

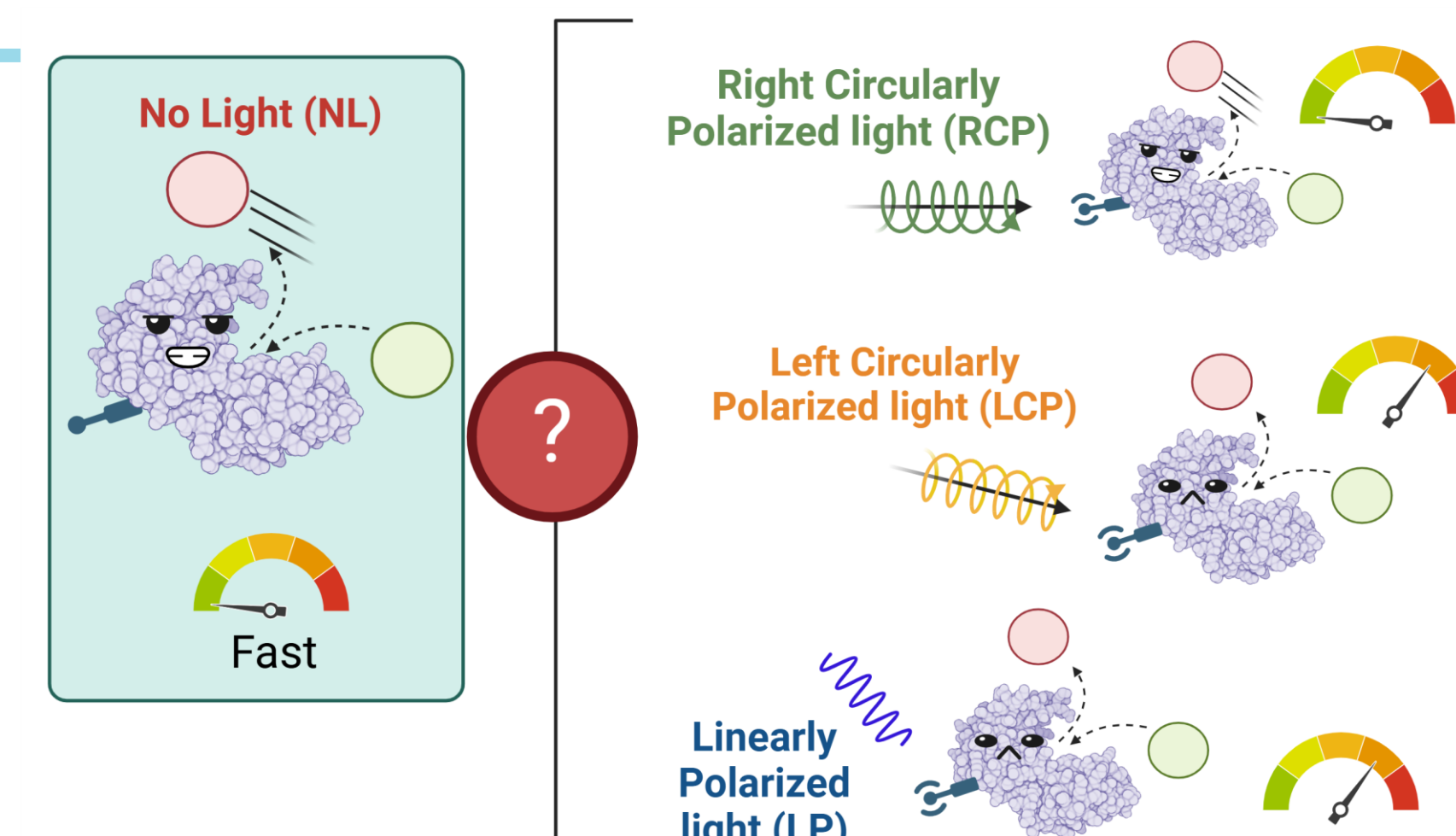
# The hidden role of spin in allosteric interactions

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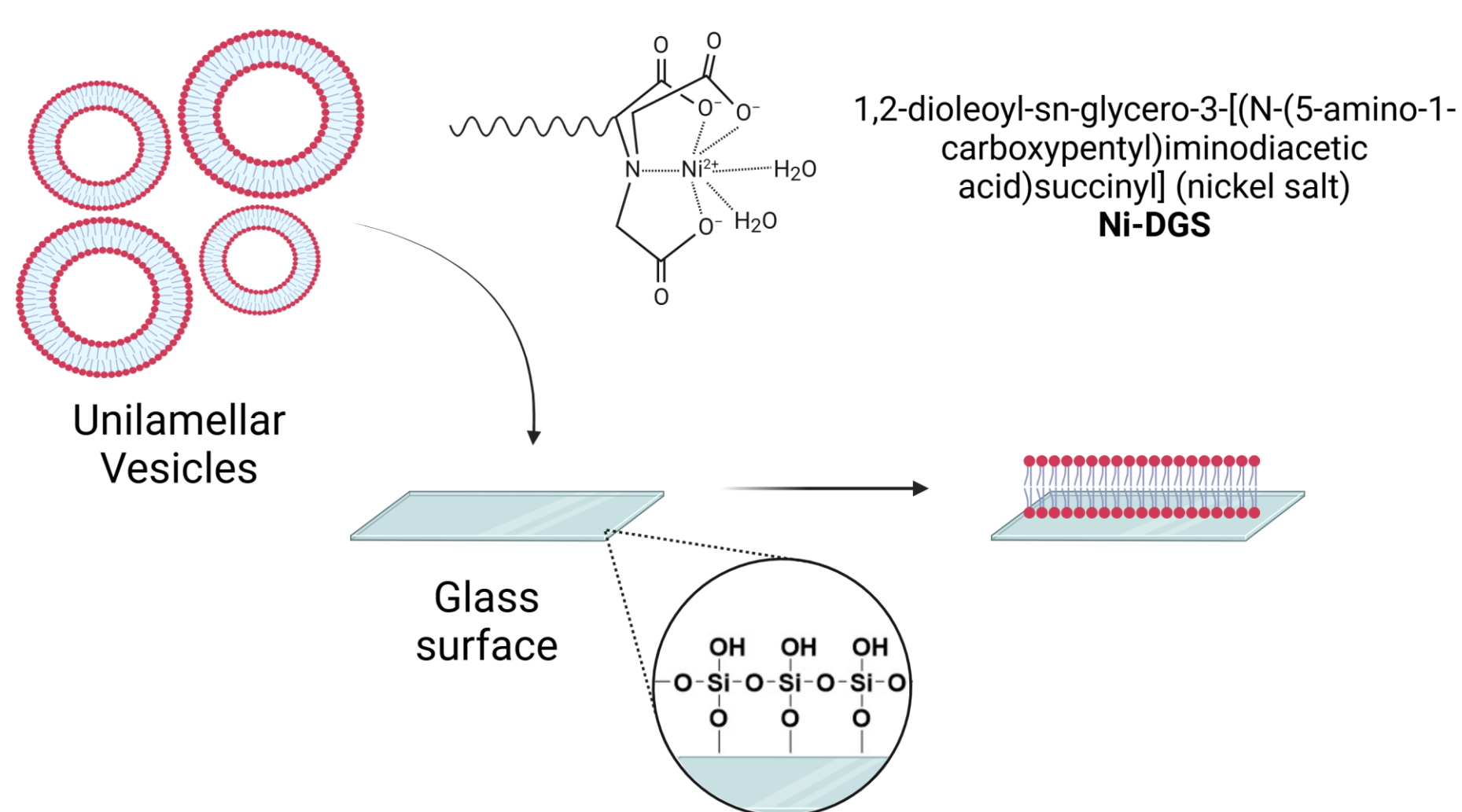
## The CISS effect and allosteric regulation

