# Applied Practice Experience (APE) Practicum Proposal

## 1. Contact Information for Practicum Site and Preceptor

Practicum Site: Tulane University – Roy Lab, Aerobiology  
Address: JBJ Research Bldg. #261  
 333 South Liberty St.  
 New Orleans, LA 70112  
Preceptor Name: Dr. Chad Roy  
Preceptor Title: Professor of Pulmonary Medicine, Microbiology & Immunology

Associate Dean for Research, Tulane School of Medicine

Vice Chair, Research, John W. Deming Department of Medicine

Director, Center for Airborne Infection & Transmission Science  
Email: croy@tulane.edu  
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## 2. Description of Practicum Proposed Activities

The practicum will involve applied biostatistical analysis of two preclinical pulmonary disease models:  
1. A bleomycin-induced idiopathic pulmonary fibrosis (IPF) model, and  
2. An influenza A virus infection model.  
  
The activities will focus on data management, statistical modeling, result interpretation, and visualization of immune, histological, and clinical outcome data. This will involve evaluating treatment responses, disease progression, and survival outcomes, and will contribute to statistical reporting for manuscripts or internal research presentations.

## 3. Practicum Objectives

1. Apply biostatistical methods to analyze complex experimental datasets related to pulmonary disease and treatment response.  
2. Develop and execute reproducible statistical workflows using R (or SAS) for data cleaning, analysis, and visualization.  
3. Interpret and communicate statistical findings to inform biological and public health conclusions.

## 4. Competencies Addressed

Foundational Public Health Competencies:

- C1: Apply epidemiological methods to the breadth of settings and situations in public health practice  
- C2: Select quantitative data collection methods appropriate for a given public health context  
- C3: Interpret results of data analysis for public health research, policy, or practice

Biostatistics Concentration Competencies:

- B1: Apply appropriate statistical methods for analyzing continuous, categorical, and time-to-event data  
- B2: Use statistical software for data management and statistical analysis  
- B3 (optional): Develop statistical analysis plans for public health or biomedical research

## 5. Proposed Work Products

1. Statistical Analysis Report – including cleaned datasets, modeling output, figures, and interpretation for both fibrosis and influenza models  
2. Data Visualization Package – reproducible graphs and tables suitable for publication or presentation  
3. A manuscript draft section (Results and Methods)

## 6. Timeline and Estimated Hours/Week

Start Date: 7/1/2025  
End Date: 12/1/2025  
Estimated Weekly Hours: 10–15 hours/week  
Total Estimated Hours: ~200 hours  
Midpoint Check-in: 9/9/2025  
Final Deliverables Submitted: 1/12/2026

## Appendix: Detailed Project Plans

### Project 1: Influenza Infection Model – Acute Pulmonary Disease

Objective:  
To apply biostatistical methods to analyze data from murine influenza infection experiments evaluating disease severity, treatment efficacy, and host response.  
  
Activities:  
- Clean and structure data   
- Conduct statistical testing across treatment groups  
- Perform survival analysis (Kaplan-Meier, log-rank test)  
- Generate publication-quality graphs  
  
Biostatistical Methods:  
- Descriptive statistics  
- ANOVA, t-tests, Kruskal-Wallis  
- Kaplan-Meier survival analysis  
- Data visualization using R (ggplot2)  
  
Public Health Relevance:  
Influenza is a major public health challenge due to its potential for seasonal and pandemic outbreaks. Preclinical modeling aids in understanding treatment effects and immune responses that can inform vaccine and therapeutic development.  
  
Deliverables:  
- Analysis report  
- Data visualizations  
- Presentation slides or poster

### Project 2: Bleomycin-Induced Pulmonary Fibrosis Model – Chronic Lung Disease

Objective:  
To analyze immune, histological, and clinical data from a murine bleomycin model to evaluate fibrotic progression and therapeutic effects.  
  
Activities:  
- Merge and clean data   
- Statistical comparison of treatment and control groups  
- Regression analysis to assess fibrosis predictors  
- Prepare graphical outputs  
  
Biostatistical Methods:  
- Descriptive stats and group comparisons  
- Repeated measures ANOVA or mixed models  
- Multivariable regression  
- Graphs and plots using R (ggplot2)  
  
Public Health Relevance:  
Idiopathic pulmonary fibrosis is a progressive chronic lung disease with high morbidity. This model supports efforts to better understand disease mechanisms and develop novel treatments.  
  
Deliverables:  
- Summary report  
- Annotated analysis code  
- Draft figures or manuscript content