



# Dynamics and Coordination of Protein Interactions in Health and Disease

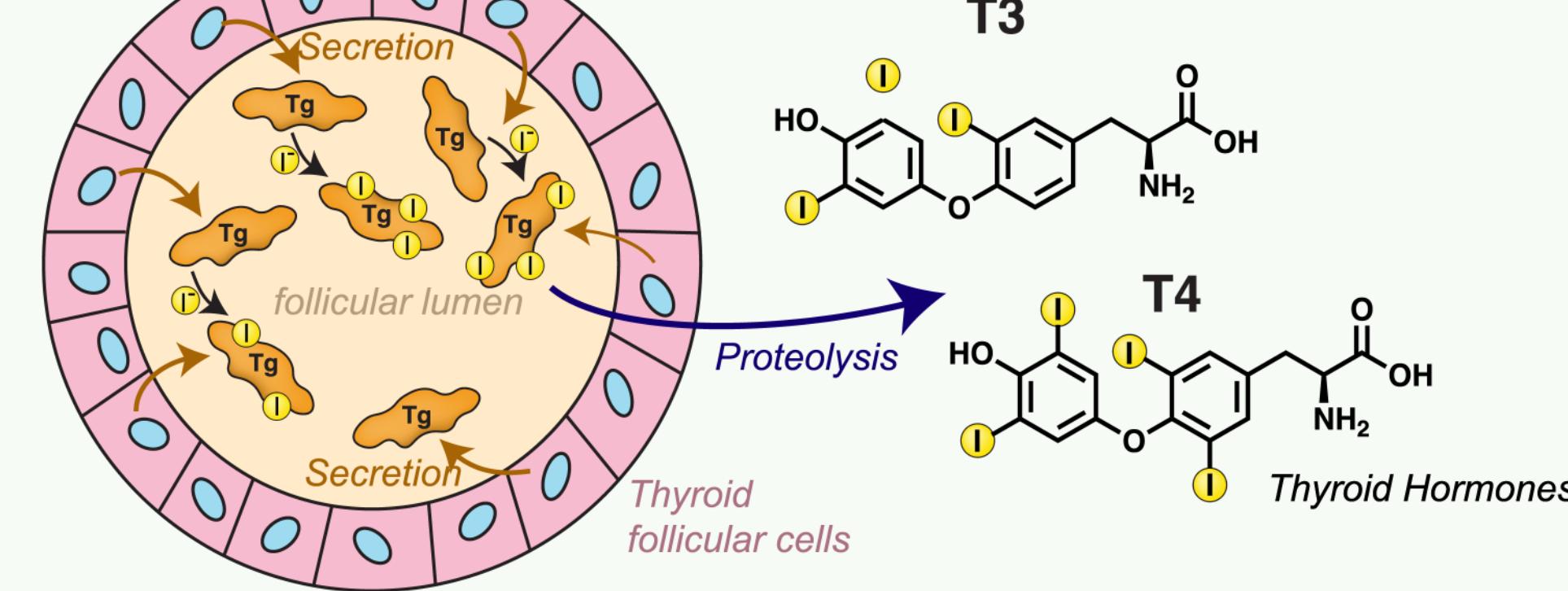
## Plate Research Group

VANDERBILT  
UNIVERSITY

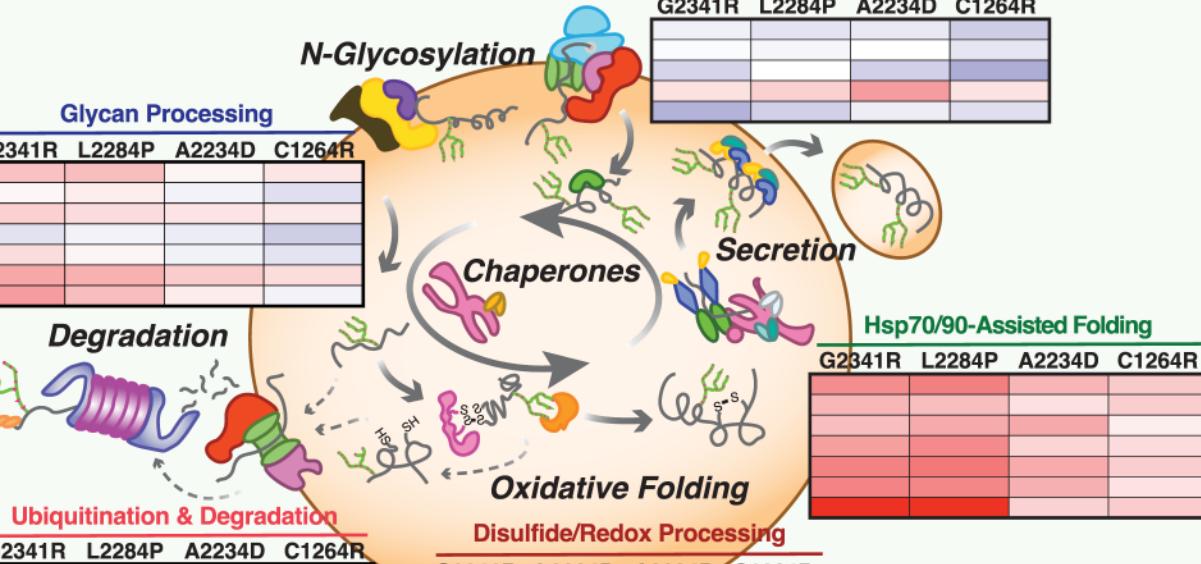
Departments of Chemistry and Biological Sciences

