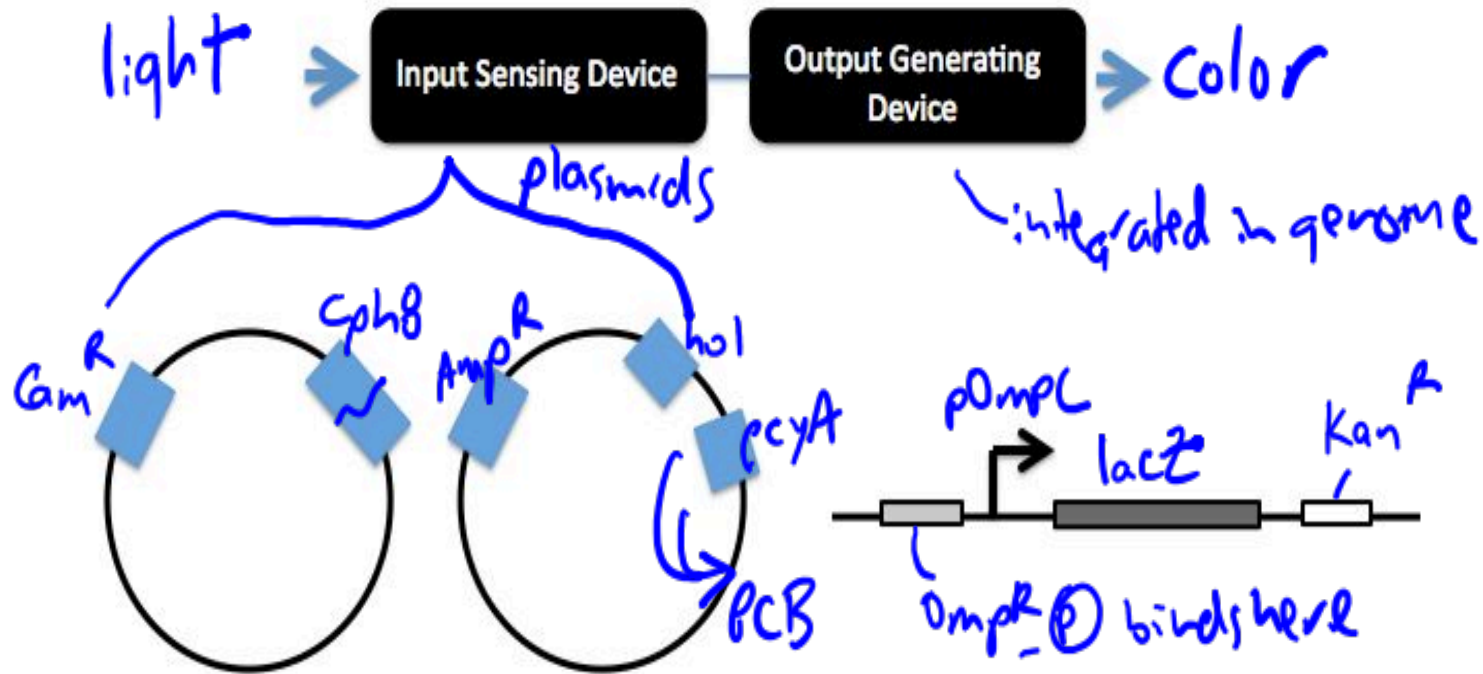


- Announcements →
 - blog comment for you
 - OH M 2-3
 - * Jclub sign-up
- Lab Quiz
- Pre-lab Lecture
 - ❖ Recap of BP components
 - ❖ Signaling details of BP system
 - ❖ Introduction to TinkerCell
 - ❖ Today in Lab (M2D2)

Recap BP components

Fill in boxes with a partner...



