User Manual: Retina Phantom with Model Eye for Ophthalmic Optical Coherence Tomography (OCT) Devices

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User Manual: Retina Phantom with Model Eye for Ophthalmic Optical Coherence Tomography (OCT) Devices

Introduction

This document describes the materials and methods to assemble and image a commercially-available model eye installed with a retina phantom already fabricated per [1].

Reference

Baxi J, Calhoun W, Sepah YJ, Hammer DX, Ilev I, Joshua Pfefer T, Nguyen QD, Agrawal A. Retina-simulating phantom for optical coherence tomography. Journal of Biomedical Optics. 2014 Feb 1;19(2):021106.

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Materials

Item	Amount/ Quantity	Supplier (Product ID)	Image
Model eye	1	Ocular Instruments (OEMI-7)	
Model eye wrench (or equivalent spanner wrench)	1	Ocular Instruments (OEMI-T)	
Retina phantom in Delrin base	1	FDA	

Plastic bucket, 2L or larger (large enough for two human hands)	1	Many	N/A
Distilled water	~2L (enough to fill bucket 2/3)	Many	N/A
Model eye bracket	1	Ocular Instruments (OEMB1)	

ASSEMBLY INSTRUCTIONS

1. Fill the bucket with distilled water about 2/3 to the top, so that when both hands are inside the water does not spill out.
2. Unscrew the anterior chamber from the model eye with the assembly tool and remove the lens with its rubber gasket from the anterior chamber. Note the orientation of the lens in the anterior chamber for later reassembly.
3. Place the anterior chamber and lens in the water bucket for 2 hours to let air pockets escape. The anterior chamber should be face down so bubbles float out the back.
4. Press the lens back onto the anterior chamber in the correct orientation noted in step 2.
5. Place the phantom in its Delrin base into the model eye posterior chamber and into the water bucket. Fit the model eye o-ring onto the posterior chamber.
6. Attach the anterior chamber to the posterior chamber with the assembly tool.

IMAGING SETUP INSTRUCTIONS

1. Attach model eye bracket OEMB1 to OCT device via horizontal clamping screw indicated with blue arrow in Figure 1 below.
2. Attach model eye to bracket by loosening screw indicated with green arrow in Figure 1, inserting model eye peg into hole beneath this screw, and then re-tightening screw.
3. Slide model eye horizontally along bracket as needed by loosening screw beneath peg hole indicated with red arrow in Figure 1.
4. Example scanning laser ophthalmoscope (SLO) and OCT images from Heidelberg Spectralis device are shown in Figure 2.

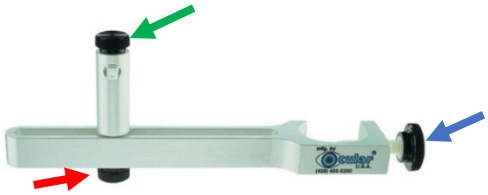

Figure 1. OEMB1 model eye bracket

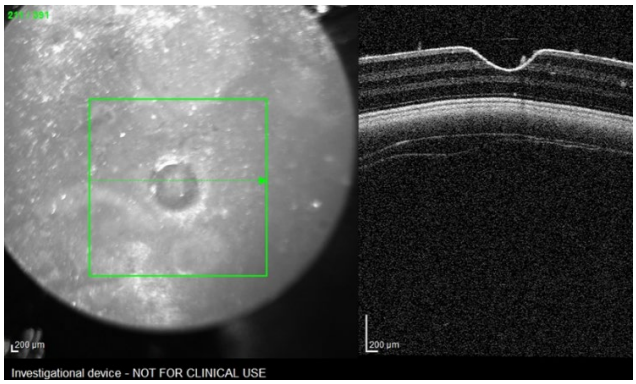

Figure 2. Scanning laser ophthalmoscope (left) and OCT (right) images of retina phantom inside model eye.

USAGE NOTES

1. Check for bubbles inside the model eye prior to each use.
2. Clean the outside corneal surface of the model eye with lens paper and alcohol solution. Do not use acetone as this can etch the plastic.
3. Model eye should always be shipped and stored inside its case. Model eye may be shipped with water inside if temperatures remain above freezing.