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1092 Supplementary Figure Legends

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Supplementary Figure 1. Cell-impermeable chelators effectively reduce Zn²⁺ levels in external media but do prevent initiation or continuation of Ca²⁺ oscillations.

1096 (A) A representative trace of FluoZin3 fluorescence in replete monitoring media (TL-HEPES). The 1097 media was supplemented with cell-impermeable FluoZin-3, and after initiation of monitoring, the 1098 addition of EDTA (100 µM) occurred at the designated point (triangle). (B) The left black trace represents Ca²⁺ oscillations initiation by injection of mPlc ζ mRNA (0.01 µg/µl). The oscillations were 1099 monitored in Ca^{2+} and Mg^{2+} -free media and in the presence of EDTA (110 μ M) to chelate residual 1100 divalent cations derived from the water source or reagents used to make the media. The right red trace 1101 1102 represents the initiation of oscillations as above, but after a period indicated by the black and green bars, Ca²⁺ and Mg²⁺ were sequentially added back. 1103

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1105Supplementary Figure 2. Overexpression of ER accessory protein ERp44 did not1106change the Ca^{2+} responses initiated by mPlc ζ mRNA microinjection, Actylcholine,1107or SrCl₂.

1108 (A) Representative immunofluorescent images of MII eggs with overexpression of 1109 ERp44. At 5 hr. post microinjection, eggs were treated with 10 or 50 μ M of TPEN and 1110 incubated for 1 hr, after which they were fixed and stained. An anti-HA antibody was 1111 used. Scale bar: 10 μ m. (B) Representative Ca²⁺ responses induced by m*Plc* ζ mRNA 1112 microinjection (0.01 μ g/ μ l-left column), SrCl₂ (10 mM-center column), and 1113 acetylcholine (50 μ M-right column) in eggs with (top panels) or without (bottom panels) 1114 ERp44 overexpression.

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Supplementary Figure 3. Elevated Zn²⁺ impairs egg activation and the subsequent embryo development.

(A) MII eggs were incubated in TL-HEPES containing 0, 0.1, or 1.0 µM ZnPT at room 1118 temperature for 10 min and washed several times with fresh TL-HEPES and injected with 1119 mPlc z mRNA. After it, eggs and zygotes were cultured in KSOM for 24h. PN formation 1120 1121 and 2-cell development were checked at 7 and 24h post-microinjection. Bars represent 1122 the percentages of injected eggs that reached the PN and the 2-cell stage. Scale bar: 50 1123 μ m. (B) MII eggs injected with mPlc ζ mRNA were incubated in KSOM without ZnPT for an hr. and then incubated in KSOM with 0 or 0.1 µM ZnPT for 24h. The second polar 1124 body extrusion, PN formation, and 2-cell development were checked at 2.5-, 7- and 24h. 1125 post-microinjection. Bars represent the percentages of injected eggs that reached the PN 1126 and the 2-cell stage. Scale bar: 50 µm. 1127

Supplementary Figure 1.



Supplementary Figure 2.





Α

Supplementary Figure 3.









1.0 µM