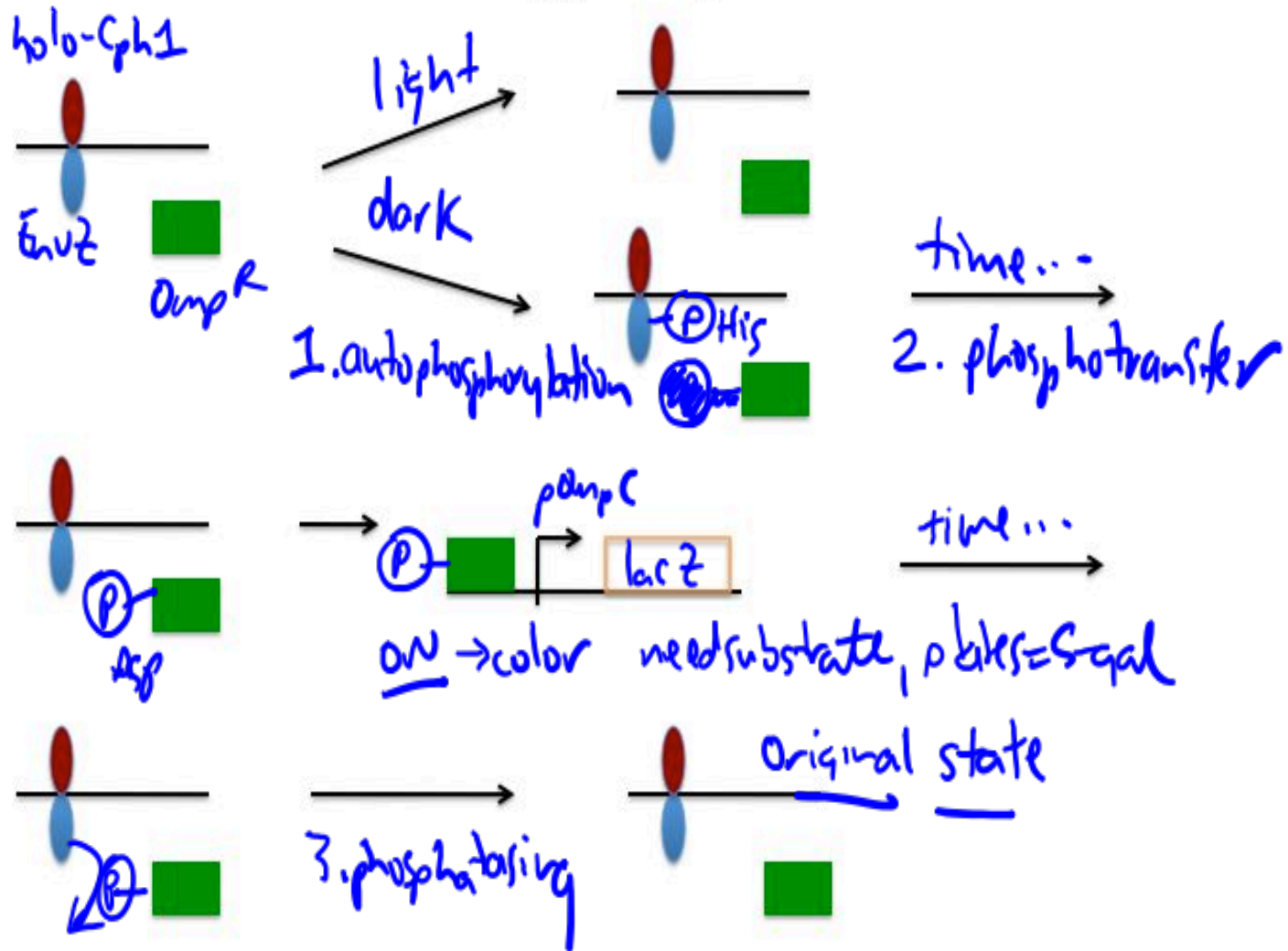
$Cph8 = Cph1 / EnvZ$

$apo-Cph1 + PCB = \text{holo-Cph1}$
bound/functional

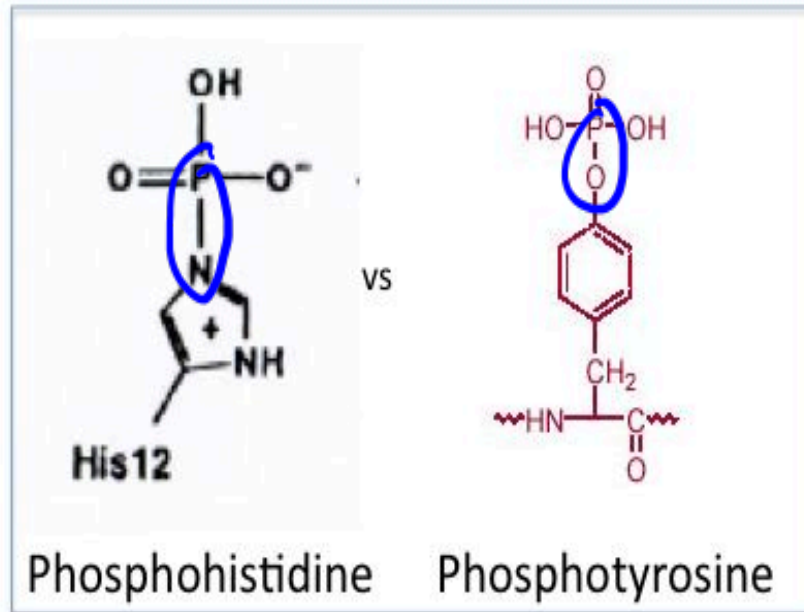
* rely on native $OmpR$

* $\Delta EnvZ \quad \Delta lacZ$

How is the signal processed?



