

DBT-InStem scientists test new logarithm for COVID testing



New Delhi, June 22: Researchers at the Department of Biotechnology's Bengaluru-based Institute for Stem Cell Science & Regenerative Medicine (DBT-InStem) is in the process of writing a new chapter in the history of sample testing in collaboration with their colleagues in Tata Institute of Fundamental Research's National Centre for Biological Sciences (NCBS) and IIT, Mumbai.

Random pooling of test samples is an important testing strategy for community surveillance and wide coverage of particular significance during epidemics. However, this approach is relevant only in areas with low levels of infection: not effective when prevalence rates are close to or higher than 5% in a population. Researchers are working towards developing smart pooling strategies that overcome this limitation.

In a method known as combinatorial tapestry pooling, individual samples are pooled together with various combinations. Thus, each pool comprises a combination of different individual samples. No two pools are identical. This is designed and achieved using sophisticated computerized algorithms, which once developed, can be executed by individuals trained in sampling and running diagnostic RT-PCR based assays using automated approaches.

The major advantage of this effort is that depending on the combination of pools in the matrix, it is even possible to identify individual samples that are positive, thereby eliminating the requirement for second-round testing of individual samples in pools and thus provide for faster reporting.

Theorists at NCBS and IIT Mumbai have developed one such algorithm, which is currently being experimentally tested in the laboratories at inStem. It involves matrices of increasing complexity and samples of known status. Two matrices have tested successfully. More are in the pipeline.

Meanwhile, activity in the COVID-19 testing laboratory jointly run by DBT-InStem and NCBS at the Bangalore Life Science Campus continues without a break. Testing is primarily driven by volunteers drawn from students and staff and the laboratory. It has continued to process 300-500 samples a day. The laboratory functions seven days a week with volunteers managing fatigue and many other constraints as they strive to fulfill their commitment to the effort. They are, among other things, learning how to strike a balance between the responsibility and their ownership of the testing effort with the tug of their research, as activities cautiously ramp up in the laboratories on campus. A wonderful story on this future generation of research leaders, their motivation and the impact of this experience in their lives, is in the making.

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