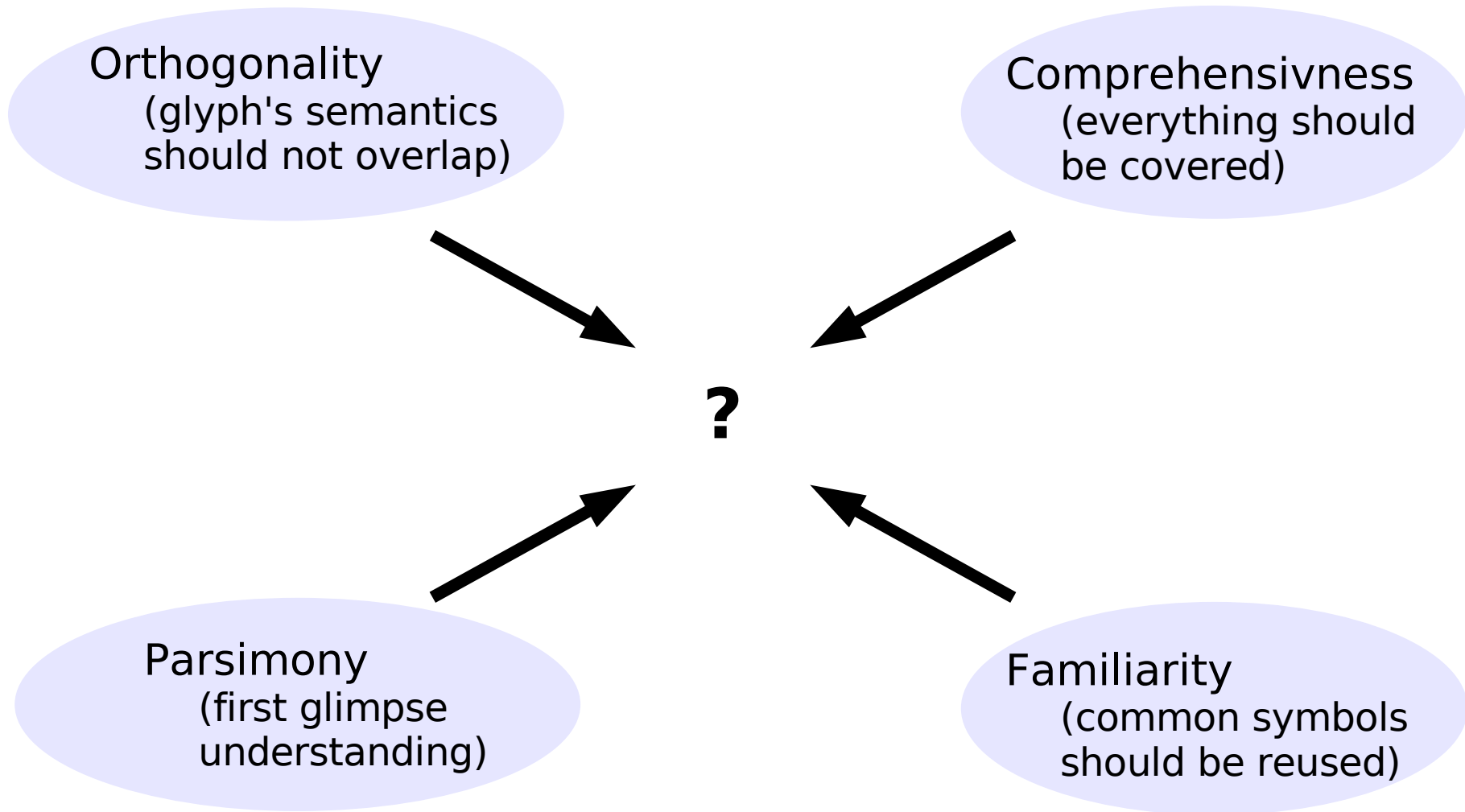


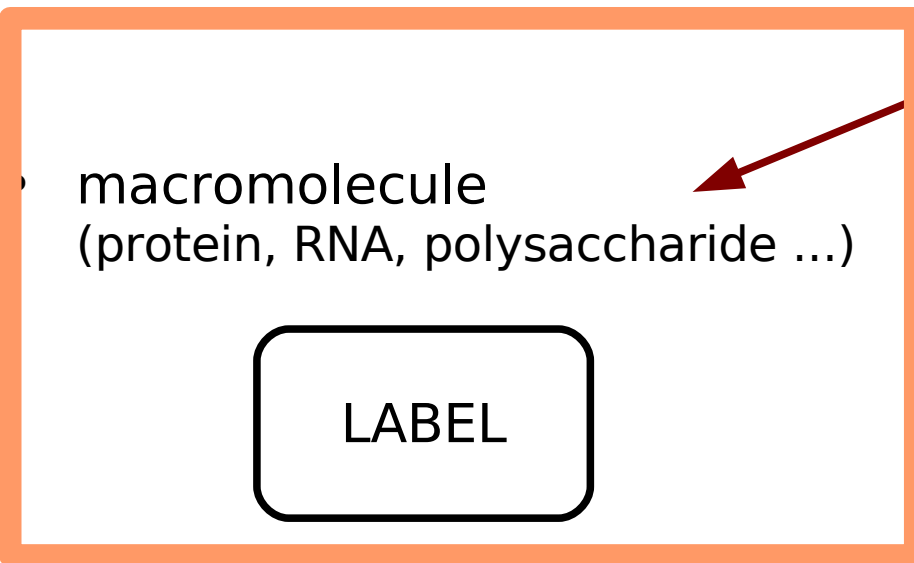
Toward SBGN Level-1

- To cover a large spectrum of biochemical (biological) processes
- To describe biological features at various levels
- To build on the good ideas coming from CellDesigner, MIM, Edinburgh, Patika etc.
- To provide the ground for an expandable language
 - It is not a computing language hidden behind applications
 - We should not change the meaning of symbols between versions