### Coordination of Protein Quality Control in Protein Misfolding Diseases

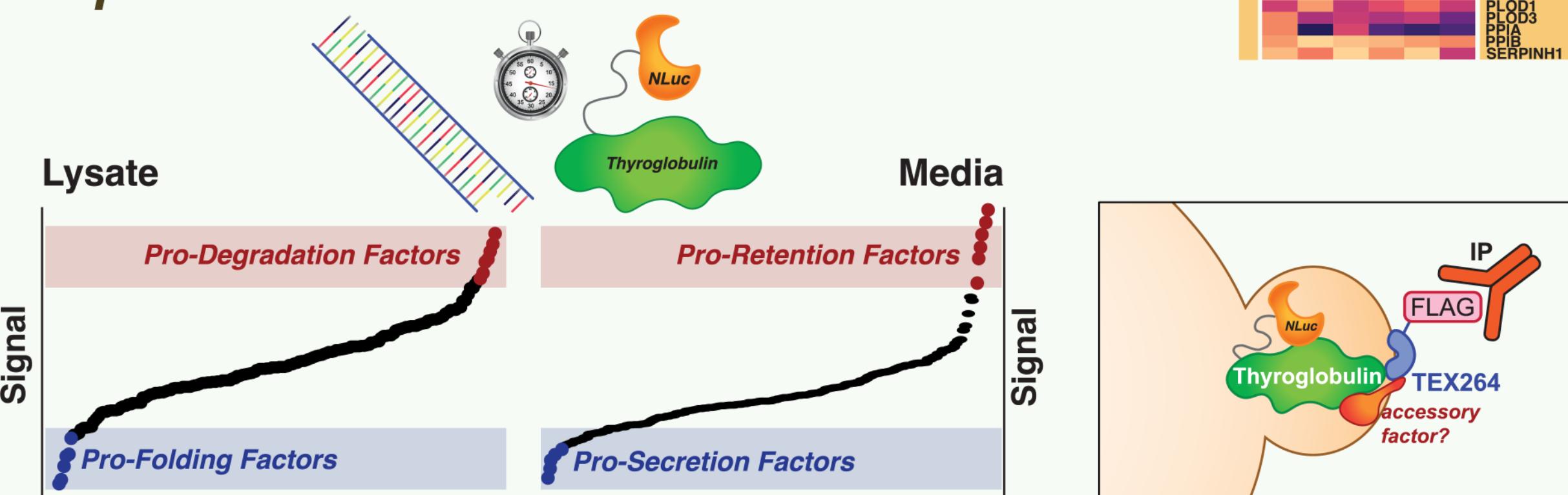
**Thyroglobulin:** essential for the production of thyroid hormones when secreted from thyroid cells. Mutations can lead to retention of protein and inhibit production of hormones.



