

Accepted Manuscript

Title: Physiological identification of cortico-striatal projection neurons for song control in Bengalese finches

Authors: Neal A. Hessler, Kazuo Okanoya

PII: S0166-4328(17)31942-3
DOI: <https://doi.org/10.1016/j.bbr.2018.04.044>
Reference: BBR 11410

To appear in: *Behavioural Brain Research*

Received date: 6-12-2017
Revised date: 8-4-2018
Accepted date: 25-4-2018

Please cite this article as: Hessler NA, Okanoya K, Physiological identification of cortico-striatal projection neurons for song control in Bengalese finches, *Behavioural Brain Research* (2018), <https://doi.org/10.1016/j.bbr.2018.04.044>

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.



Physiological identification of cortico-striatal projection neurons for song control in Bengalese finches

Neal A. Hessler^L, Kazuo Okanoya^{L,2}

1 Department of Life Sciences, Graduate School of Arts and Sciences, The University of Tokyo, Tokyo, Japan

2 Cognition and Behavior Joint Laboratory, RIKEN Brain Science Institute, Saitama, Japan

HIGHLIGHTS

- Bengalese finch cortico-striatal HVC projection neurons have distinct spike waveforms
- Units with such waveforms fire phasically during singing of specific syllables
- The same units fire more weakly at the same points during passive song playback

ABSTRACT

The avian song system is a group of brain areas specialized for vocal learning and production of song. A major cortical control area, HVC, projects both to a motor output circuit and to a striatal area in the anterior forebrain pathway. These projections are made by two groups of neurons, with mainly distinct roles in either programming vocal production or regulating vocal plasticity. In order to distinguish these two types of projection neurons in singing birds, we recorded unit activity in HVC of anesthetized birds, while stimulating in the anterior forebrain nucleus Area X. HVC units identified in this way had a distinct spike waveform, with a much longer duration positive peak than an initial negative one. We further found that units with a very similar spike waveform were phasically active during singing, firing at specific points of a limited number of song syllables. These units were also less active when birds only heard their own song, during the same syllables. While similar results from anesthetized and awake recordings have been reported in previous studies, the combination of both types of experiments here may be useful as a basis for identifying HVC neurons projecting to Area X based on their spike waveforms, and aid further study of their role in song learning and control.

Abbreviations

DLM, dorsal lateral nucleus of the medial thalamus; HVC-RA, HVC neuron projecting to RA; HVC-X, HVC neuron projecting to Area X; LMAN, lateral magnocellular nucleus of the nidopallium, MF,

Download English Version:

<https://daneshyari.com/en/article/8837713>

Download Persian Version:

<https://daneshyari.com/article/8837713>

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