LATERAL MOBILITY OF PLASMA MEMBRANE LIPIDS IN *XENOPUS* EGGS: REGIONAL DIFFERENCES RELATED TO ANIMAL/VEGETAL POLARITY

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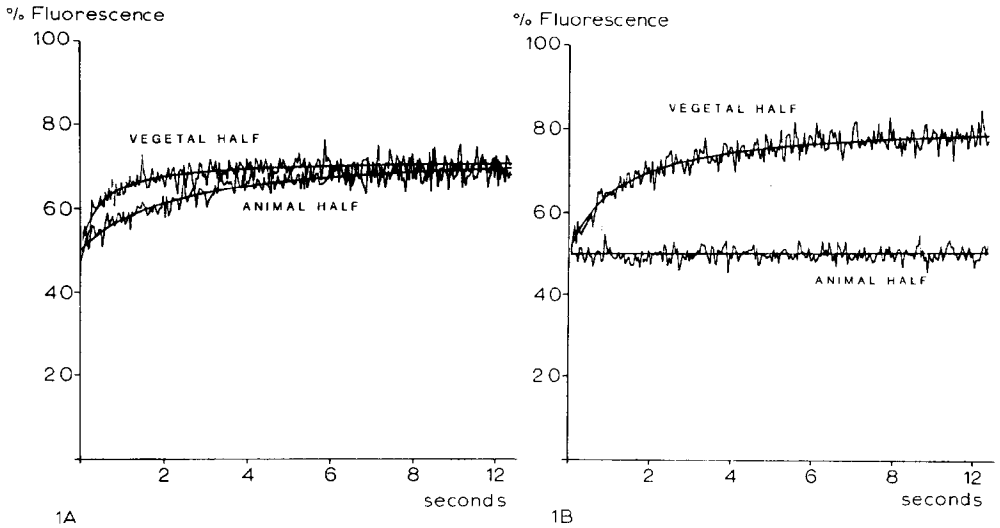
Regional differences in the lateral mobility properties of plasma membrane lipids were studied in unfertilized and fertilized *Xenopus* eggs by fluorescence photobleaching recovery (FPR) measurements. Out of a variety of commonly used lipid probes only the aminofluorescein-labelled fatty acids HEDAF (5-(N-hexadecanoyl)-aminofluorescein) and TEDAF (5-(N-tetradecanoyl)-aminofluorescein) appear to distribute itself in the plasma membrane. Under all experimental conditions used these molecules show partial recovery upon photobleaching, indicating the existence of lipidic microdomains. In the unfertilized egg the mobile fraction of plasma membrane lipids (~50%) has a 5-fold smaller lateral diffusion coefficient ($D = 1.5 \times 10^{-8}$ cm^2/s) in the animal than in the vegetal plasma membrane ($D = 7.6 \times 10^{-8}$ cm^2/s). This demonstrates the presence of an animal/vegetal polarity within the *Xenopus* egg plasma membrane. Upon fertilization this polarity is strongly (> 100x) enhanced, leading to the formation of two distinct macrodomains within the plasma membrane. On the animal side of the egg lipids are completely immobilized on the time scale of FPR measurements ($D \ll 10^{-10}$ cm^2/s), whereas on the vegetal side D is only slightly reduced ($D = 2.8 \times 10^{-8}$ cm^2/s). The immobilization of animal plasma membrane lipids, which could play a role in the polyspermy block, probably arises by the fusion with the plasma membrane of cortical granules, which are more numerous here. The transition between the animal and the vegetal domain is sharp. The fate of the animal plasma membrane in embryogenesis is to become the protective outer surface of the embryo. In contrast, the vegetal plasma membrane will take position inside the embryo at gastrulation and will later perform receptor and transduction functions in cellular interactions. The polar organization of the plasma membrane found seems to herald the future divergence in function already at the single-cell stage.



Fluorescence recovery of HEDAF in animal and vegetal halves of unfertilized (1a) and fertilized (1b) *Xenopus* eggs.

Received: 13th February 1984. Accepted: 7th March 1984

0309-1651/84/040269-01/$03.00/0