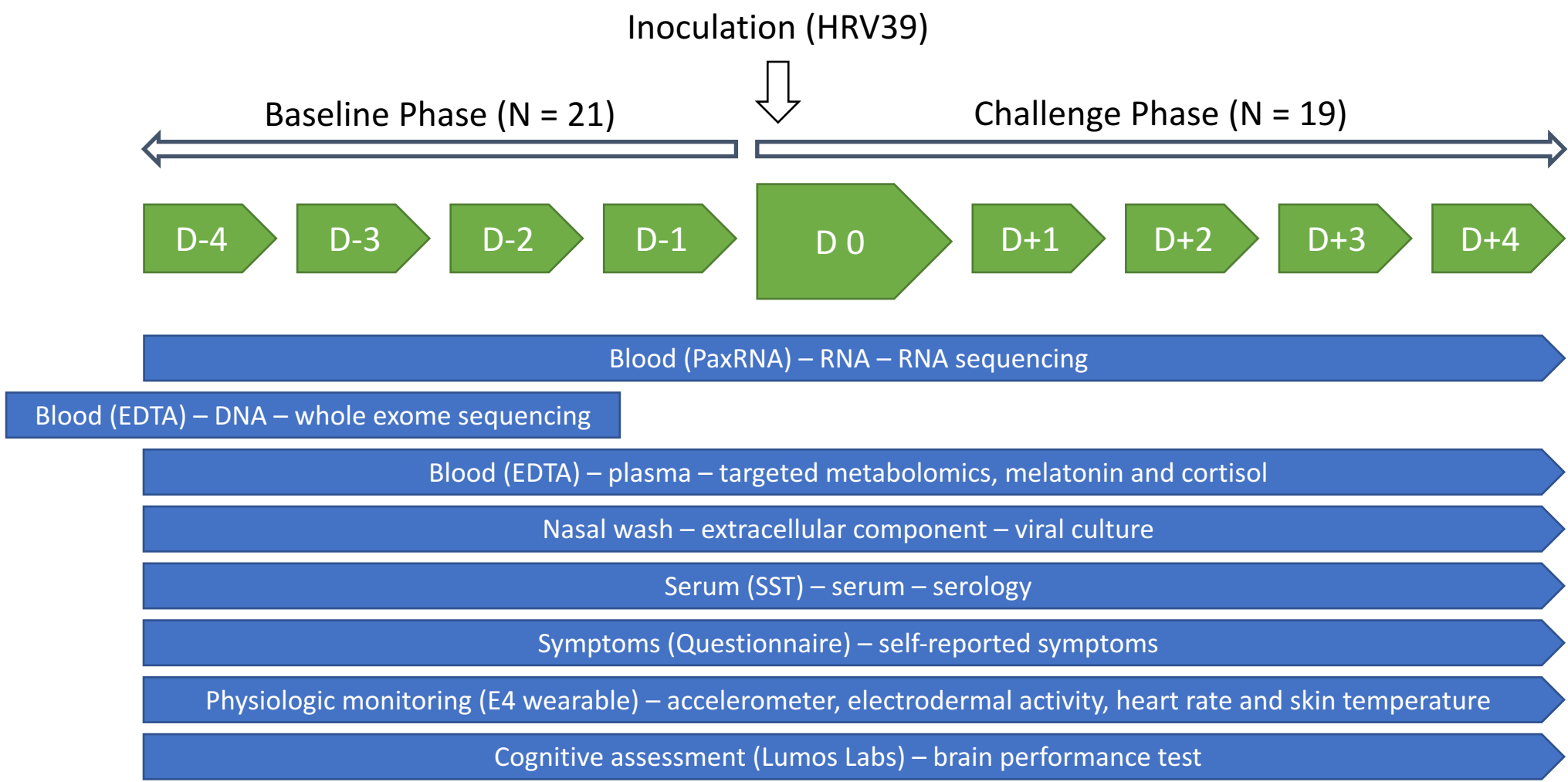


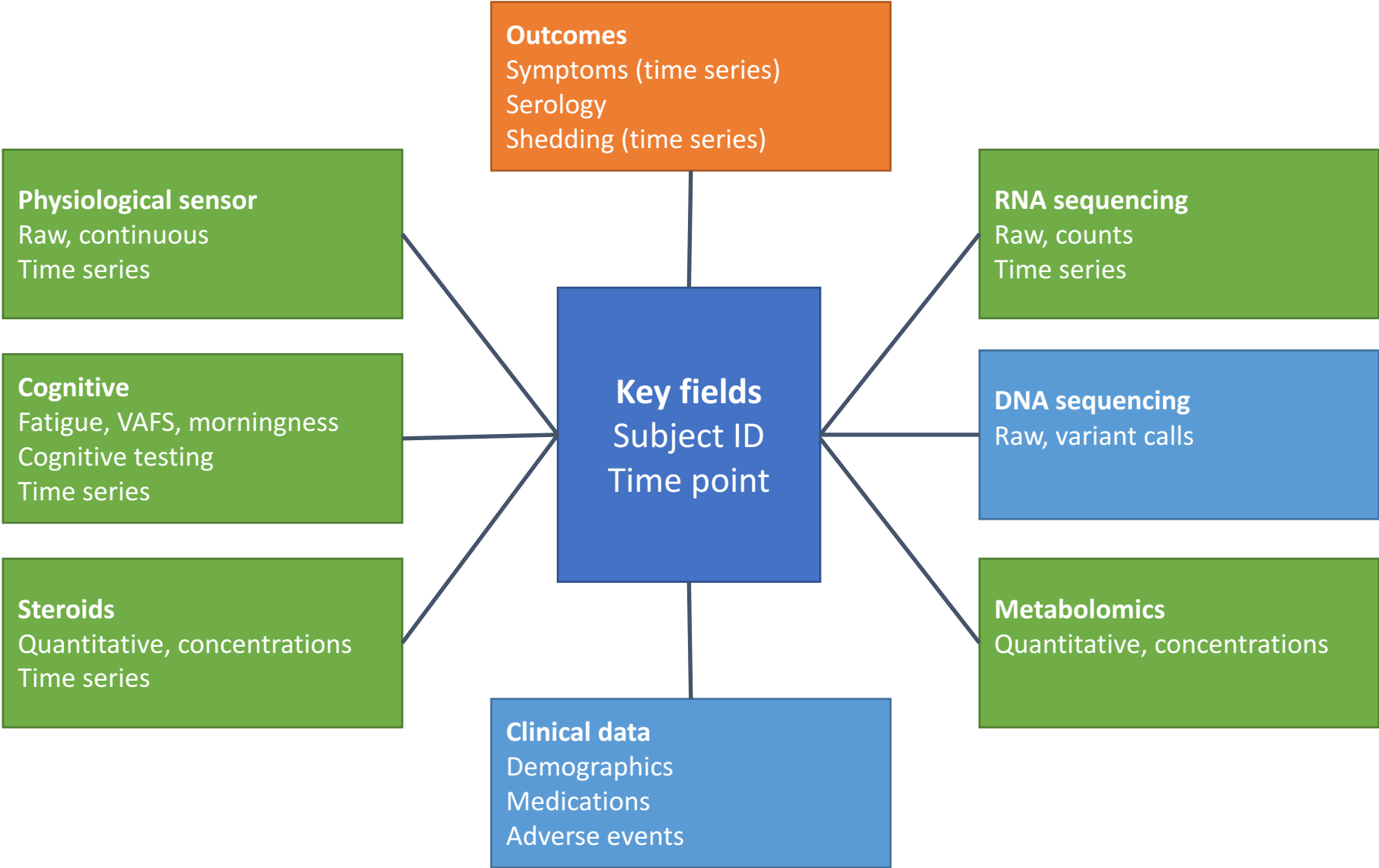
Biochronicity Pilot Study: Experimental Challenge Design