- To do all that in consistent way, both semantically and graphically

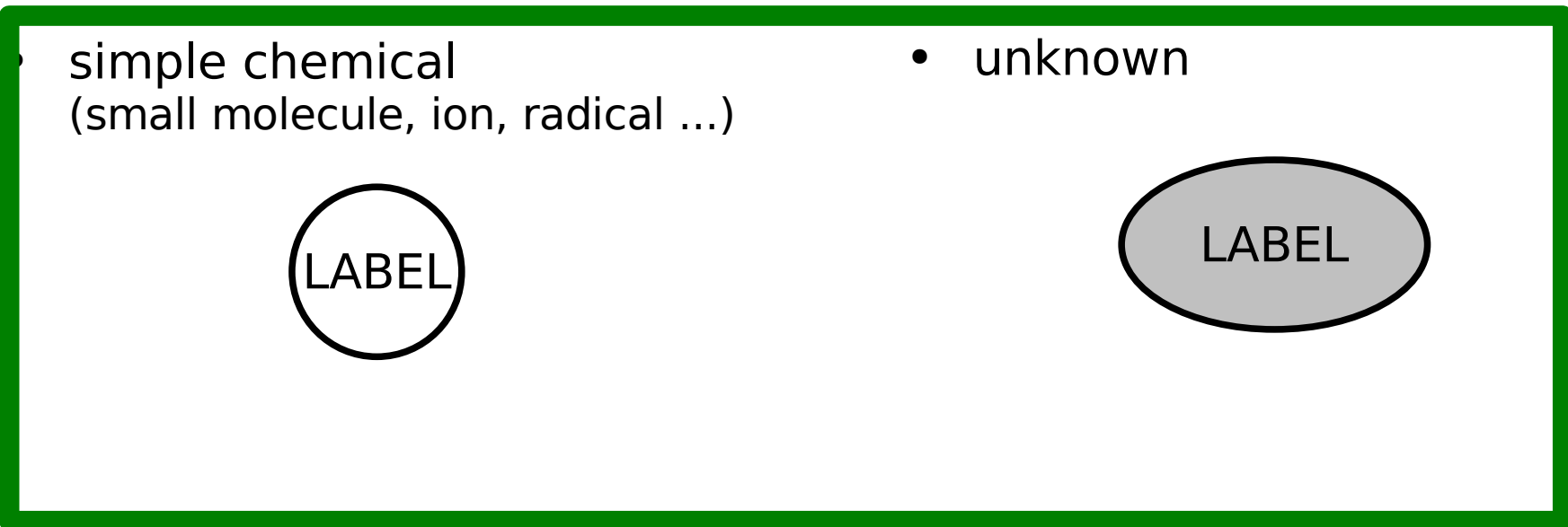


- Process Diagram => State Transition
- SBGN will have ER and ST (agreed in SBGN-1)
- SBGN should be colour independent
- SBGN should be “thickness” independent
- Symbols should be identical in ST and ER as much as possible
- Our audience is not the specialist field but the biologist community: 20-25 basic symbols are the upper boundary for SBGN Level 1 (agreed in SBGN-1)

