



Does CASZ1 play a role in regulating photoreceptor genes?

Blessy Mikhail and Pierre Mattar

Undergraduate research at OHRI, Faculty of Medicine, University of Ottawa

1

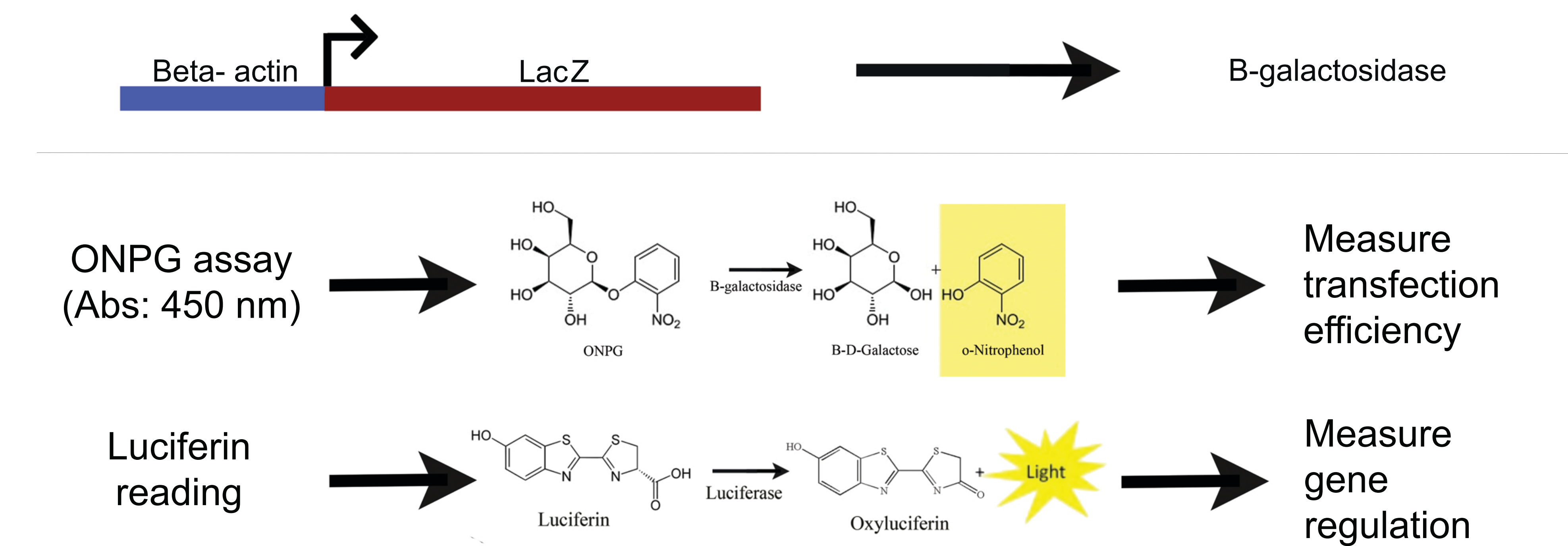
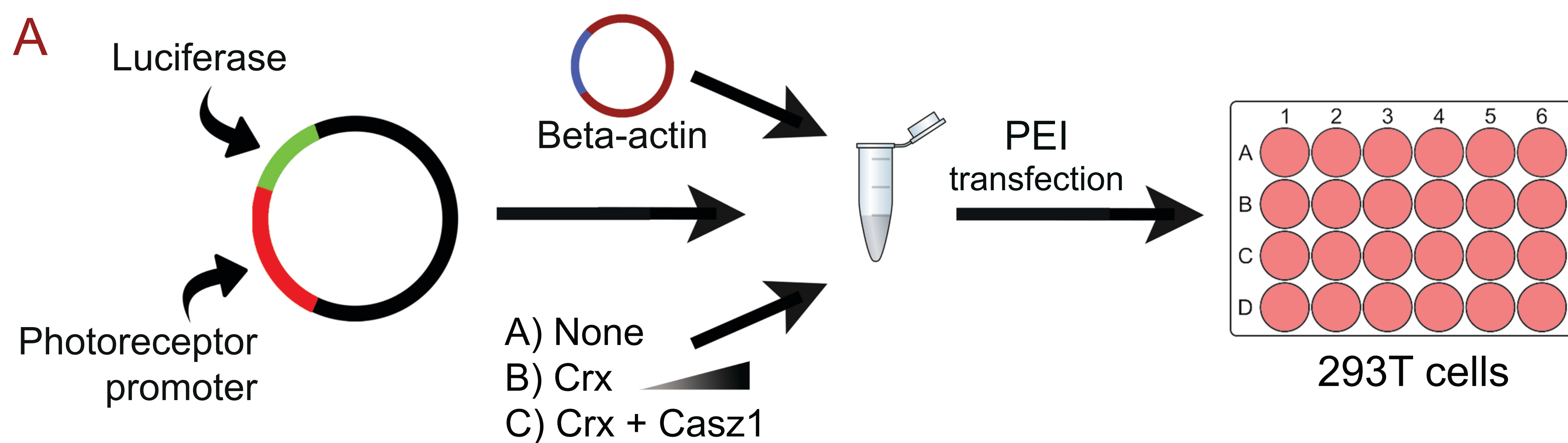
BACKGROUND