#### Steady-State Characterization

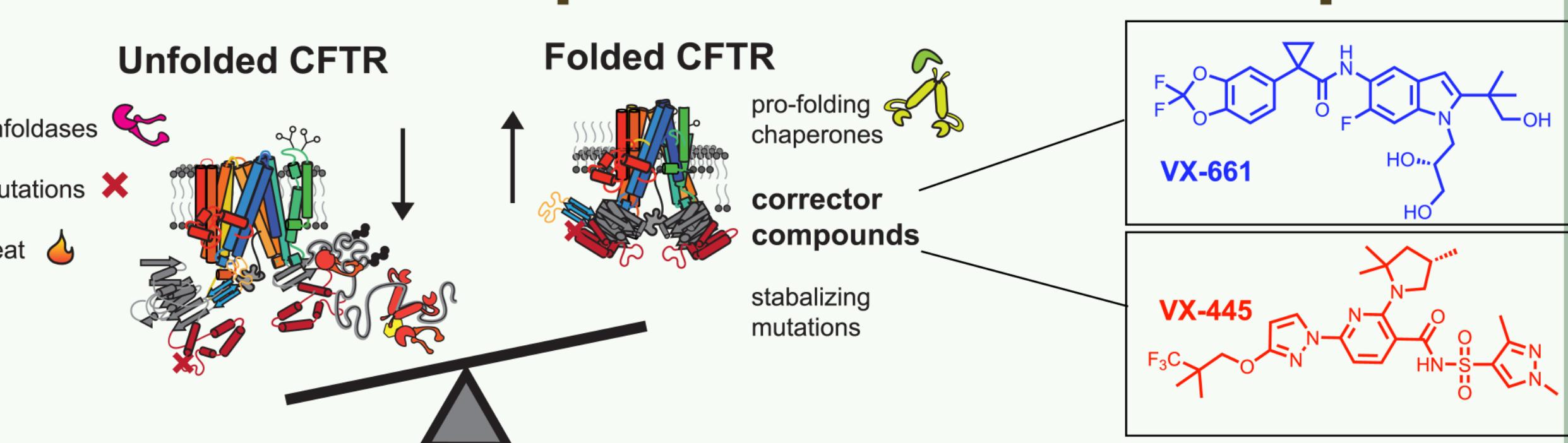


#### Functional Screening & Temporal Characterization

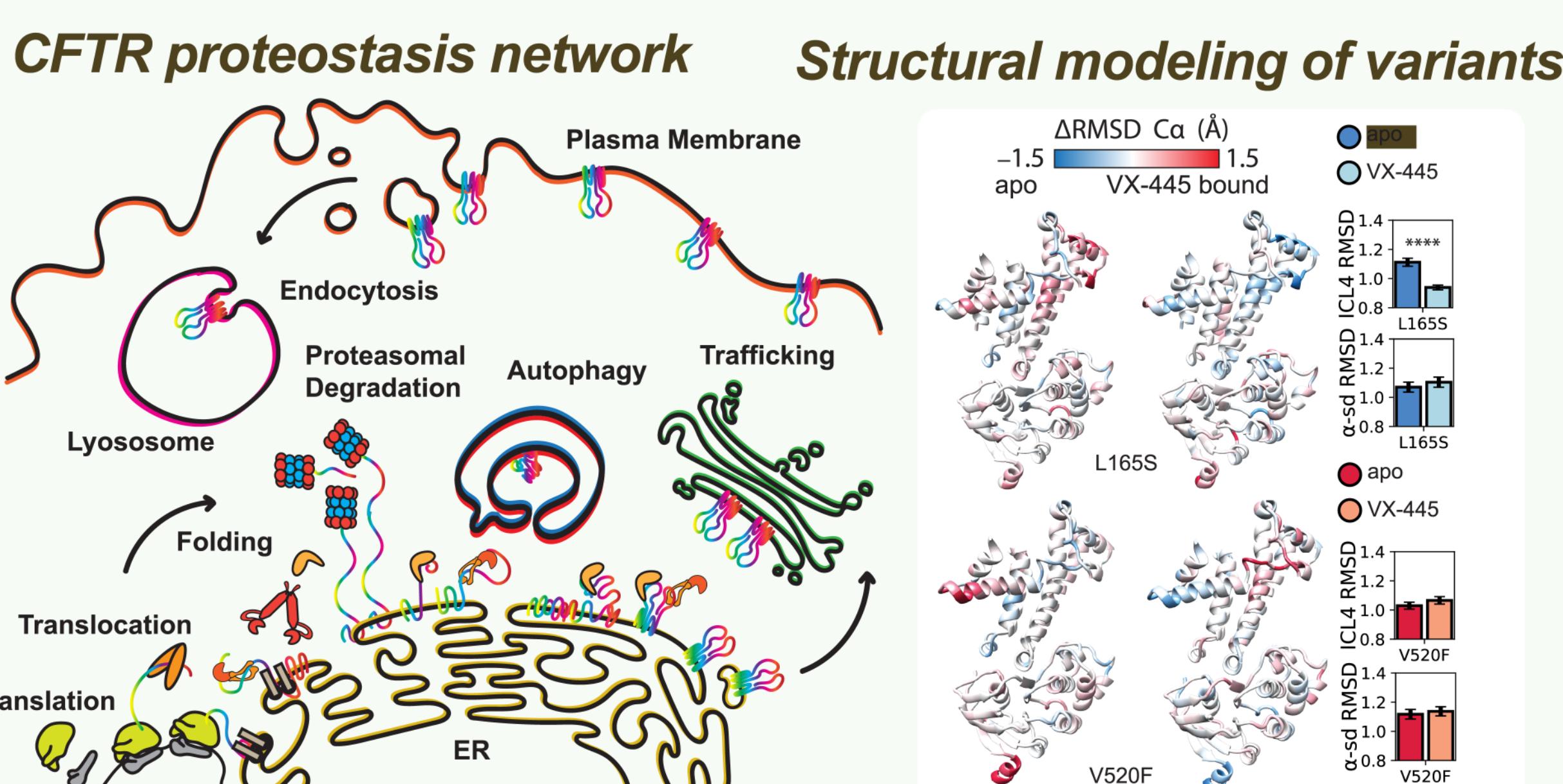


Wright, Kouba & Plate. (2021) Molecular & Cellular Proteomics  
Wright & Plate. (2020) Experimental Cell Research  
Wright, Timalsina, Garcia Lopez & Plate. (2022) bioRxiv

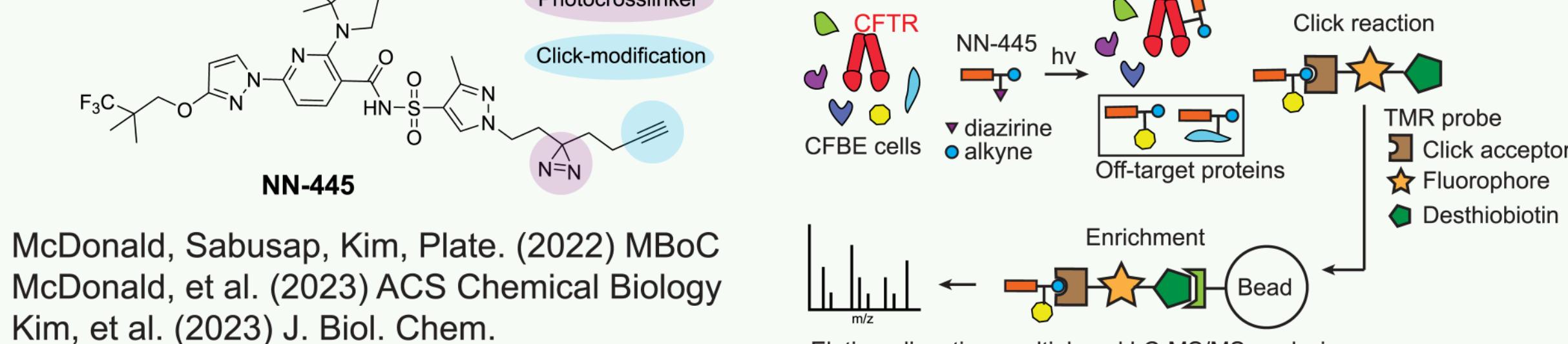
### CFTR variant proteostasis landscapes



