



A Second Space Age Spanning Omics, Platforms, and Medicine Across Orbit

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The Space Omics and Medical Atlas (SOMA) and international astronaut biobank

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Space Omics and Medical Atlas

INSPIRATION4 TEAM PEOPLE PARTNERS

SpaceX Inspiration4

Inspiration4 was the first human spaceflight to orbit Earth with only private citizens on board. The Crew Dragon capsule *Resilience* launched on 16 September 2021 and landed on 18 September 2021.

For the mission we have collected and analyzed a comprehensive set of longitudinal multiomics data from the astronauts that span pre-, in-, and post-flight periods. These results and datasets are made available as a resource for all related biomedical and spaceflight research.

2911 Collections 1194 Processed samples 22 Assays 10 Timepoints



a

Samples	Assays	Timepoints			
		Pre-Flight	Flight	Post-Flight	Recovery
Whole Blood	Whole Genome Sequencing Clone Hemogenics Complete Blood Count (CBC) Dried Blood SmartRead RNA-seq	L-30 L-14 L-3	F01 F02	P01 P02 P03 P04	R+1 R+40 R+42 R+100
Breast	Cytokine/Chemokine Biomarker Panels Cardiovascular Biomarker Panel Comprehensive Metabolite Panel				
PMBCs	Single-Cell RNA-seq Single-Cell ATAC-seq Single-Cell T-Cell Viability Sequencing Single-Cell B-Cell Viability Sequencing				
Plasma	Proteomics Metabolomics cDNA cRNA				
EVNTs	Proteomics				
Dried Blood Spot	Hemogenics qPCR				
Monocyte	Metabolome Metametabolome				
Monocyte Derived	Metabolome Metametabolome				

b

Samples	Assays	Timepoints			
		Pre-Flight	Flight	Post-Flight	Recovery
Whole Blood	Whole Genome Sequencing Clone Hemogenics Complete Blood Count (CBC) Dried Blood SmartRead RNA-seq	L-30 L-14 L-3	F01 F02	P01 P02 P03 P04	R+1 R+40 R+42 R+100
Breast	Cytokine/Chemokine Biomarker Panels Cardiovascular Biomarker Panel Comprehensive Metabolite Panel				
PMBCs	Single-Cell RNA-seq Single-Cell ATAC-seq Single-Cell T-Cell Viability Sequencing Single-Cell B-Cell Viability Sequencing				
Plasma	Proteomics Metabolomics cDNA cRNA				
EVNTs	Proteomics				
Dried Blood Spot	Hemogenics qPCR				
Monocyte	Metabolome Metametabolome				
Monocyte Derived	Metabolome Metametabolome				

c

Samples	Assays	Timepoints			
		Tissue Study	SOMA	Atmos. Changes	Assay Data From Prior Studies
Whole Blood					
Breast					
PMBCs					
Plasma					
EVNTs					
Dried Blood Spot					
Monocyte					
Monocyte Derived					

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