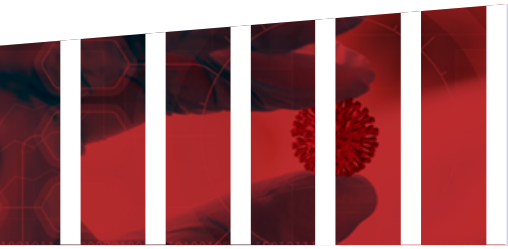

PROGNOSTIC BIOMARKER OF COVID-19 SEVERITY AND RISKS OF SEQUELAE POST-ACUTE INFECTION

KEYWORDS

- Biomarker
- In Vitro Diagnosis/ Prognosis
- COVID-19
- Disease Severity

Collaboration type
License agreement
R&D collaboration

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THE TECHNOLOGY IN A NUTSHELL

New prognostic Biomarker enabling early identification of patients infected by SARS (including COVID-19) at risk of developing severe illness, clinical complications and post-acute sequelae including pulmonary fibrosis.

STATE OF THE ART

While efficient diagnostic methods have been developed to identify COVID-19 infection, biomarkers enabling early and accurate prediction of COVID-19 severity and adverse clinical development are still lacking. Despite the large amount of data generated during the pandemic phase, correlation of specific markers with disease severity and survival remains difficult considering the large number of analytes affected during the clinical evolution of the disease.

Translation of such biomarkers into clinical practice is however needed to recognize COVID-19 patients at risk of severe illness and post-acute sequelae who would most benefit from an early specific, novel and expensive treatment as monoclonal therapeutic antibodies.

THE INVENTION

The present invention is directed to the use of the heptapeptide of angiotensin (Ang-1-7) as biomarker for the prognosis and early decision-making of therapeutic treatment in COVID-19 patients. According to blood level of Ang-1-7, stratification of patients' subpopulation at higher or lower risk of COVID-19 pulmonary fibrosis/sequelae is achieved. The combination of Ang-1-7 with additional markers provides means to rapidly provide the most appropriate treatment to the patients according to their risk profile ranging from mild treatment, Ang-1-7 agonists, antifibrotics or monoclonal therapeutic antibodies and/or oxygen supplementation at an early stage of the disease progression. This comprehensive patient stratification method is also of interest in the design of clinical trials so as to assess treatment efficacy according to subgroups of patients.

The technology is conducive to development of immunoassays including ELISA and CLEIA kits directly useful in clinical settings and could therefore efficiently contribute to limit clinical complications for COVID-19 patients receiving the most suitable treatment rapidly upon admission at the hospital.

KEY ADVANTAGES OF THE TECHNOLOGY

- Early diagnosis of disease severity
- Global comprehensive prediction test discriminating at-risk patients subpopulation
- Therapeutic treatment decision tree based on composite index
- Potential to limit post-acute sequelae for patients

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POTENTIAL APPLICATIONS

- COVID-19 patient stratification upon hospital admission for therapeutic treatment decision-making
- Companion diagnostic for innovative treatment (therapeutic antibodies) under development
- Possible implementation on automated CLEIA platforms

TECHNOLOGY READINESS LEVEL: 1 2 3 4 5 6 7 8 9

TRL-3 Proof of concept assay established for ELISA – Clinical validation ongoing

THE TEAM

LHUB-ULB is one of the five largest university hospital laboratories in Europe. It was founded in the nineties and is now the common laboratory of clinical biology for 5 hospital campuses including ULB academic hospital and the oncology Jules Bordet Institute. The laboratory provides comprehensive services in all fields of clinical biology ranging from medical chemistry, hematology, immunology, microbiology all with an extensive panel of routine and specialized analysis. It hosts 8 national centers of references (i.e. HIV, S. aureus). The laboratory, which operates under a quality control system accredited ISO 15189, gathers more than 450 collaborators for a total surface of 8.500 square meters of laboratories equipped with state-of-the-art analytical platforms and instruments. In addition to its clinical services, the laboratory also conducts research and technological development activities aiming at advancing innovative methods and assays of direct interest for clinical implementation.

THE INVENTOR

Dr Nathalie DE VOS is a clinical biologist at the Chemistry core lab of LHUB-ULB since 2018 after 9 years in a similar position at the Heilig Hart hospital in Mol. She graduated as Pharmacist clinical biologist specialist at the KULeuven in 2009. She is an expert in IVD and has published several research articles related to SARS-CoV-2 Diagnostic tests since the start of the pandemic.

RELEVANT PUBLICATIONS

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> Post-discharge critical COVID-19 lung function related to severity of radiologic lung involvement at admission, Truffaut L., Demey L., Bruyneel A. V., Roman A., Alard S., De Vos N., Bruyneel M., Respiratory Research, Jan 2021, 22:29. DOI: 10.1186/s12931-021-01625-y

> Similar pulmonary functional outcomes at 3 months in critical COVID-19 survivors hospitalized during the first, second, and third pandemic waves, Dusart C., Smet J., Chirumberro A., André S., De Bels D., Roman A., Claus M., Bruyneel A. V., Menez O., Alard S., De Vos N., Bruyneel M., Research Square preprint. DOI: 10.21203/rs.3.rs-1384691/v1

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