

THE SEA URCHIN EGG AS A MODEL FOR MOLECULAR PHARMACOLOGY STUDIES ON
DOPAMINERGIC STIMULATION OF THE ADENYLATE CYCLASE.

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The sea urchin egg contains both catecholamines and indolamines re-
ceptors (Renaud et al., 1983; Capasso et al., 1987).

The adenylate cyclase activity present in the plasma membrane of the egg is
maximally stimulated by dopamine (DA) and GTP. The two indolamine deriva-
tives gramine (Gr) and metergoline bring about non competitive inhibition
of dopamine-stimulated adenylate cyclase activity.

Table I

Adenylate cyclase activity
(pmoles cAMP/mg protein/30 min)

Addition	None	Treatment	
		CT	IAP
None	1.67±0.24	25.10±5.2	2.55±0.30
10 ⁻⁵ M DA	5.56±0.13	40.97±2.9	8.62±0.40
10 ⁻⁵ M DA + 10 ⁻⁵ M Gr	3.91±0.30	-	6.65±0.50

Treatment of the membranes with cholera toxin (CT) results in an in-
creased level of adenylate cyclase even in the absence of dopaminergic sti-
mulation. On the other hand, treatment with pertussis toxin (IAP) causes an
attenuation of the gramine-induced inhibition of adenylate cyclase (Table I).

These data show that the sea urchin egg may be a useful tool for the
study of pharmacologically active substances involved in the dopaminergic
regulation of the adenylate cyclase.

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