Modulation of cytosolic Ca\textsuperscript{2+} signalling by cADPR independent of ryanodine receptors

Michiko Yamasaki, Angelo Demuro, Ian Parker
Department of Neurobiology and Behavior, University of California, Irvine, U.S.A.

The intracellular second messenger, cyclic ADP-ribose (cADPR) regulates Ca\textsuperscript{2+} release from internal Ca\textsuperscript{2+} stores in a wide range of cells, where it is thought to promote Ca\textsuperscript{2+} liberation through ryanodine receptors. However, there is evidence suggesting that cADPR may also modulate SERCA pump activity. We examined this hypothesis by using *Xenopus* oocytes, which lack ryanodine receptors, to study the effects of cADPR on Ca\textsuperscript{2+} transients evoked by photoreleased IP\textsubscript{3} and by influx through plasma membrane channels.

Oocytes were injected either with Ca\textsuperscript{2+} indicator (Fluo-4) and caged-IP\textsubscript{3}; or with these compounds plus caged-cADPR. Ca\textsuperscript{2+} transients evoked by photoreleased IP\textsubscript{3} showed no change in amplitude with concomitant photorelease of cADPR, but their decay rate was accelerated. Moreover, this change in kinetics appears to result from modulation of Ca\textsuperscript{2+} sequestration rather than a direct action on IP\textsubscript{3}R because the decay of signals evoked by transient Ca\textsuperscript{2+} influx through nicotinic receptor/channels expressed in the oocyte membrane was similarly accelerated.

Our results suggest that cADPR acts through multiple pathways to regulate cellular Ca\textsuperscript{2+} signalling via actions on both Ca\textsuperscript{2+} release channels and sequestration mechanisms.

Presenting author : Michiko Yamasaki e-mail : michiko@uci.edu