

Post COVID conditions: immunological studies and future perspectives

Joe Breen, Ph.D.

Division of Allergy, Immunology and Transplantation

National Institute of Allergy and Infectious Diseases, NIH USA



Outline

- Highlights from selected NIAID post COVID-19 longitudinal studies
 - IMPACC
<https://clinicaltrials.gov/ct2/show/NCT04378777?id=NCT04411147+OR+NCT04378777&draw=1&rank=2&load=cart>
 - Longitudinal study of COVID-19 sequelae and immunity (M. Sneller)
<https://clinicaltrials.gov/ct2/show/NCT04411147?id=NCT04411147+OR+NCT04378777&draw=2&rank=1&load=cart>
- NIH PASC program
- Steps Forward

Fundamental Gaps/Questions:

- What are the pathophysiologic mechanisms of disease?
 - Viral factors, host factors
- Identify risk factors (including comorbidities, severity of initial disease, viral and host genetics, host immune response to infection and vaccination)
- How do therapeutics given during early disease and vaccines alter outcomes?

Immunophenotyping Assessment in a COVID-19 Cohort (IMPACC): Overview

- Detailed clinical characterization and immunophenotyping of hospitalized adult COVID-19 patients (enrolled within 48 hours of admission)
- Fully enrolled, 1200+ patients from 17 U.S. sites
- Clinical assessment and sample collection
 - Inpatient: Baseline, days 4, 7, 14, 21, 28
 - Outpatient: Day 14, 28 (if early discharge); Months 3, 6, 9, 12 post discharge

IMPACC Clinical Data and Specimen Collection

- **Clinical**
 - Inpatient: Detailed history, lab & radiologic data (harmonized with ISARIC CRF; CORAL cohort)
 - Outpatient: Symptoms, assessment of functional recovery (PROs)
- **Standardized specimen collection and processing** (all timepoints)
 - Whole blood (WGS; CyTOF)
 - Serum (RDB, SARS-CoV-2 and related CoVs Ab titers, virus neutralization; O-link)
 - Plasma (proteomics, metabolomics)
 - PBMC (bulk RNA-seq)
 - Nasal swab (viral load, viral sequence, epithelial bulk RNA-seq)
 - Endotracheal aspirate (if intubated: CyTOF, bulk RNA-seq)

Outline

- Highlights from selected NIAID post COVID-19 longitudinal studies
- NIH Post-Acute Sequelae of SARS-CoV-2 Infection (PASC) Initiative
 - Initiative includes those with post COVID conditions (Long COVID patients, pediatric population, etc.)
 - <https://covid19.nih.gov/nih-strategic-response-covid-19/research-initiatives#postacute-sequelae-of-sarscov2-infection-pasc-initiative>
- Steps Forward

NIH PASC Research: Toward Recovery from SARS-CoV-2 Infection

Goal

Rapidly improve our **understanding** of and **ability to treat** and prevent PASC

Key Scientific Questions

- 1 What are the clinical spectrum of and biology underlying recovery from acute SARS-CoV-2 infection over time?
- 2 For those patients who do not fully recover, what is the incidence/prevalence, natural history, clinical spectrum, and underlying biology of this condition? Are there distinct phenotypes of patients who have prolonged symptoms or other sequelae?
- 3 Does SARS-CoV-2 infection initiate or promote the pathogenesis of conditions or findings that evolve over time to cause organ dysfunction or increase the risk of developing other disorders?

PASC Initiative Components

- Clinical Recovery Cohort
- Autopsy Cohort (Acute and PASC)
- EHR- and Other Real World Data-Based Studies



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Investigator Consortium

*All study investigators will work together
to achieve **speed and scale**:*

- Develop a streamlined set of common core protocol elements (specific hypotheses, design elements, screening evaluations, exams, lab tests, functional assessments, imaging, etc.)
- Conduct rapid systematic screening and follow-up evaluations of infected individuals, to provide a resource for in-depth multi-disciplinary phenotyping, and to pool data and share biospecimens and data from across studies

PASC Initiative Components

The goals of the Recovery Cohort and Investigator Consortium will be supported by [administrative coordination](#) and [oversight](#) as well as [three cores](#):

- Clinical Science Core
- Data Resource Core
- PASC Biorepository Core



Steps Forward

- NIH PASC Initiative
 - Initial research opportunity announcements – applications under review
 - Development of a collaborative multidisciplinary research consortium to answer key questions
- Continue to engage with key stakeholders (including WHO, CDC, clinicians, patient community, advocates and caregivers)
- Facilitate ongoing collaboration and knowledge sharing

Thank you

Jbreen@niaid.nih.gov

+1 301 467 0363