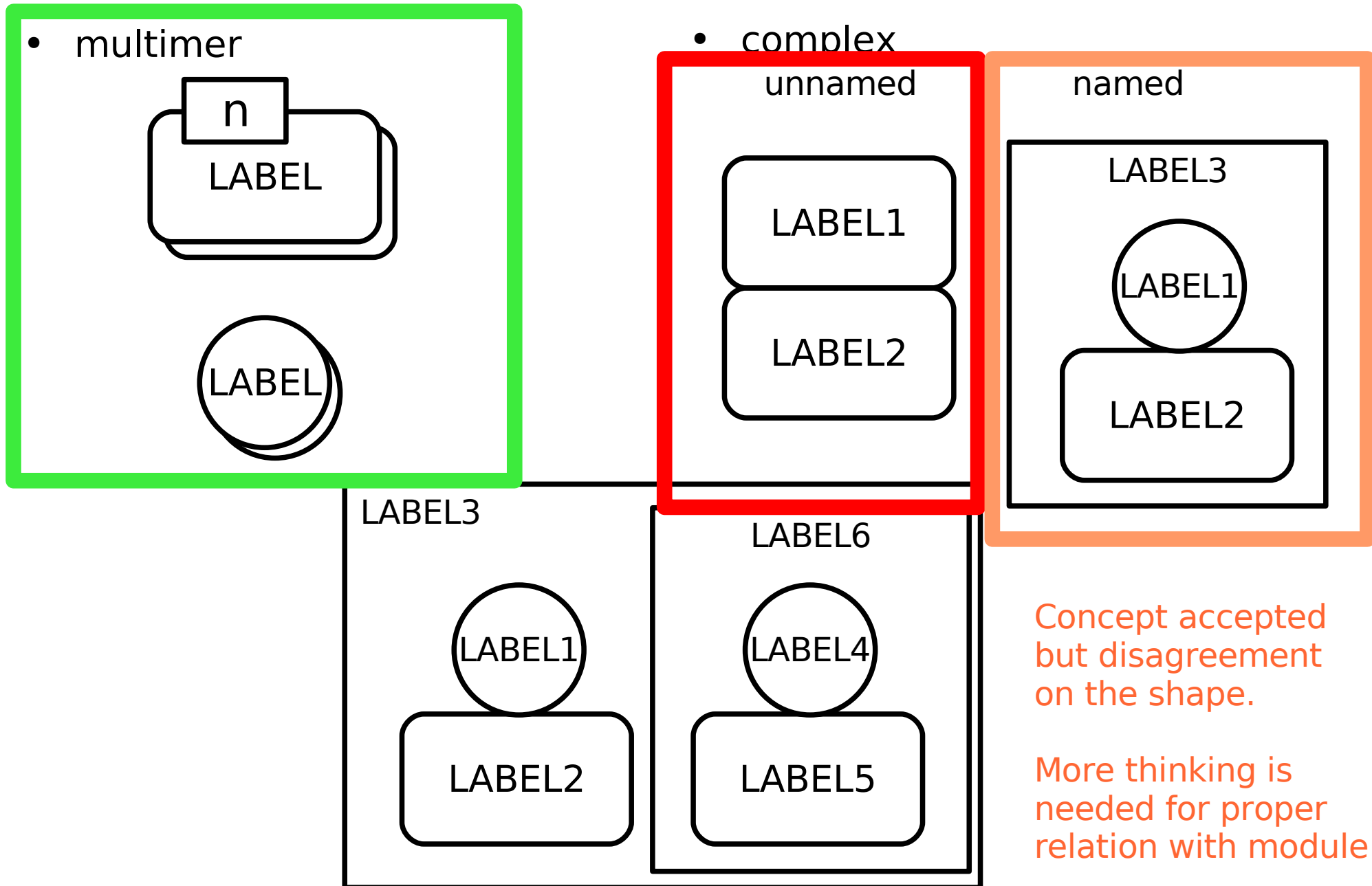
3



no separate glyphs for protein, RNA, DNA, polysaccharides, etc.



5

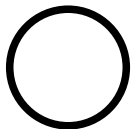


7

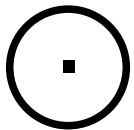
- state variable
(covalent modification, conformation, isoform ...)

[LABEL:]value

- covalent modification



empty modification



any modification



unknown modification



phosphorylation (acetylation: Ac, glycosylation: G, hydroxylation: OH, methylation: Me, myristoylation: My, palmytoylation: Pa, phosphorylation: P, prenylation: Pr, protonation: H, sulfation: S, ubiquitination: Ub)

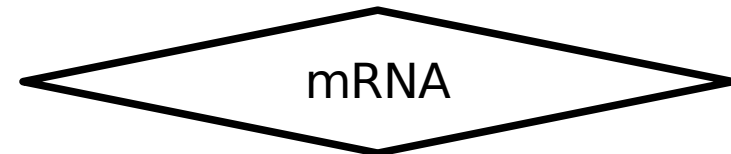
More discussion is needed to evaluate the outreach of the unit of info

The idea of a controlled vocabulary has been proposed to define macromol

- unit of information
(binding site, piece of genet info)

