Three proteins may play key roles in female fertility and cancer biology

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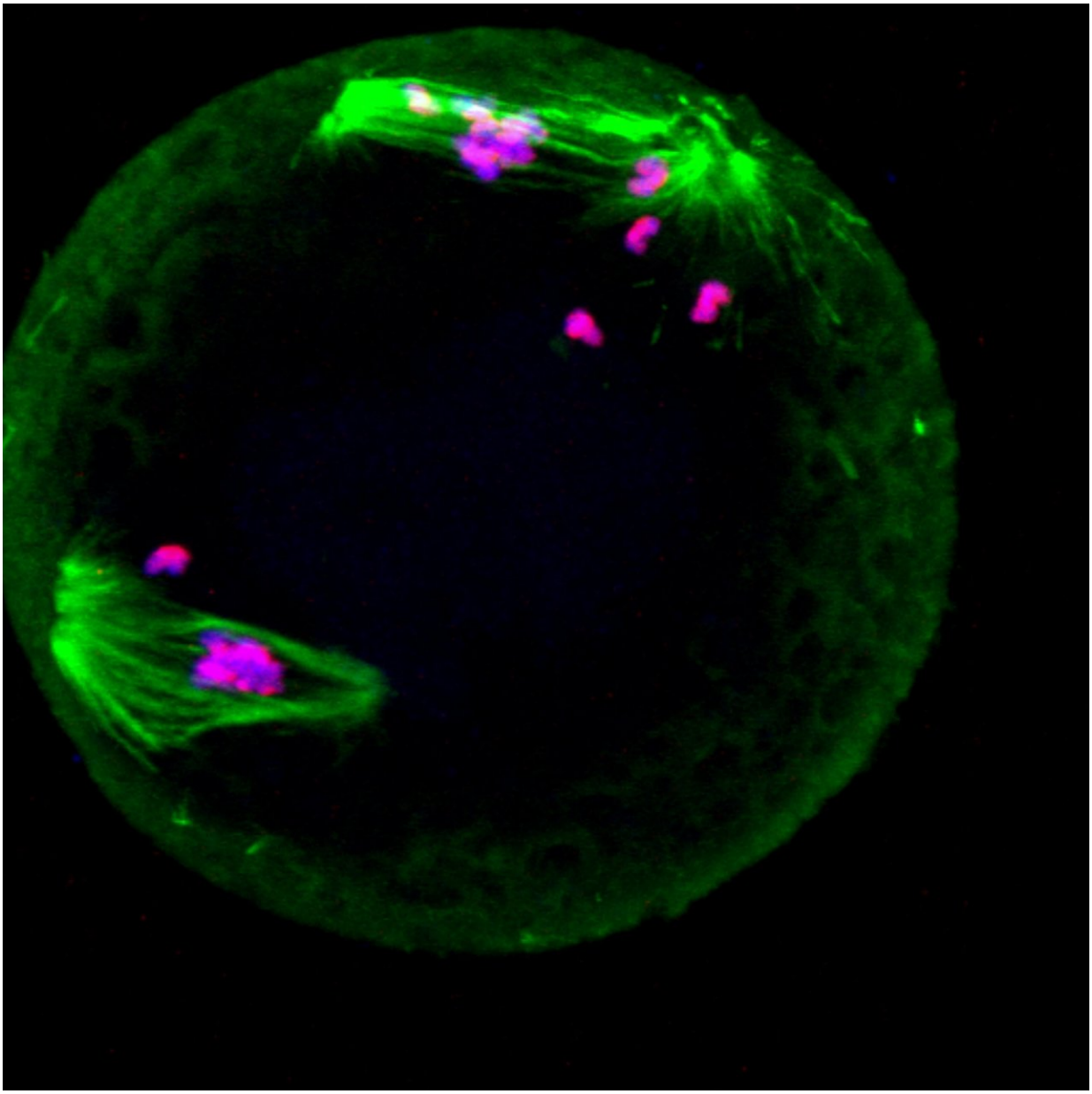

When a good egg goes bad. The bright green shows spindles, the machinery that helps chromosomes divide. The pink shows one of three key proteins growing out of control after another protein regulator is deleted. The blue shows the chromosomes (DNA). Credit: Alexandra L. Nguyen

Three proteins regulate each other with surprising twists and turns in female mouse eggs, a finding that may play an important role in female fertility and cancer biology, according to Rutgers-led research.

The unexpected complexity in how these proteins regulate one another does not occur in any other healthy cell type, said study senior author Karen Schindler, an associate professor who specializes in infertility research in the Department of Genetics at Rutgers University-New Brunswick.

The three proteins are Aurora kinase A (AURKA), AURKB and AURKC, and the research is published in the journal *Current Biology*.

"Our research could provide a way to diagnose and perhaps treat certain types of infertility that end in early miscarriage," said Schindler, who works in the School of Arts and Sciences. "This work also impacts cancer biology research because we suspect that the inter-protein regulation that occurs in eggs also occurs in certain types of aggressive cancers. Therefore, the findings could be useful in thinking about precision medicine treatments for cancer patients."

Schindler, an internationally recognized expert in female gamete (egg) biology, said she specializes in infertility research because she's fascinated by the surprisingly high frequency of infertility worldwide. One in six couples struggle to start a family in the U.S. alone, she noted.

The next steps for reproductive biology include studying the genomes of infertile patients to see if mutations in their genes represent a significant percentage of the patient population with poor outcomes in an in vitro fertilization (IVF) clinic, Schindler said. The next steps for cancer biology include carefully evaluating cancers that have all three proteins and finding ways to harness their interactive regulation into a cancer therapeutic.

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