

The Electrophysiological Identification of the Cone- and the Rod- HCs Dissociated from Goldfish Retina

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Goldfish retina has been well studied to a great extent. In spite of that, electrical characteristics of dissociated horizontal cells(HCs) have not been identified in detail. Thus the cone-and the rod- HCs dissociated from goldfish retina were investigated electrophysiologically using whole-cell patch-clamping recording. To explore the basic electrical property, We examined voltage-dependent channels in all types of HCs. For the further understanding of GABAergic pathway, the localization and distribution of GABA receptors was examined in cone- HCs including HC axon terminals(ATs). Voltage-gated sodium channels were shown in H1, H2 and H3 but not in rod HCs. All HC types possessed either voltage-gated calcium channels or inward rectifier potassium channels. GABA-induced inward currents at a holding potential of -50mV appeared to be apparent into two groups. One was sustained inward currents in H1 cells and its ATs(AT1). The other was transient inward currents in the other HCs and ATs(AT2). In result of pharmacological applications, it can be suggested that GABA-induced transient currents were mediated by GABA_A receptors whereas GABA-induced sustained currents by GABA_C receptors. This study presents the discernible criterion between the dissociated HCs in the goldfish retina functionally as well as structurally.