LABEL

-



- Can a state variable not be restricted to binary states? What about multiple states, such as inactive, active and desensitised?
- If non-binary, how does ER deal with it?
- Boolean logic on state variables:

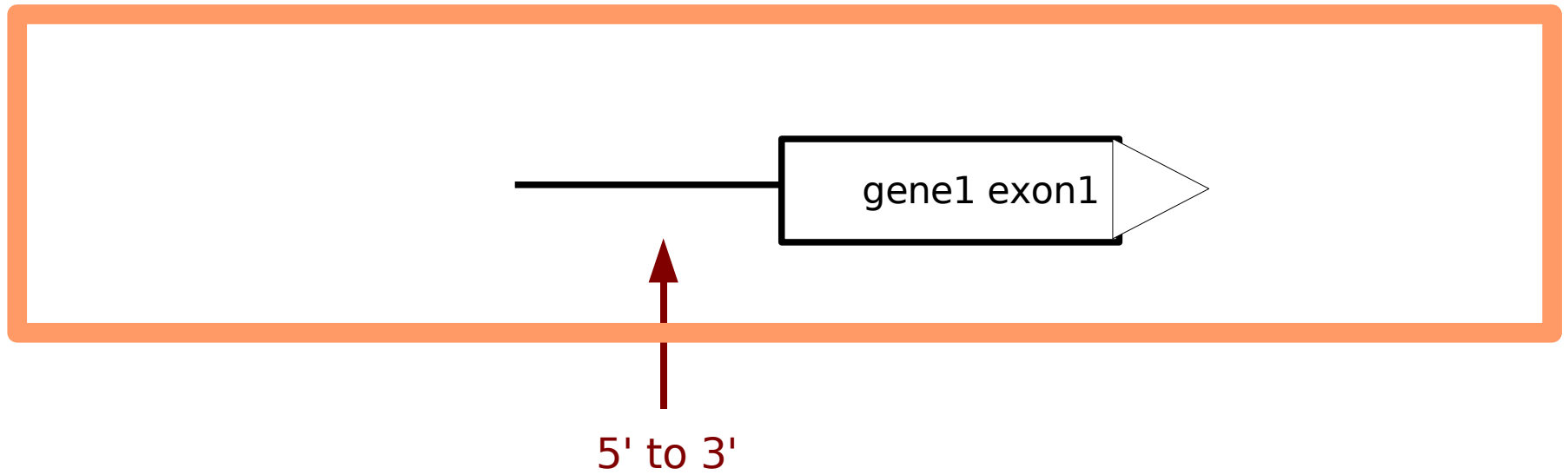
[LABEL:]value

[LABEL:].

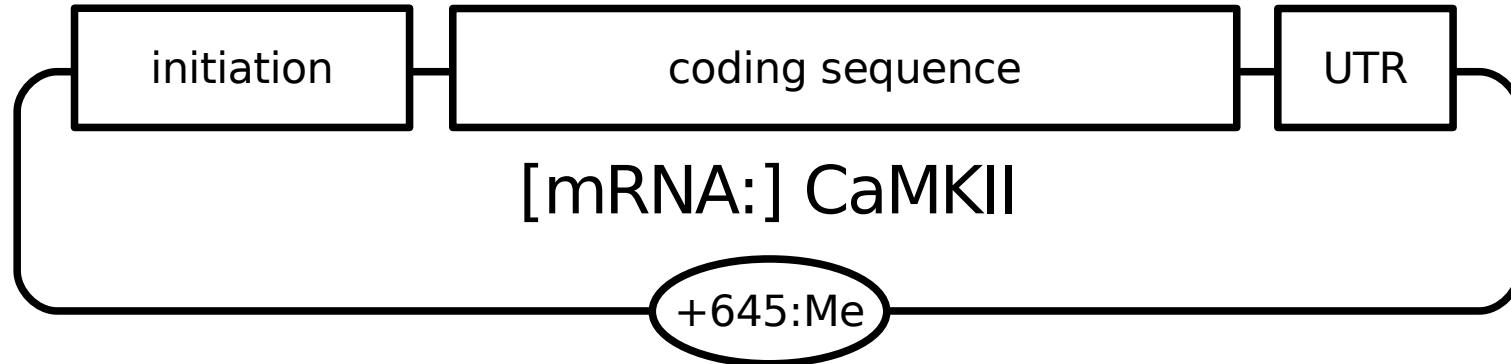
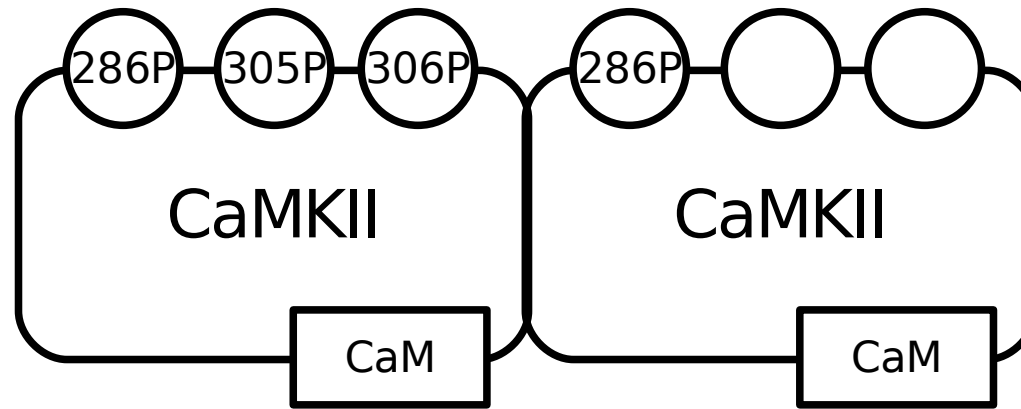
[LABEL:]?

