Newsletter

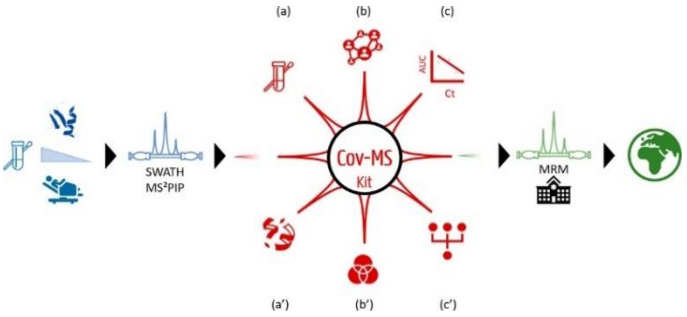
03/2021

Mass-Spectrometry-Based Detection of SARS-CoV-2 Infection

The ongoing SARS-Cov-2 pandemic keeps challenging the world since it first appeared in late 2019. At the peak of the waves test labs reached their limits for RT-PCR tests (e.g. reagent shortage). Therefore a consortium of academic and industrial laboratories decided to develop an alternative method to detect SARS-CoV-2 infection in clinical samples.

Diagnostics using mass spectrometry

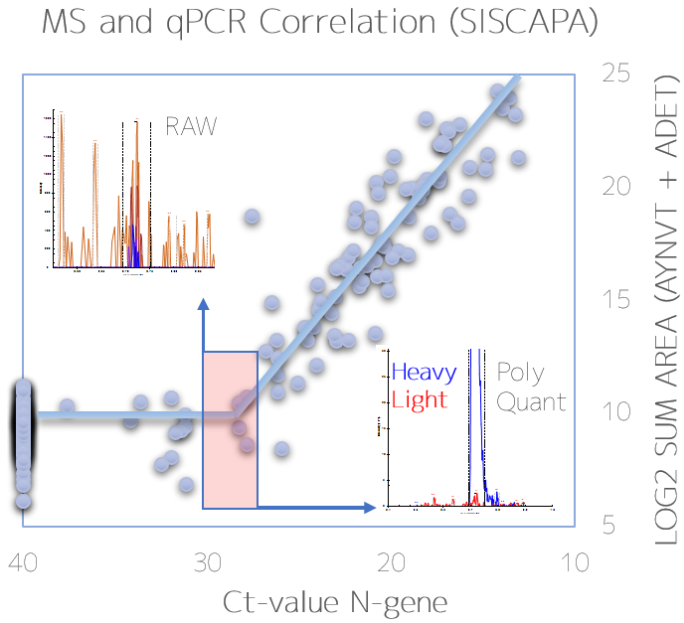
Mass spectrometry allows detection of proteins with high sensitivity and specificity and therefore has high potential in clinical applications. Van Puyvelde *et al* (JACS Au, 2021) could show that mass spectrometry allowed the detection of a SARS-CoV-2 infection in clinical samples (nasopharyngeal swabs) with a high agreement with RT-qPCR. While RT-PCR measures mRNA levels, mass spectrometry detects protein, which could proof a better proxy for infectiousness of the patient.



Van Puyvelde et al.

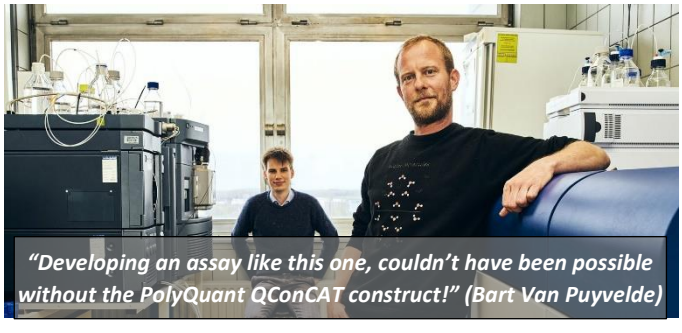
Developing a Clinical Assay

Building on these efforts, Van Puyvelde *et al* now established a clinical protocol using SISCAPA Technology, allowing detection of SARS-CoV-2 infection down to Ct30 using mass spectrometry instrumentations readily available in diagnostic laboratories (*in preparation*).
Their robust, sensitive and specific diagnostic test includes a control assessing for sample quality using a QconCAT from PolyQuant as reference standard. This reference standard (Cov-MS) facilitates workflow optimization, absolute quantification of the viral load, inter-laboratory comparison and automation of peak detection.



Cov-MS reference standard

Cov-MS (PQ-Cov-MS_15N) is a synthetic protein assembled of proteotypic peptides for the spike protein and the highly expressed nuclear capsid protein (NCAP) that are unique for SARS-CoV-2 and peptides that are also present in SARS-CoV, coronaviridae and their lowest common ancestor (LCA). Additionally, Cov-MS comprises control peptides for histone H2A, H2B, H3 and H4 to determine sample quality and synthetic peptides for workflow calibration and standardisation (complementing product: RePLiCal, PQ-CS-1561). The complete 79.41 kDa synthetic protein is available as ^{15}N heavy isotope labelled purified full-length protein (PQ-Cov-MS_15N). Other labelling is available upon request.



"Developing an assay like this one, couldn't have been possible without the PolyQuant QConCAT construct!" (Bart Van Puyvelde)

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