Multifocal electroretinograms (mfERG) from ten isoflurane (4%) anesthetized pigs were recorded and sequential application of TTX (5uM), NMDA (4mM), APB (1mM) and PDA (3.5mM) were used to identify contributions to the mfERG from inner retinal neurons, ON-pathway, OFF-pathway and photoreceptors.

The mfERG stimulation was driven by VERIS 5.01 according to pseudo-random binary m-sequence of m-sequence of $2^{14}-1$. Bandpass filter was from 1 to 300 Hz Refractive errors were reviewed by retinoscopy and corrected for 20cm working distance.

The cellular origins of the first order kernel (K1) and the first slice of the second order kernel (K2.1) porcine mfERG are contributed from both inner and outer retina.

For the K1 waveform, the n1 involved responses of cone photoreceptors and OFF-bipolar cells. The leading edge of p1 is dominated by ON-bipolar cell depolarization. The rear edge of p1, n2 and p2 are dominated by ON-bipolar activities and shaped by the activities of OFF-bipolar cells and inner retinal activities. The p3 is mainly inner retinal activities, because NMDA and TTX both reduced and delay the p3.

For the K2.1 waveform, the p1 and n1 are the summation of activities of ON-, OFF-bipolar cells and inner retinal activities. The p2 is mainly inner retinal activities. The n1 and p1, which was increased by NMDA, were reduced by TTX. The n1 was reduced by NMDA. Thus NMDA and TTX blocking different activities of different retinal elements. After PDA and APB, there was still some K2.1 responses left. The ON- and OFF-pathways have some indirect contributions to K2.1.