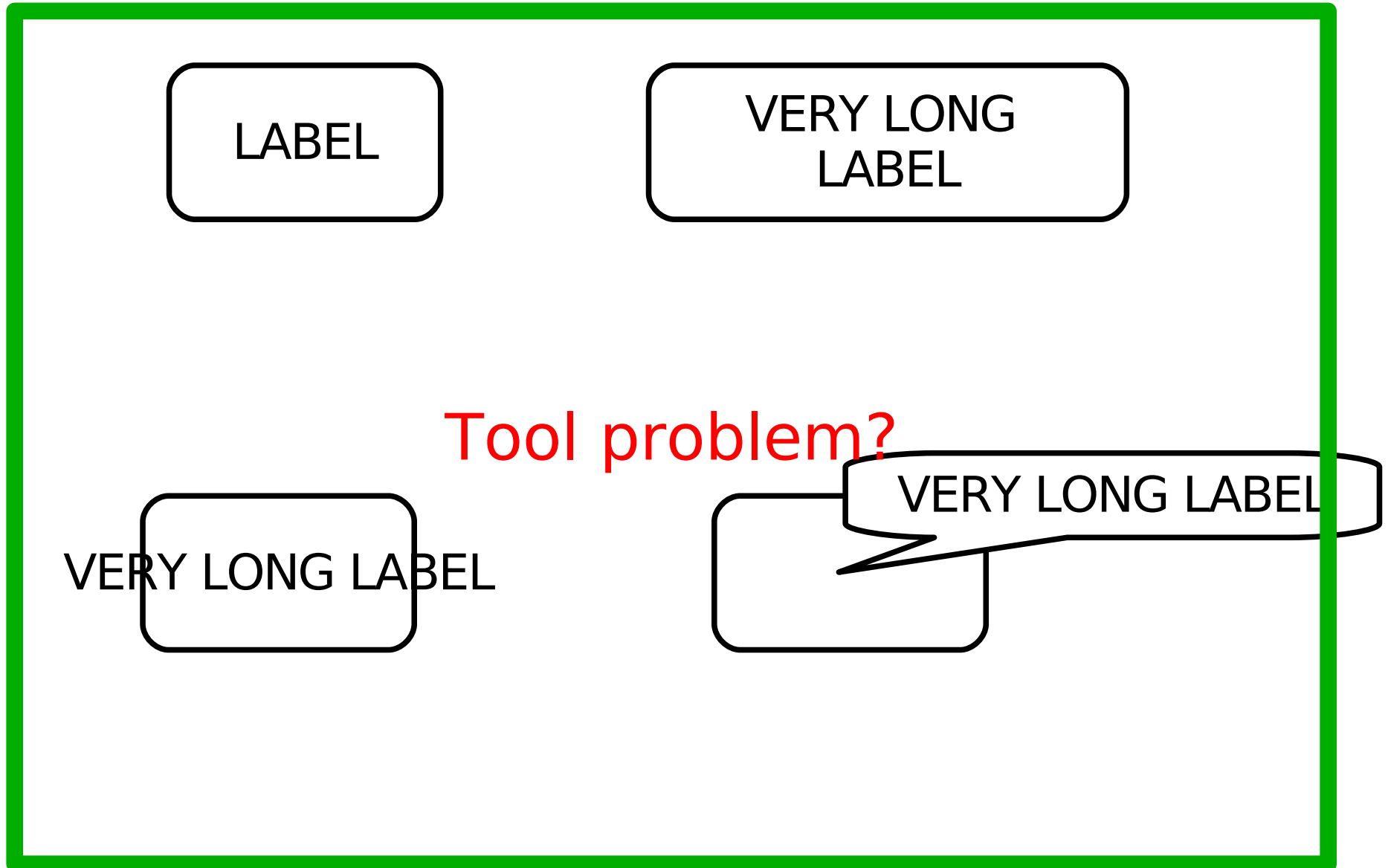
[LABEL:]A|B

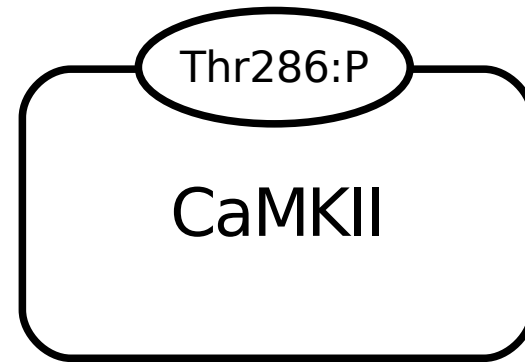
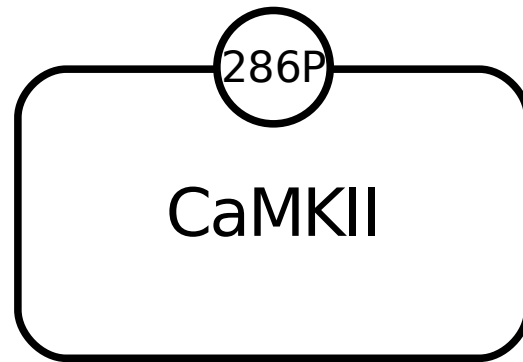
8



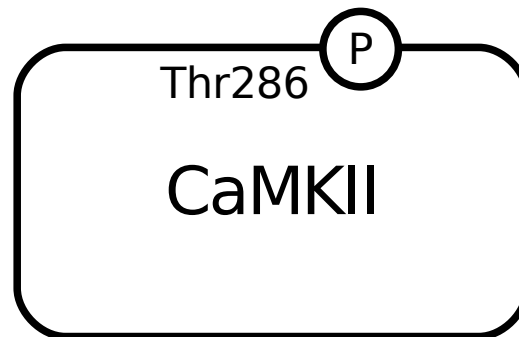
Concept accepted
but more discussion
needed for shape

