

# South Florida - RAD

## Wastewater-Based Monitoring of COVID-19.

Presented by:  
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NSF Covid Information Commons, November 15, 2021



**Weill Cornell  
Medicine**

Funded by  
NIH RADx-rad Grant  
1U01DA053941-01

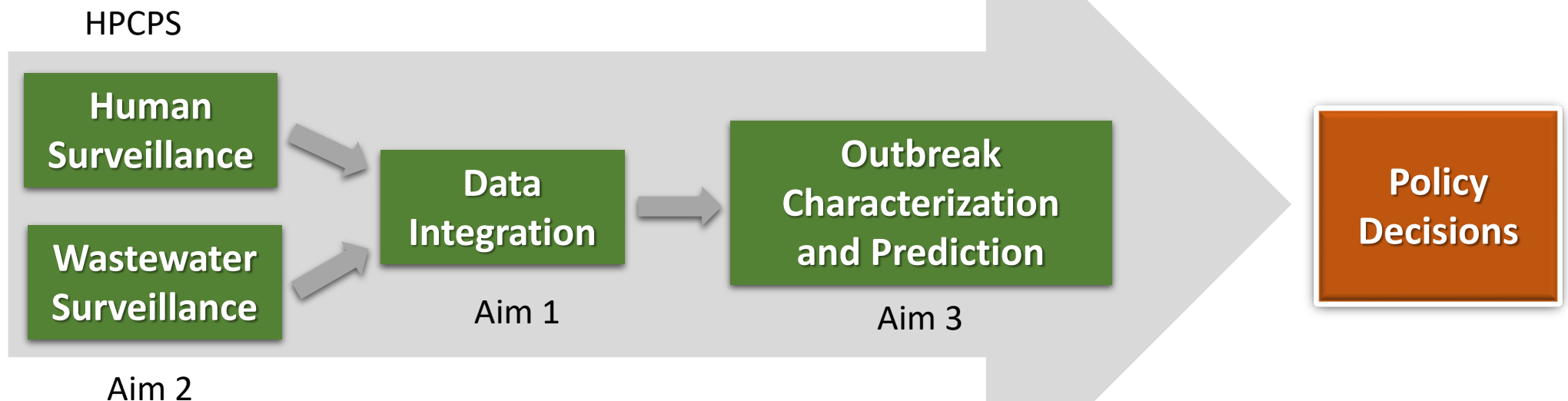
(PIs: Mason, Schürer, Solo-Gabriele)

[covid sfrad.org](https://covid sfrad.org)

# SF-RAD: SARS-CoV-2 Wastewater-Based Surveillance

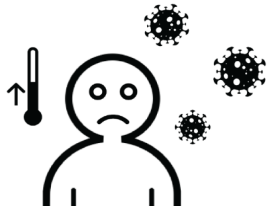
## Aims

1. Data standardization and informatics infrastructure
2. Wastewater characterization
3. Integration with human health surveillance

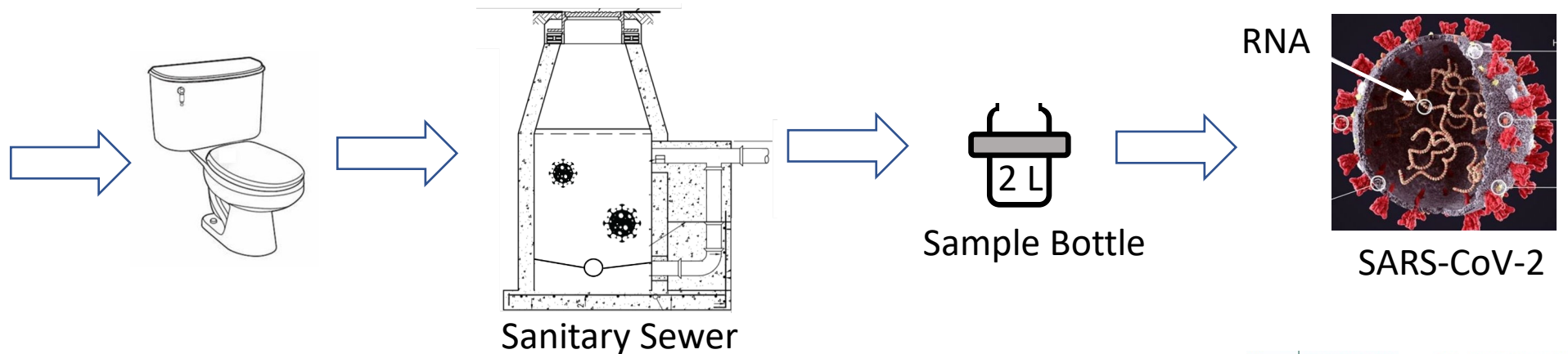


Ultimate objective: Relate wastewater measurements to predict COVID-19 cases.

