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MOREHOUSE COLLEGE

Development and application of Atomic Force Microscopy (AFM) and imaging tools towards the measurement of oocyte mechanical behavior

BACKGROUND

Calcium plays an important role in the egg-to-embryo transition. It has been found that both calcium signalling and the actin cytoskeleton does participate in the membrane block to polyspermy. The actin cytoskeleton plays a key role in cell morphology, investigating the mechanical properties during the morphological changes during maturation and fertilization is something that has been a subject of interest.

GOALS

- The development and application of AFM and imaging tools towards the measurement of oocyte mechanical behavior
- To elucidate how calcium signaling and cytoskeletal dynamics interact during the egg-to-embryo transition

METHODS

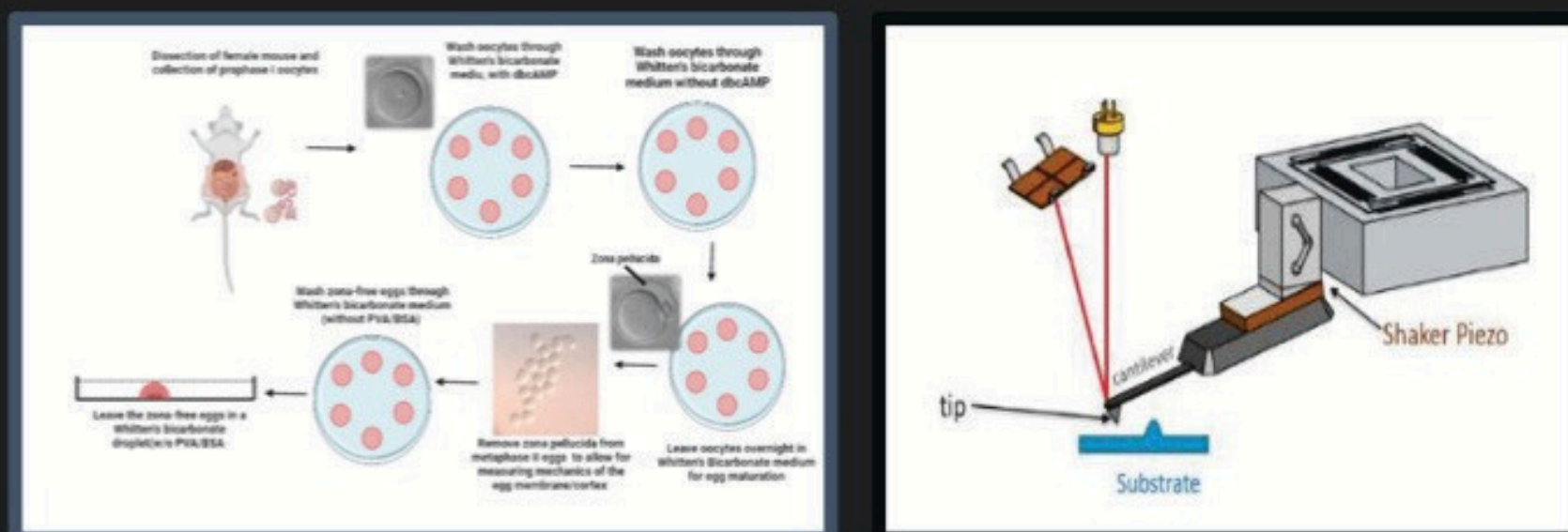
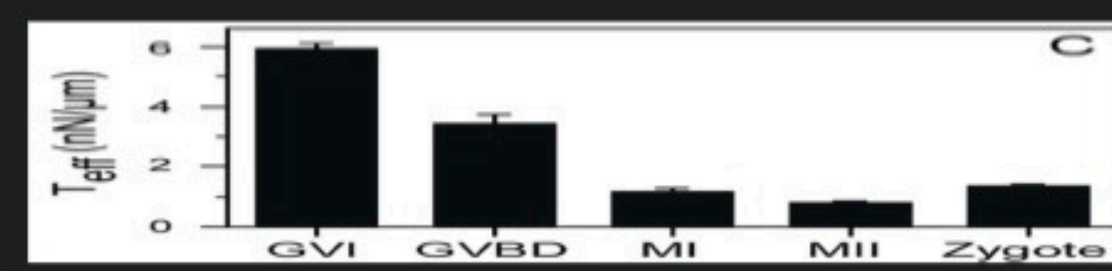
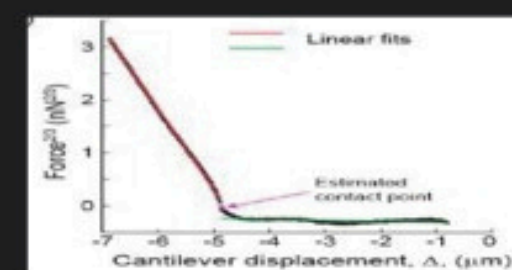


Diagram of oocyte collection immobilization in culture dish by adhesion to plastic(left) image of AFM(right)

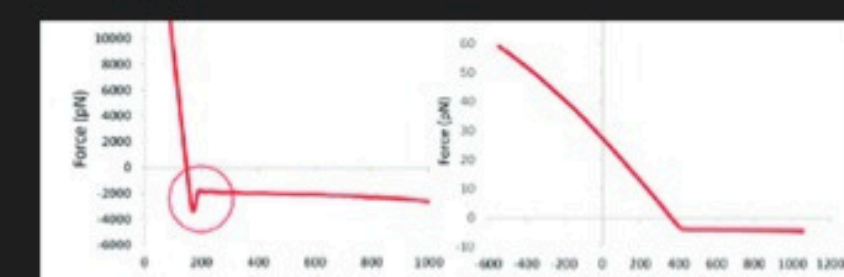
FUTURE TESTING AND RESULTS



Tension throughout different phases of oocyte maturation completed via MPA



Example of measurement of cell modulus using AFM



AFM force spectroscopy Van Der Waals forces (left) vs. Electrostatic Repulsion (right)

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