

Plan Overview

A Data Management Plan created using DMP Tool

DMP ID: <https://doi.org/10.48321/D1VH4D>

Title: Modeling Hormone and Genetic Mechanisms Driving Sex Differences in Influenza Immunity

Creator: Sabra Klein - **ORCID:** [0000-0002-0730-5224](https://orcid.org/0000-0002-0730-5224)

Affiliation: Johns Hopkins University (jhu.edu)

Contributor: Andrew Pekosz

Funder: National Institutes of Health (nih.gov)

Funding opportunity number: RFA-AI-23-056

Template: NIH-FDP Pilot Template Bravo

Project abstract:

Influenza viruses contribute to a substantial number of illnesses and fatalities annually, underscoring their impact on both health and the economy. Biological sex significantly influences immune responses to influenza infection and vaccination, where females experience higher morbidity and mortality than males despite being more likely to get vaccinated. Sex hormones and genetics are increasingly recognized as two host factors that have a substantial impact on immunity and the development of protective responses during influenza virus infection and after vaccination. To advance the goals of understanding how sex hormones and X-linked genes influence immune memory and protection from influenza, it is essential to develop new computational tools that can dissect the contributions of multiple mechanisms, account for multiple sources of heterogeneity, and precisely forecast the dynamics that yield better protection. To address this, we aim to establish new predictive immune models and simulate human populations using virtual patient cohorts that differentiate the effects of sex hormones and X-linked genes while considering variable hormonal landscapes. The studies will identify controlling factors of sex-influenced immunity with calibration and validation in samples obtained from human populations of infected patients and vaccinated individuals with age, sex, and hormone levels stratified. PUBLIC HEALTH RELEVANCE STATEMENT: Influenza is a leading cause of death in the United States despite availability of vaccines, with sex hormones and genetics emerging as critical host factors influencing the risk of infection. This project provides validated computational methodologies and tools needed to assess sex differences in immunity to this important pathogen.

Start date: 12-01-2024

End date: 11-30-2029

Last modified: 07-08-2024

Copyright information:

The above plan creator(s) have agreed that others may use as much of the text of this plan as they would like in their own plans, and customize it as necessary. You do not need to credit the creator(s) as the source of the language used, but using any of the plan's text does not imply that the creator(s) endorse, or have any relationship to, your project or proposal

Modeling Hormone and Genetic Mechanisms Driving Sex Differences in Influenza Immunity

PART I: General Information (To be completed by all applicants)

Type of Plan

- New

This data sharing plan is specific to the model validation experiments involving use of stored plasma and cells from ongoing studies as well as testing of hypotheses in mouse models. Oversight will be provided by Dr. Sabra Klein, <https://orcid.org/0000-0002-0730-5224>

Plan Version Number

v1

Plan Submission Date

01/18/2024

Point of Contact for DMS plan

Sabra Klein, <https://orcid.org/0000-0002-0730-5224>

Project/Application/Protocol ID

MO21H236

PART II: Data Management Sharing Plan Details

Does the [Genomic Data Sharing \(GDS\) Policy](#) apply?

- No

not applicable

Element 1: Data Type

Describe DMS Plan Elements 1-6 in the section below with free text. To maximize the use of structured information in writing a Plan (e.g., data types, repositories) with a drop-down menu option, please proceed to the adjacent tab labeled "Research Outputs."

Will all scientific data generated by the research project be shared in a data repository that makes data available to the larger research community? If No, explain the rationale that determines which scientific data will not be shared in the comment area below.

Raw immunology data (protein and cells from mice and stored human samples) will be deposited at the JHU data repository
Raw viral titer data from mice will be deposited at the JHU data repository
Raw steroid data from mice will be deposited in the JHU data repository
Raw morbidity data from mice will be deposited in the JHU data repository
Processed data from mice, if needed, will be deposited in the JHU data repository
Processed data from human cells, if needed, will be deposited in the JHU data repository
Statistical analysis scripts can be deposited in GitHub, but also in the JHU data repository so that our code can have a DOI that is associated with our data.

Element 2: Tools, Software, Code

Describe the tools, software, and/or code that are needed to access or manipulate shared scientific data to support replication or reuse, if any.

Data will be made available in standard formats and will not require the use of specialized tools to be accessed or manipulated.