# Pairing of



Human Health Surveillance with  
Wastewater SARS-CoV-2 RNA levels



# Human Surveillance

## Student Residents

### Fall'20/Spring'21

- Students tested weekly
- Nasal swab, qPCR & breath test
- COVID results and total tests by building/dorm room

### Summer/Fall'21

- Unvaccinated students tested weekly
- All students tested when wastewater exceeds

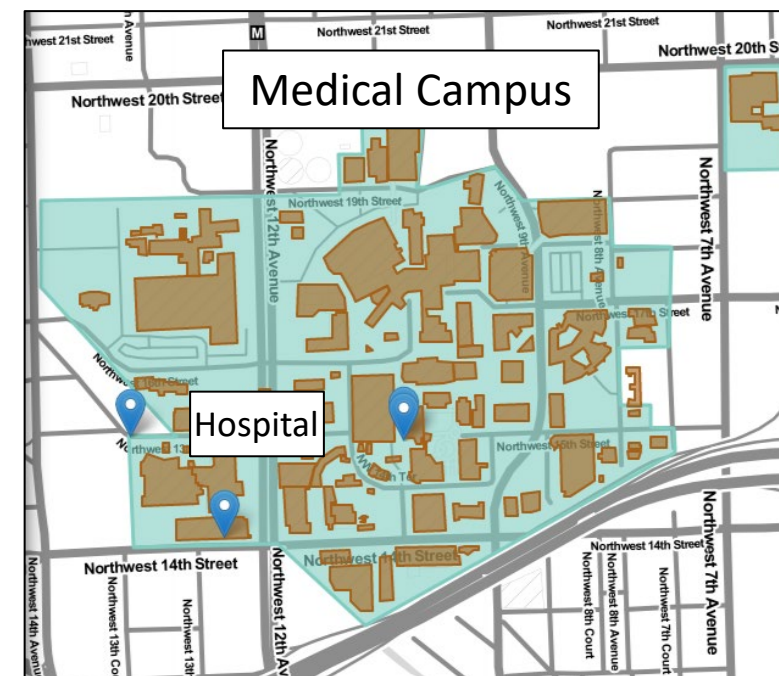
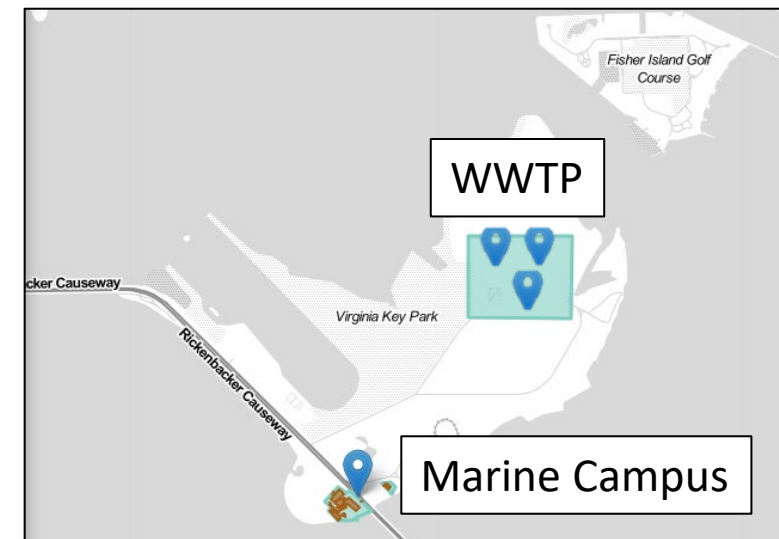
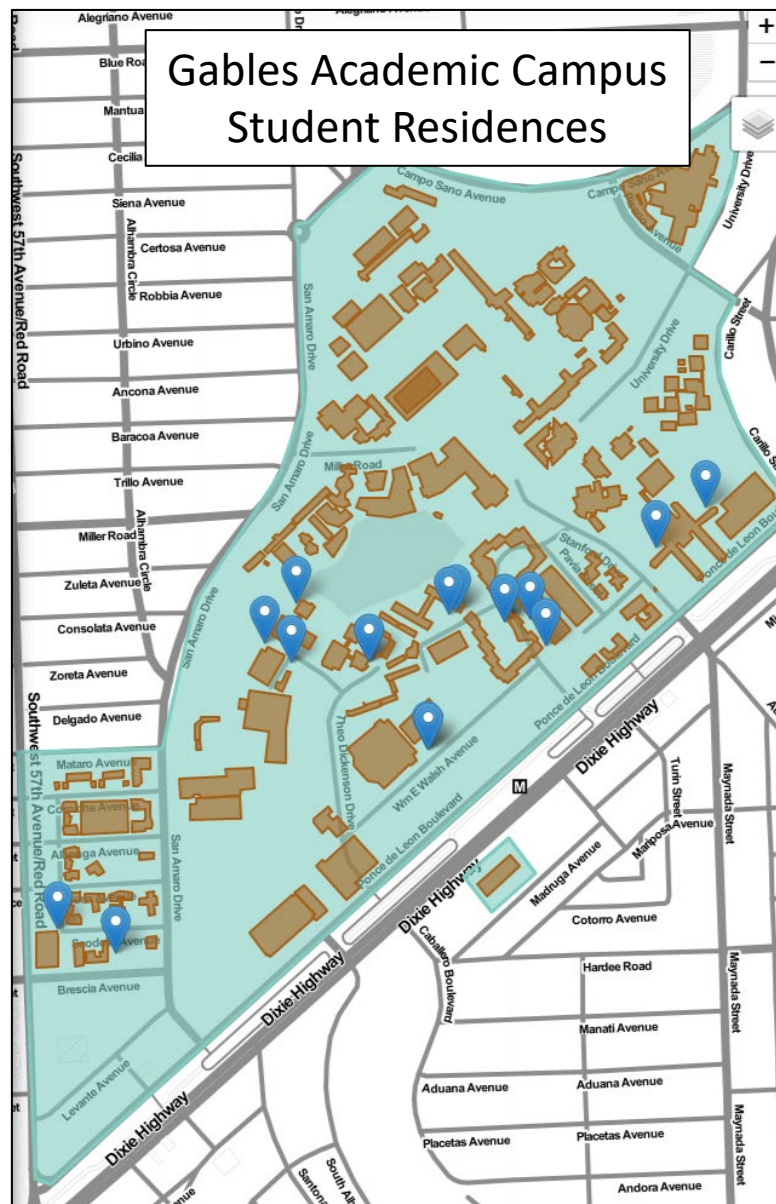
## University Hospital

