UAB COVID Enterprise Biorepository

The IRB-approved UAB COVID Enterprise Repository was established to evaluate COVID-19+ *hospitalized patients* and *convalescent individuals, including those with Long-COVID. We also have enrolled vaccinated individuals who have underlying health conditions (i.e. solid organ transplants, HIV infected, autoimmune disease) or breakthrough infections*. The patients were enrolled in the repository beginning in April 2020 with enrollment continuing to the present day. The cohort reflects the evolution of COVID management over time, and includes enrollees pre-remdesivir, pre-steroids and those representing current interventions, including monoclonal antibody therapy. All enrollees have consented to access of their UAB electronic medical record (EMR) and all have *agreed to be contacted for further follow up*. We have IRB approved questionnaires that are used to collect health data at the time of enrollment and during follow-up visits, and we have IRB permission to integrate external data sets (e.g., census, death index, area deprivation).

Currently there are **>4,260 unique consented enrollees** who can and are being *recalled for further study (see Tables 1 & 2)*.

UAB established a *dedicated research space* to safely interact with participants that are currently infected or that have entered the convalescent phase of their illness to allow *active longitudinal engagement, specimen collection and capture of patient reported health data*. We staffed this facility and have established the specimen management workflow, including BSL2+ and BSL3 facilities, to ensure rigorous processing, storage, discovery and collaborative distribution for experimental use. We carefully studied COVID-19 data collection instruments, informed in part by the NIH Common Data model, the National COVID Cohort Collaborative and NHLBI's "Cohort of Cohorts" initiative, to develop baseline and follow-up questionnaires, which are coded in REDCap. We have begun follow up with those previously enrolled in COVID Enterprise in support of a longitudinal assessment of outcomes in partnership with the Department of Epidemiology in the UAB School of Public Health. The new COVID research facility also allowed for expansion of the cohort to enroll ambulatory patients who experience long-term symptoms, as well as individuals who were fully vaccinated and had breakthrough infections or healthy controls for comparison. We are currently following **121 participants with Long COVID** who have completed baseline PRO and blood sample collection. We have longitudinal sample and data collection on 47 of those individuals. We have **>100 vaccinated individuals with breakthrough infections** (some outpatient and some hospitalized) and will continue to follow these participants longitudinally.

Table 1. COVID-19 Enterprise Cohort Characteristics

Total Enrollment		4266
Demographics		
Age Range	<18	0
	18-29	249
	30-39	421
	40-49	649
	50-59	928
	60-69	985
	70-79	697
	>=80	337
Sex	Male	2094
	Female	2172
	Unknown/Other	0
Ethnicity	Hispanic	81
	Not-Hispanic	3907
	Unknown/Other	278
Race	Asian	102
	Black	1660
	White	2259
	Unknown/Other	245

Table 2. COVID-19 Enterprise Cohort Comorbidities.

Total Enrollment	4266
Comorbidities	
Obesity (BMI of 30 or higher)	2215
Diabetes	1828
COPD	609
Hypertension	1827
ESRD	364
Heart failure, CAD, cardiomyopathy	1420
Rheumatologic Disorder	207
Solid Organ Transplant Recipient	234
HIV	71
Malignancy	362
Dialysis	350
MI	1062
Dialysis or ESRD	401

Description of biospecimens in Enterprise repository (April 2020 – January 2022)

Samples collected include longitudinal serum and plasma (while hospitalized), PBMCs (frozen), saliva/saline rinses, nasal swabs, DNA, tracheal aspirates, urine and virus swabs. We are also collecting PBMCs, serum and plasma from hospitalized and vaccinated individuals and we have bio-banked autopsy tissues from deceased donors.

Table 3. COVID-19 Enterprise Biorepository specimens in hand.

	Plasma	PBMCs	Saliva	Tracheal Aspirates
Neither Diabetic Nor Obese	708	708	84	13
Obese	454	454	24	31
Diabetic	232	232	3	29
Both Diabetic and Obese	368	368	3	41
Grand Total	**1,762**	**1,762**	**114**	**114**

Cross-sectional samples

- >6500 Viral swabs stored for virus sequencing (1200 sequenced to date and 34 variants identified).
- Matched serum/plasma and PBMC samples from >1700 infected patients (including hospitalized, outpatient, breakthrough infections, range of vaccination statuses).
- 114 tracheal aspirate samples (hospitalized only).
- Genomic DNA from >1000 hospitalized donors and >100 vaccine breakthrough patients
- Saliva and oral saline rinse from >100 donors.

Longitudinal Samples (defined as ≥3 samples collected over time; as of October 2021)

- Serum/plasma from 231 hospitalized donors
- Matched serum/plasma and PBMCs from 326 hospitalized and convalescent individuals
- Matched serum/plasma and PBMCs and genomic DNA from 121 Long-COVID patients with 47 longitudinal samples collected to date and collection ongoing.
- Matched serum/plasma and PBMCs and genomic DNA from 102 vaccine break-through infections. Collection ongoing including after 3rd vaccination
- Matched serum/plasma and PBMCs from 33 HIV^+ vaccinated individuals. Collection ongoing including after 3rd vaccination
- Matched serum/plasma and PBMCs from ~50 vaccinated solid organ transplant recipients. Collection ongoing including after 3rd vaccination
- PBMC, serum and plasma from >50 healthy donors immunized with Pfizer or Moderna vaccine Collection ongoing including after 3rd vaccination (these are controls for our other groups)

Autopsy Specimens - Since March 2020, UAB Pathology has conducted 74 COVID-related autopsies, tissues from which are consented for research use. Deidentified paraffin embedded blocks, and in many cases, wet formalin fixed tissues, may be available from:

- heart, coronary arteries, aorta, pulmonary artery,
- lungs,
- lymph nodes,
- liver,
- kidney
- brain,
- stomach, colon, duodenum and ileum.

UAB Pathologists are also in the process of scanning and uploading all of the COVID autopsy slides to the UAB PEIR website.

UAB COVID-19 TBR Virtual Biorepository: https://peir-vm.path.uab.edu/specialcases.php

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