Chemistry of phospho-aa



(1) acid-labile

acid stable

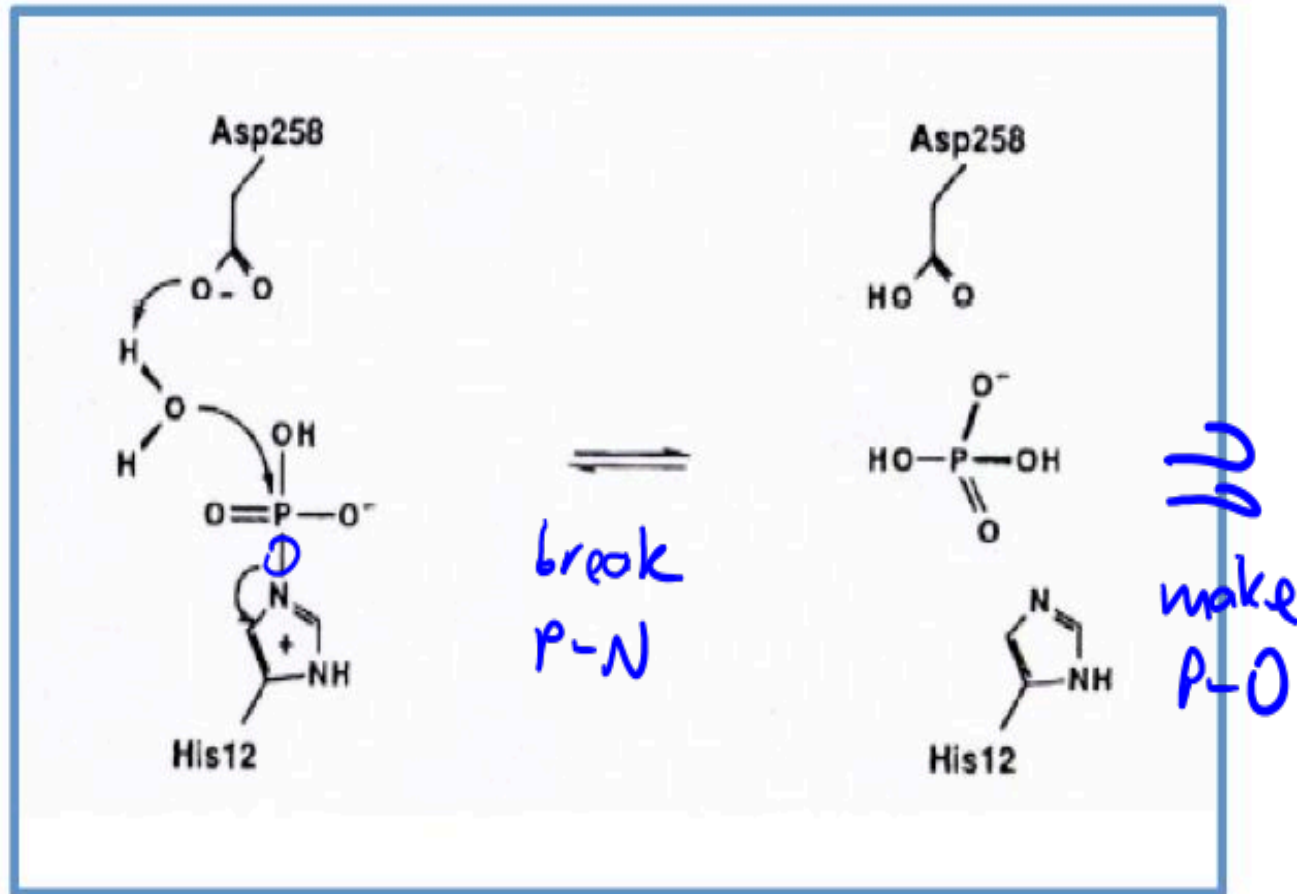
(2) e^- -depleted form
in significant

" plays some role

Slide from N. Kuldell

↓
• unstable to nucleophilic attack

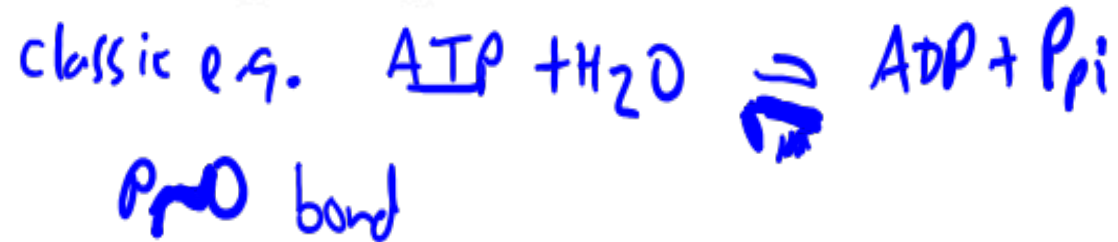
Chemistry of phosphorelay system



Slide from N. Kuldell

Thermodynamics of phosphorelay

What is a "high-energy" bond?



Typical ΔG° of hydrolysis

-6.5 to -9.5 kcal/mol

-12 to -14 kcal/mol

Which one is phosphoester, which is phosphoramidate?

P-O

P-N (His)

ΔG° numbers from review: P.V. Attwood et al., *Amino Acids* **32**:145 (2007). Original research by Stock et al. (1990).

TinkerCell modeling program

A

- Two major utilities for biological systems
- Visualizing networks
 - GUI to combine enzymes, promoters, etc.
- Simulating and perturbing networks
 - ODE-based modeling
 - initial concentrations, rate constants, etc.
- Consider assumptions and reliability in modeling vs. experiments

Today in Lab:M2D2

- Observe/take pics of solid media from last time
- Prepare bacterial photograph
- Test liquid cultures from last time
 - β -gal assay (lyse cells, etc.) $+ \text{tNPG}$
 - Expected results: $[\beta\text{-gal}]_{\text{light}} < [\beta\text{-gal}]_{\text{dark}}$
- TinkerCell
 - Draw network
 - Simulate changes to k 's, etc. (or next time)
- Atissa will give talk about talks @ 4 pm

