

Seeking a Treatment for Huntington's Disease:

A brief update on HD gene modification research
at the UC Davis Institute for Regenerative Cures

Kyle Fink, Ph.D.

NRSA Ruth L Kirschstein Postdoctoral Fellow

Stem Cell Program

Institute for Regenerative Cures

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Huntington's disease (HD) is an autosomal dominant genetic disorder caused by an expansion of a specific region of the DNA. Although the exact gene location and sequence has been known since 1993, today there are still no effective treatments that specifically target this gene mutation.

Every human being has two huntingtin genes, one inherited from each parent. For disease onset to occur, only one of these genes has to contain this mutated expansion. Since the normal huntingtin protein is essential for human development and for normal cellular functioning in adulthood, completely removing both the mutant and healthy genes is not an option as this would do more harm than good.

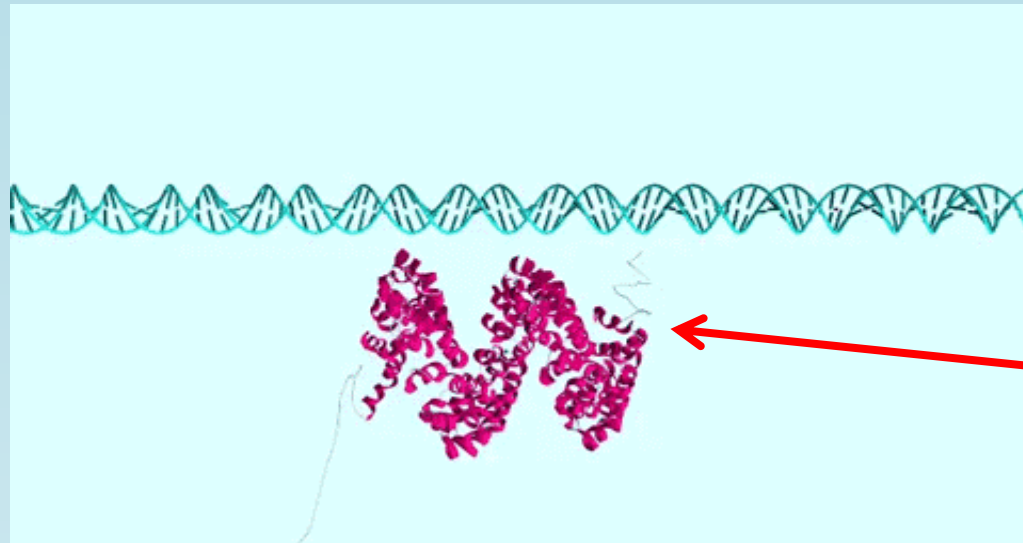
Our new research platform involves creating proteins in our lab that can specifically recognize and bind to *only* the mutant gene. These proteins are called Transcription Activator-Like Effectors, or TALEs. They can be paired with a variety of other proteins and engineered to turn on or enhance a gene, to cut out a piece of the DNA, or to silence that gene from being expressed.

In the Nolta lab at the UC Davis Institute for Regenerative Cures, we are using this technology to develop two treatment avenues:

1. To reduce the length of the mutant gene expansion and restore it to a normal length.
2. To specifically bind and silence the mutant gene.

Our preliminary results using human skin cells derived from HD patients show great promise, indicating that our treatment can target the mutant HD gene and restore some of the normal function. Although these results are very preliminary and much work lies ahead to study the safety and effectiveness of our TALE research, we feel that this platform may hold great promise for those suffering from Huntington's disease, and we are planning future studies of TALEs using HD transgenic mouse models.

Transcription Activator-Like Effectors

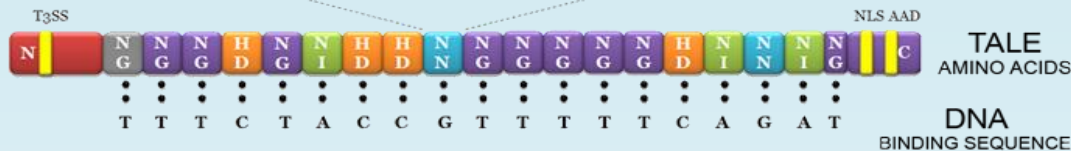


DNA

TALE designed to recognize and bind to specific gene sequence

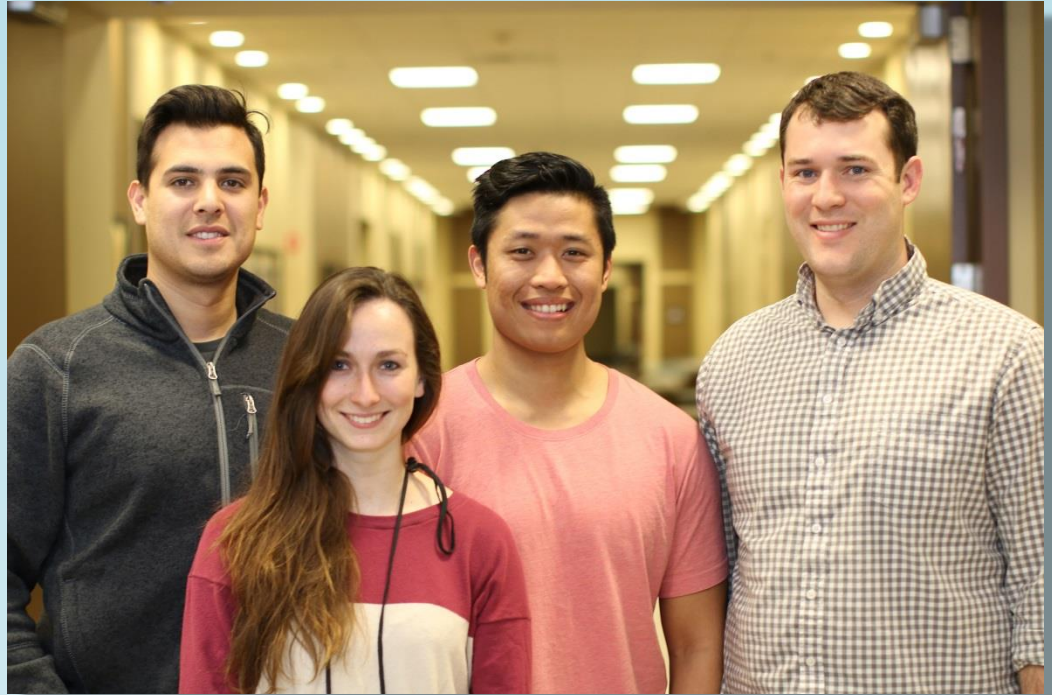


TALE binding to DNA



Thank you!

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