Allostery is mechanism that regulates protein function. While it traditionally arises from conformational changes or shifts in protein dynamics, recent studies have highlighted the role of electrons and their spins in this process. Charge redistribution, along with spin polarization, has been identified as a key factor influencing protein function, a mechanism known as charge-reorganization allostery (CRA).

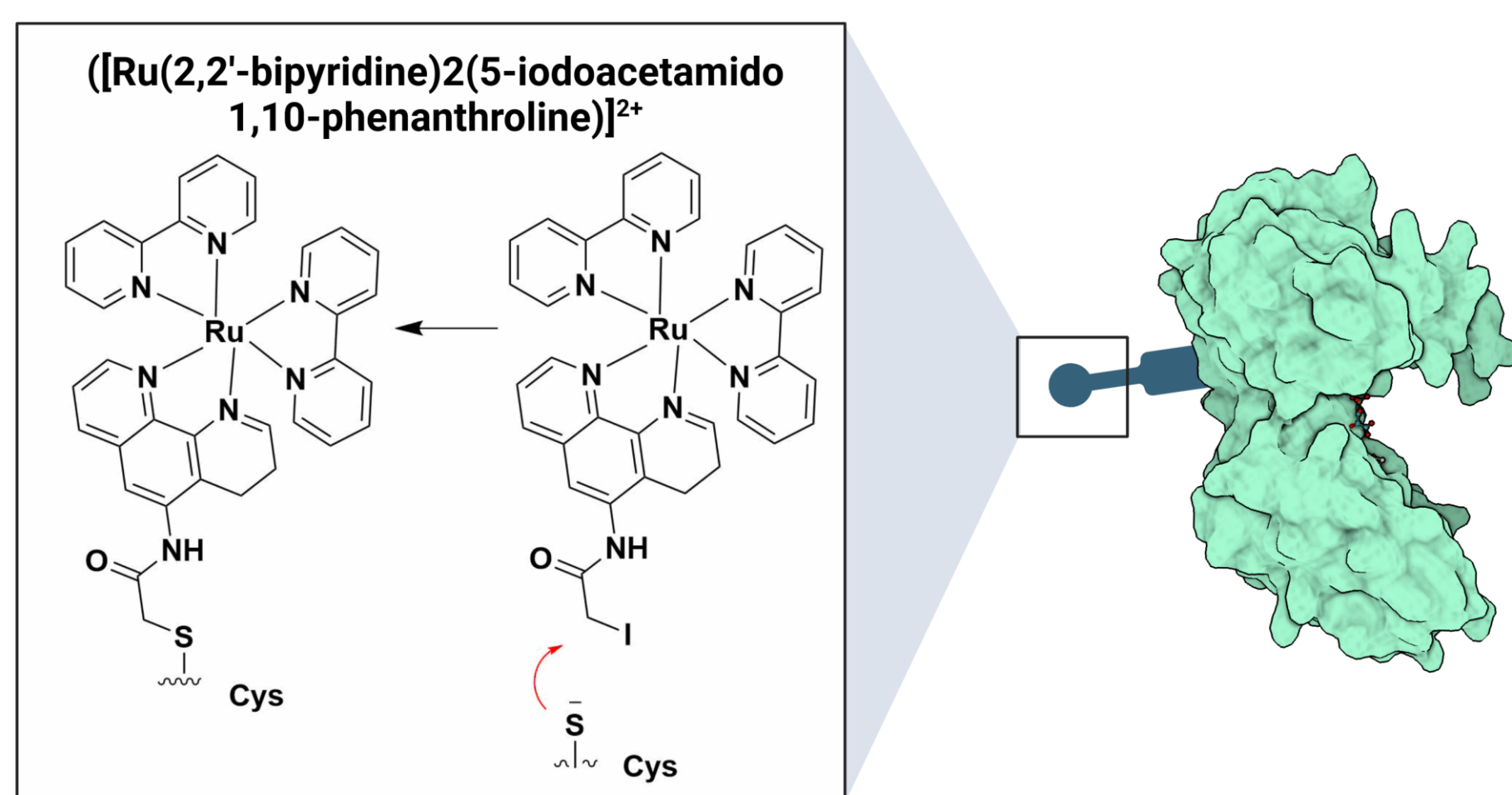


## PGK labeling and immobilization

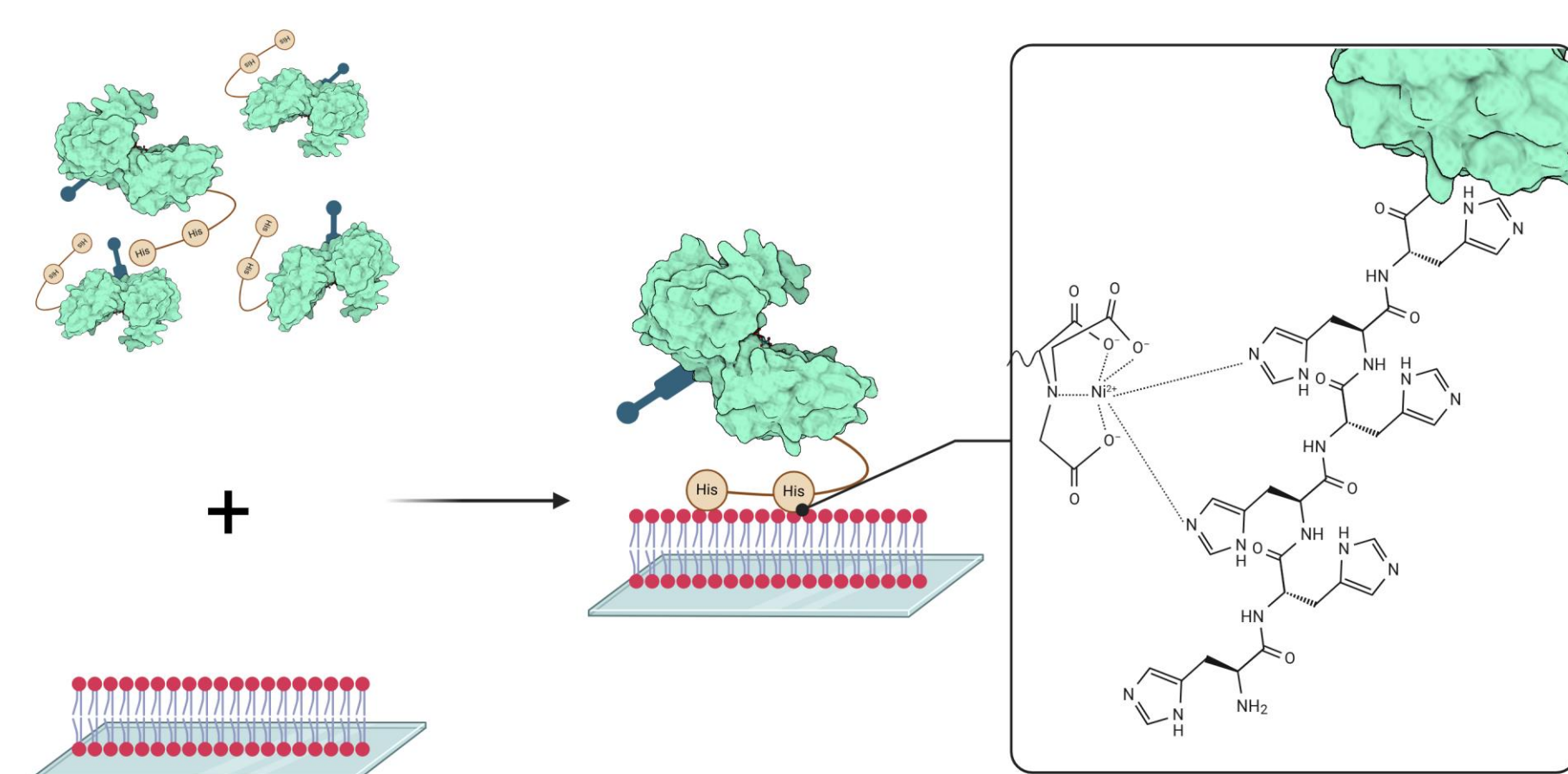
### 1. Formation of the lipid bilayer:



