

# Excessive cortical contractility triggers early oocyte polarization and aberrant cytoplasmic flows in mammals



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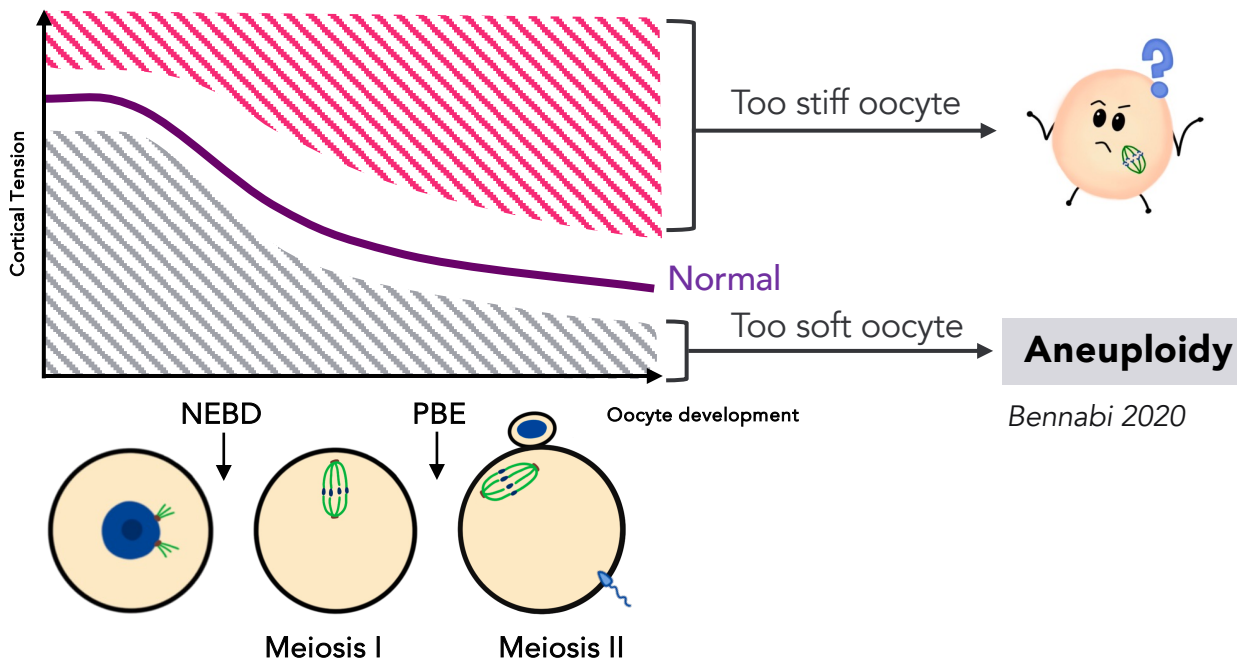
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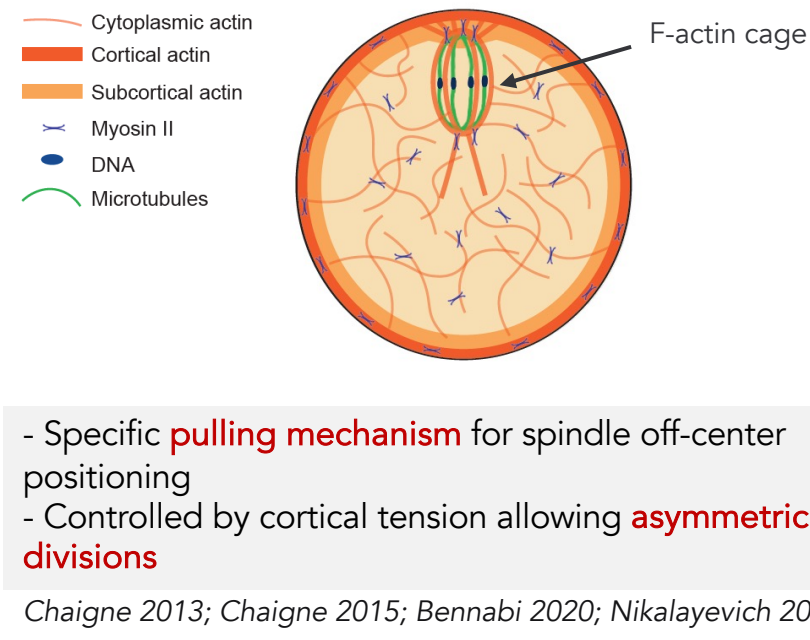
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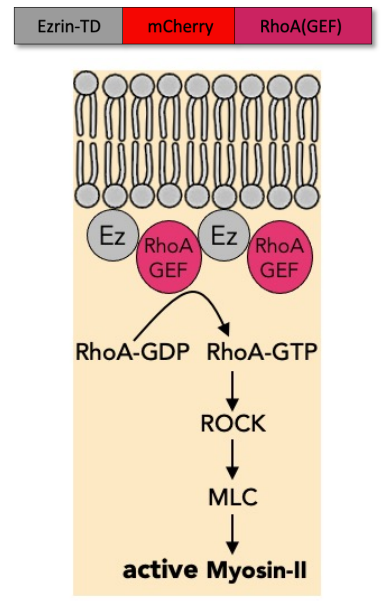
## Oocyte development is linked to cortical tension



