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EFFECTS OF CYTOCHALASIN-B AND COLCHICINE ON POLAR LOBE FORMATION IN EGGS OF THE MARINE MUDSNAIL, *Ilyanassa obsoleta*

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The constrictions of the plasma membrane involved in polar lobe formation in mollusk embryos resemble cleavage furrows except that polar lobe constrictions do not cleave the cell completely, they are not associated with a spindle apparatus visible at the level of the light microscope, and they are relaxed quickly after polar body formation and early cleavage. Factors regulating polar lobe constrictions are unknown. Cytochalasin-B and colchicine, drugs which affect the function of microfilaments and microtubules respectively were used to determine the extent to which the polar lobe constrictions behaved similarly to first cleavage furrows. Fertilized eggs were treated for varying periods of time with sea water containing one or both of these drugs at times prior to second or third polar lobe formation. The eggs were then allowed to progress through early cleavage. Experiments using cytochalasin-B at concentrations of 0.1 - 10 μg/ml showed that (1) the formation of polar lobes could be completely prevented by cytochalasin-B. (2) the second and third polar lobes, once formed, were rapidly resorbed when exposed to this drug, (3) the formation of the second polar lobe could be prevented at concentrations which still allowed formation of the third polar lobe, (4) the formation of the third polar lobe could be prevented at concentrations which still allowed first cleavage, and (5) the formation of a third polar lobe did not depend on the prior formation of a second polar lobe. Experiments using colchicine at concentrations of 0.1 - 1000 μg/ml showed that polar lobes could form in all concentrations but that concentrations which inhibited first cleavage also prevented the rapid resorption of polar lobes. In the presence of colchicine stabilized lobes were resorbed much more rapidly if cytochalasin-B was also present. These data suggest that the formation of polar lobe constrictions and their stability once formed involve only cytoplasmic filaments, whereas their resorption may depend in some way on microtubule function.

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STUDIES ON THE MECHANISM OF POLAR LOBE FORMATION IN EGGS OF THE MARINE MUDSNAIL, *Ilyanassa obsoleta*

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Snail eggs undergo a series of shape changes preceding first cleavage. These deformations of the fertilized egg result in the formation of a protuberant bulge of cytoplasm, the polar lobe. This lobe contains morphogenetic substances of an unknown nature, probably sequestered somewhere near the plasma membrane, which are necessary for the normal differentiation of the shell, operculum, foot, statocysts, heart, intestine, and eyes in the older embryo. The purpose of the present study was