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Sea urchin blastomeres are not dye-coupled during early embryogenesis. WILLIAM C. FORRESTER (University of Washington, Seattle, SM-30, Seattle, Washington 98195) AND JACEK KUBIAK.

Intercellular communication among sea urchin blastomeres was studied using microinjected fluorescent dyes. Fluoresceinated dextran (av. m.w. 110 kD) and Lucifer yellow (m.w. 430) were separately injected into intact fertilized eggs. The fluorescent blastomeres were disaggregated at the 16 cell stage after culturing the embryos in calcium-free seawater. Reaggregating individual fluorescent micromeres and unlabeled macromeres, mesomeres, or micromeres from similarly staged embryos yielded tight cellular morulae upon subsequent divisions. However, at no stage during this reaggregation was there any dye coupling between any of the blastomere combinations.

We may conclude, from our reaggregation experiments that large amounts of (micromere) cytoplasmic material is not transferred. Because the dyes become bound to cytoplasmic components and are thereafter unable to diffuse freely (after *ca.* 30 min.) (Stewart 1978, *Cell* **14:** 741–759) these experiments do not address the possibility of small membrane (gap-like) junctions between blastomeres. Therefore, we injected Lucifer yellow directly into blastomeres at the 2, 4, 8, 16, 32, and 64 cell stages. In no case was coupling observed. Culturing these injected embryos produced blastulae with dye sectors corresponding to the lineage of the originally injected blastomere, *i.e.*, if injection was into one blastomere at the 2 cell stage, precisely ½ of the blastula was labeled.

Previous studies also attempted to show how micromeres communicate with other blastomeres. Iontophoretic injections of Lucifer yellow directly into the micromeres (Woodruff *et al.* 1982, *Biol. Bull.*) and the fate of isotopically labeled micromere RNAs (Speigel and Rubinstein 1972, *Exp. Cell Res.* **70:** 423–430) did not demonstrate a direct cytoplasmic link between the micromeres and the other blastomeres.

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Steady currents enter wounds in the enveloping layer of Fundulus *embryos.* L. F. JAFFE, R. D. FINK, AND J. P. TRINKAUS (Marine Biological Laboratory).

Deep cells in *Fundulus* embryos move about between the extraembryonic region of the enveloping layer—a monolayered epithelium—and the surface membrane of the underlying yolk syncytial layer. When the enveloping layer is wounded, deep cells immediately begin to move toward the wound from distances up to 700 μm. This eventually results in a large accumulation of cells at the wound site. (Fink and Trinkaus 1986, *J. Cell Biol.*, abstract in press.) Electrical measurements on wounds in guinea pig skin have revealed large steady outward currents. These in turn generate large voltage gradients which could help direct cell movements closing the wound. (Barker *et al.* 1982, *Am. J. Physiol.* **242:** R358). Therefore we explored possible wound currents in a system where migratory cell responses can be directly observed.

Stage 21 *Fundulus* embryos were manually dechorionated, immobilized in 2% 1500 cps methyl cellulose in 2× Holtfreter's solution, and wounded by puncturing the enveloping layer and the yolk syncytial layer with a tungsten needle. Measurements of external wound currents were made with a vibrating probe both with the needle in place, and soon after withdrawing the needle.

We consistently observed large steady currents *entering* the wound. Current densities were often as high as 30 $\mu A/cm^2$ at the closest measurable point (about 30 μm from the wound). These densities fell off steadily with distance from the wound, reaching a half-maximum level about 100 μm away. When the needle was removed, the measured currents fell greatly in the course of five minutes, presumably indicating epithelial wound closure.

We were surprised to discover inward wound currents, since almost all epithelia normally pump positive charge inwards and are therefore expected to leak positive charge out through coarse wounds. Perhaps the wounded *Fundulus* enveloping layer pumps chloride or bicarbonate anions inwards to give the observed inward (positive) wound currents.

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Analysis of the meiotic cycles occurring in the absence of protein synthesis in activated Spisula *oocytes.* FRANK LUCA, TIM HUNT, AND JOAN RUDERMAN (Departments of Anatomy and Zoology, Duke University, Durham, North Carolina 27706).

When *Spisula* oocytes are parthenogenetically activated by adding KCl to 40 m*M* excess, they synchronously undergo germinal vesicle breakdown (GVBD), meiosis I, and meiosis II with the same timing as oocytes that have been activated by fertilization. Chromosome clustering, metaphase plate formation,