- Treat known COVID patients
- Electronic medical records pulled regularly

## Miami-Dade County Residents (FDOH)

- Positives by zip code
- Number of tests by zip code

# Sample Collection Plans



**Sample Frequency: weekly, 2x per week, daily, hourly**

# Center for AIDS Research (CFAR)

(Dr. Mark Sharkey)

## Volcano 2<sup>nd</sup> Generation (V2G) - qPCR

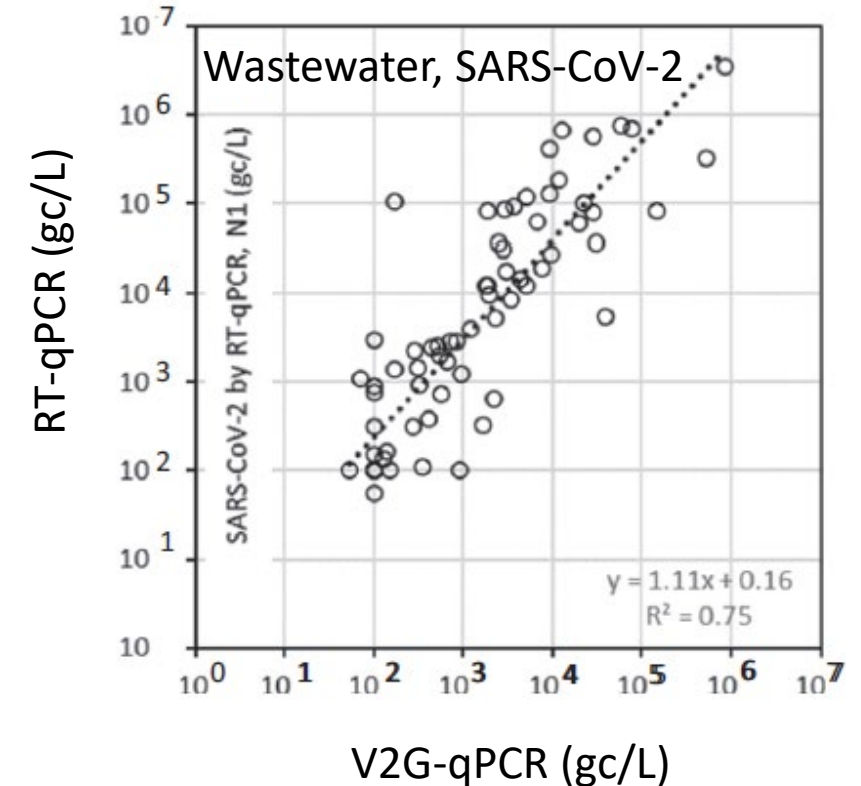
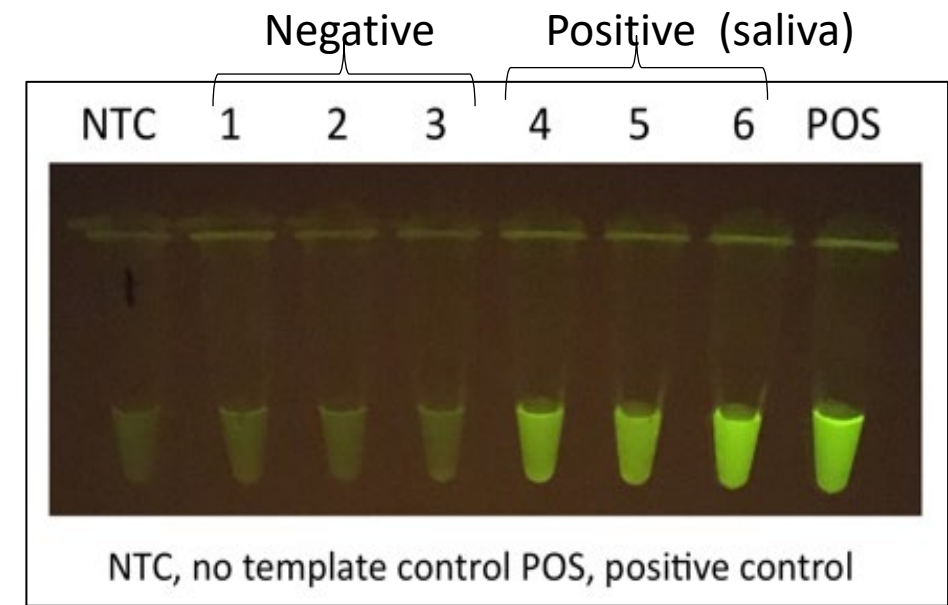
a) Novel polymerase, uses both RNA and DNA as templates