## Cortical tension is controlled by the actomyosin network

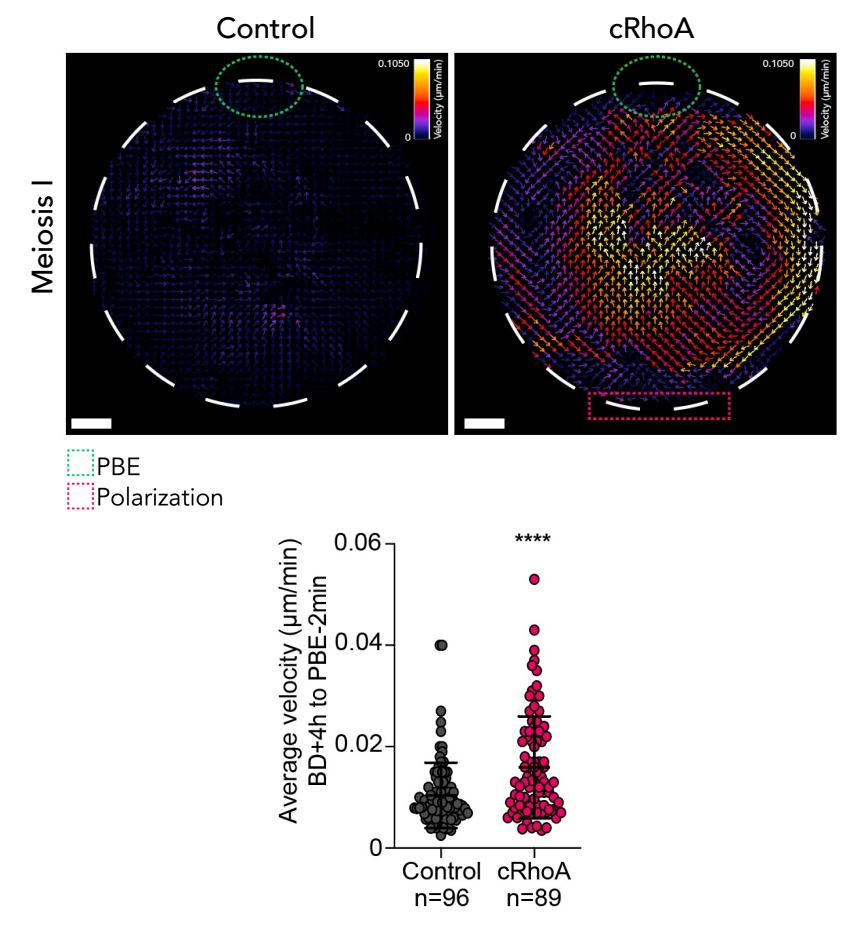
