Computational Analysis of Receptive Fields of Retinal Ganglion Cell During Fixational Eye Movements

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The vertebrate retina converts light signals into electrical signals and performs spatio-temporal filter processing on the electrical signals. The receptive field (RF) of retinal ganglion cells (RGCs) represents its spatiotemporal characteristics. Recent physiological studies have shown that the RFs of RGCs change dynamically during fixational eye movements [1]. Inhibitory signals from wide-field amacrine cells in the inner retina are involved in forming such RF.

Previously, we proposed the simulation model shown in Figure 1 to analyze the spatio-temporal RFs of RGCs with fixational eye movements [2]. Using the model, we visualized the pseudo-RF of a RGCs at the center of the simulation space. As shown in Figure 1b, the size of the pseudo-RF vertically reduced with fixational eye movements compared to without fixational eye movements.

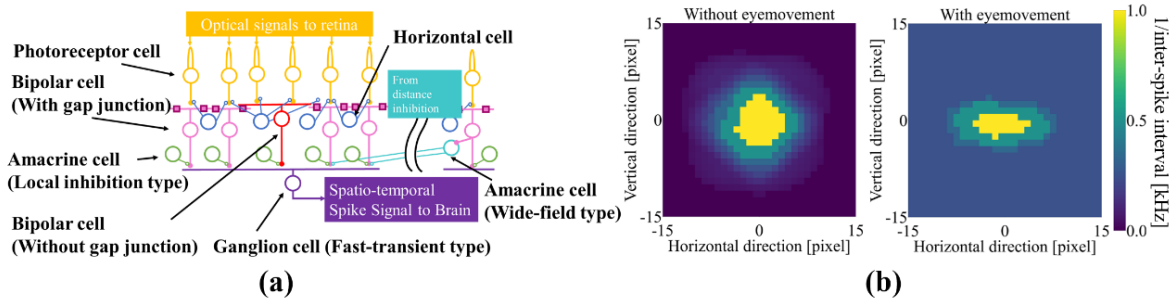

Figure 1: Simulation model and experimental results. (a) Proposed model. (b) RFs of RGCs.

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References

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