Transcription factors found in human retinal cells, such as Crx, are involved in regulation of photoreceptor genes and other processes such as rod differentiation. Although Casz1 is known to play a role in rod cell differentiation¹, its role in regulating photoreceptor genes - rhodopsin and s-opsin - is still unclear. Perhaps gaining insight into photoreceptor regulation by Casz1 might shed more light on photoreceptor degeneration in diseases such as retinitis pigmentosa.

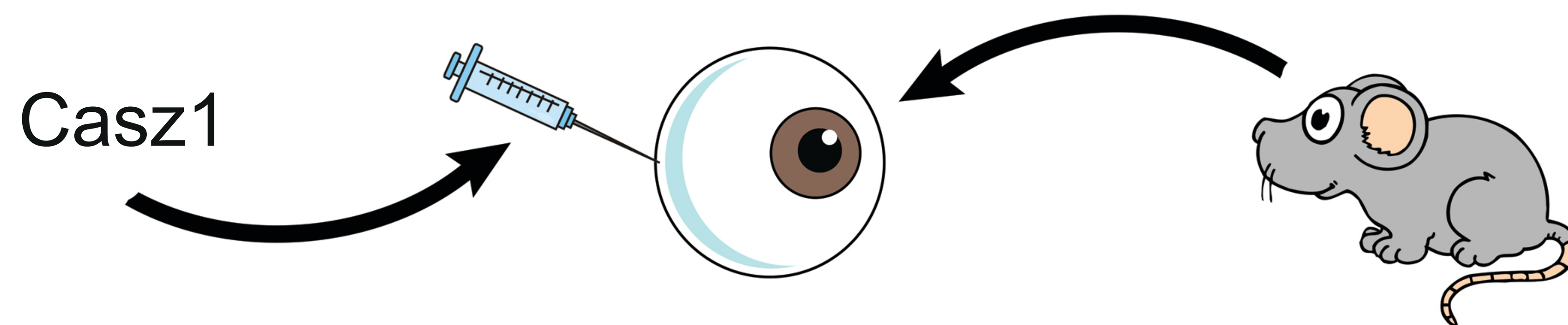


2

METHODS



B



4

CONCLUSION

- Transfections of 293T and mouse retinal cells were successful
- Increased concentrations of Crx seems to down regulate photoreceptor gene expression in 293T cells
- Mice retinal cell transfections suggest that Casz1 increases expression of both rhodopsin and s-opsin photoreceptor genes

5

FUTURE DIRECTIONS

Given that repeats of this experiment yield reliable results, understanding how Casz1 affects photoreceptor gene regulation might provide insight into photoreceptor degradation in diseases such as retinitis pigmentosa.

