

A New Method for Fast and Accurate Molecular Diagnostics

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Scientists at the Science for Life Laboratory (Scilifelab), Stockholm, Sweden, have developed a novel method for detecting small quantities of pathogens and cancer biomarkers. Normally pathogens infect us and cause diseases. When pathogens like bacteria or viruses infect us initially, they are usually in very limited amount. They need time to multiply before they start causing problems. It is not easy to detect the pathogens when their abundance is low in a normal healthy individual.

Similarly, cancers and tumors do not grow in one day. It takes time after some abnormal changes happen in the body. These changes cannot be observed during the early stages. They remain unnoticed for many months and even years, but eventually they may become sufficiently severe to kill a person. Similar to the pathogens, it is hard to identify these changes when they are very few in numbers.

In both cases, if it was possible to identify the pathogens or tumor markers early, people could live healthier lives. It is difficult to find disease causing agents when they are in very low quantity, but that does not mean it is impossible. Scilifelab researches have designed a procedure that can detect very low numbers of pathogens and cancer biomarkers. This is done by capturing a signature of the pathogens or the genetic changes in affected cells and then amplifying the captured information to make them detectable.

With the help of a specifically designed microfluidic chip and a standard fluorescent microscope, they have achieved to detect a much lower count of biomarkers. So far, the method has been proved effective to identify the gene mutation that is responsible for many cancers, especially 30-40% cases of most prevalent colorectal cancer.

The process of building a small and fully automated machine is underway. The goal is to figure out a very fast and cost-effective procedure to search for the presence of a multitude of different biomarkers, potentially in one test. This will help physicians to diagnose patients sooner and more effectively.