### 2. Site-specific labeling:

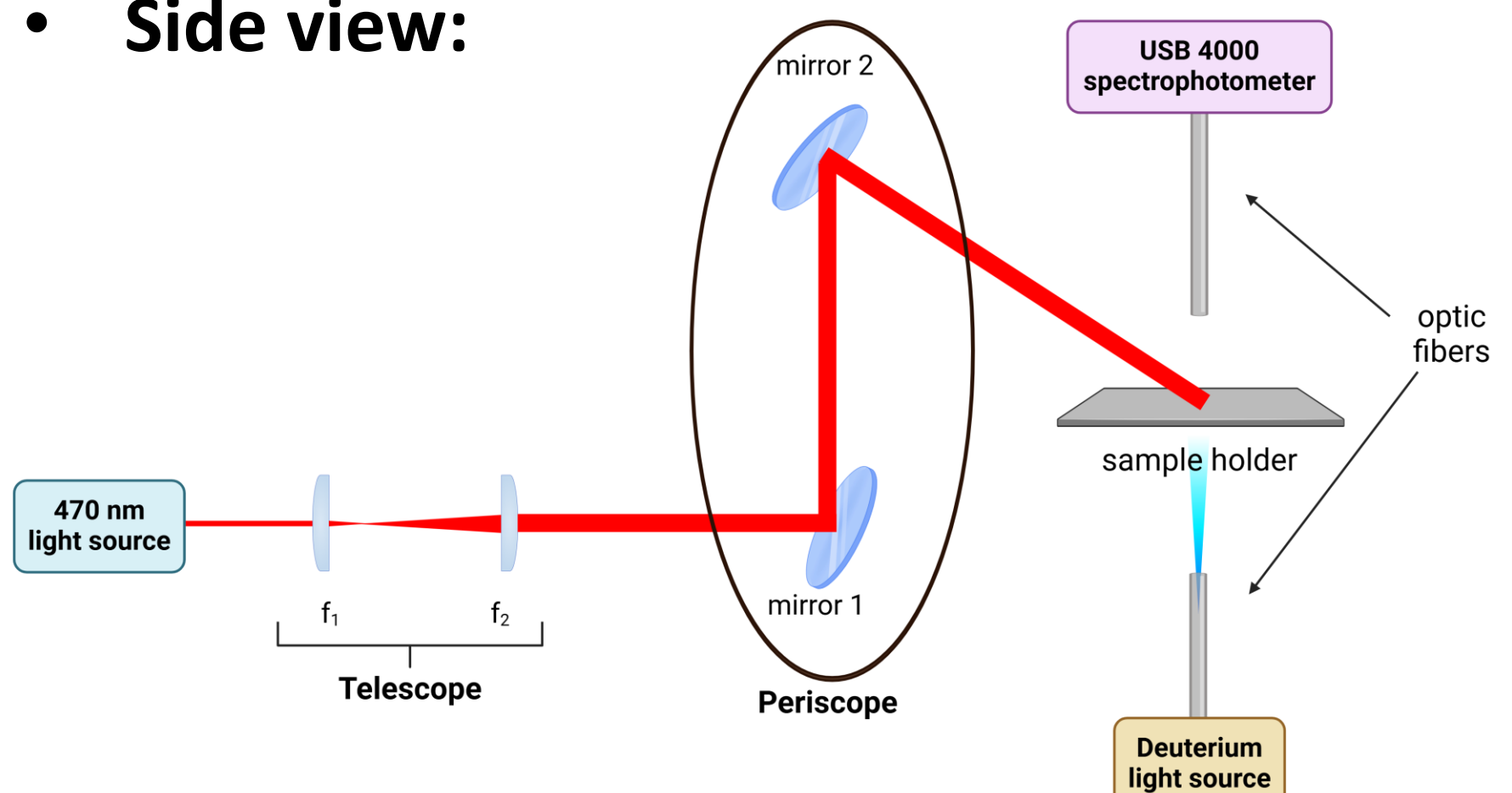


### 3. Enzyme immobilization (polyhistidine tag):

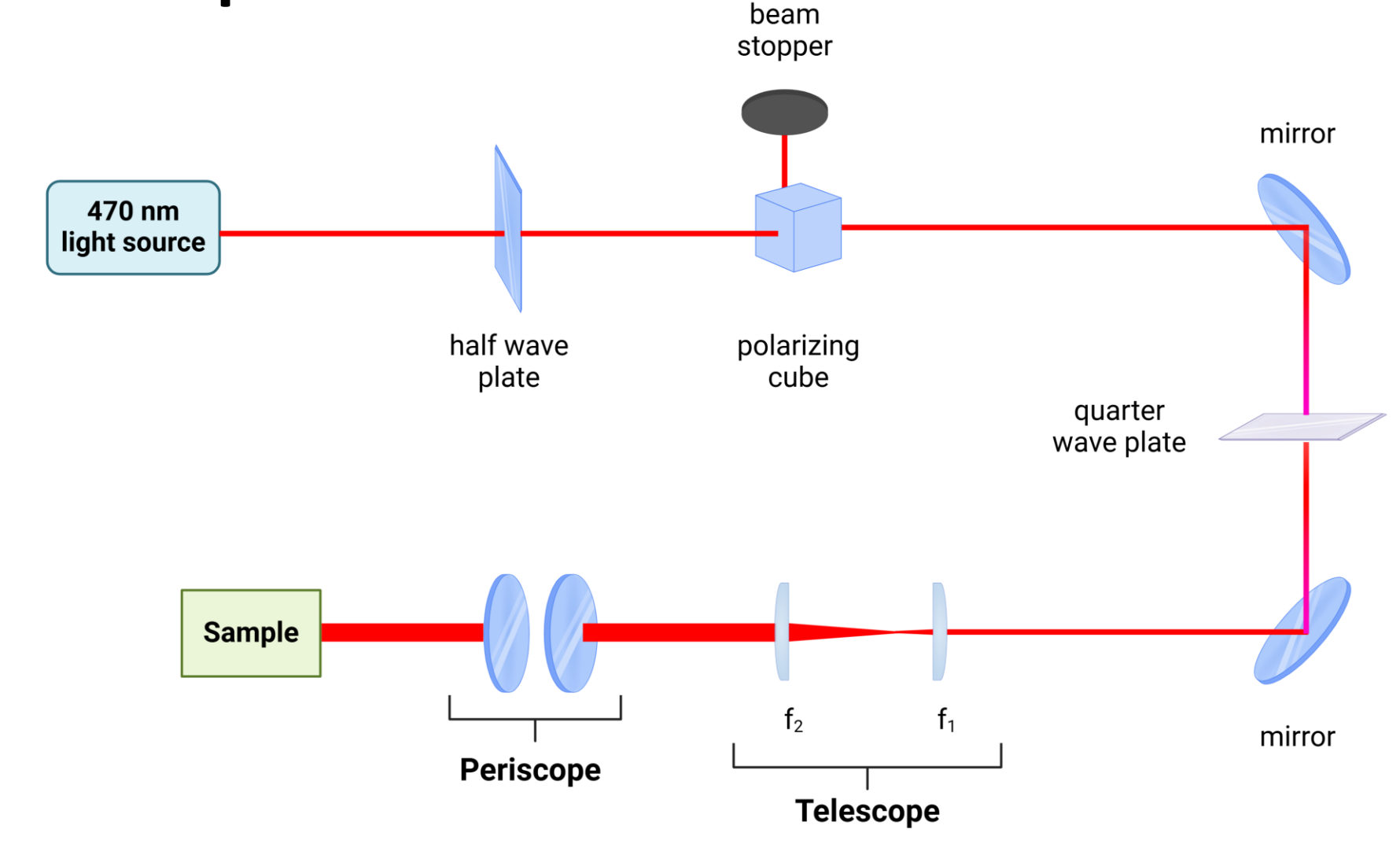