3

RESULTS

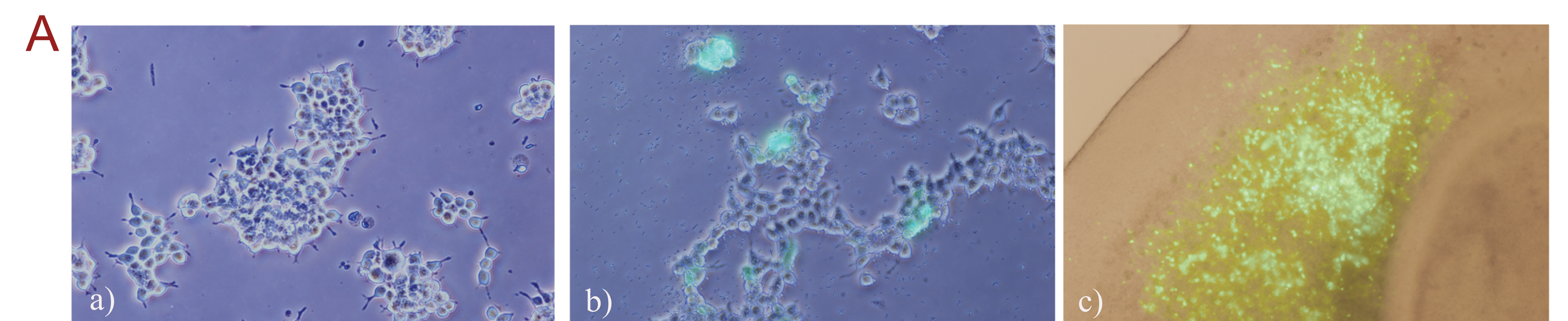


Figure 1: GFP is absent in a) untransfected 293T cells, but present in transfected b) 293T and c) mouse retinal cells.

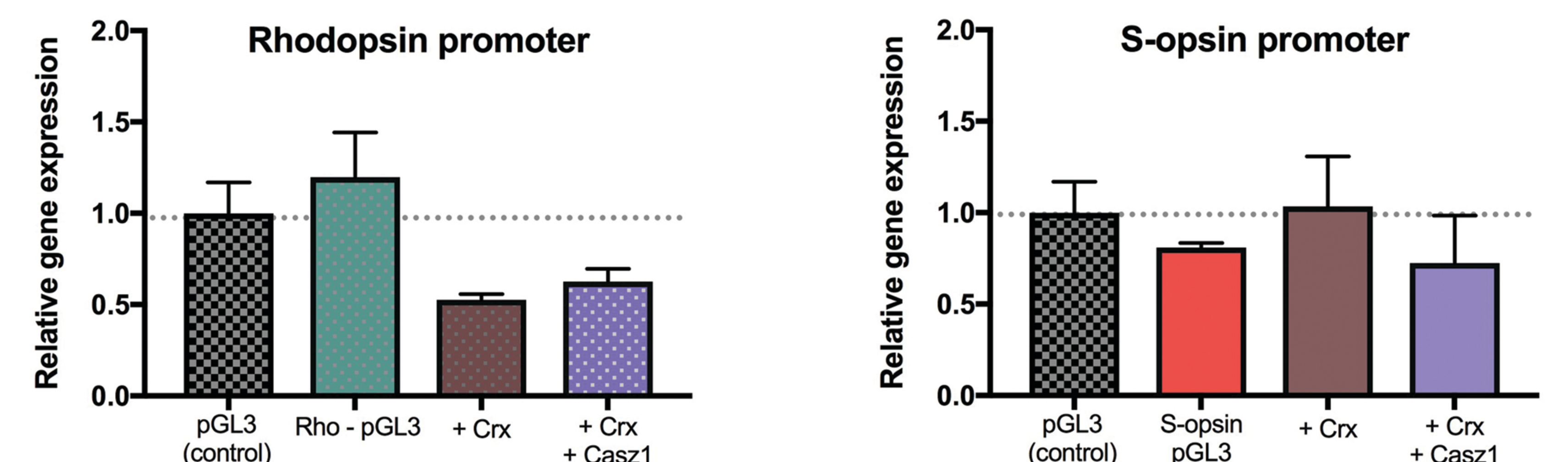


Figure 2: Crx and Casz1 transcription factors affect Rhodopsin and S-opsin gene expression in transfected 293T cells

