DB 143

DEAMINATED NEURAMINIC ACID (KDN)-RICH GLYCOPROTEIN OF RAINBOW TROUT VITELLINE ENVELOPES: A UNIQUE EGG SURFACE GLYCOPROTEIN WITH SPERM-AGGLUTINATING ACTIVITY

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Deaminated neuraminic acid-rich glycoprotein (KDN-gp) was isolated from the vitelline envelope of rainbow trout eggs, and was found to have strong sperm-agglutinating activity at 25-50 μg/ml. KDN-gp contains multiple O-linked acidic glycan chains and their structures were determined as:

$$[\text{-8KDN}\alpha 2]_n \qquad \text{GalNAc 1-Thr/Ser}$$
$$\text{KDN}\alpha 2\text{-3Gal}\beta 1\text{-3GalNAc}\alpha 1 \quad {}^{6}\quad {}^{3}$$

(n = 0, 1, 2, 3, ---)

Oligosaccharides released from KDN-gp were shown to inhibit sperm-agglutination, suggesting sperm to have a unique lectin-like material on their surface. Immunochemical study established localization of KDN-gp in the second layer of vitelline envelope.

KDN-gp also agglutinated sperm of Plecoglossus altivelis ("ayu"), which is phylogenetically close to Salmonidae fishes, but not "medaka" (Oryzias latipes) sperm.

DB 144

SPECIES-SPECIFICITY OF DEGENERATION OF URODELE ACCESSORY SPERM.

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To determine species-specificity of sperm nuclear degeneration in physiologically polyspermic urodele eggs, we examined cross-fertilization between various species. *Ambystoma mexicanum*, *A. texanum* or *A. maculatum* sperm did not degenerate in *Cynops pyrrhogaster* eggs. In these cases, sperm migration was poor. This could account for the lack of degeneration, since inhibition by thiabendazole or D_2O of sperm nuclear migration in self-species fertilization can prevent degeneration. *Notophthalmus viridescens* or *Pleurodles waltl* sperm degenerated in *Cynops* eggs, but *Pleurodeles* sperm sometimes caused heavy polyspermy. *Cynops* sperm did not degenerate in *Notophthalmus* or *Pleurodeles* eggs. Most sperm remaining in the animal hemisphere formed accessory mitotic bipolar spindles. These results indicate that even among the physiologically polyspermic species, sperm respond differently to the egg-cytoplasm with respect to migration and sensitivity to nuclear degeneration.

DB 145

PHORBOL ESTER INDUCES THE DEPOLARIZATION IN ACTIVATED EGGS OF SEA URCHINS.

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Fertilization enhances the breakdown of phosphatidylinositol(4, 5)bisphosphate to inositol(1, 4, 5)triphosphate(IP_3) and diacylglycerol(DG). DG is known to activate Na/H exchange via C-kinase and to raise intracellular pH(pH_i). We had supposed that the pH_i rise might cause the slow depolarizing component in fertilization potential. However, the pH_i rise by NH_4Cl or high extracellular pH did not elicit depolarization but caused little hyperpolarization. An analogue of DG, phorbol dibutyrate(PDBu), activated Na/H exchange both in unfertilzed and fertilized eggs. On the membrane potential, 10μM PDBu had no effect in unfertilized eggs, but elicited depolarization both in fertilized eggs, and in eggs activated by Ca ionophore. These results indicate that DG dose not evoke the depolarization via the pH_i rise. DG might regulate an ion channel and evoke the depolarization.

DB 146

EFFECT OF CTC ON OXYGEN CONSUMPTION ENHANCED BY TREATMENTS WITH ACTIVATING REAGENTS IN SEA URCHIN EGGS.

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We reported that O_2 consumption of unf. sea urchin eggs is enhanced not only by treatments with procaine and NH_4Cl, but also by subthreshold stimulation with Ca ionophore A 23187, insufficient to induce visible cortical changes. In the present study, it was determined whether or not chlortetracycline (CTC), a chelator of membrane-associated calcium, has inhibitory effects on increase of O_2 consumption induced by treatments with activating reagents, such as procaine, NH_4Cl, and A 23187. It was revealed that an increase of O_2 consumption is cancelled by treatments combining 300 μM CTC with 1 μM A23187, but not treatments combining 300 μM CTC with 10 mM procaine or 10 mM NH_4Cl. These results are quite similar to those obtained by treatments combining above-mentioned activating reagents and TMB-8, an antagonist of intracellular Ca release (Kojima et al., 1988). Therefore, it may be said that Ca ionophore A23187 induces a release of intracellular membrane-associated Ca, and as a result, a rise of respiration occurs, while weak bases, such as procaine and NH_4Cl can enhance O_2 consumption by stimulation of some metabolic changes which do not directly connect to processes of intracellular Ca release.