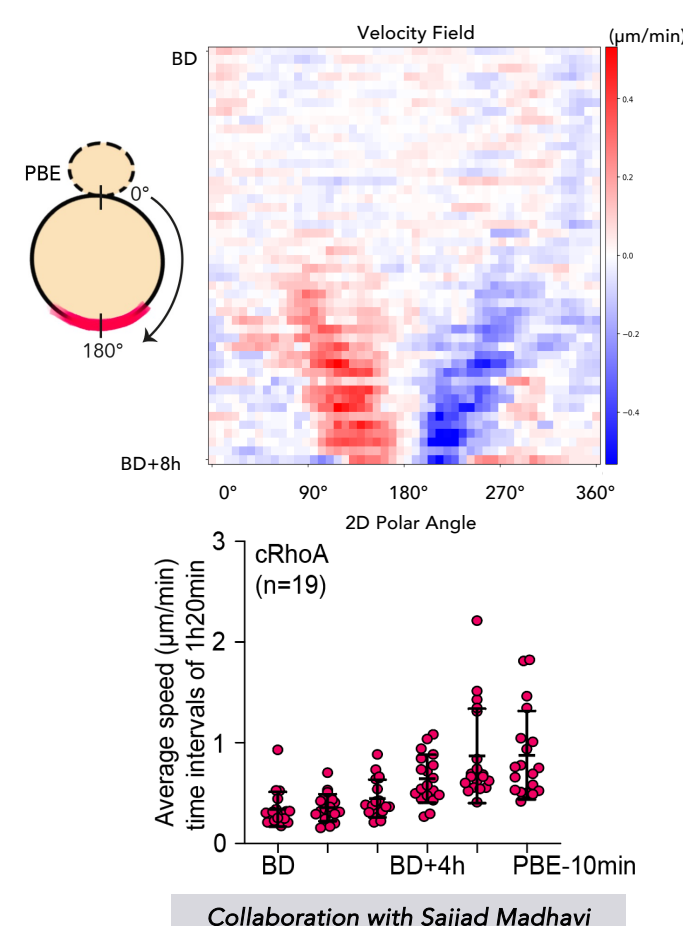
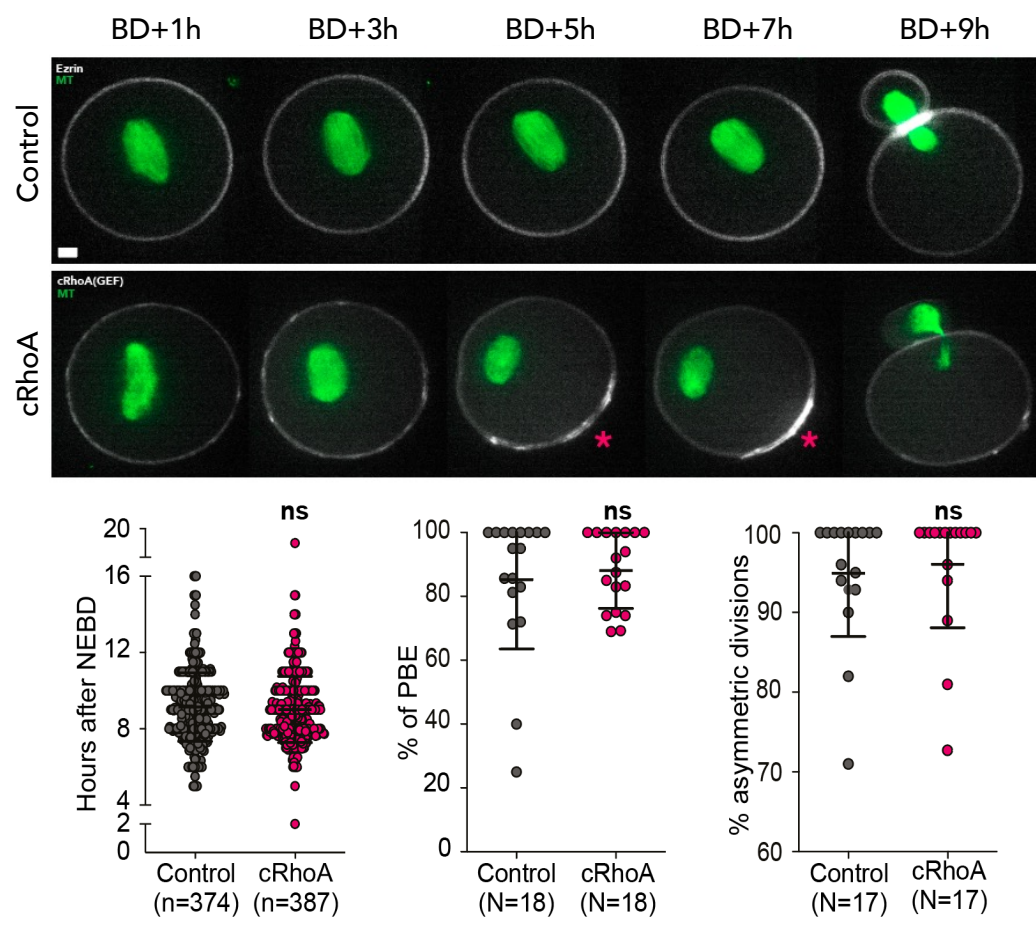