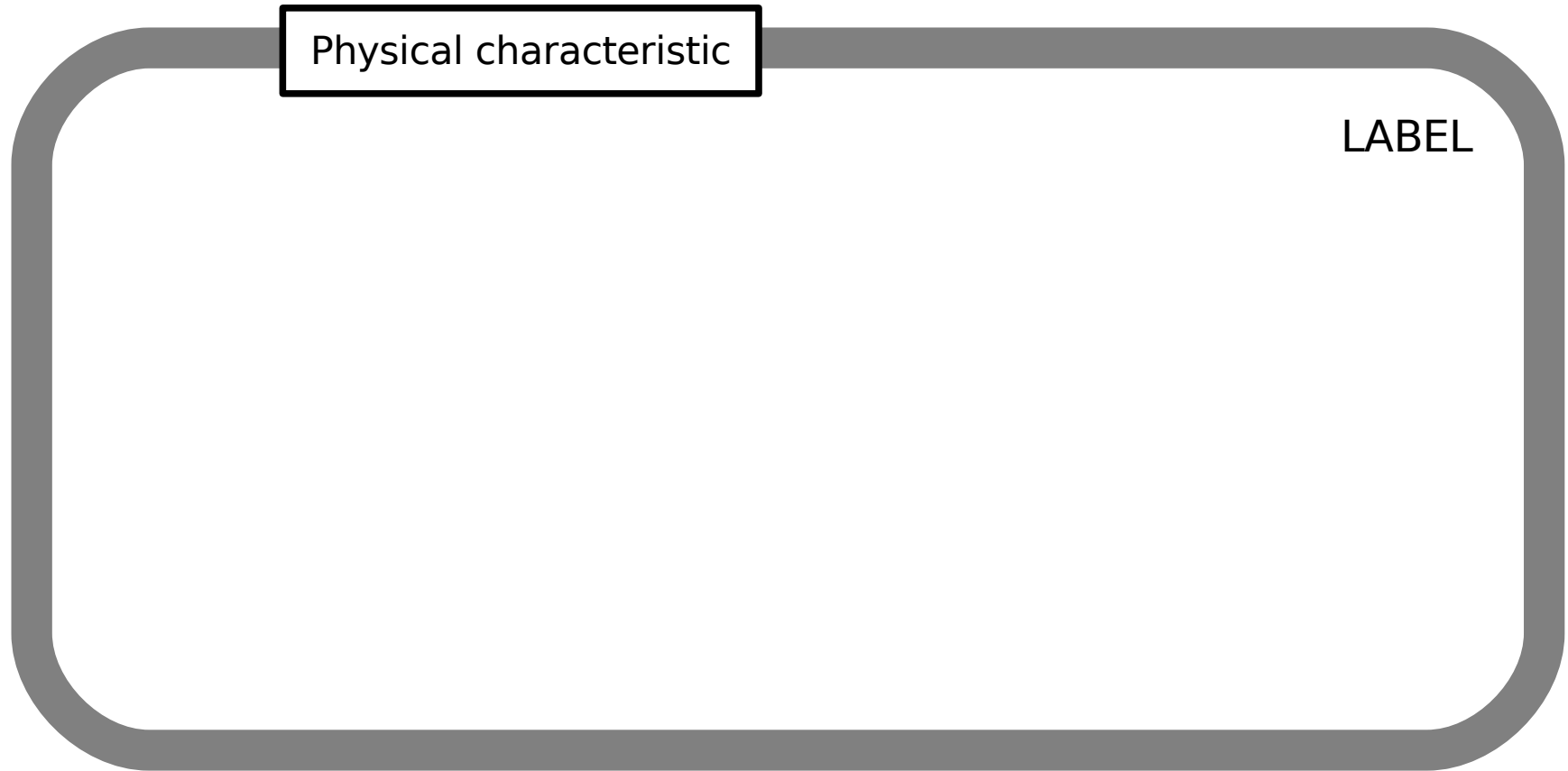






Tool problem?





8+3