## Setup for simultaneous excitation and measurement

### • Side view:

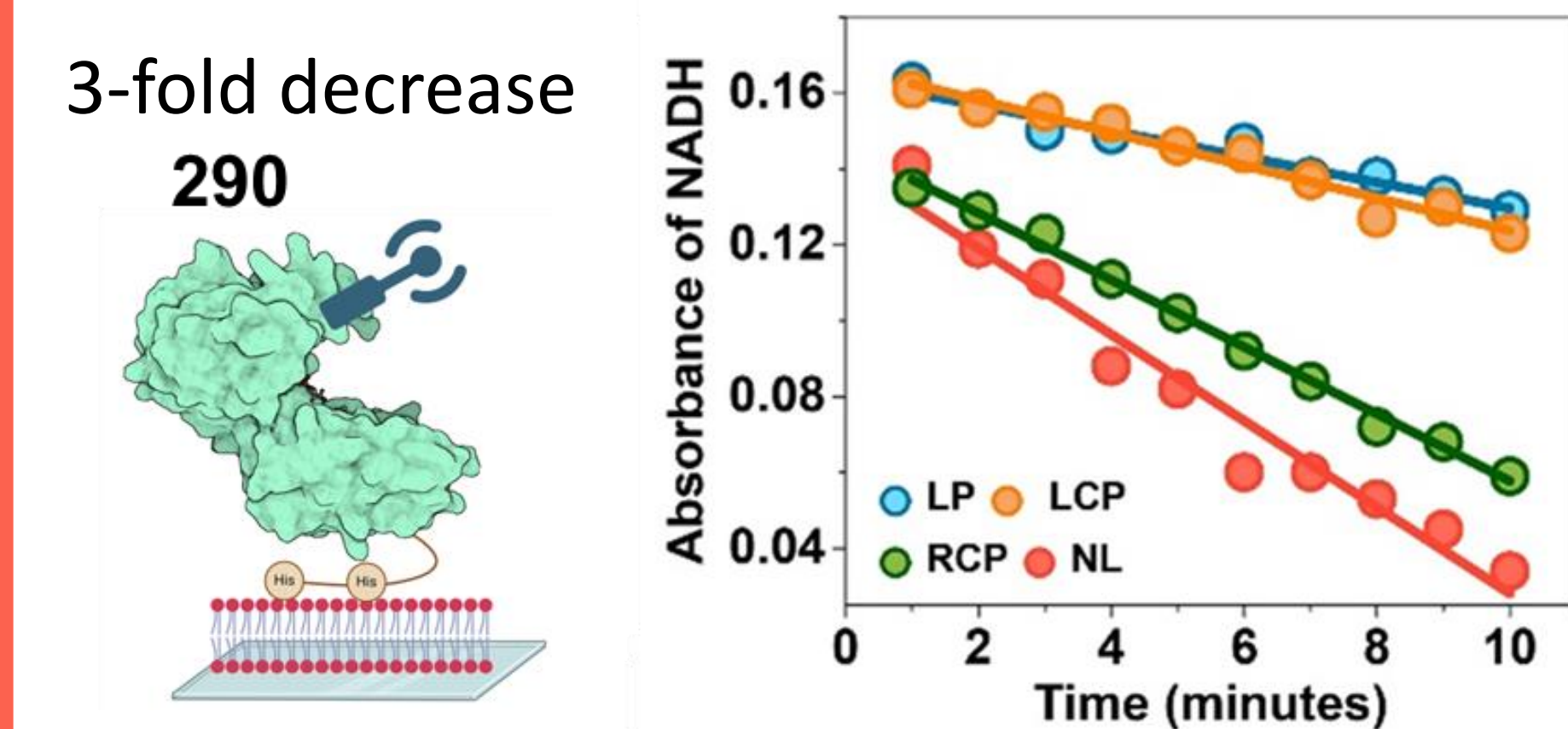
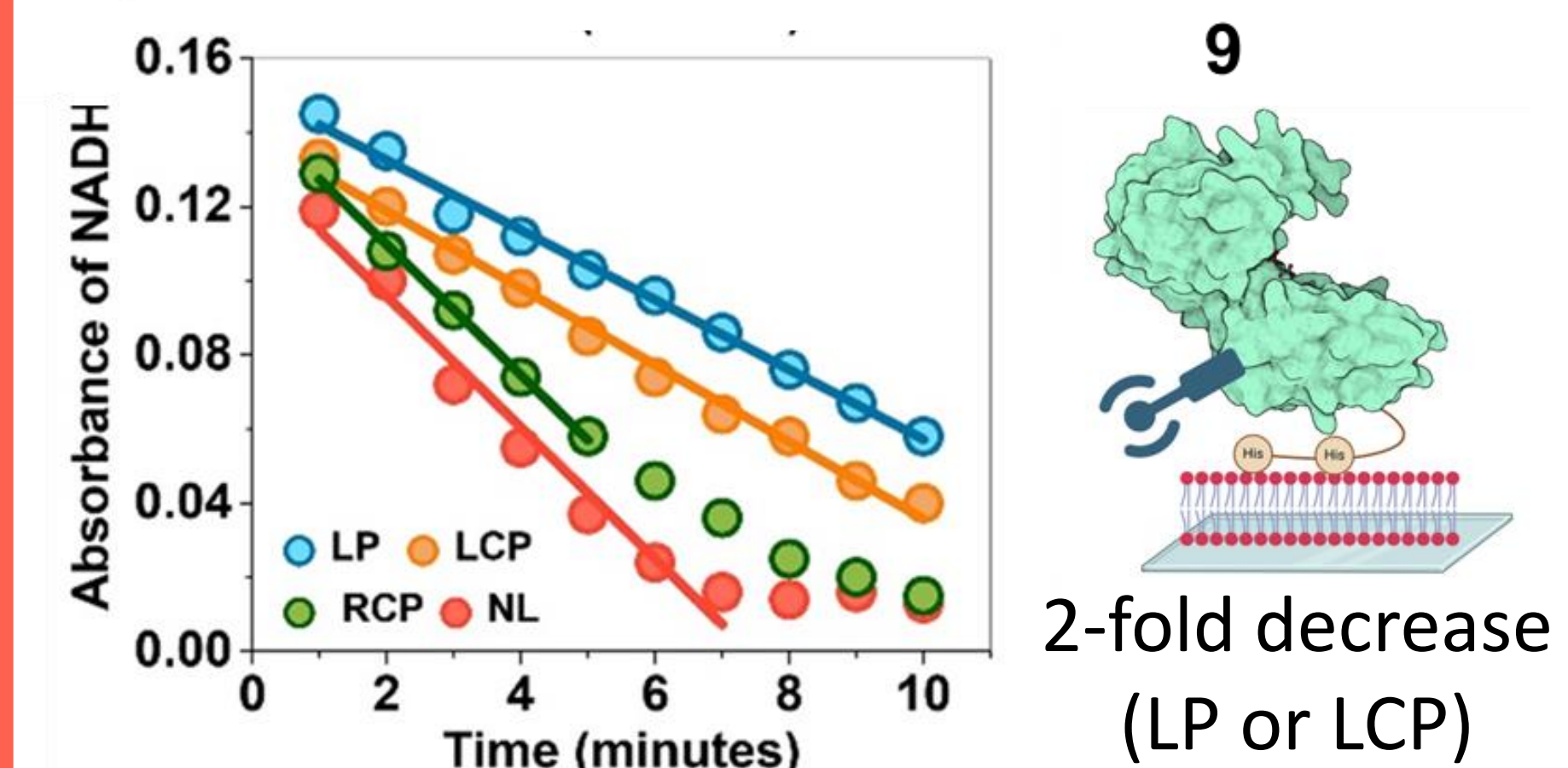


### • Top view:



## Aim

We aim to build on previous work and elucidate the role of spin in site-specific charge injection and map allosteric pathways in PGK.