Method:  
Forcing recruitment of active Myosin-II to the cortex



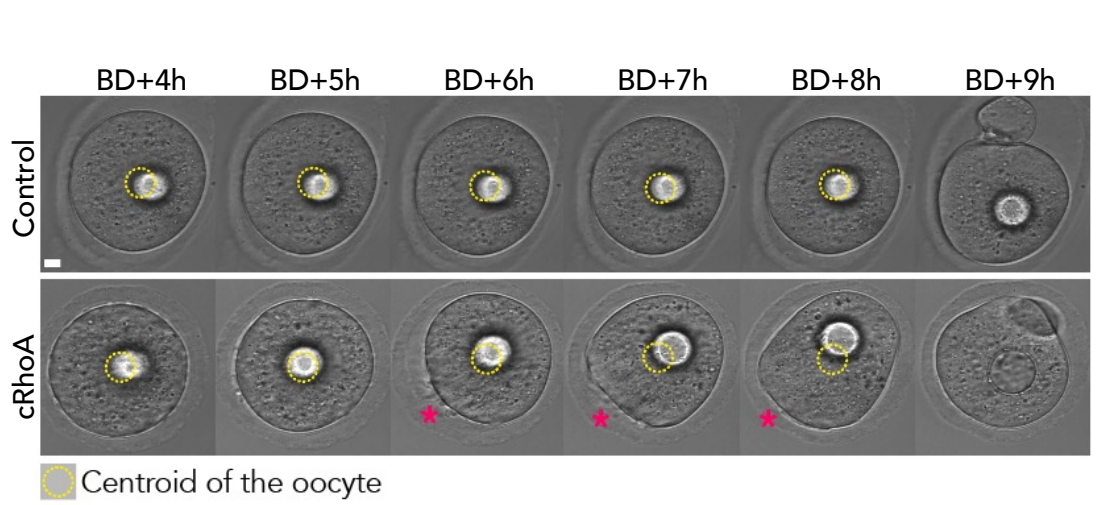
## What are the consequences of excessive cortical tension on oocyte development?

Stiff oocytes divide "normally" but polarize spontaneously mid-meiosis I, inducing aberrant cytoplasmic flows...