Avoids cDNA synthesis step

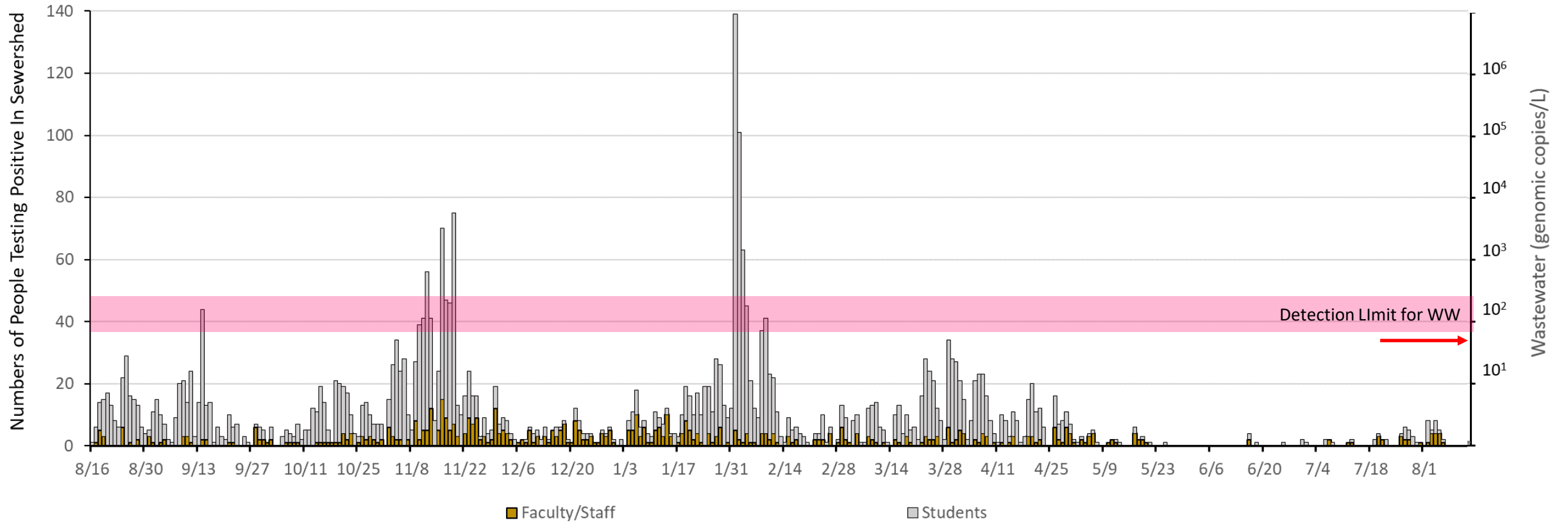
b) Sequence-specific fluorescent hydrolysis probes