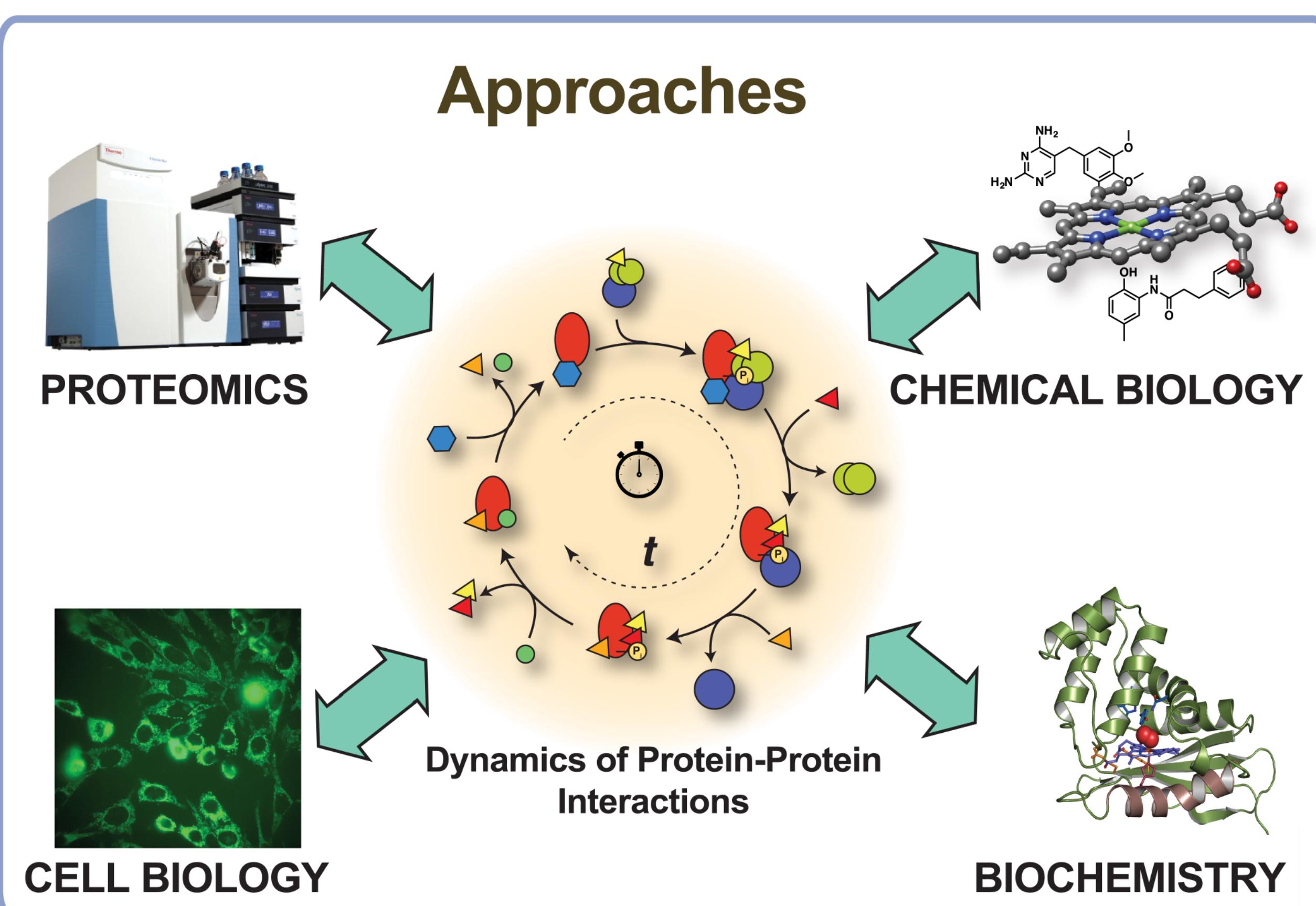
#### CFTR proteostasis network



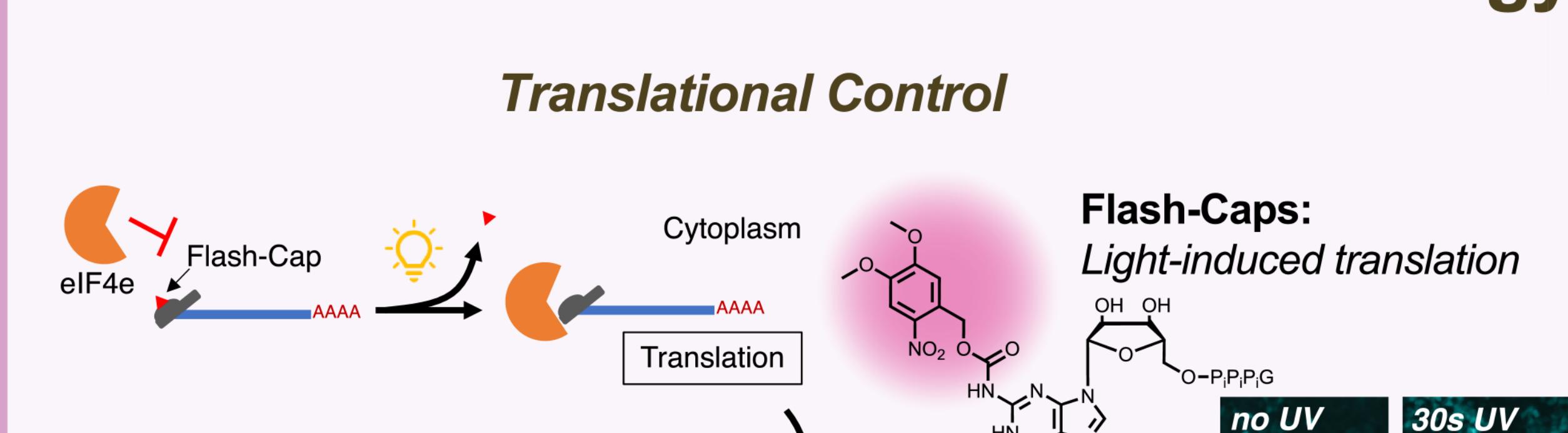
#### Photo-crosslinking target ID



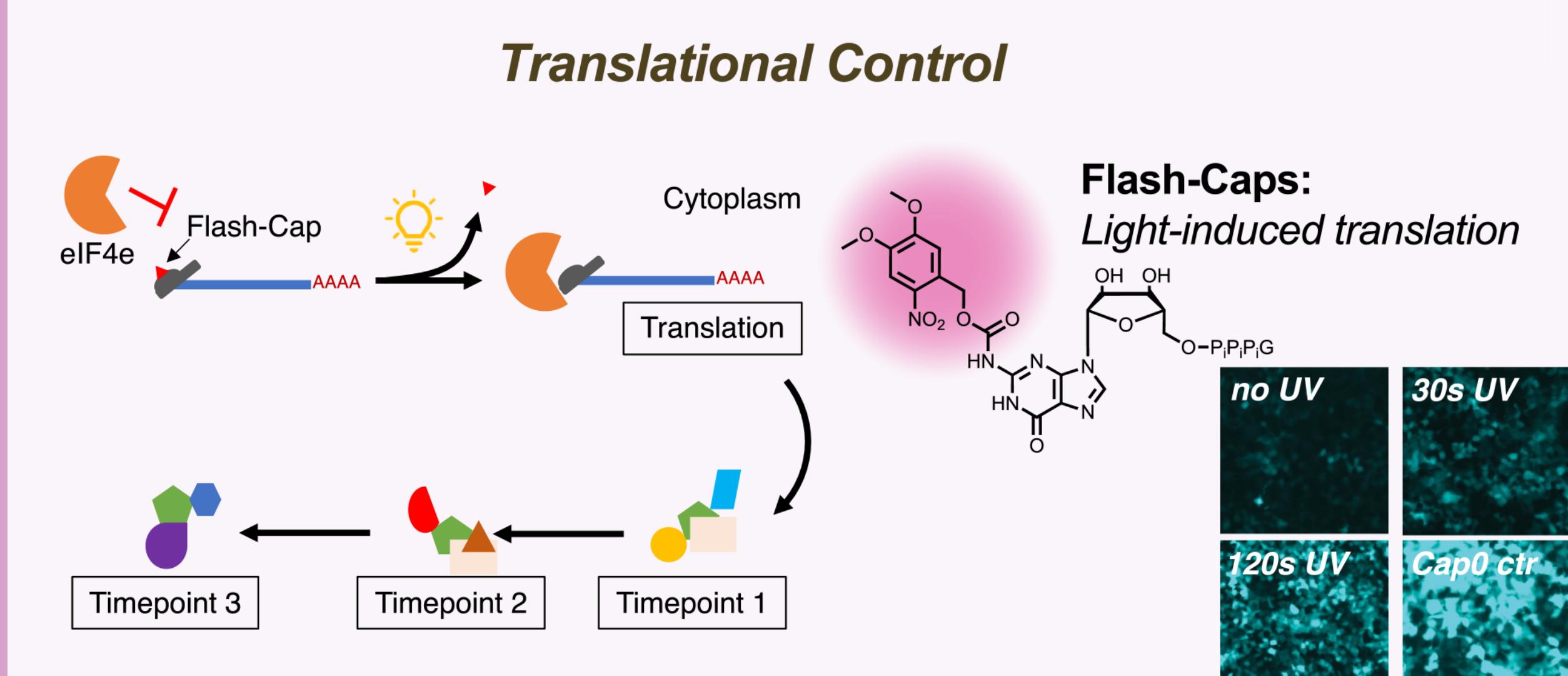
McDonald, Sabusap, Kim, Plate. (2022) MBoC  
McDonald, et al. (2023) ACS Chemical Biology  
Kim, et al. (2023) J. Biol. Chem.  
Kim, et al. (2024) Isr. J. Chem.



