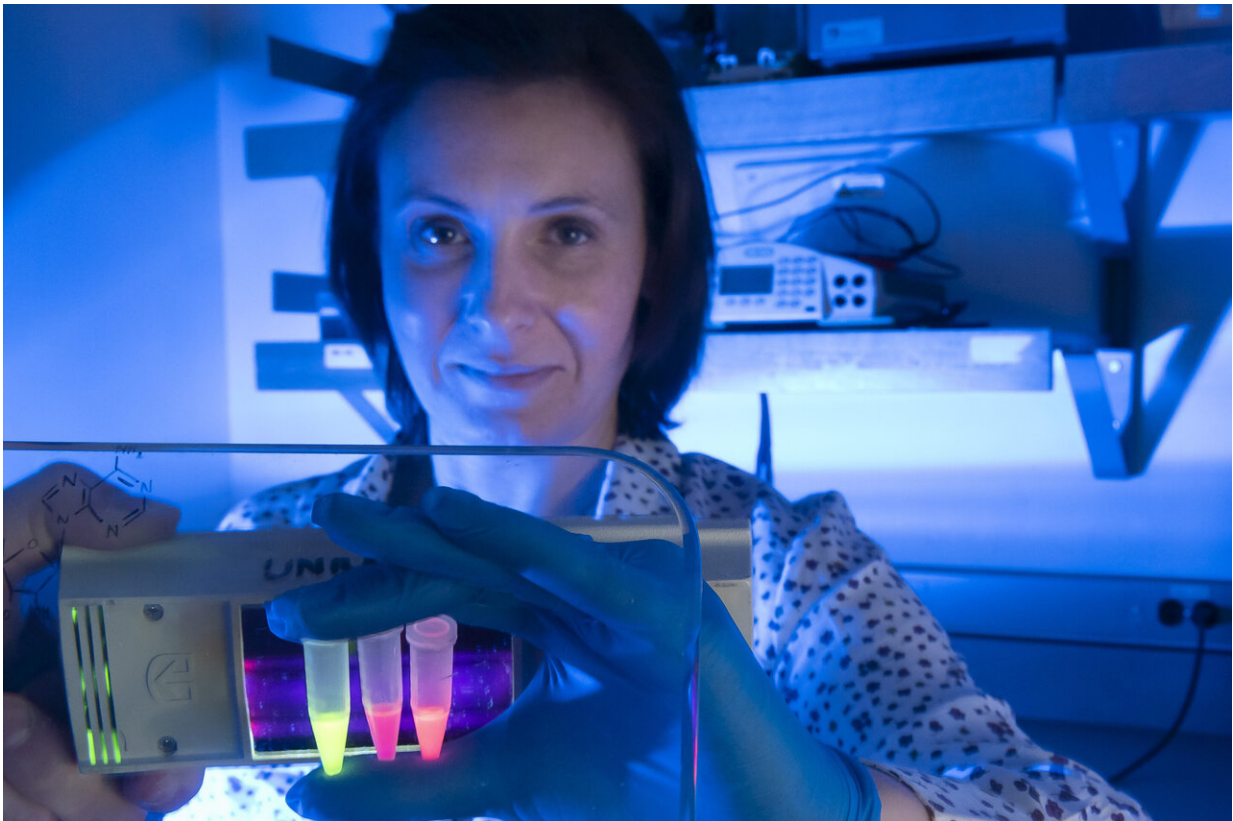


Coronavirus testing kits to be developed using new RNA imaging technology

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SFU researcher Lena Dolgosheina holds up tubes to demonstrate the Mango imaging technology. Credit: Simon Fraser University

Simon Fraser University researchers will use their pioneering imaging technology—called Mango, for its bright colour— to develop

coronavirus testing kits. They're among a small set of Canadian researchers who responded to the rapid funding opportunity recently announced by the Canadian Institutes of Health Research (CIHR) to help address COVID-19.

SFU researchers Lena Dolgosheina, a post-doctoral fellow and Peter Unrau, a professor of molecular biology and biochemistry, developed Mango to sensitively detect RNA molecules, helping to improve viral screening for viruses such as the coronavirus while enabling basic discoveries into the functioning of [cells](#).

The latest research, led by Unrau, involves using Mango to detect individual molecules of RNA within a living cell.

"We are made of molecules so when something goes wrong within a cell it happens at the molecular level, says Unrau. "We are using the Mango system as a catalyst, to allow us to not only extend fundamental research questions but also to detect pathogens like the coronavirus, faster and more efficiently."

The Mango system consists of an RNA Mango aptamer that binds tightly and specifically to a [fluorescent dye](#). The aptamer acts like a magnet—targeting and binding those dye molecules. The dye becomes excitable when bound and glows brightly. RNA molecules modified to contain the aptamer 'magnet' now stand out from the other parts of the cell, which makes it much easier for researchers to see and study RNA [molecules](#) under a microscope.

"Cell regulation takes place at the level of RNA," he says. "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 currently available from Applied Biological

Materials (ABM) in Richmond, B.C. The coronavirus research made possible by CIHR funding will allow the team 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 and the development of effective cures for cancer and other diseases demand better imaging methodologies to rapidly learn how cells work in detail," Unrau adds.

The team's research is published in *Nature Communications*.

More information: Adam D. Cawte et al, Live cell imaging of single RNA molecules with fluorogenic Mango II arrays, *Nature Communications* (2020). [DOI: 10.1038/s41467-020-14932-7](https://doi.org/10.1038/s41467-020-14932-7)

Provided by Simon Fraser University

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