Data Summary

Assessment/Assay	Details	Data Type
Quantitative viral culture	Viral titers for infection status	Raw titers
Symptoms	Self-reported scores (0-4 scale)	Raw scores
Composite scale of morningness (CSM)	Self-report of most productive time of day	Raw scores
Visual analog fatigue scale (VAFS) Fatigue severity score (FSS)	Self-report of general fatigue on a given day (VAFS) and generally (FSS)	Raw scores
Perceived stress scale (PSS)	Self-report of stress and control over life during the past month	Raw scores
Brain Performance Test (Lumos Labs)	Reaction speed, mental flexibility, speed of processing, memory, attention	Raw scores
E4 Empatica Physiological Sensor	Temperature, blood pressure volume (heart rate), accelerometer (3-axis), skin temperature, electrodermal activity	Raw (continuous) data
Metabolites	Targeted metabolomics (p180)	Quantitative data
RNA sequencing	Sequencing transcripts (20M reads) to evaluate differential gene expression levels	Raw data, quantitative data
DNA whole exome sequencing	Sequencing expressed genes (total exomes)	Raw data, quantitative data
Steroid assays	Melatonin, cortisol and DHEAS (Dehydroepiandrosterone)	Quantitative data

Data Summary



Data Summary

Key fields:

- Subject identifier (`subject_id`): HRV15-###
- Study date (`studyDate`): YYYY-MM-DD
- Study time (`studyTime`): ##:##:## 24 hour format
- Study day (`studyDay`):
 - Screening: prior to study
 - DayMinus{4,3,2,1}: baseline no inoculum
 - Day0: inoculation day
 - Day{1,2,3,4}: infection period, post inoculation
 - FollowUp: 21-28 day follow up
- Time of day (`tod`): AP, PM1, PM2
- Study time point (`studyTimepoint`): studyDay + tod

Data collected once per day typically lacks time.

Missing values are represented as NULL or empty fields: data not collected.

Data Summary

Outcomes (sqlViews):

- Daily symptoms (vw_dailySymptoms_release): symptom-by-symptom self-reported severity (0-4 scale)
- Serology (vw_serology_release): acute and convalescent measurements of immune system response to HRV
- Shedding (vw_shedding_release): viral titers for challenge phase, positive indicates shedding of virus in nasal cavity

RNA sequencing (sqlViews):

- Processed unique counts (vw_mRNASeqTotalCountsFtDetrick_release): counts, transcripts x samples
- Processed total counts (vw_mRNASeqTotalCountsDuke_release): counts: transcripts x samples
- Key (vw_mRNASeqKeyDuke_release, vw_mRNASeqKeyFtDetrick_release): sample ID, key fields, sample info
- Raw data (fastq): available separately through Ft Detrick

DNA sequencing:

- Variant calls (VCF, exomeSeqVCF/variant_filetered): counts
- Key (vw_dnaseqKey_release, sqlViews): sample ID (VCF filename), key fields

Metabolomics (sqlViews):

- Quantitative data (vw_p180FIAdata_release, vw_p180UPLCdata_release): concentration, analytes x samples
- Annotation (vw_p180FIAattributes_release, vw_p180UPLCattributes_release): analyte info, detection limits

Data Summary

E4 (HDF5, wearableDevice):

- Data (BIOCHRON_E4.hdf5):
 - TEMP.csv: temperature in Celsius
 - EDA.csv: electrodermal activity in microsiemens
 - BVP.csv: blood volume pressure
 - ACC.csv: accelerometer, 3-axis, acceleration (1/64g)
 - IBI.csv: inter beat interval in seconds
 - HR.csv: hearth rate from BVP in Hz
- Description (README_E4_HDF5): file system structure and parsing notes

Cognitive, fatigue, stress and morningness:

- Fatigue scores (vw_fatigueScore_release): scores (ordinal), ~10 (duties, exercise, motivation, etc) x samples
- Morningness score (vw_morningness_score_release): mixed (categorical, time frames)
- Cognitive testing (vw_cognitiveLumos_release): scores,
- VAFS (Visual Analog Fatigue Score) score (vw_VAFS_release): scores (ordinal)

Data Summary

Steroids (sqlViews):

- Quantitative data (vw_steroid_release): concentrations, {melatonin,cortisol,DHEAS} x samples

Clinical data (sqlViews):

- Screening (vw_screening_release): demographics, contraceptives, medical problems, allergies, etc.
- Medications (vw_screening_release): categorical, self-reported at screening
- Adverse events (vw_adverseEventsSummary_release, vw_adverseEvents_release): categorical with time
- Concomitant medications (vw_conmeds_release): categorical with time
- Daily survey (vw_dailySurvey_release): log from the challenge, sample manifest and notes

Dictionary (vw_viewDictionary_release): variable details, type, names, defaults, etc