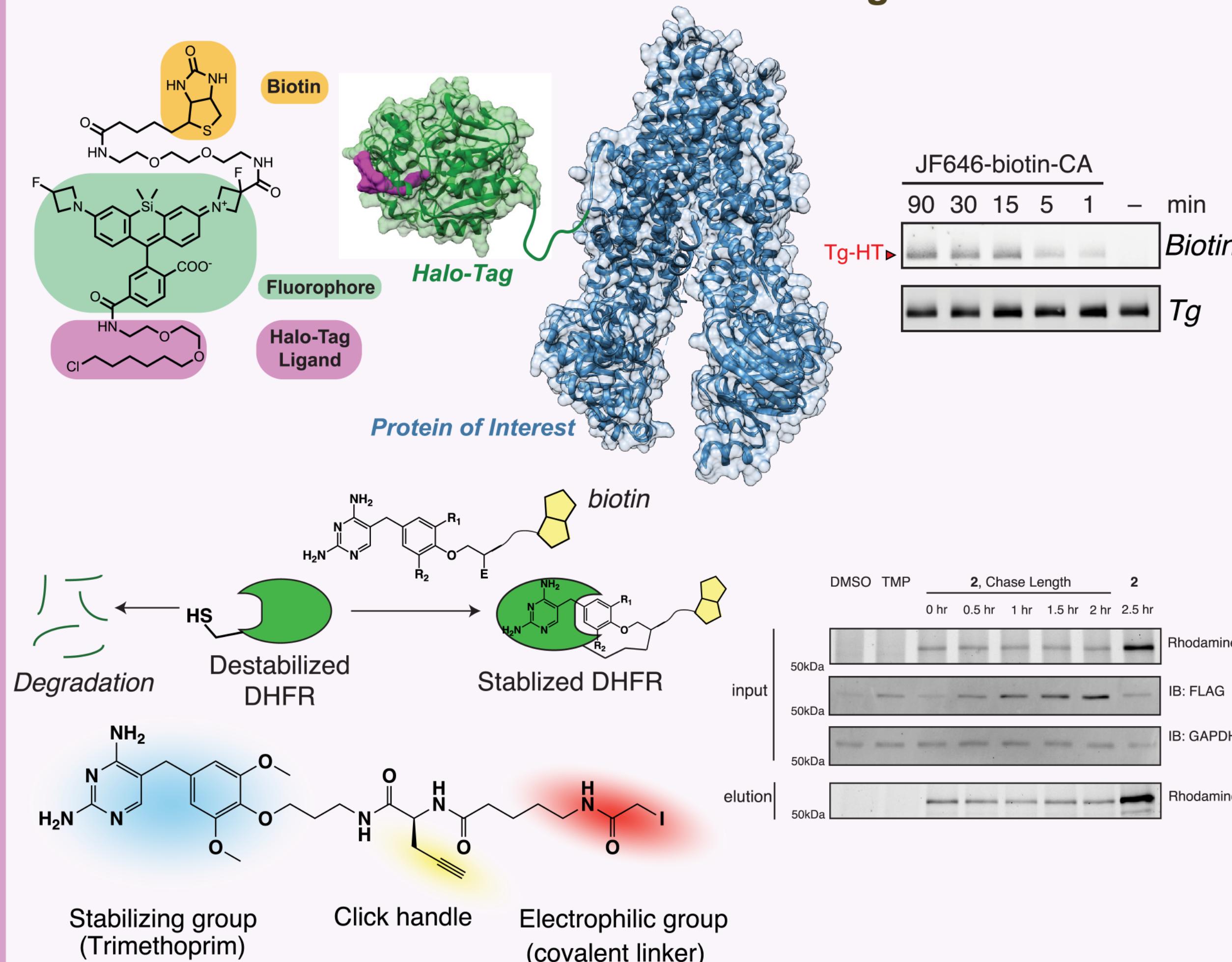
### Time-Resolved Interactome Profiling



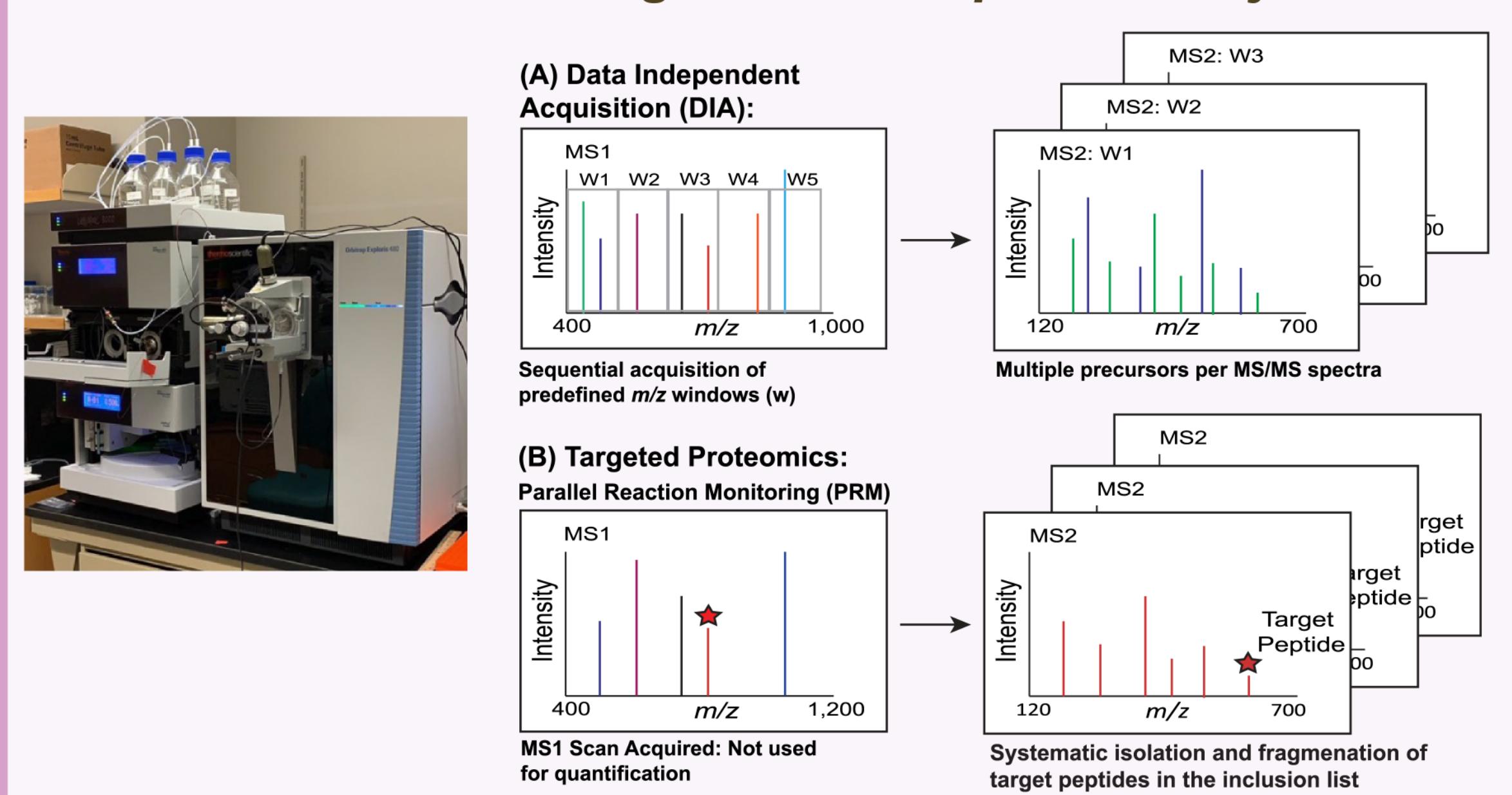
### Time-Resolved Interactomics Methodology



