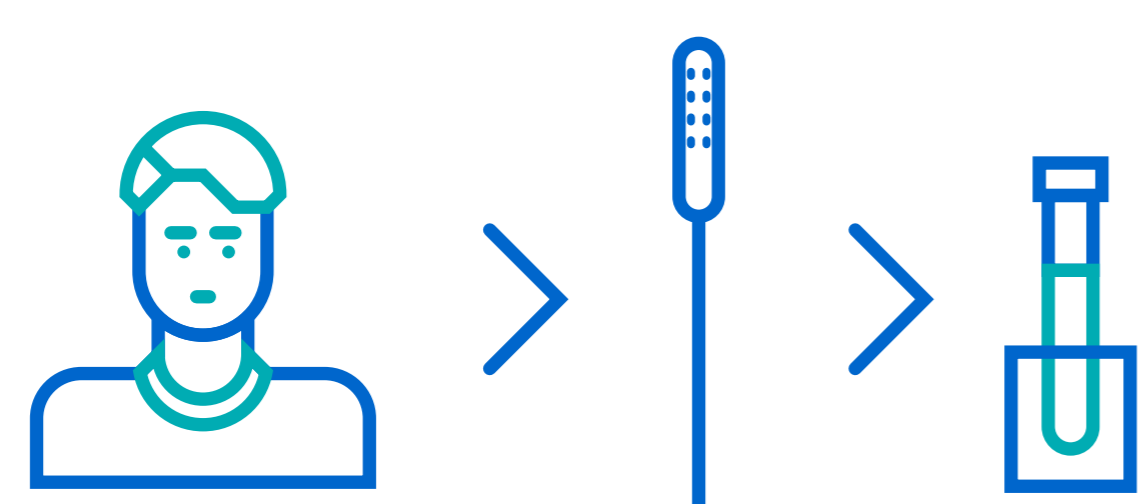


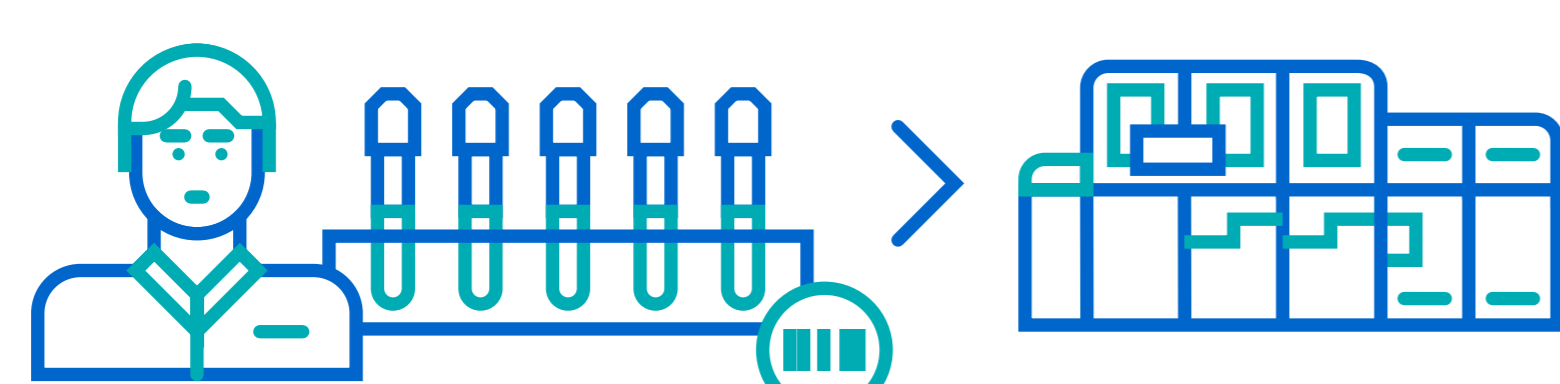
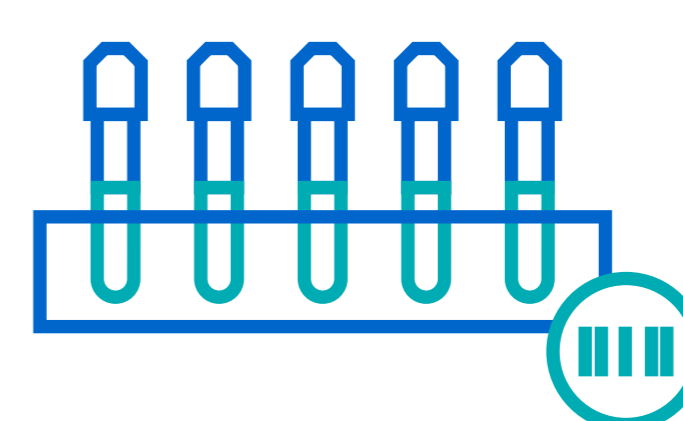
# How Roche molecular testing detects SARS-CoV-2, the virus causing COVID-19



**1.** The **patient's swab** is taken and sent to the **lab for analysis**.



**2.** **Trained lab professionals** prepare the swab sample in the tube **for processing**. To ensure correct identification and traceability each tube has a **unique barcode**.

