Formation of vision in the outer retina

Questions:

1. *Which light-sensing cell types in the outer retina constitute the very first step in vision? Why is there more than one type?*

2. *Which retinal cell types contribute most to the a-wave of the electroretinogram (ERG)?*

3. *Which retinal cell types contribute most to the b-wave of the electroretinogram (ERG)?*

4. *In darkness, the cyclic nucleotide-gated (CNG) channels in photoreceptors are … what? (open or closed)*

5. *Find the right combinations for each model: In the rhodopsin/Cnga3 knockout mouse, rod/cone system ERG responses are zero, but rod/cone system responses are (at an age of 4 weeks) practically normal.*

6. *Bleaching of rhodopsin happens*
   (a) usually in the absence of light
   (b) when all-trans retinol is regenerated to 11-cis retinol
   (c) without any change in vitamin A compounds
   (d) in a way that changes the color of the retina
   (e) only during REM sleep periods

7. *What is the main role of the RPE65 isomerase protein in the retinoid cycle?*

8. *Point mutations in genes associated with retinal degenerations and dysfunctions*
   (a) always lead to recessive diseases
   (b) either lead to X-linked or dominant but not recessive diseases
   (c) have the potential to lead to the production of truncated proteins
   (d) may lead to a milder phenotype
   (e) cause by definition visible retinal dots (like in fundus albipunctatus)

9. *Which retinal layer usually degenerates first in light damage?*

10. *HCN1 channels in the retina*
    (a) are usually located outside of photoreceptors
    (b) are usually located inside of photoreceptors in the inner segment
    (c) reduce the synaptic output of rods when activated
    (d) have no effect on the synaptic output of rods
    (e) lead to successive cyanide poisoning of cells