c) 2.5 hours turn-around time

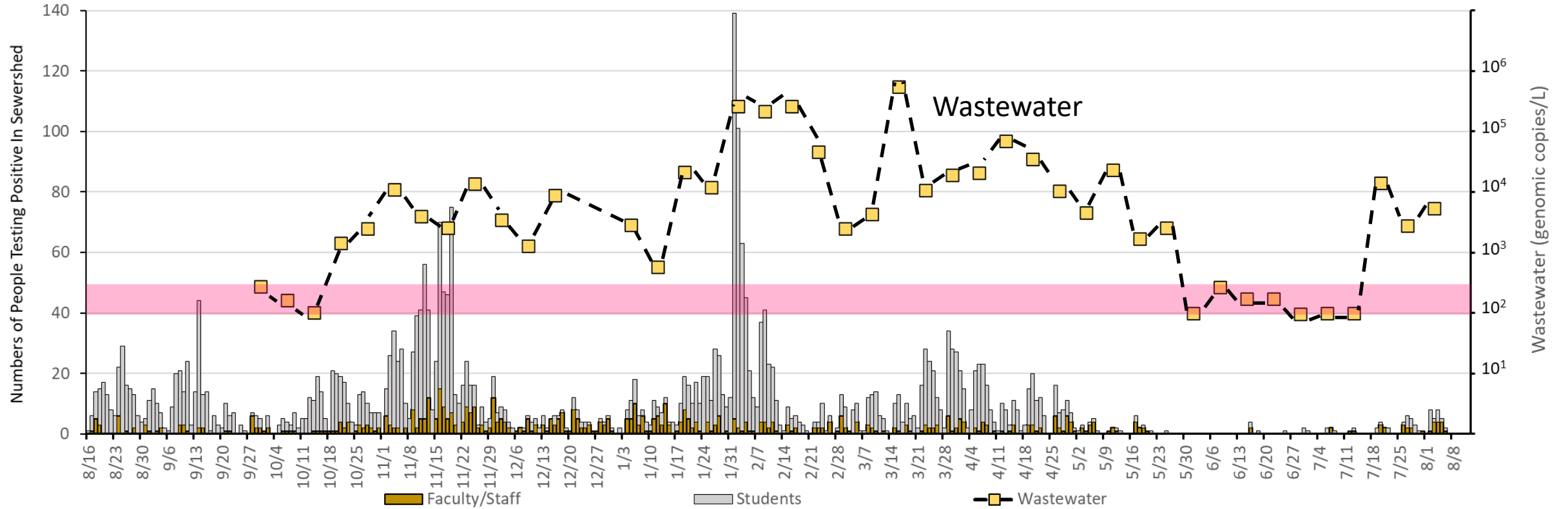
Faster and less expensive than RT-qPCR ★



