this thesis*)
3. Investigating the structures of diverse prime editor variants provides insights to enhance the prime editing efficiency. (*this thesis*)
4. To understand how endogenous mechanisms deal with the PE-created DNA flaps will bring an opportunity to further improve the prime editing efficiency. (*this thesis*)
5. The CRISPR effectors possessing an inducible trans-cleavage ability can potentially be utilized in cancer therapy. (*this thesis*)
6. From base editors and prime editor, the concept of CRISPR effector-carried functional domain is greatly extending the application scope of 'genome editing'. (*Chen et al., Nature Biotechnology, 2022*)
7. Future research should address the challenges of low editing efficiency, off-target effects, and delivery strategies in CRISPR-Cas technology to maximize its potential in both research and the therapeutic applications. (*Jennifer A. Doudna, Nature, 2020*)
8. The trend of genome editing tools is moving from DNA repair-dependent to DNA repair-independent strategies, offering more precise and efficient editing possibilities. (*Anzalone et al., Nature Biotechnology, 2020*)
9. "have no doubt, this technology will – someday, somewhere – be used to change the genome of our own species in ways that are heritable, forever altering the genetic composition of human kind." – *Jennifer A. Doudna, A Crack in Creation: Gene Editing and the Unthinkable Power to Control Evolution*
10. In science, even a little success needs substantial efforts. Yet, these little successes create the sense of accomplishment and become a source of sustainable passion.
11. The world's complexity lies in the shades of grey, where the magic of scientific exploration thrives. Embracing ambiguity, we unveil new insights and enrich our understanding, discovering the true beauty of life within these nuances.