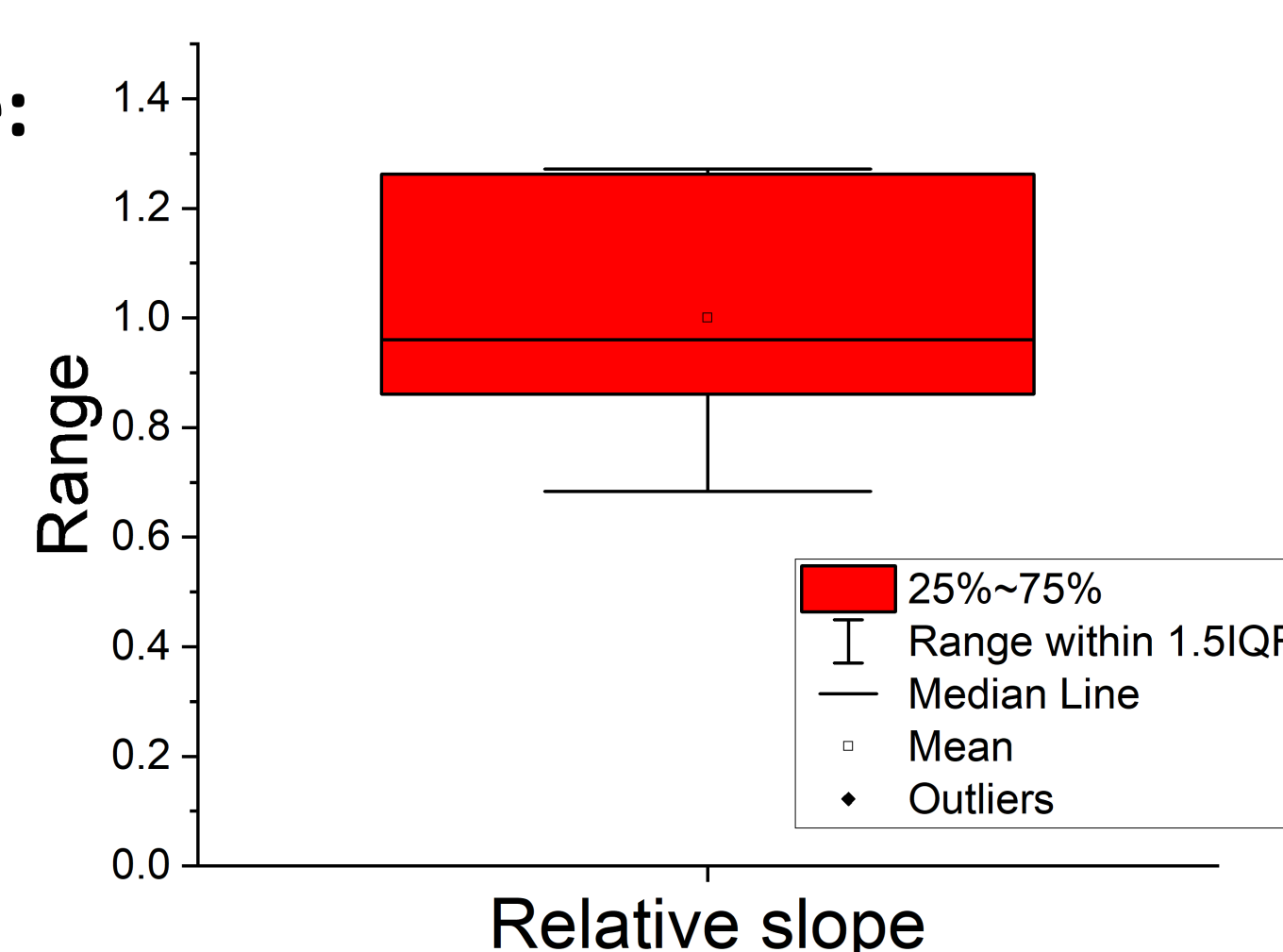


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## Preliminary results

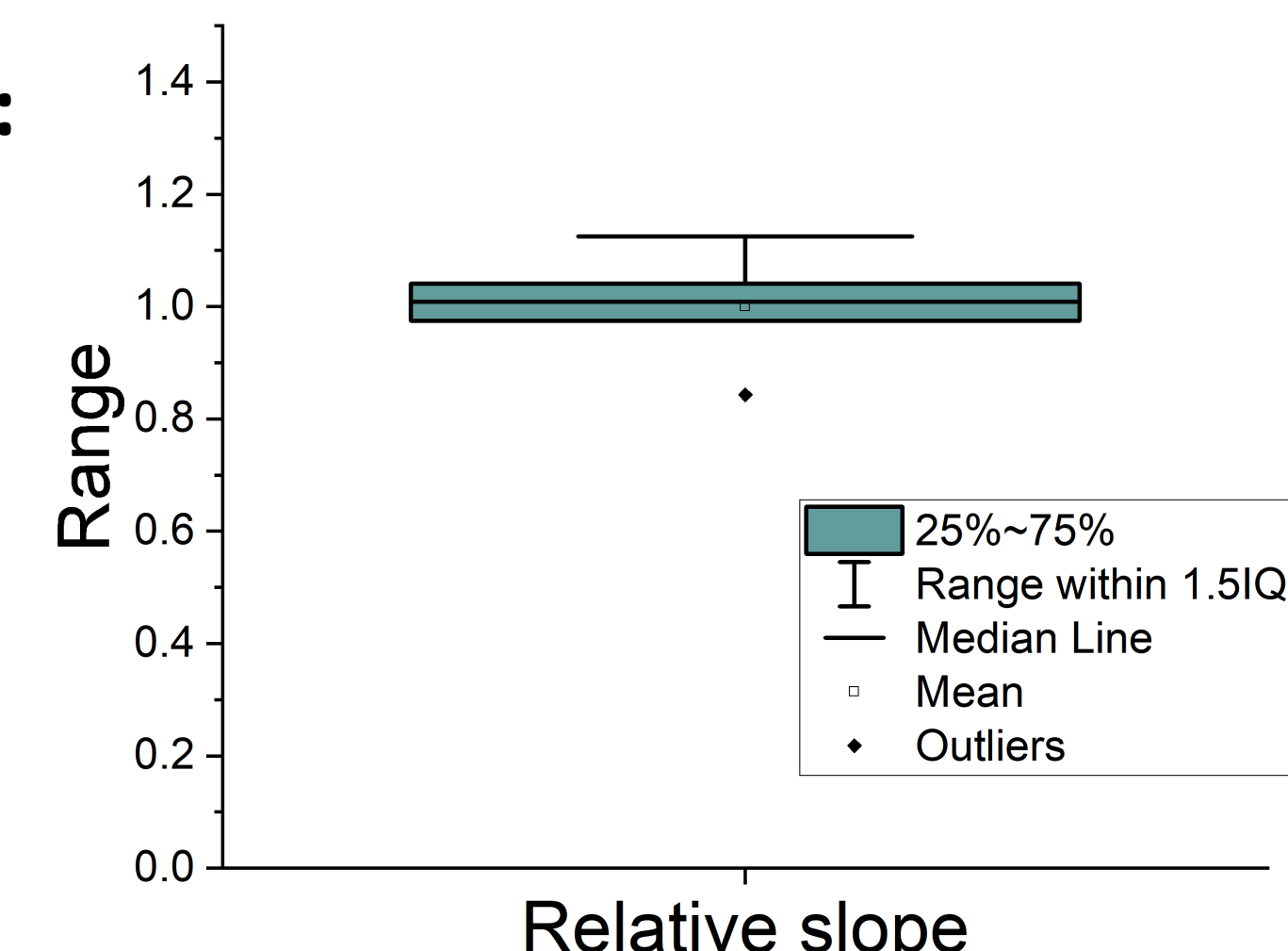
### • Initial procedure:

