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RGC-5: ARE THEY REALLY 661W? THE SAGA CONTINUES

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In a recent publication, Krishnamoorthy *et al.* demonstrated that the purported rat ganglion cell line RGC-5 is in fact of mouse origin and not derived from rat retina (Krishnamoorthy *et al.*, 2013, *Invest. Ophthalmol. Vis. Sci.* 54:5712-5719). Furthermore, the authors demonstrated that the cells expressed photoreceptor markers that are also expressed in the 661W cell line. Finally, the manuscript suggested that the RGC-5 cultures may have been contaminated with the 661W cells during the initial stages of establishing the RGC-5 cell line; since the 661W cells were, at the time, in use in the laboratory that generated the RGC-5 cells (Krishnamoorthy *et al.*, 2013, *Invest. Ophthalmol. Vis. Sci.* 54:5712-5719). As the originator of the 661W cells, I feel it is imperative that I caution the research community against assuming that RGC-5 stocks obtained from ATCC (catalog PTA-6600, now removed from distribution) or from other laboratories are not completely representative of the 661W cell line.

My laboratory has used RGC-5 cells and found that although they share certain features with 661W cells, they also have features that are not part of the characteristics of the 661W cells; including (degree of sensitivity to light (Kanan *et al.* 2007, *Invest. Ophthalmol. Vis. Sci.* 48:40–51; Kanan *et al.* 2009) and pattern of expression of tyrosine sulfated proteins (*Exp. Eye Res.* 89:559–567)). This is not to imply that RGC-5 were derived from retinal ganglion cells, but rather to caution that they have features that are not consistent with those found in 661W cells.

Because of the RGC-5 cell issue, several vision journals have adopted new policies when reviewing manuscripts using cell lines (Clark *et al.*, 2013, *Exp. Eye Res.* Sep 7. [Epub ahead of print]; Beebe, D. 2013, *Invest. Ophthalmol. Vis. Sci.* 54:5720, Boatright *et al.* 2013, *Mol. Vis.* 19:1848–1851). It is now unlikely that any journal will accept a manuscript for publication that uses RGC-5 cells as an *in vitro* model for retinal ganglion cells. Despite the demonstrations that the RGC-5 cells express similar markers as 661W, those labs that continue to use these cells should not assume that they truly represent 661W cells.

This unfortunate issue highlights the need to be vigilant about contamination of cultures, precise in descriptions of lines in use, and above all, quite clear in all cases about the origin and source of cell lines used in research.

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