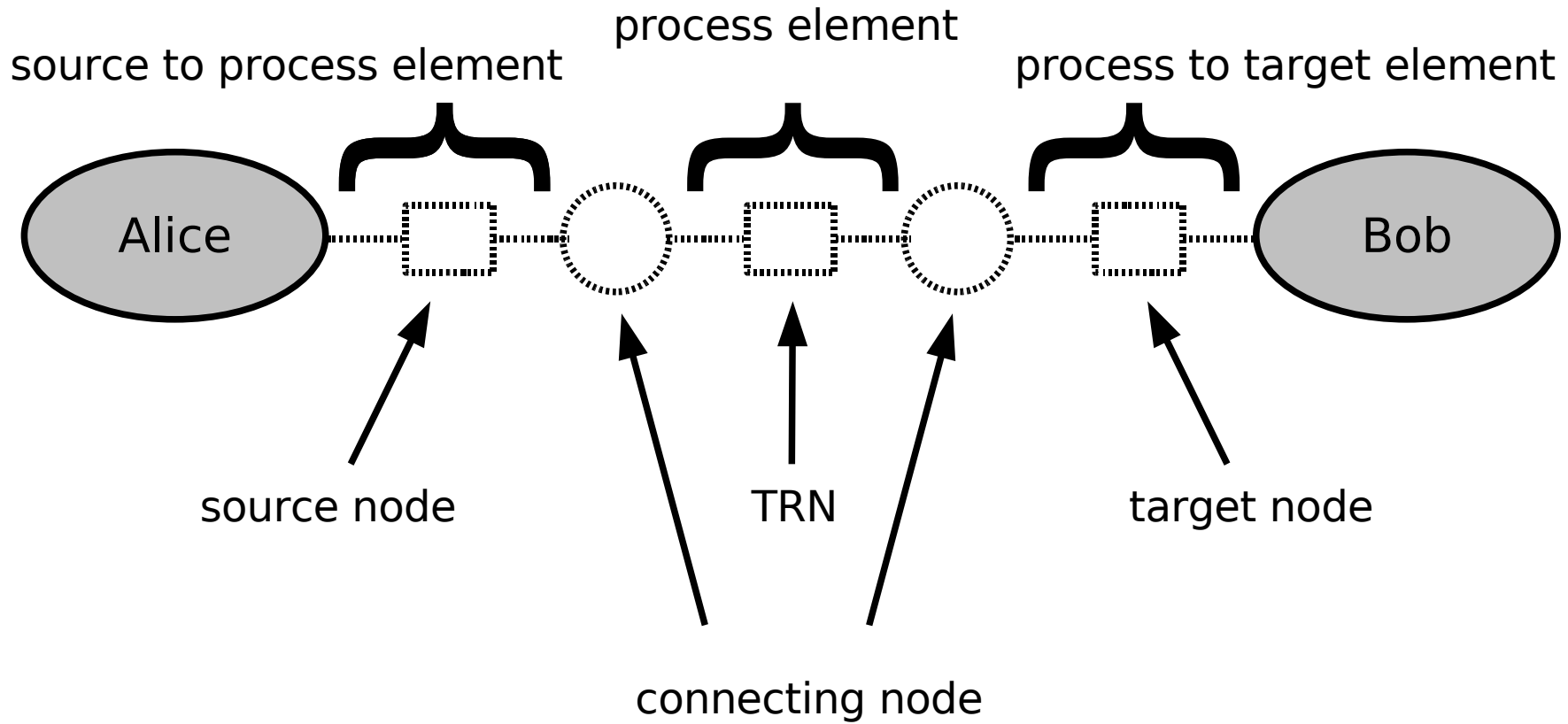
- Covalent links

Tool problem?

