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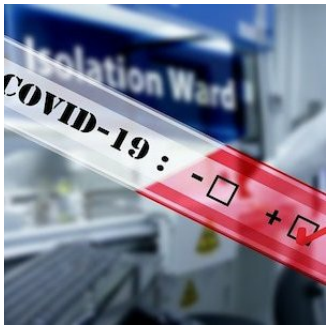
New Imaging Technology for COVID19 Testing Kits



Our body is made up of molecules and RNA molecules play important roles in many cellular processes. With a new imaging technology, developed by Simon Fraser University researchers, it becomes much easier to detect individual molecules of RNA within a living cell.

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The pioneering technology – called Mango, for its bright colour – will be used to produce coronavirus testing kits, badly needed in this time of COVID-19 pandemic. This is because Mango can sensitively detect RNA molecules, helping to improve viral screening for viruses such as the COVID-19 coronavirus, according to research published in the journal Nature Communications.

Mango's ability to detect individual molecules of RNA enables basic discoveries into the functioning of cells. The Mango system will "allow us to not only extend fundamental research questions but also to detect pathogens like the coronavirus, faster and more efficiently," says Peter Unrau, a professor of molecular biology and biochemistry, who led the SFU research team.

This is how the new technology works: An RNA Mango aptamer, which works like a magnet, binds tightly and specifically to a fluorescent dye. The dye molecules become excitable when bound and glow brightly. RNA molecules modified to contain the aptamer "magnet" now stand out from the other parts of the cell, making it easier for researchers to see and study RNA molecules under a microscope.

"Cell regulation takes place at the level of RNA," Professor Unrau explains. "For a long time, the focus has been on protein but it is RNA and not protein that regulates the vast majority of processes within a cell."

RNA Mango dyes are sourced from Applied Biological Materials (ABM) in Richmond, B.C. The SFU research project, funded by the Canadian Institutes of Health Research (CIHR), aims to develop an isothermal testing methodology, known as Mango NABSA (nucleic acid sequence-based amplification).

The Mango NABSA kits can be used to test for the coronavirus, which is a positive strand RNA virus. ABM is actively involved with this project as a partner and will supply the enzymes and buffers needed, which the SFU team originally developed.

"Mango technology is state of the art," Unrau points out, "and the development of effective cures for cancer and other diseases demand better imaging methodologies to rapidly learn how cells work in detail."

Source: Simon Fraser University
Image credit: Pixabay

Reference Cawte AD, Unrau PJ, Rueda DS (2020) Live cell imaging of single RNA molecules with fluorogenic Mango II arrays. Nat Commun 11, 1283. https://doi.org/10.1038/s41467-020-14932-7

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