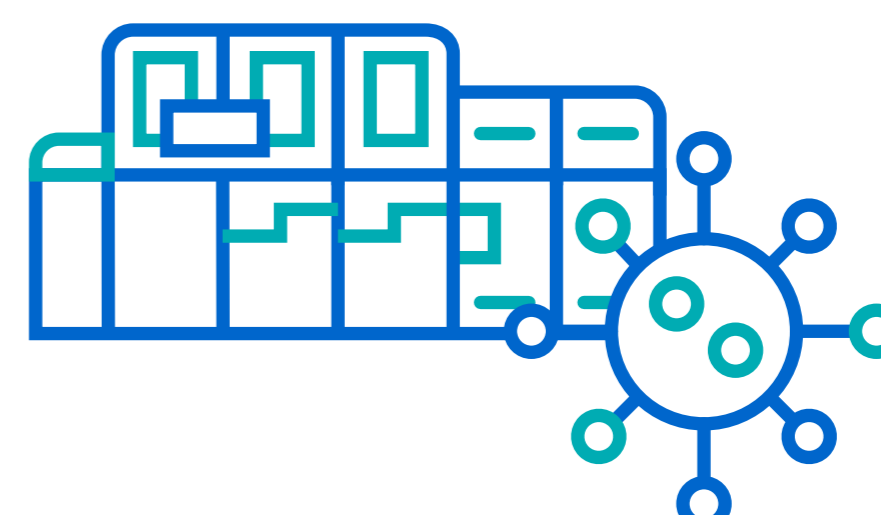


**3.** The tube is **loaded into the high throughput system** with other patients' sample.

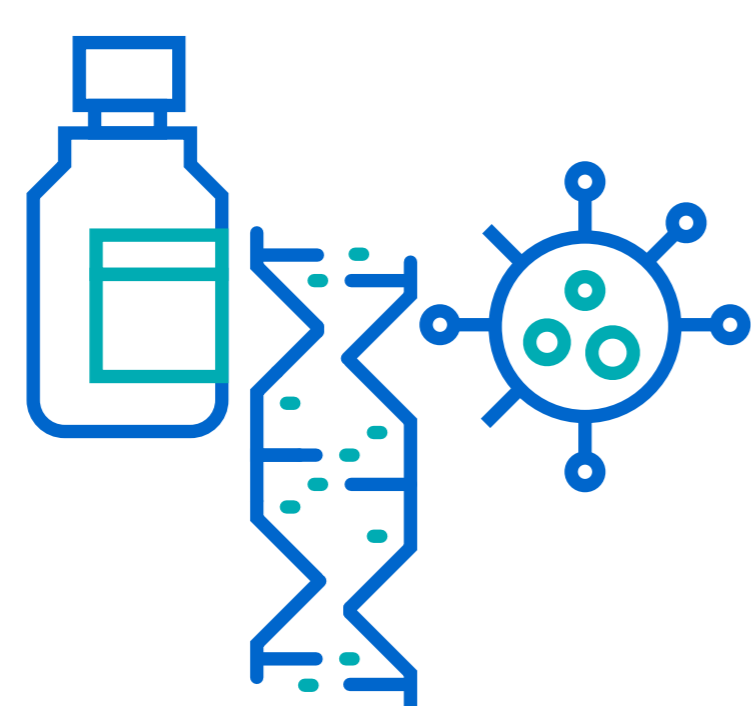
These highly automated **systems** are very sophisticated pieces of robotics with complexity approaching that of modern-day jet aircraft. They can have **more than 20,000 fine-tuned components** and require hundreds of hours to assemble.



**4.** The **system** begins the process of extraction, amplification and detection of the **virus genetic material**.



**9 reagents** are used to process a full PCR reaction. Reagents are complex mixtures of biochemicals or chemicals. The manufacturing of quality reagents at industrial scale is technically demanding.

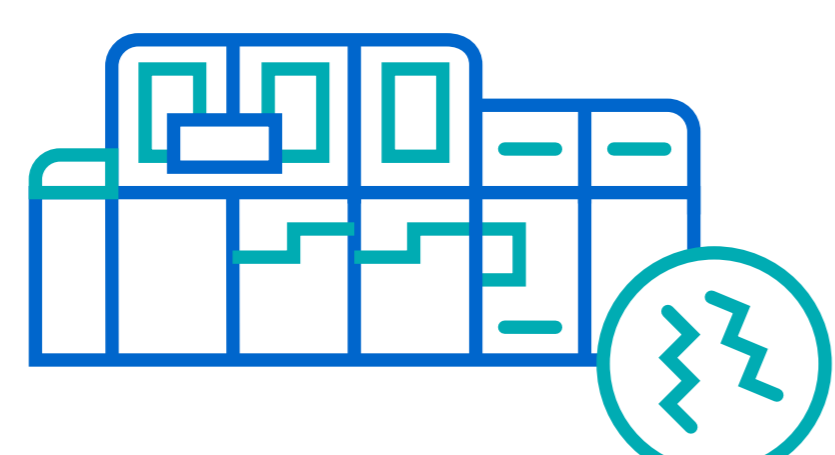


**4a.** The **viral RNA** is extracted to **isolate** it from other cellular components.

The **virus SARS-CoV-2** uses positive-sense single-stranded RNA (ribonucleic acid) as its genetic material.



