# Cell division research expected to lead to containment of cancer cells and regenerative medical treatments

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Researchers in Singapore, for the first time in the world, replicate the contractile ring's structure by isolating a refined protein and placing it within a cell-imitation capsule.

All organisms grow and develop through the regenerative ability of cell division. An indispensable ability for all living beings, it can be said that life is defined by this process. Research into the nature of this process is of significant importance in biology and medical science. When organisms undergo cell division, what is known as a contractile ring is created in the interior wall of a cell membrane. As this ring contracts, the cell is pinched into multiple daughter cells. Although research in molecular and cellular biology has gradually shed light on the proteins that form and control the contractile ring, there are many aspects of its self-organizational structure that remain a mystery.

Professor Shin'ichi Ishiwata (Graduate School of Advanced Science and Engineering) and Research Assistant Makito Miyazaki's (Research Institute for Science and Engineering) research team at the Waseda Bioscience Research Institute in Singapore (WABIOS) are the first in the world to replicate the contractile ring's structure by isolating a refined protein and placing it within a cell-imitation capsule. Furthermore, the team has reached an understanding of the self-organizational structure of the ring and the minimum requirements and physical conditions of its contraction properties. This achievement is

expected to play a great role in understanding the overall workings of cell division.

If cell division can be fully understood, it will become possible to control this process. This is expected to lead to medical treatments in various fields that can for example, prevent cancer cells from multiplying, and promote the propagation of healthy cells. It is also possible that this research can be utilized to create artificial cells with self-propagation abilities.

The details of this research were published in the online English science magazine *Nature Cell Biology* on March 23.

**More information:** "Cell-sized spherical confinement induces the spontaneous formation of contractile actomyosin rings in vitro." *Nature Cell Biology* 17, 480–489 (2015) DOI: 10.1038/ncb3142

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