

## Supplementary Information

### Electroretinography Reveals Difference in Cone Function between Syndromic and Nonsyndromic *USH2A* Patients

Jesse D Sengillo<sup>1,2,3</sup>, Thiago Cabral<sup>1,2,4,5</sup>, Kaspar Schuerch<sup>1,2</sup>, Jimmy Duong<sup>6</sup>, Winston Lee<sup>1,2</sup>, Katherine Boudreault<sup>1,2,7</sup>, Yu Xu<sup>8</sup>, Sally Justus<sup>1,2</sup>, Janet R Sparrow<sup>2,9</sup>, Vinit B Mahajan<sup>10</sup>, Stephen H Tsang<sup>1,2,9\*</sup>

<sup>1</sup>Jonas Children's Vision Care, and Bernard & Shirlee Brown Glaucoma Laboratory, Department of Ophthalmology, Columbia University Medical Center, New York, NY, USA

<sup>2</sup>Edward S. Harkness Eye Institute, New York-Presbyterian Hospital, New York, NY, USA

<sup>3</sup>State University of New York Downstate Medical Center, Brooklyn, NY, USA

<sup>4</sup>Department of Ophthalmology, Federal University of Esp rito Santo, Vit ria, Brazil

<sup>5</sup>Department of Ophthalmology, Federal University of S o Paulo, S o Paulo, Brazil

<sup>6</sup>Department of Biostatistics, Columbia University, New York, NY, USA

<sup>7</sup>Department of Ophthalmology, University of Montreal, Montreal, Que., Canada

<sup>8</sup>Department of Ophthalmology, Xin Hua Hospital affiliate of Shanghai Jiao Tong University School of Medicine, Shanghai, China.

<sup>9</sup>Department of Pathology & Cell Biology, Stem Cell Initiative (CSCI), Institute of Human Nutrition, College of Physicians and Surgeons, Columbia University, New York, NY, USA.

<sup>10</sup>Omics Laboratory, Byers Eye Institute, Department of Ophthalmology, Stanford University, Palo Alto, CA, USA

\*Corresponding author

Running title: Cone Function in *USH2A* Patients

Address Correspondence:

Stephen H. Tsang, MD, PhD

Harkness Eye Institute

635 West 165<sup>th</sup> Street, Box 212, New York, NY 10032

Phone: (212) 342-1189 / Fax: 212-305-4987 / Email: sht2@columbia.edu

Supplemental Figure 1.



Supplemental Fig. 1. *Retinal imaging of an USH2A patient with normal audiometry.* Digital color fundus photography montage of the right (*a*) and left (*b*) eyes showing rare intraretinal pigment migration, pale discs, attenuated vasculature, and peripheral mottling. SW-AF imaging shows an autofluorescent ring in both eyes (*c*, *d*). SD-OCT of the right and left eyes (*e* and *f*) shows typical loss of outer nuclear layer in the periphery and sparing of the ellipsoid zone in the center macula.

Supplemental Table 1. All *USH2A* mutations in Patient Cohort

<i>dbSNP</i>	<i>Exon</i>	<i>Intron</i>	<i>Nucleotide change</i>	<i>Protein variant</i>	<i>Coding effect</i>
--	6		c.895delC	p.(Gln299Asnfs*37)	frameshift
rs397517963	6		c.1000C>T	p.(Arg334Trp)	missense
rs756570931	8		c.1478A>G	p.(Tyr493Cys)	missense
rs483353054	10		c.1724G>A	p.(Cys575Tyr)	missense
rs80338902	13		c.2276G<T	p.(Cys759Phe)	missense
rs80338903	13		c.2299delG	p.(Glu767Serfs*21)	frameshift
--	17		c3476C>T	p.(Pro1159Leu)	missense
--	17		c.3713C>G	p.(Thr1238Arg)	missense
--	19	19	c.4251+1G>A	p.(?)	--
--	22		c.4711G>C	p.(Ala1571Pro)	missense
--	29		c.5848A>G	p.(Thr1950Ala)	missense
--	30	30	c.6049+2T>G	p.(?)	--
--	42		c.8442_8443insT	p.(Thr2815Tyrfs*20)	frameshift
rs372347027	44	43	c.8682-9A>G	p.(?)	--
rs73090721	48		c.9459C>A	p.(Cys3153*)	nonsense
rs760858249	49		c.9676C>T	p.(Arg3226*)	nonsense
--	50	49	c.9740-1G>T	p.(?)	--
rs148660051	51		c.10073G>A	p.(Cys3358Tyr)	missense
rs202175091	54		c.10712C>T	p.(Thr3571Met)	missense
rs111033418	55		c.10759C>T	p.(Gln3587*)	nonsense
--	61		c.11918delC	p.(Ala3973Valfs*11)	frameshift
rs750396156	63		c.12574C>T	p.(Arg4192Cys)	missense
rs199605265	63		c.12575G>A	p.(Arg4192His)	missense
rs527236137	63		c.13010C>T	p.(Thr4337Met)	missense
rs768161313	63		c.13112_13115delAAAT	p.(Gln4371Argfs*19)	frameshift
--	63		c.13223T>C	p.(Val4408Ala)	missense
--	63		c.13231C>G	p.(Leu4411Val)	missense
--	63		c.13491_13499dupTACTCTCAC	p.(Thr4498_Thr4500dup)	in-frame
--	64		c.13943delG	p.(Gly4648Aspfs*30)	frameshift
rs397517990	65		c14287G>A	p.(Gly4763Arg)	missense
--	72	71	c.15520-22_15524del27	p.(?)	--

Supplemental Table 2. Functional and structural indices of a 41-year old female with normal audiometry and NSRP due to biallelic *USH2A* mutations.

<b>ffERG parameter</b>	<b>OD</b>	<b>OS</b>	<b>Comments</b>
<i>Scotopic B-wave Amplitude (<math>\mu\text{V}</math>)</i>	122	143	<i>dtl</i>
<i>30 Hz Flicker Amplitudes (<math>\mu\text{V}</math>)</i>	52	74	<i>dtl</i>
<i>30 Hz Flicker Implicit Time Delay (ms)</i>	31 <sup>d</sup>	32 <sup>d</sup>	<i>dtl</i>
<i>Ellipsoid Zone-line Length (<math>\mu\text{m}</math>)</i>	3661	3810	--
<i>Horizontal ring diameter (<math>\mu\text{m}</math>)</i>	4784	4564	--
<i>Vertical Ring Diameter (<math>\mu\text{m}</math>)</i>	4145	3822	--