

The FASEB Journal / Volume 34, Issue S1 / p. 1-1

Biochemistry and Molecular Biology | [Free Access](#)

Endogenous Promoters enable efficient CRISPR/Cas9 in a Tilapia Cell Line Model

Jens Hamar, Dietmar Kultz

First published: 18 April 2020

<https://doi.org/10.1096/fasebj.2020.34.s1.06516>

Abstract

Cell cultures are effective supplemental models to study specific biochemical pathways used for environmental adaption in animals. They enable isolation from system influence and facilitate control of the extracellular environment. The recent rise of CRISPR/Cas9 gene editing has provided an additional powerful tool to aid in these studies. For work focusing on fish species many fish cell lines now exist. However, conventional tools and methods for implementing CRISPR/Cas9 gene targeting in these cells doesn't always provide sufficient results as seen in other animal cell models. A tilapia brain cell line (OmB) developed in our lab has proven useful for gene expression studies. Previous work with multiple conventional methods attempting to apply CRISPR/Cas9 failed to indicate genomic alteration at the targeted sites. Here we present a plasmid vector based system utilizing both Polymerase II and III tilapia endogenous promoters that enables proficient gene targeting. This system demonstrated efficient cleavage in most target sites attempted with efficiency as high as 80%. These tools will allow generation of knockout cell lines for gene targeting studies in tilapia and other phylogenetically related fish species.

Support or Funding Information

This study was funded by a grant from NSF (IOS-1656371) and BARD (IS-48000-ISR).



© 2021 Federation of American Societies for Experimental Biology (FASEB)

About Wiley Online Library

[Privacy Policy](#)
[Terms of Use](#)

[Cookies](#)
[Accessibility](#)

[Help & Support](#)

[Contact Us](#)
[Training and Support](#)
[DMCA & Reporting Piracy](#)

[Opportunities](#)

[Subscription Agents](#)
[Advertisers & Corporate Partners](#)

[Connect with Wiley](#)

[The Wiley Network](#)
[Wiley Press Room](#)

Copyright © 1999-2021 John Wiley & Sons, Inc. All rights reserved