MCW researchers find “color-correcting glasses” don’t live up to the hype

May 16, 2016 MCW News - In the first controlled study of glasses marketed to allow those with colorblindness to better perceive color, Medical College of Wisconsin (MCW) vision researchers have found that the glasses do not improve color discrimination for people with red-green color vision deficiency. The research, led by University of Wisconsin-Green Bay student Rebecca Mastey, who came to MCW in 2015 as part of the Summer Program for Undergraduate Research under the supervision of Joseph Carroll, PhD, the Richard Schultz, MD/Ruth Works Professor in Ophthalmology, professor of ophthalmology & visual sciences, biophysics and cell biology, neurobiology and anatomy, and co-director of the Advanced Ocular Imaging Program at MCW, was presented in a poster May 1 at the annual meeting of the Association for Research in Vision and Ophthalmology in Seattle.

Red-green color vision deficiency (CVD) is a hereditary condition and the most common type of color blindness, affecting about 8 percent of men with Northern European ancestry, according to the National Institutes of Health. People with red-green CVD experience abnormalities or a complete loss of function in the color-detecting molecules, called photopigments. Depending on which color photopigments are abnormal or nonfunctional, a person with red-green CVD might see redder hues of yellow and green, reds as brownish yellow and greens as beige, or even reds as black.

Recently, two companies, EnChroma and O2Amp, have produced glasses using different technologies marketed to help those with colorblindness better perceive color. While EnChroma touts that with their glasses, a person’s “experience of color vision is fundamentally transformed,” O2Amp claims to “restore near-normal color perception.” To examine their effectiveness, Mastey, Carroll and colleagues recruited 27 men with genetically confirmed red-green CVD and gave them the Color Assessment and Diagnosis test with and without the color-correcting glasses.

While the participants with limited or complete loss of function with their green photopigments saw some improvement in their ability to discriminate between colors along the red-green spectrum with the O2Amp glasses, those with no working red photopigments saw no significant effect using O2Amp’s product. Meanwhile, the EnChroma glasses had no significant impact on the red-green color discrimination of any of the participants; and for those with green photopigment abnormalities, the glasses actually resulted in poorer yellow-blue discrimination.

“The data confirm that these glasses don’t work,” says Dr. Carroll. “In fact, they make some aspects of your vision worse.”

Additional co-authors of the poster include Emily J. Patterson, PhD, postdoctoral fellow, and Phyllis Summerfelt, lab manager, of the MCW Department of Ophthalmology & Visual Sciences Advanced Ocular Imaging Program; Jolene Luther, former MCW Neuroscience Doctoral Program student; and Jay Neitz, PhD, and Maureen Neitz, PhD, from the University of Washington Department of Ophthalmology.