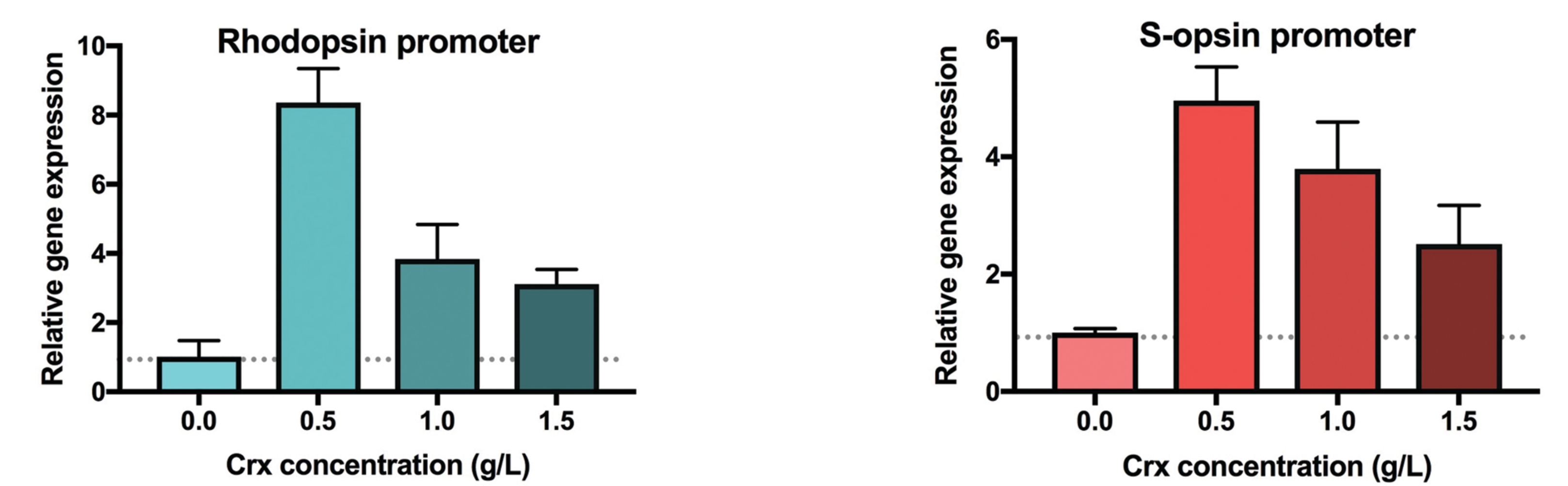


Figure 3: Effects of increasing Crx concentrations on Rhodopsin and s-opsin photoreceptor gene expression.

B

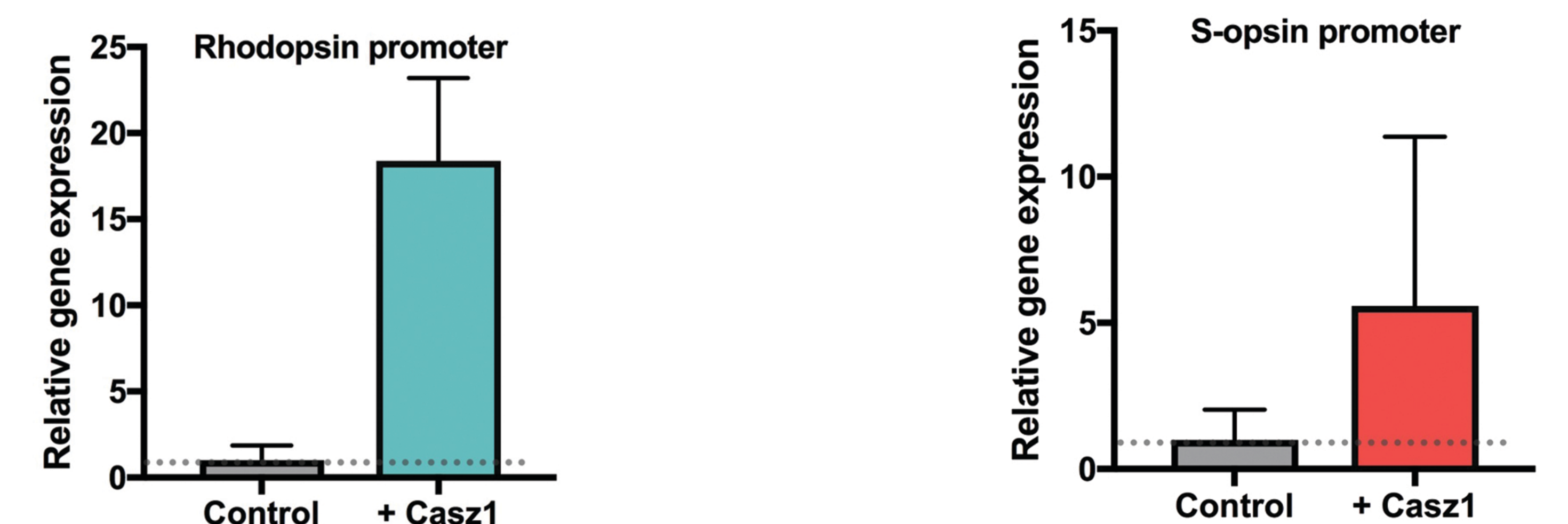


Figure 4: Effects of Casz1 on photoreceptor gene expression in transfected mouse retinal cells

6

REFERENCES

1. Mattar P., Ericson J., Blackshaw S., Cayouette M. (2015). A conserved regulatory logic controls temporal identity in mouse neural progenitors. *Neuron* 85, 497–504.