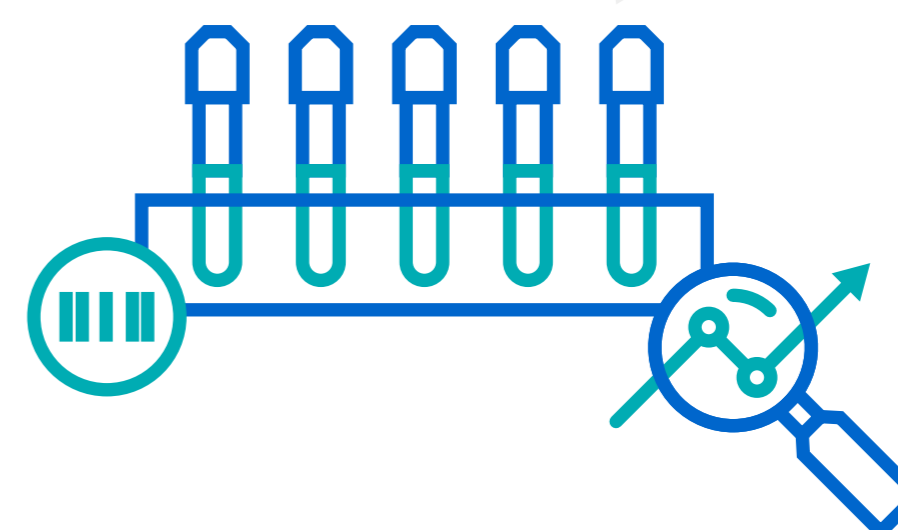
**4b.** **Multiple copies** of a short fragment of that **RNA** are made.



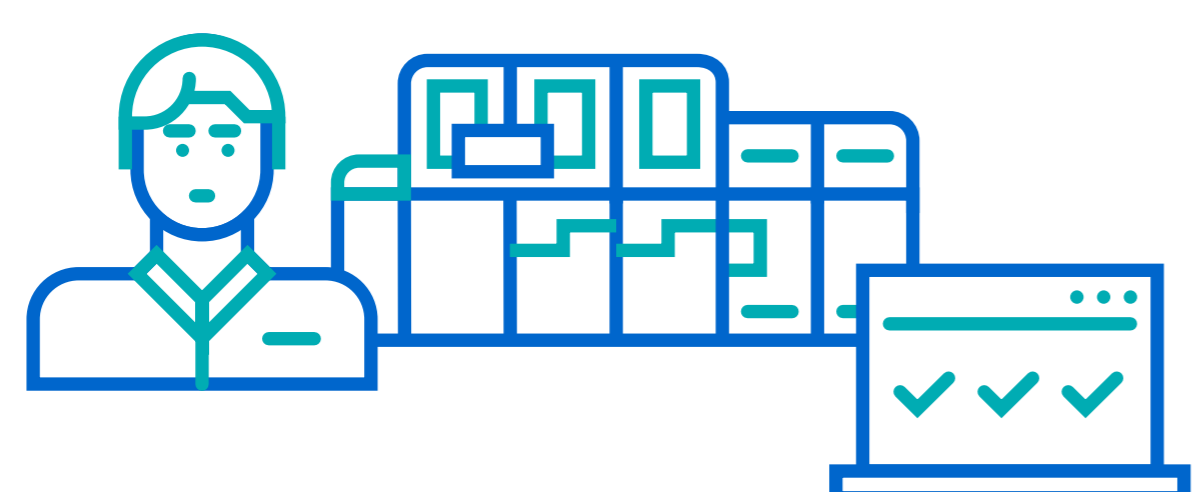
**4c.** The presence of those copies is detected with **fluorescent dye**.

**4d.** The signal from the **fluorescent dye** is analysed by a complex mathematical algorithm to decide whether **viral RNA** was present in the sample.

**Positive** and **negative** controls ensure the reaction is working properly.



About **3 hours** after loading the sample, the system provides test results.



**5.** Specialised lab professionals **analyse, control** and **approve** the **test results** before they go into the lab reporting information **system**.



**6.** These **results** are made **available** to the **healthcare provider** to improve patient management and to enable more **informed decisions**.

