INTRODUCTION AND METHODS. Inositol-1,4,5-trisphosphate (IP₃) is an important second messenger which mobilizes intracellular calcium stores (1). It has been demonstrated that in various tissues, including the retina, stimulation of several receptor types activates hydrolysis of membrane phospholipids with concomitant formation of IP₃ (1-3). Data on effects of dopamine (DA) on IP₃ production are scarce and contradictory, and to our knowledge, lacking for avian retina. Some authors reported that activation of a D₂ subtype of DA receptors (a member of a D₂-DA receptors family) can stimulate IP₃ formation, while others did not observe any effect of DA and agonists of DA receptors on phosphoinositide breakdown (2,4,5). This work was aimed at examining effects of DA-ergic compounds on IP₃ level in chick retina. Male white leghorn chicks (kept from the day of hatching under 12 h light:12 h dark illumination cycle) were decapitated during the 2nd h of the dark phase. Effects of DA-ergic drugs on IP₃ formation were examined in an eye cup preparation. IP₃ levels were measured in extracts of retinal supernatants using a specific IP₃ [³H] radioreceptor assay kit (Du Pont NEN, Boston, USA). Data are expressed as mean ± SEM values (n=7-10/group). For statistical evaluation of results ANOVA was used followed by Student-Newman-Keuls test.

RESULTS AND DISCUSSION. Incubation of chick eye cups with 0.1 μM of bromocriptine (BRC) and quinpirole (QNP), agonists of D₂-DA receptors, increased the IP₃ level of the retina by 142% and 10896, respectively. (±)-1-Phenyl-2,3,4-tetrahydro-(1H)-3-benzazepine-7,8-diol (SKF 38393; 1 μM), an agonist of D₁-DA receptors, was ineffective. The stimulatory effect of QNP on IP₃ formation in chick retina was significantly attenuated by D₂-DA receptors antagonists, clozapine (CLOZ) and raclopride (RACL), 0.1 μM each (Fig. 1). To our knowledge, this is the first demonstration showing that stimulation of D₂-DA receptors activates formation of IP₃ in chick retina. The physiological significance of this phenomenon is yet to be established.

Fig. 1. Effect of DA-ergic drugs on IP₃ level in chick retina. aP<0.05 vs Control, bP<0.05 vs Quinpirole.


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