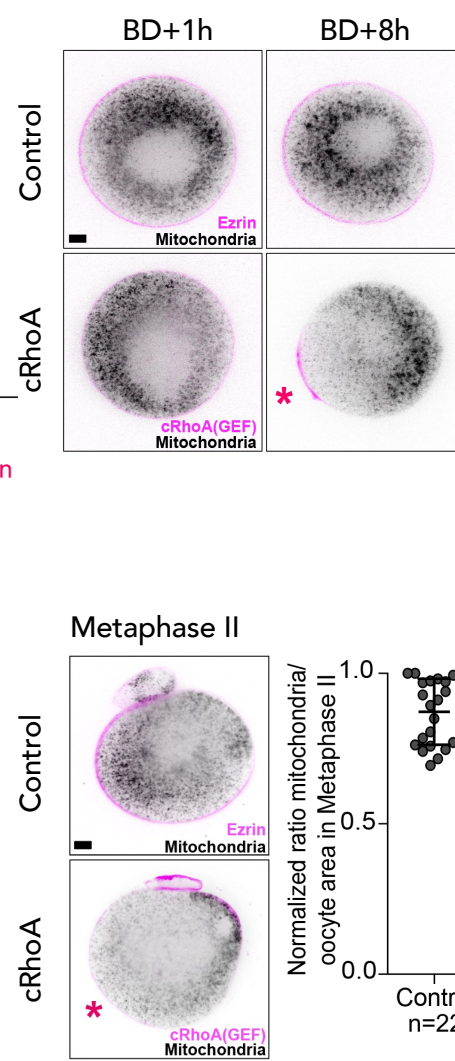


... that affect various objects in the cytoplasm and cortex of the oocyte

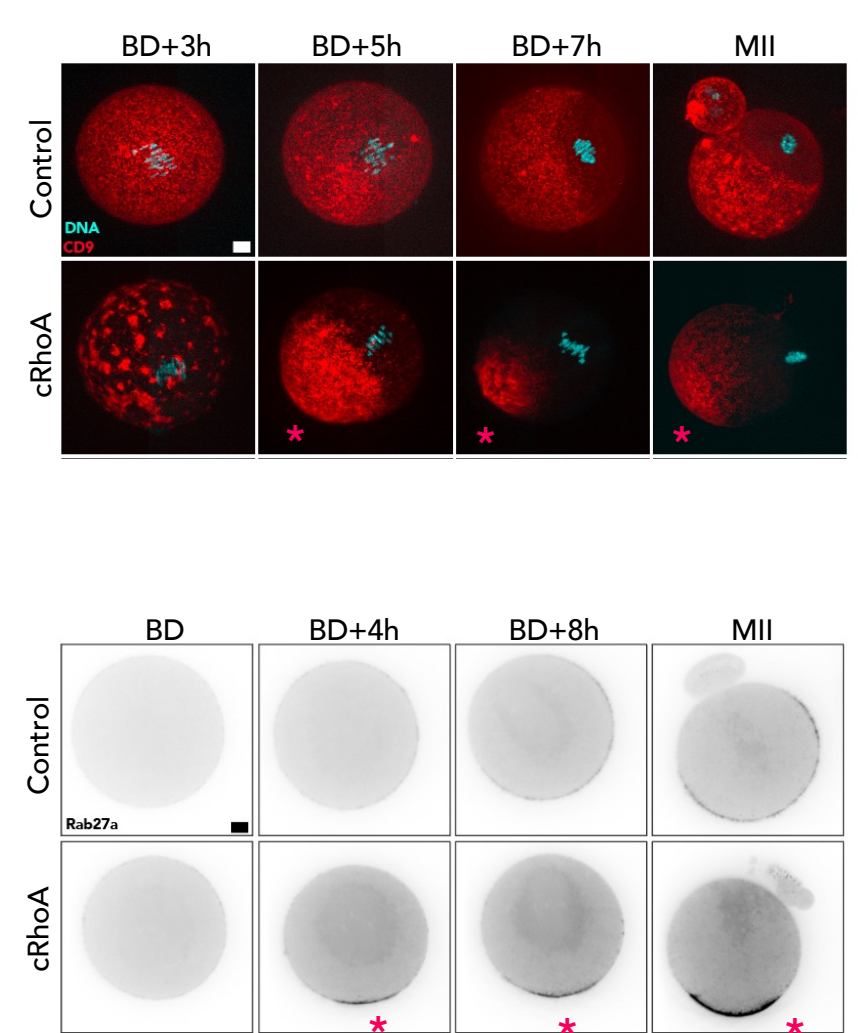
Such as an oil droplet ...



