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(54) Title: SEQUENCING MICROBIAL CELL-FREE NUCLEIC ACIDS TO DETECT INFLAMMATION, SECONDARY INFECTION, AND DISEASE SEVERITY

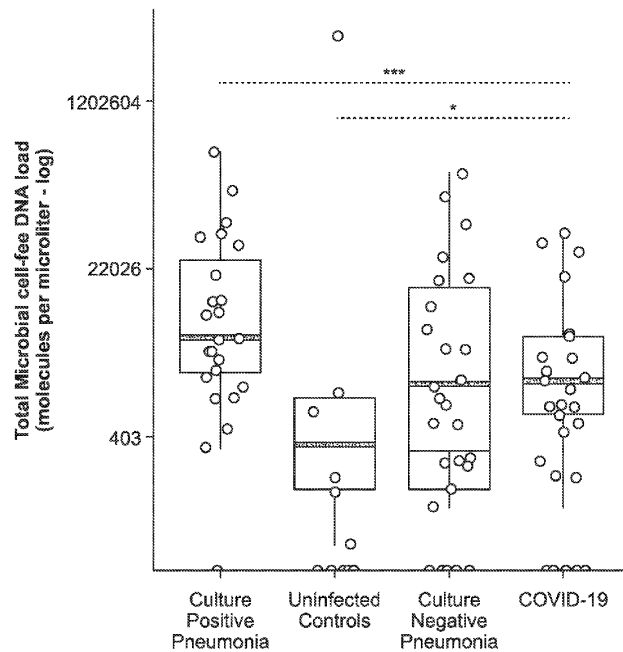


FIG. 1A

(57) Abstract: Described herein is a method of detecting secondary infection in a patient, particularly a patient with a primary infection that is a pneumonia, a COVID-19 infection, or a COVID-19 pneumonia. In some cases, the secondary infection is a secondary bacterial infection, e.g., secondary bacterial pneumonia. In some cases, the methods provided herein detect a hyper-inflammatory response or severity of disease, e.g., indicating a severe COVID-19 infection, or provide a risk of death from a disease (e.g., COVID-19). This disclosure also provides method of detecting a localized respiratory infection in a subject by quantifying microbial cell-free nucleic acids (e.g., mdfDNA) from plasma from the subject. In some cases, the subject is not bacteremic when plasma is collected from the subject. This disclosure also provides systems, such as nucleic acid-sequencing systems with increased reliability for detecting secondary infections, particularly in patients with culture-negative pneumonia.

[Continued on next page]

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