### Post-Translational Labeling



### DIA and Targeted Mass Spectrometry

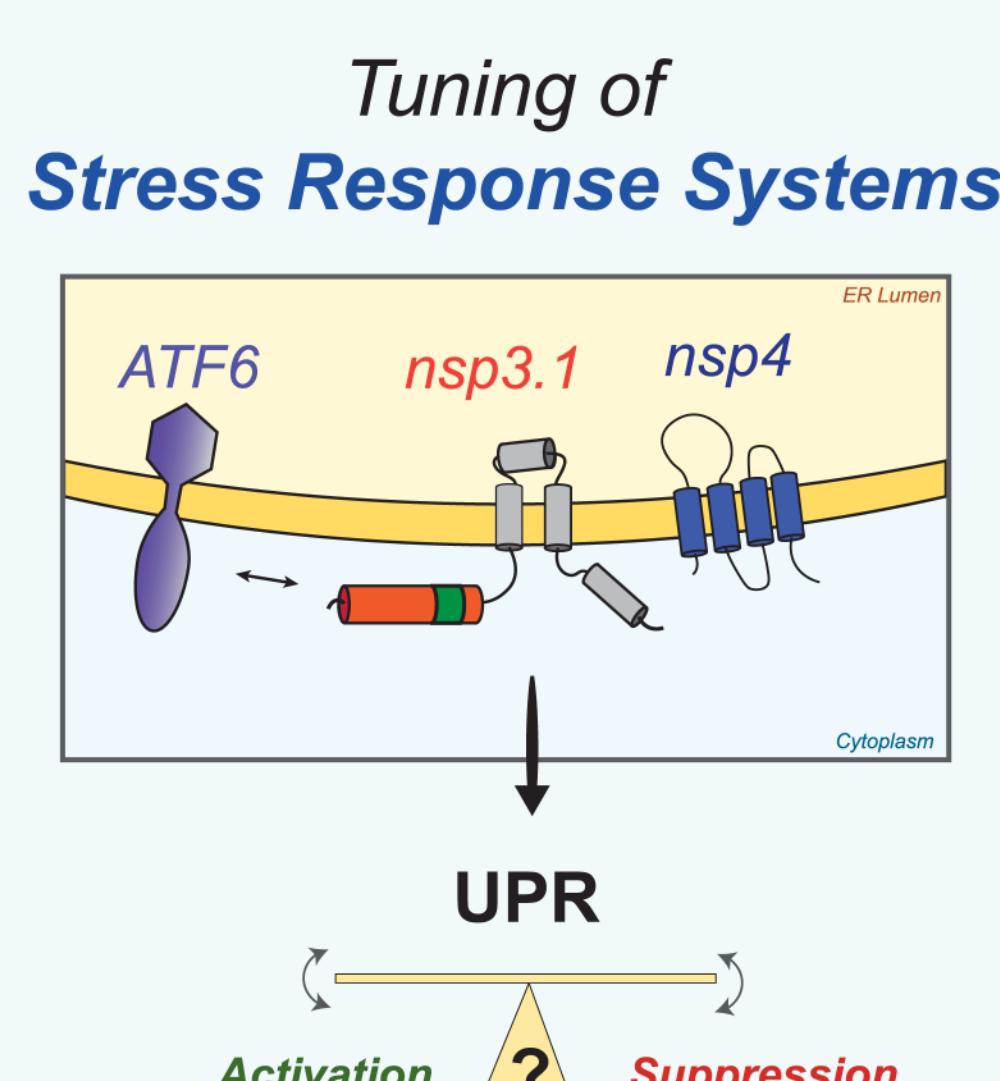
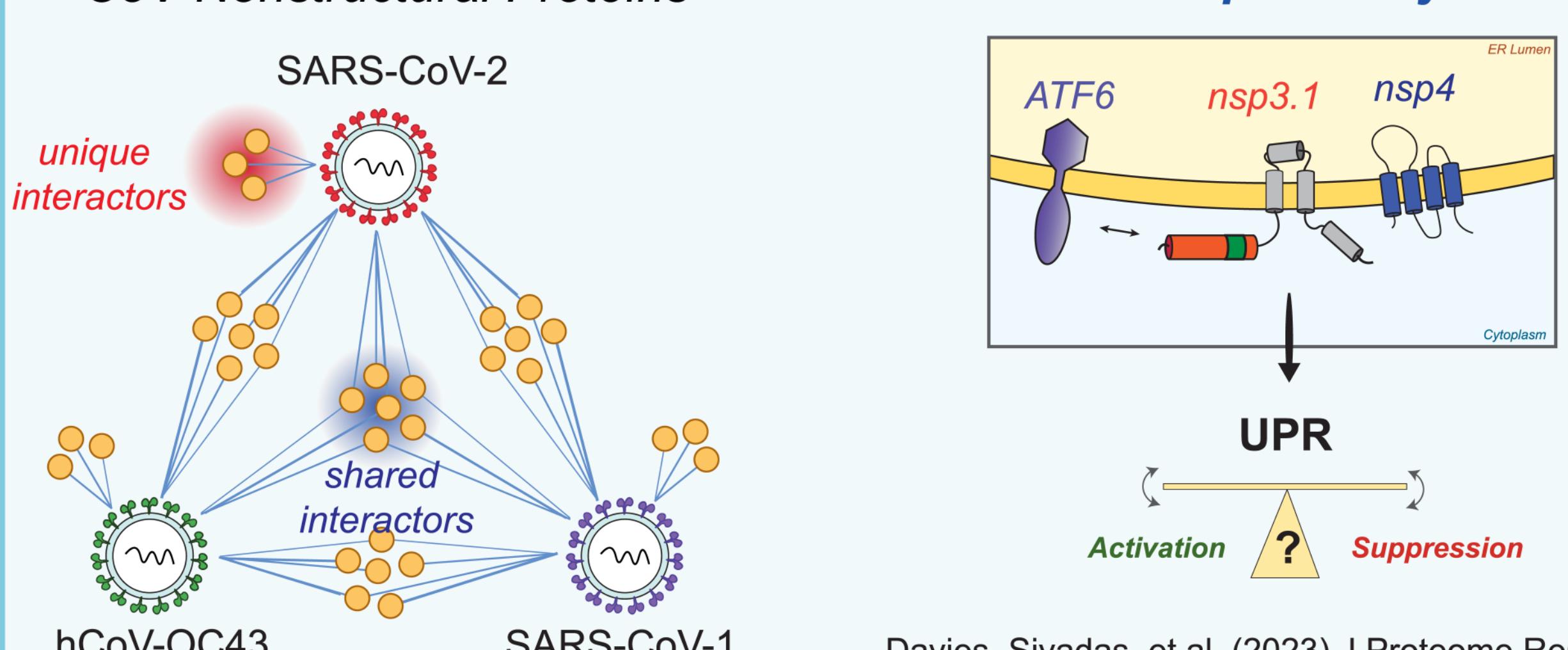