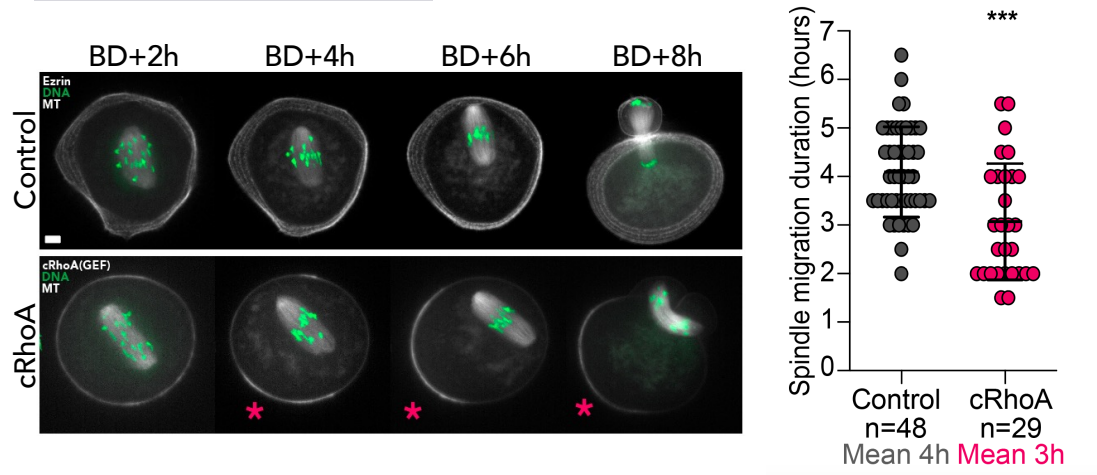
Organelles ...



And factors important for fertilization

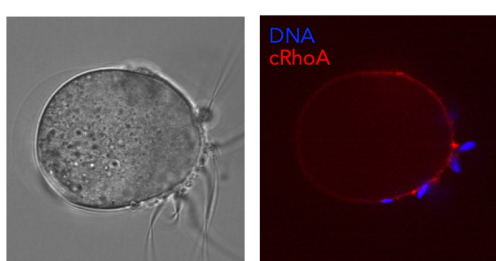


The spindle ...

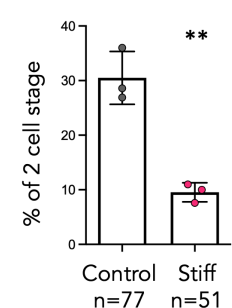


## Possible consequences and perspectives

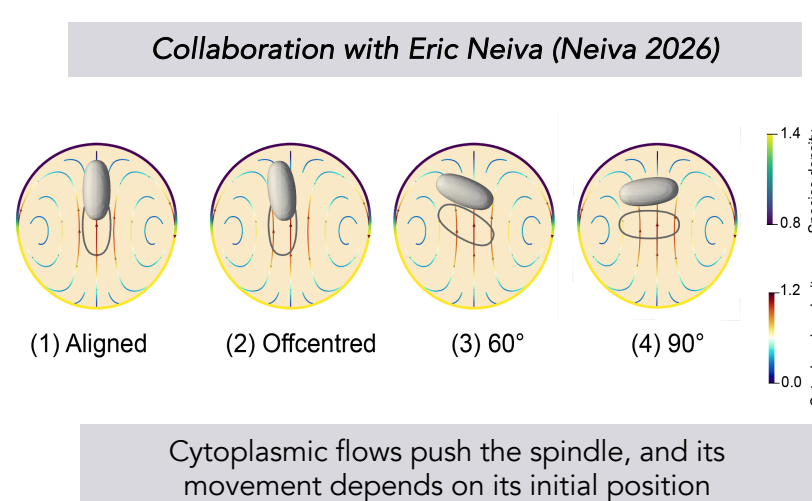
Fertilization defects?



Impaired embryonic development?



Modelisation of the effects of polarization



Does this phenotype exist naturally?

Collaboration with Gaëlle Letort using Oocytar (Letort 2022)

Validated in mouse oocytes – 11.5% of mouse oocytes present a Stiff-like phenotype

Human oocyte maturation films provided by Xavier Pollet-Villard and Mohamed Yahiatene (Nataliance Clinic)

50% of human oocytes present a Stiff-like phenotype

