

## DIAGNOSIS OF SARS-COV-2 INFECTION: INCLUSIVE TESTING OF INDIVIDUALS WITH AN IMMUNODEFICIENCY (COD. 2020.013)

### COORDINATOR

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### RESEARCH AREA

Diagnostic

### DEVELOPMENT STAGE

Level 1 - TRL - Basic principles observed and reported. MRL - Basic principles observed and reported.

### PROPOSITION / APPLICATION

There are currently no diagnostic tests for COVID-19 that are considered safe for asymptomatic people. In the absence of symptoms, it is not possible to identify the viremia period. Then the diagnosis of SARS-CoV-2 infection cannot be reached with RT-PCR. Antibody-based diagnosis is also inefficient, given that antibody production is late in the viremia period. The researchers estimate that the proportion of infected and asymptomatic people is huge: between 5 and 80% of people who tested positive for SARS-Cov-2 may be asymptomatic; symptom-based selection does not reach a considerable number of cases; cases defined as asymptomatic may become symptomatic after a few weeks; all children and young adults can be asymptomatic. Serological diagnosis is also not an option for people with antibody production deficiency. Deficient antibody production is one of the most frequent inborn errors, with 56.7% in Europe, 53.2% in Latin America. Deficient antibody production is estimated to occur in six million people worldwide. In Brazil, the researchers estimate the prevalence of cases of innate errors in the production of antibodies in children with diagnosed repetitive respiratory infections at 8.7% (Leiva et al., 2007). Although fatal cases in children aged 0 to 9 years represent only 0.01% of global cases, they appear to have a different presentation. Therefore, the CDC called them Multisystem Inflammatory Syndrome in Children (MIS-C). Children and young people are not at a greater risk of developing a severe illness. However, this group may be the primary transmitter of SARS-CoV-2. Important, children have a positive result by RT-PCR for longer than adults, especially in the 6-12 age group, when they have an average of 32 days testing positive. It is also noteworthy that the reliable diagnosis in children also needs particular attention since it depends on the return to classes, the safety of the community, their families, and collaborators. Another critical point is that the two vaccine strategies under development shall not include individuals with an immunodeficiency. So the diagnosis proposed by the research group may illuminate more efficient vaccine strategies in inducing cellular responses.

### INNOVATION

The research group proposes a diagnostic test capable of diagnosing the infection in most individuals, both immunocompetent children and adults, and also affected with innate errors in the immune system, excluding those presenting errors in cellular immunity.

### OPPORTUNITY

Development of a diagnostic test for SARS-CoV-2 infection for immunocompetent and immunodeficient adults and children but with errors in cell function.

### CONTACT

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