# University Surveillance



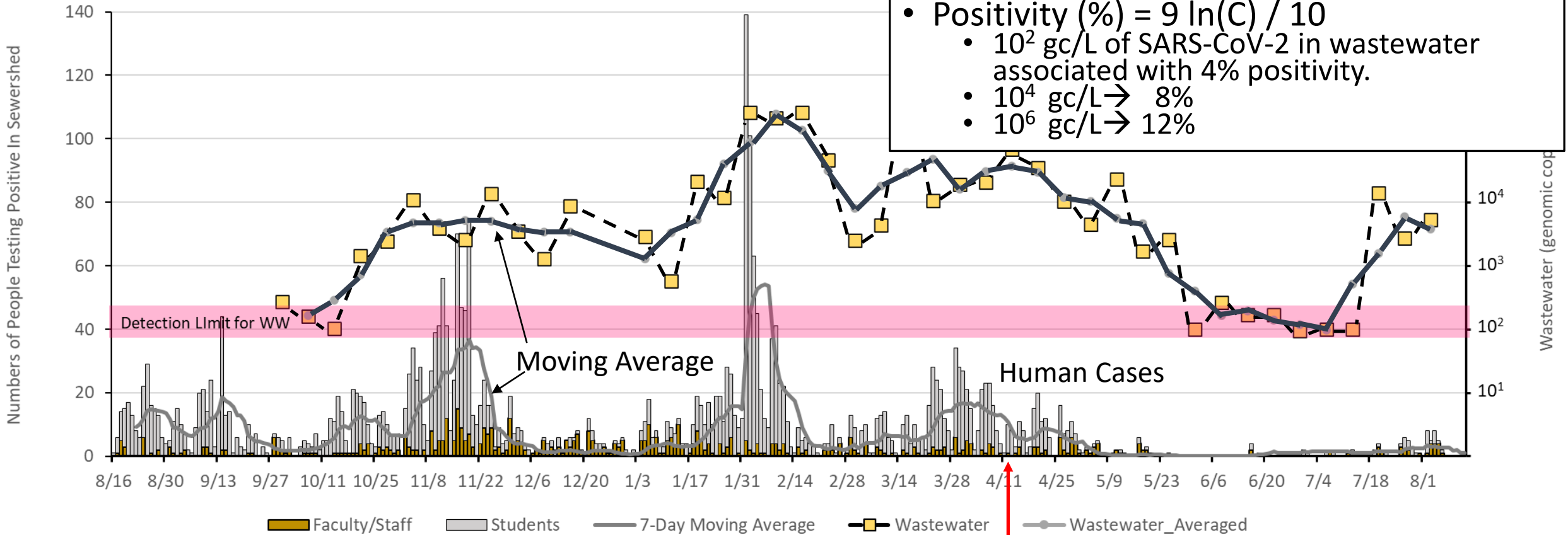
# University Surveillance



# University Surveillance

Naresh Kumar & Alejandro Mantero

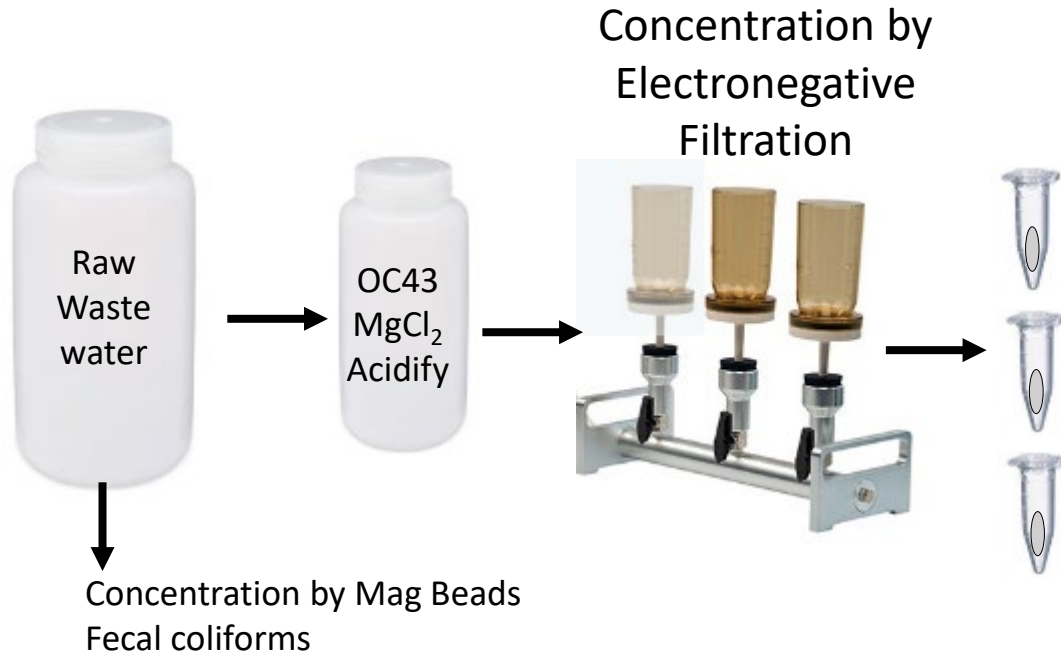
- SARS-CoV-2 in wastewater was a 4-day lead indicator
- Positivity (%) =  $9 \ln(C) / 10$ 
  - $10^2$  gc/L of SARS-CoV-2 in wastewater associated with 4% positivity.
  - $10^4$  gc/L  $\rightarrow$  8%
  - $10^6$  gc/L  $\rightarrow$  12%