### Funding



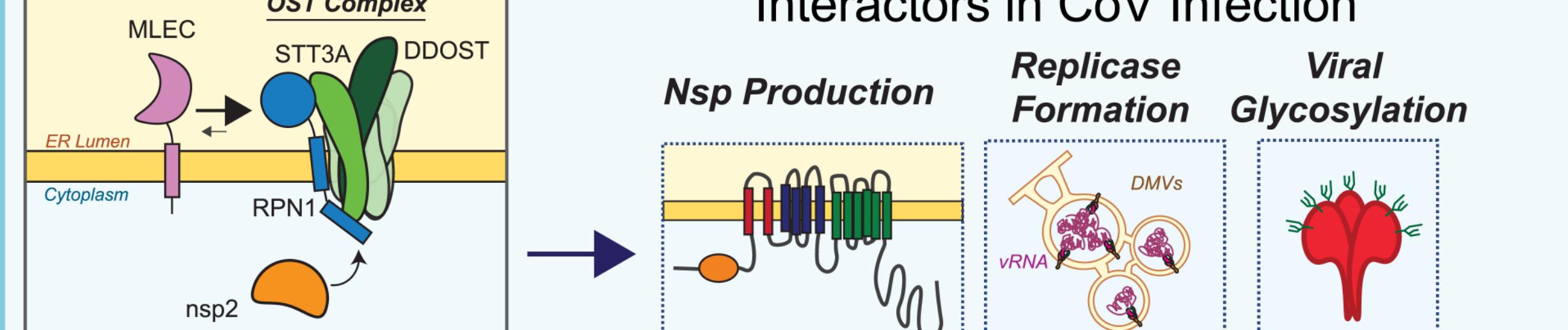
### Viral-Host Interactomics

#### Comparative Interactomics of CoV Nonstructural Proteins

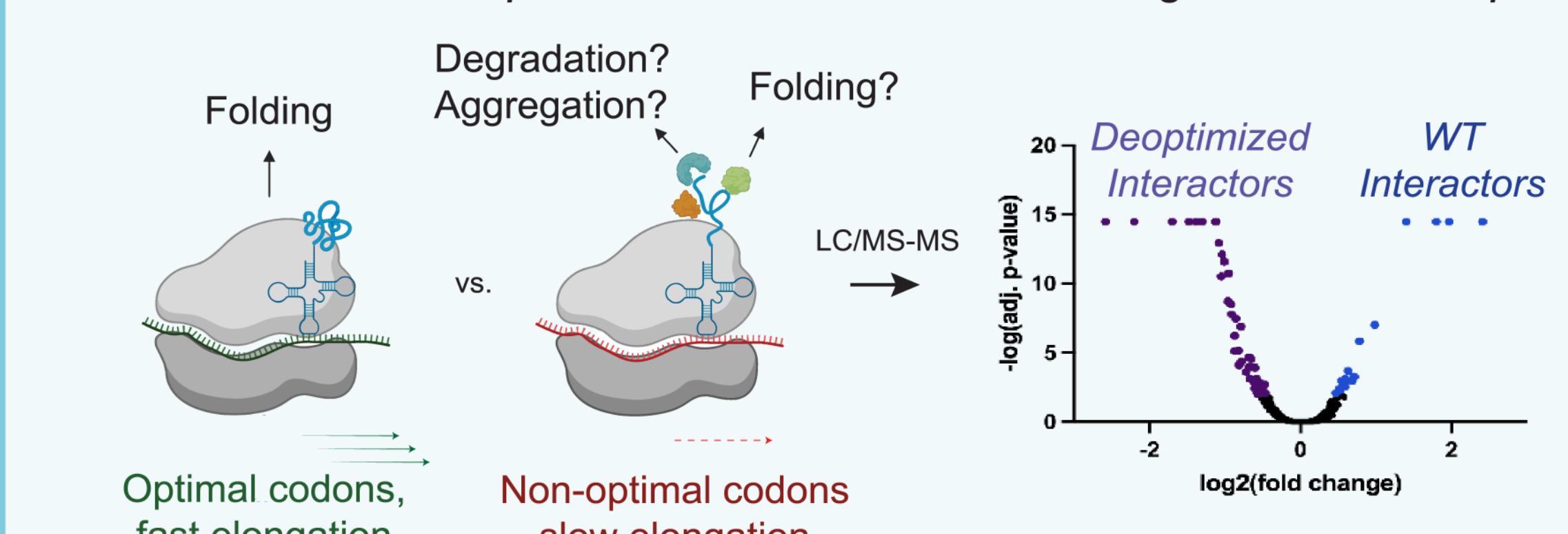


#### Glycoprotein Quality Control

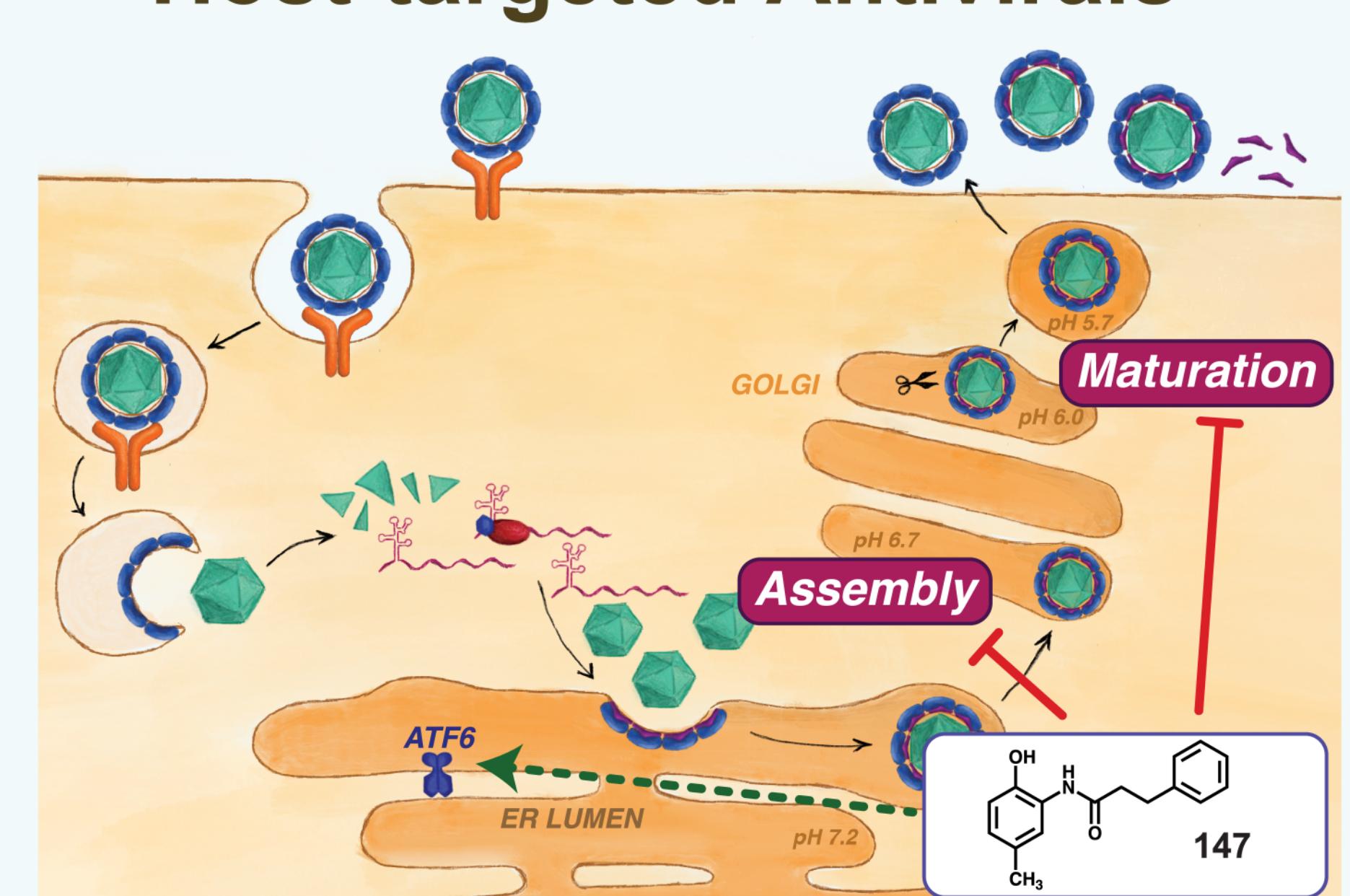
Interactors in CoV Infection



Role of synonymous codon mutations on translation & proteostasis interactions during viral host adaptation



### Host-targeted Antivirals



Almasy, Davies, Lisy, Tirgar, Tran & Plate. (2021) PNAS