

Accepted Manuscript

Title: Spectral properties of the zebrafish visual motor response

Authors: Charles E. Burton, Yangzhong Zhou, Qing Bai, Edward A. Burton



PII: S0304-3940(17)30204-5
DOI: <http://dx.doi.org/doi:10.1016/j.neulet.2017.03.002>
Reference: NSL 32690

To appear in: *Neuroscience Letters*

Received date: 18-12-2016
Revised date: 28-2-2017
Accepted date: 1-3-2017

Please cite this article as: Charles E. Burton, Yangzhong Zhou, Qing Bai, Edward A. Burton, Spectral properties of the zebrafish visual motor response, *Neuroscience Letters* <http://dx.doi.org/10.1016/j.neulet.2017.03.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Spectral properties of the zebrafish visual motor response

Charles E. Burton^a, Yangzhong Zhou^{b, c, d}, Qing Bai^{b, c}, Edward A. Burton^{b, c, *}

^aWinchester Thurston School, Pittsburgh, PA, USA

^bPittsburgh Institute for Neurodegenerative Diseases, University of Pittsburgh, Pittsburgh, PA, USA

^cDepartment of Neurology, University of Pittsburgh, Pittsburgh, PA, USA

^dTsinghua University Medical School, Beijing, China

* Correspondence to: E. A. Burton, 7015 BST-3, 3501 Fifth Avenue, Pittsburgh, PA, 15213, eab25@pitt.edu

Highlights:

- Zebrafish show stereotypical motor responses to changes in illumination
- We characterized the spectral properties of the visual motor response (VMR)
- Light at 399nm, 458nm, 514nm or 632nm elicited the characteristic phases of the VMR
- Components of the VMR were differentially elicited by discrete light wavebands
- Distinct photoreceptor populations likely mediate different components of the VMR

Abstract:

Larval zebrafish react to changes in ambient illumination with a series of stereotyped motor responses, called the visual motor response (VMR). The VMR has been used widely in zebrafish models to analyze how genetic or environmental manipulations alter neurological function. Prior studies elicited the VMR using white light. In order to elucidate the underlying afferent pathways and to identify light wavelengths that elicit the VMR without also activating optogenetic reagents, we employed calibrated narrow-waveband light sources to analyze the spectral properties of the response. Narrow light wavebands with peaks between 399nm and 632nm triggered the characteristic phases of the VMR, but there were quantitative differences between responses to different light wavelengths at the same irradiant flux density. The O-bend component of the VMR was elicited readily at dark onset following illumination in 399nm or 458nm light, but was less prominent at the transition from 632nm light to dark.

Download English Version:

<https://daneshyari.com/en/article/5738703>

Download Persian Version:

<https://daneshyari.com/article/5738703>

[Daneshyari.com](https://daneshyari.com)