

## CONTRIBUTION OF DIFFERENT TYPES OF $Ca^{2+}$ CHANNELS TO CATECHOLAMINE SECRETION IN RAT CHROMAFFIN CELLS

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Adrenal chromaffin cells secrete catecholamine in response to acetylcholine. The secretory response has absolute requirement for extracellular calcium, indicating that  $Ca^{2+}$  influx through voltage operated  $Ca^{2+}$  channels (VOCC) is the primary trigger of the secretion cascade. Although the existence of various types of  $Ca^{2+}$  channels has been explored using patch clamp technique in adrenal chromaffin cells, the contribution of different types of  $Ca^{2+}$  channels to catecholamine secretion remains to be established.

To investigate the quantitative contribution of different types of  $Ca^{2+}$  channels to catecholamine secretion,  $Ca^{2+}$  current ( $I_{Ca}$ ) and the resultant membrane capacitance increment ( $\Delta C_m$ ) were simultaneously measured. Software based phasor detector technique was used to monitor  $\Delta C_m$ . Effects of L, N, and P type  $Ca^{2+}$  channel blockers (nicardipine,  $\omega$ -conotoxin, and  $\omega$ -agatoxin, respectively) on  $I_{Ca}$  ( $43.85 \pm 6.72$  % of control,  $56.13 \pm 6.40$  % of control,  $91.3$  % of control) was also in parallel with the resultant  $\Delta C_m$  ( $30.10 \pm 16.44$  % of control,  $56.66 \pm 9.49$  % of control,  $75.2$  % of control).

It was concluded that L, N, and also P type  $Ca^{2+}$  channels served as  $Ca^{2+}$  source for exocytosis and no difference was observed in their efficiency to evoke exocytosis among L, N, and P type  $Ca^{2+}$  channels.