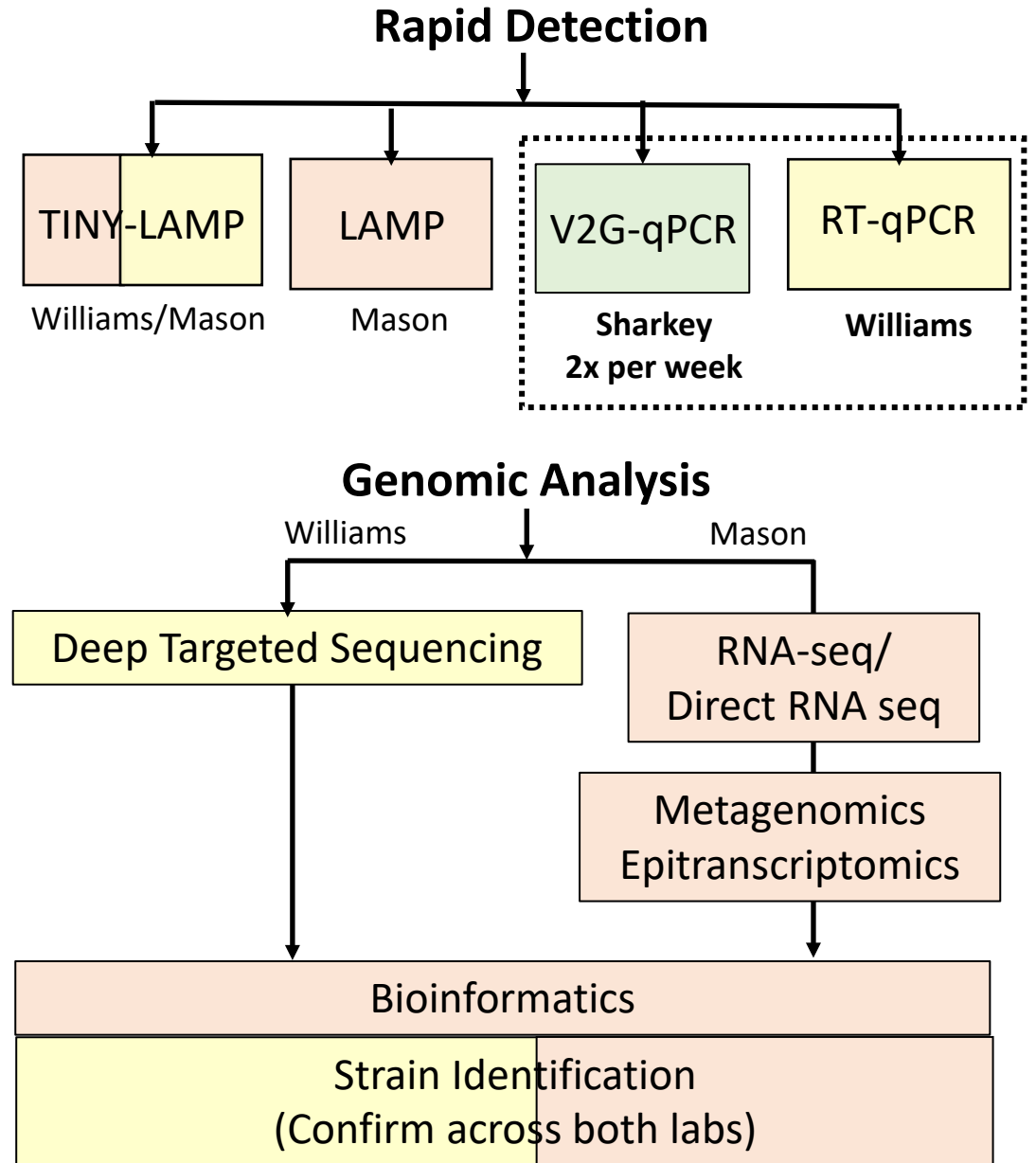
Vaccine Opt In  
For Students

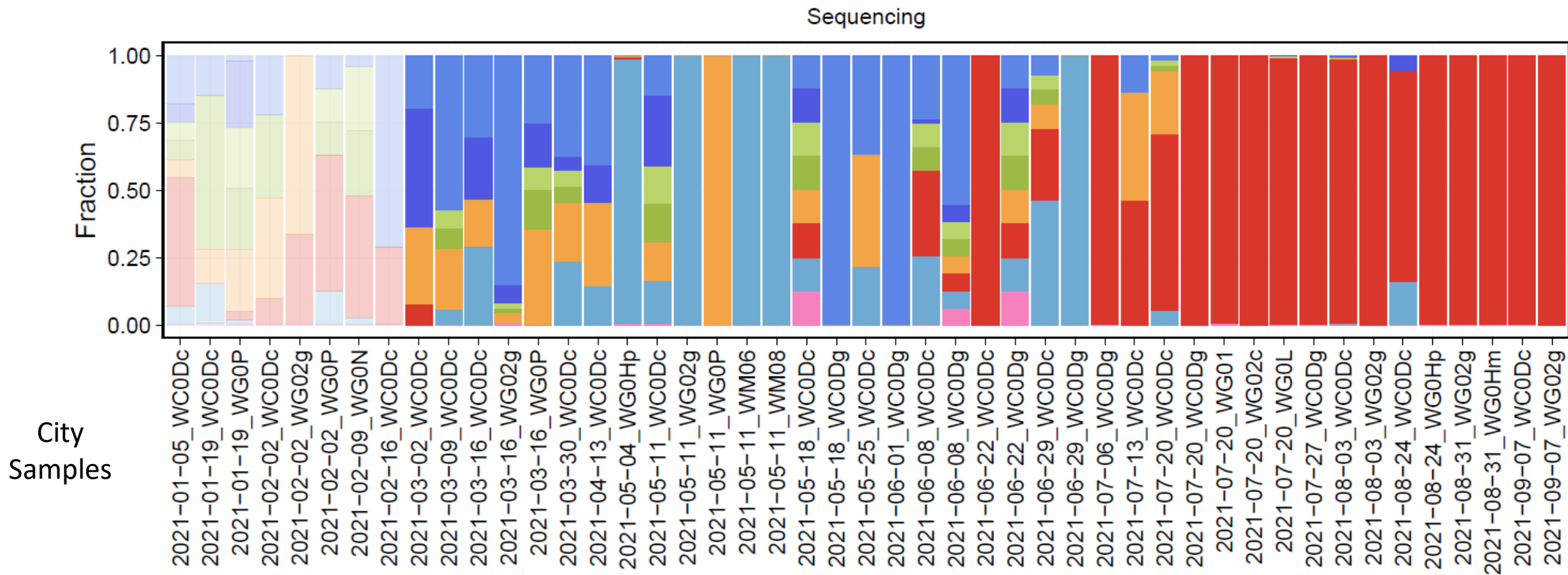
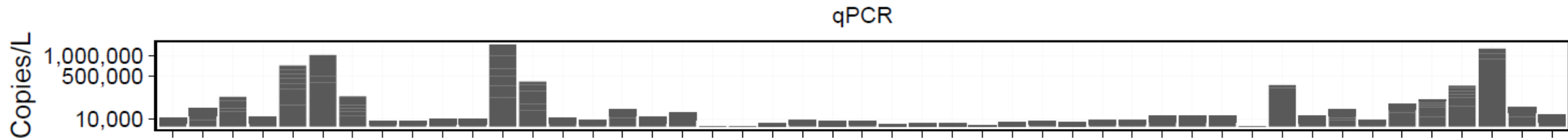


# Sample Analysis Plan (Weekly Sampling)



- M. Sharkey,  
Center for AIDS Research, UM
- S. Williams  
Onco-Genomics Shared Resource, UM
- C. Mason,  
Integrated Genomics Lab, WCM/MetaSub





# Acknowledgments: (NIH RADx-rad 1U01DA053941)

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UM Leadership  
President Frenk  
Dr. Erin Kobetz  
George Grills

Facilities, G/R  
• John Tallon  
• Georgia Norton  
• Norman Pasquier  
• Cecil Bowen

Facilities, Med.  
• Dr. W. Lamar  
• Ed Hengtgen  
• Rob Curtis  
• Joseph Vota  
• Leo Petrache  
• M. Kuindua  
• Yanelis Reyes

Ethics  
• Ken Goodman  
Administration  
• Maria Robertson  
• Xue (Sherry) Yin

Medical Security  
• Ray Valdes  
• City Miami Police

Environ. Health Safety  
• Dr. Jennifer Laine  
• Brian Reding  
• Shane Gillooly  
• Vaughn Munro

Students  