- 6 repeats
- Glass-bottom petri dishes
- Taking aliquots

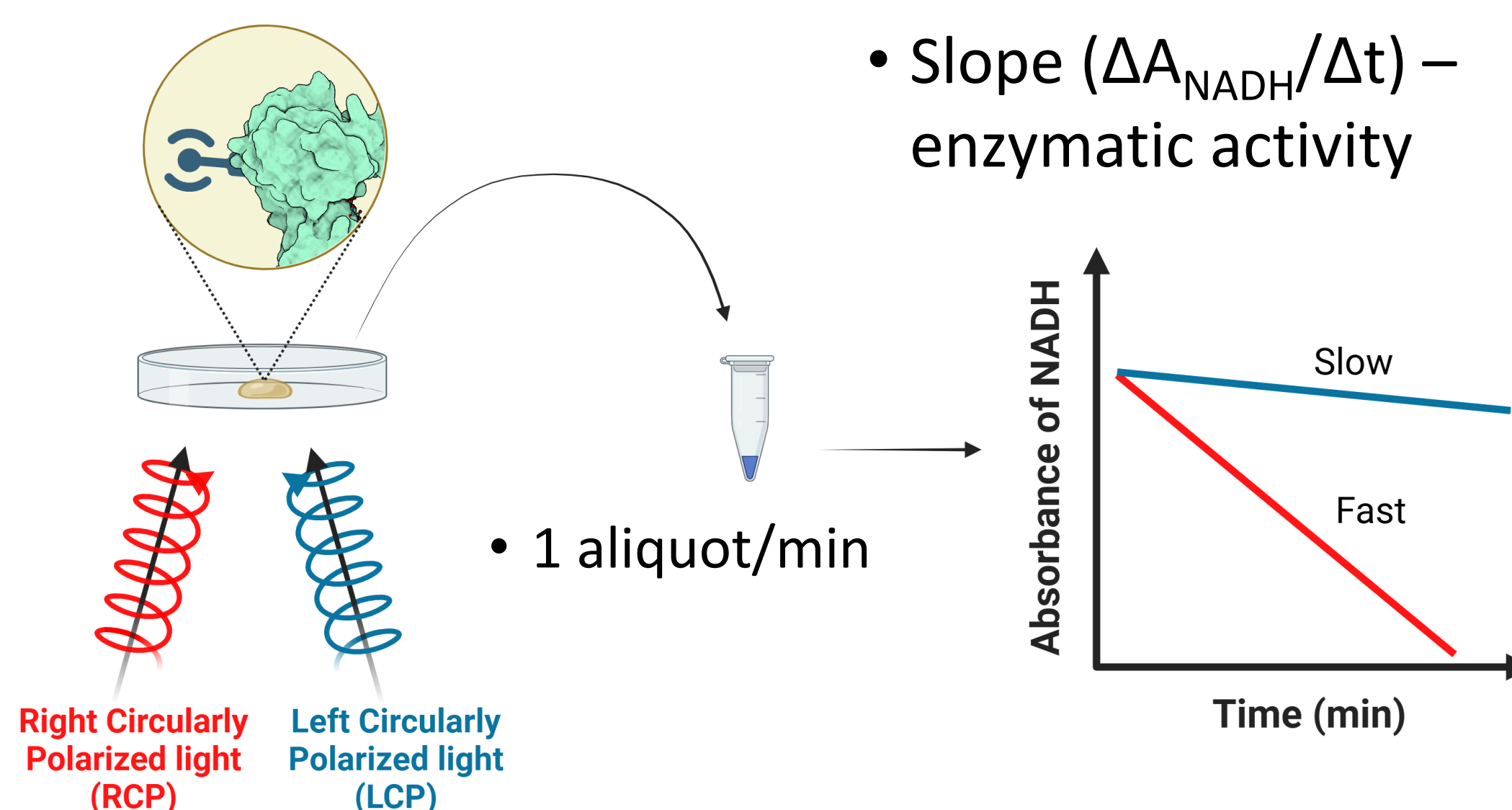
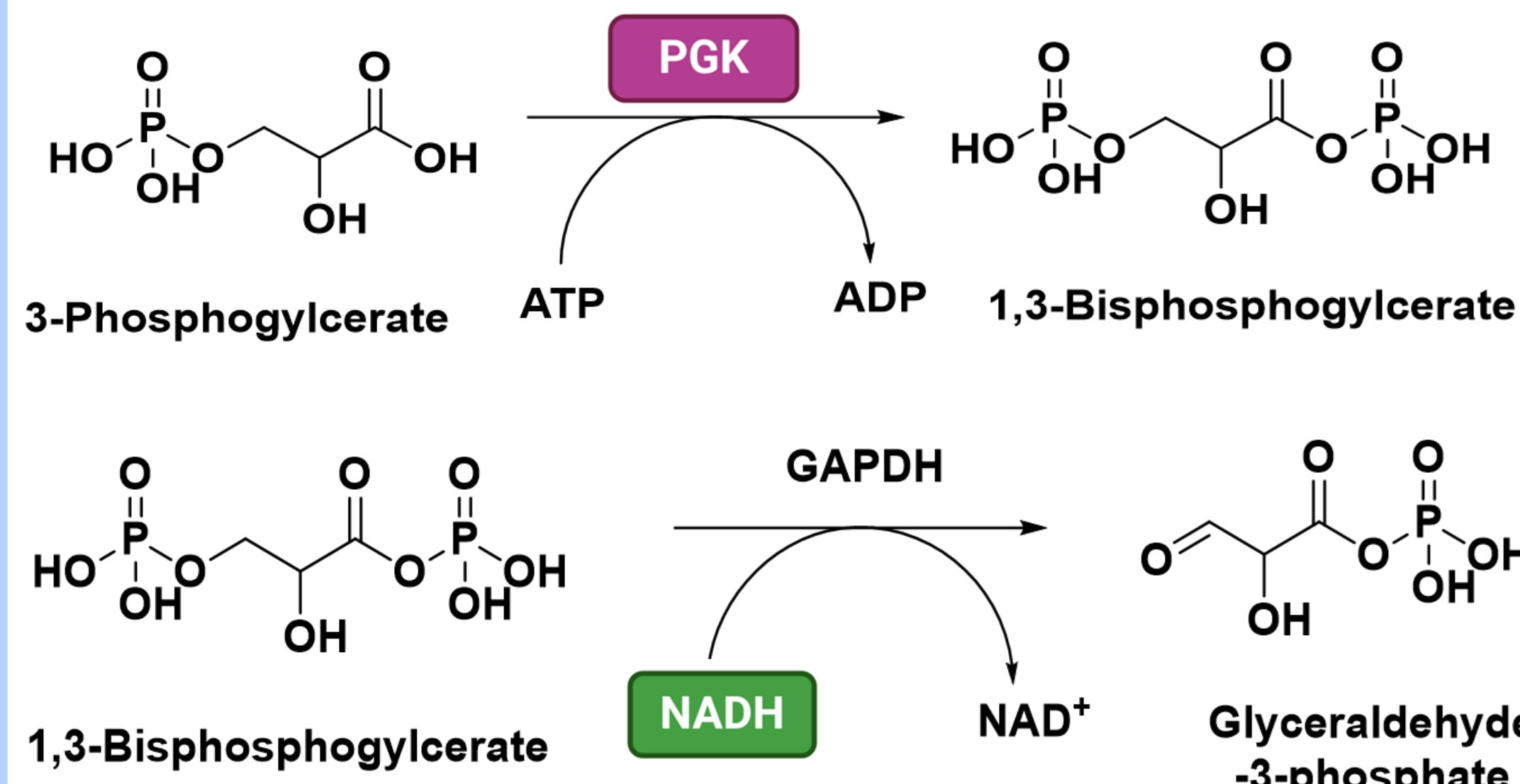