Element 2: Tools, Software, Code

Describe how researchers can access the tools, software, and/or code listed above. Describe if “Other.”

open source

Element 3: Standards

List data or metadata standards or common data elements that will be used applicable to each data type shared. Write N/A if no existing standards.

n/a

Element 4: Data Preservation, Access, and Timelines

Explain if data sharing timelines will not meet expectations of the DMS or other policies, if applicable.

Long-term archiving of non-genomic data will be managed by Johns Hopkins Data Services (JHUDS) using the Johns Hopkins Research Data Repository. The Data Repository provides public access to data through an established repository platform supported by storage and preservation practices that follow the Open Archival Information System reference model. Deposited data is given standard data citations and persistent identifiers (DOIs). JHUDS provides system administration and consultative support for researchers preparing data for deposit. Data will be archived under a memorandum of understanding renewed every 5 years with the PI's consent.

Element 4: Data Preservation, Access, and Timelines

What types of persistent identifiers/ indexing methods will be used for data releases, to enable findability and citation of shared datasets?

We will deposit data in the JHU data repository, which will not be made public until the time of publication. We will receive an identifier that will be included in any publication for easy access to our dataset.

Element 5: Access, Distribution or Reuse Considerations

Describe any limitations or factors affecting subsequent access, distribution, or reuse of this data.

Deidentified data may be reused

Element 5: Access, Distribution or Reuse Considerations

Are there any privacy or informed consent considerations for human data? If Yes, describe including methods to protect privacy and confidentiality.

- Yes

This is not applicable to the majority of data from this project, which will be from mice. For the data derived from human PBMCs and plasma obtained from the Johns Hopkins biorepository, all identifiers will be removed to maintain confidentiality. Sharing of anonymized human PBMC data is pending IRB's review of the donor licensing for secondary open access sharing. If controlled access is required, the plan will be updated with an alternative repository such as Vivli.org

Element 5: Access, Distribution or Reuse Considerations

What type of access will secondary users utilize to access the shared data? Describe if “Other.”

- Open access

Open access to mouse data with identifiers. Open access to deidentified human cellular data.

Element 6: Compliance

Describe how compliance with the Plan will be monitored and managed, frequency of oversight, and by whom.

The corresponding author on the resulting publication would be responsible for providing any needed oversight.

Element 6: Compliance

Will data management and/or sharing activities be facilitated by individuals outside of the project team? If YES, list individual(s), their organization(s), and describe their role(s) and responsibilities in the comments area below.

- No

not applicable

Please proceed to the Research Outputs tab in this application to provide details about the data.

PART III: Additional Information (optional)

If additional policies apply (e.g., Clinical Trials Access Policy, FOA-specific requirements), describe additional information required to meet the policy.

Question not answered.

Provide any additional information or context for readers and reviewers of your Data Management and Sharing Plan.

Please proceed to the Research Outputs tab in this application to provide details about the data.

Planned Research Outputs

Bioassays and measurements - "antibody responses"

ELISA and live virus neutralization data

Bioassays and measurements - "cytokines and chemokine"

multiplex concentrations of cytokines and chemokine in plasma from humans and mice and tissues from mice only

Bioassays and measurements - "Sex steroids"

measure sex steroids by either multiplex luminex assay or ELISAs

Bioassays and measurements - "Virus measurements"

virus titers measured in tissues from mice

Bioassays and measurements - "Raw immune cell data"

Immune cell quantifications from mouse tissues and human PBMCs

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
antibody responses	Bioassays and measurements	Unspecified	Open	JHU Research Data Repository	80 MB	Creative Commons Attribution Non Commercial Share Alike 4.0 International	None specified	No	No
cytokines and chemokine	Bioassays and measurements	Unspecified	Open	JHU Research Data Repository	80 MB	Creative Commons Attribution Non Commercial Share Alike 4.0 International	None specified	No	No
Sex steroids	Bioassays and measurements	Unspecified	Open	JHU Research Data Repository	40 MB	Creative Commons Attribution Non Commercial Share Alike 4.0 International	None specified	No	No
Virus measurements	Bioassays and measurements	Unspecified	Open	JHU Research Data Repository	100 MB	Creative Commons Attribution Non Commercial Share Alike 4.0 International	None specified	No	No
Raw immune cell data	Bioassays and measurements	Unspecified	Open	JHU Research Data Repository	60 MB	Creative Commons Attribution Non Commercial Share Alike 4.0 International	None specified	No	No