

# Novel Repressor Proteins for Gene Regulation and CRISPRi

---

## A solution to CRISPRi's limitations

The current gold standard for decreasing gene expression in human cells is to use a dCas9-Zim3KRAB, a dCas9-10 KOX1KRAB, or a dCas9-KOX1KRAB+MeCP2 protein that can be targeted to a gene's promoter and shut down its expression. The current CRISPRi limitations include incomplete gene knockdown, sgRNA sequence-dependent repression activity, and variable performance across human cancer cell lines. Therefore, what is needed is new CRISPR interference system that addresses these issues.

## A new CRISPRi platform to develop CRISPR-based therapeutic agents

This invention is comprised of methods and compositions of a new Cas CRISPR gene interference (CRISPRi) platform that uses novel fusion proteins to target a gene's promoter for inhibition and/or deletion. The central aim of this technology is to enable the development of CRISPR-based therapeutic agents.

## Summary Bullets

- The new CRISPRi platform uses novel fusion proteins to specifically inhibit target genes of interest and overcome the off-target issues with existing CRISPR platforms already on the market.
- The technology can be used as a life science tool and/or for diagnostics and therapeutics.
- The platform aims to limit off-target editing, circumvent incomplete gene knockdown sgRNA sequence-dependent repression activity, and variable performance across human cancer cell lines.

## Potential Commercial Applications

- A novel CRISPRi platform that uses novel fusion proteins to specifically inhibit target genes of interest.
- Potential to overcome the off-target issues with existing CRISPR platforms already on the market.
- Use as a life science tool and/or for diagnostics and therapeutics.
- Invention aims to limit off-target editing, circumvent incomplete gene knockdown sgRNA sequence-dependent repression activity, and variable performance across human cancer cell lines

## **Inventors**

- Dr. John Blazeck  
Assistant Professor - Georgia Tech School of Chemical and Biomolecular Engineering

## **IP Status**

<p>Patent application has been filed</p>:

## **Publications**

, -

## **Images**

Visit the Technology here:

[Novel Repressor Proteins for Gene Regulation and CRISPRi](#)

---

<https://s3.sandbox.research.gatech.edu//index.php/print/pdf/node/4242>