### • Optimized procedure:

- 6 repeats
- Perfusion cell
- In-situ measurement

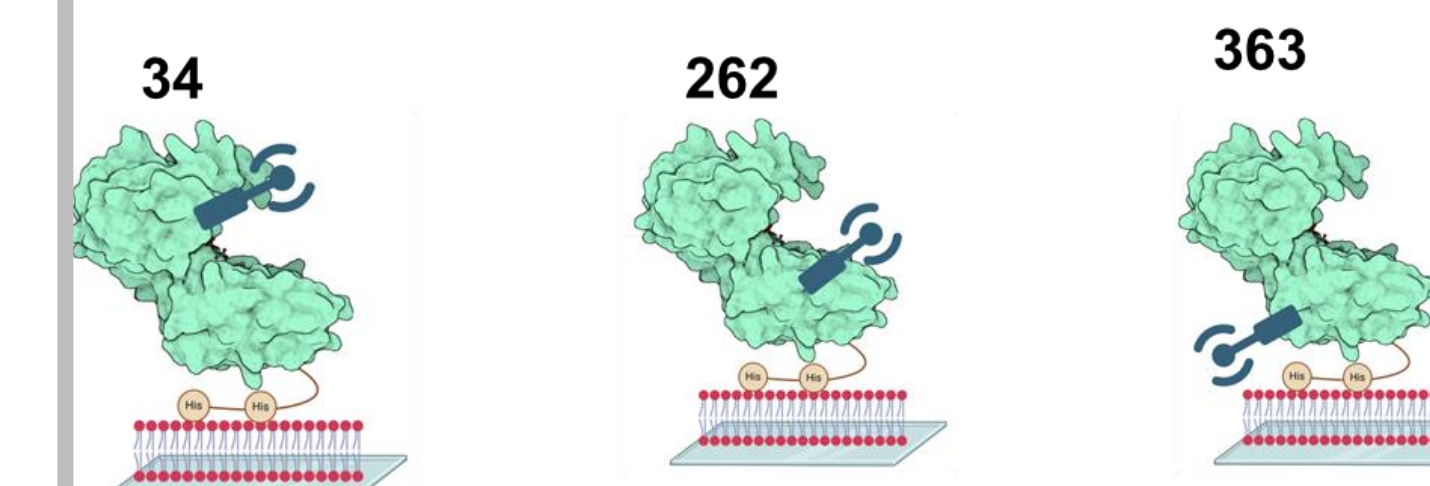


## Methodology



## What's next?

We plan to probe different charge injection sites on PGK, and map allosteric pathways.



1. Monod, J. et al. *J. Mol. Biol.*, 6 (1963) 306–329.
2. Cooper, A. et al. *Eur. Biophys. J.*, 11 (1984) 103–109.
3. Ghosh, S. et al. *J. Phys. Chem. Lett.*, 12 (2021) 10–13.