• Johann Amirali  
• Gabriella Cosculluela  
• Erik Lamm  
• Danni Mackler  
• Matthew Roca  
• Collette Thomas  
• Tori Thomas  
• Shelja Kumar  
• Samantha Abelson  
• Julio Contreras  
• Wei Zhang

Sampling Teams  
• Brian Reding  
• Tom Stone  
• Sam Comerford  
• Marleina Drane

Human Health  
• Naresh Kumar  
• Alejandro Mantero  
• Natasha Solle  
• Cynthia Beaver  
• Bhavarth Shukla  
• Darryl Pronty  
• Sebastian Arenas

Miami-Dade Water & Sewer Dept

Lab Concentration  
• Melinda Boone  
• Elena Cortizas  
• Shashana Fiedler  
• Kristina Babler

Data Standards  
• Stephan Schürer  
• Dusica Vidovic  
• Daniel Cooper  
• Chris Mader  
• Caty Chung  
• Nakul Datar  
• Julio Perez  
• Shreeharsha Ven.

Lab Detection  
Center for AIDS Res.  
• Dr. Mario Stevenson  
• Dr. Mark Sharkey  
• Jessica Salinas  
Onco-Genomics Lab  
• Dr. Sion Williams  
• Yoslay. Cardentay  
• Benjamin Currall  
Weill Cornell Lab  
• Dr. Chris Mason  
• David Danko  
• Krista Ryon  
• Jon Foox  
• Dan Butler