BU Clinical & Translational Science Institute

Title: Longitudinal measurement of anti-viral and autoimmune antibodies for two years after SARS-CoV-2 infection reveals uniquely durable vaccination responses and partial waning of self-reactive IgG

Authors: Christina McConney4, Maria Jose-Ayuso4, Erika Smith4, Victoria Volfson Sedletsky4, Manish Sagar1, Alex Olson1, Nahid Bhadelia1,2,3, Jennifer Snyder-Cappione4

Affiliations: Departments of 1Medicine, 2Center for Emerging Infectious Diseases Policy & Research, 3National Emerging Infectious Diseases Laboratories (NEIDL), and 4Microbiology, Boston University School of Medicine, Boston, MA

Abstract Contact: Christina McConney (csmcc@bu.edu)

As temporal distance from the start of the COVID-19 pandemic increases, there is mounting concern of the long-term immunological consequences of SARS-CoV-2 infection(s). Abnormally high levels of a panoply of autoantibodies are found during acute COVID-19, and to date it is still unclear if these antibodies are sustained for a year or longer post-infection. Additionally, if there is improved longevity of vaccine-induced antibodies when administered against the immune backdrop of previous SARS-CoV-2 infection remains to be elucidated. To address these questions, we measured a series of anti-viral and autoimmune antibodies from samples taken at intervals from seven subjects infected with SARS-CoV-2 in the spring of 2020 (five outpatient and two hospitalized). Blood draws were performed beginning at acute disease and for an additional 10-25 months. Plasma IgG and IgA antibodies reactive with SARS-CoV-2 spike, RBD, and nucleocapsid, as well as CMV Mosaic, EBV GP 350, and Flu H1 were measured using the BU ELISA protocol, autoantibodies to self-antigens associated with connective tissue disease were measured using a commercial kit. Anti-viral antibody responses induced by vaccination were sustained for more than one year post SARS-CoV-2 infection in multiple subjects. Autoantibody trajectories varied, with many positive 'hits' falling below baseline after 1 year, and others remaining high for all time points measured. Future work will include increasing subject numbers to a larger cohort with differing clinical presentations and outcomes to define connections between serological signatures, protection from re- infection, and PASC.