- Physical parameters: temperature, pressure, voltage, pH






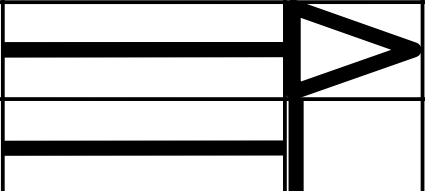







Compartment state variable
+ module

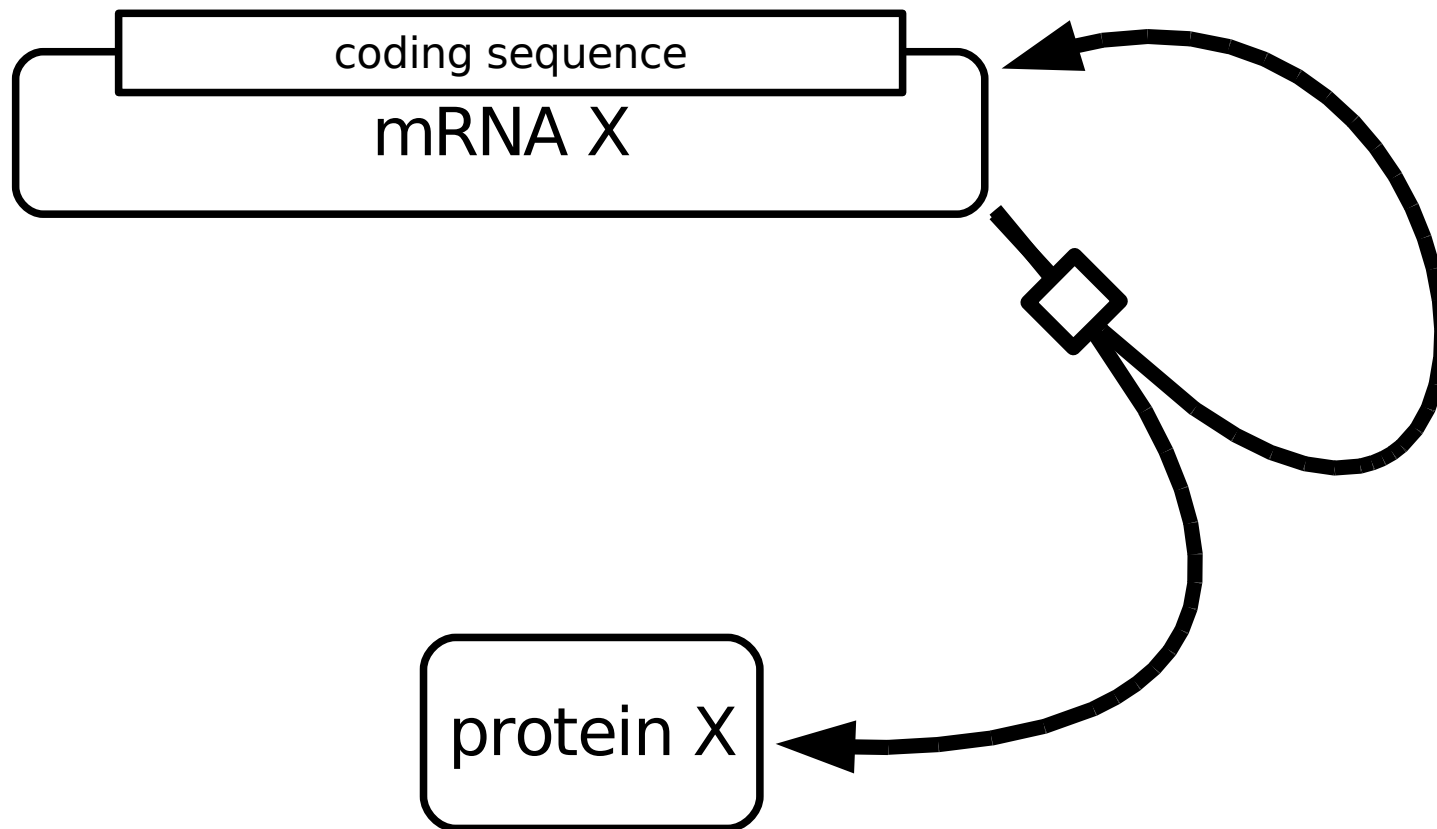
- phenotype







21+3

Problem with reversible transitions:
How to know which direction is
potentiated/inhibited by a control?

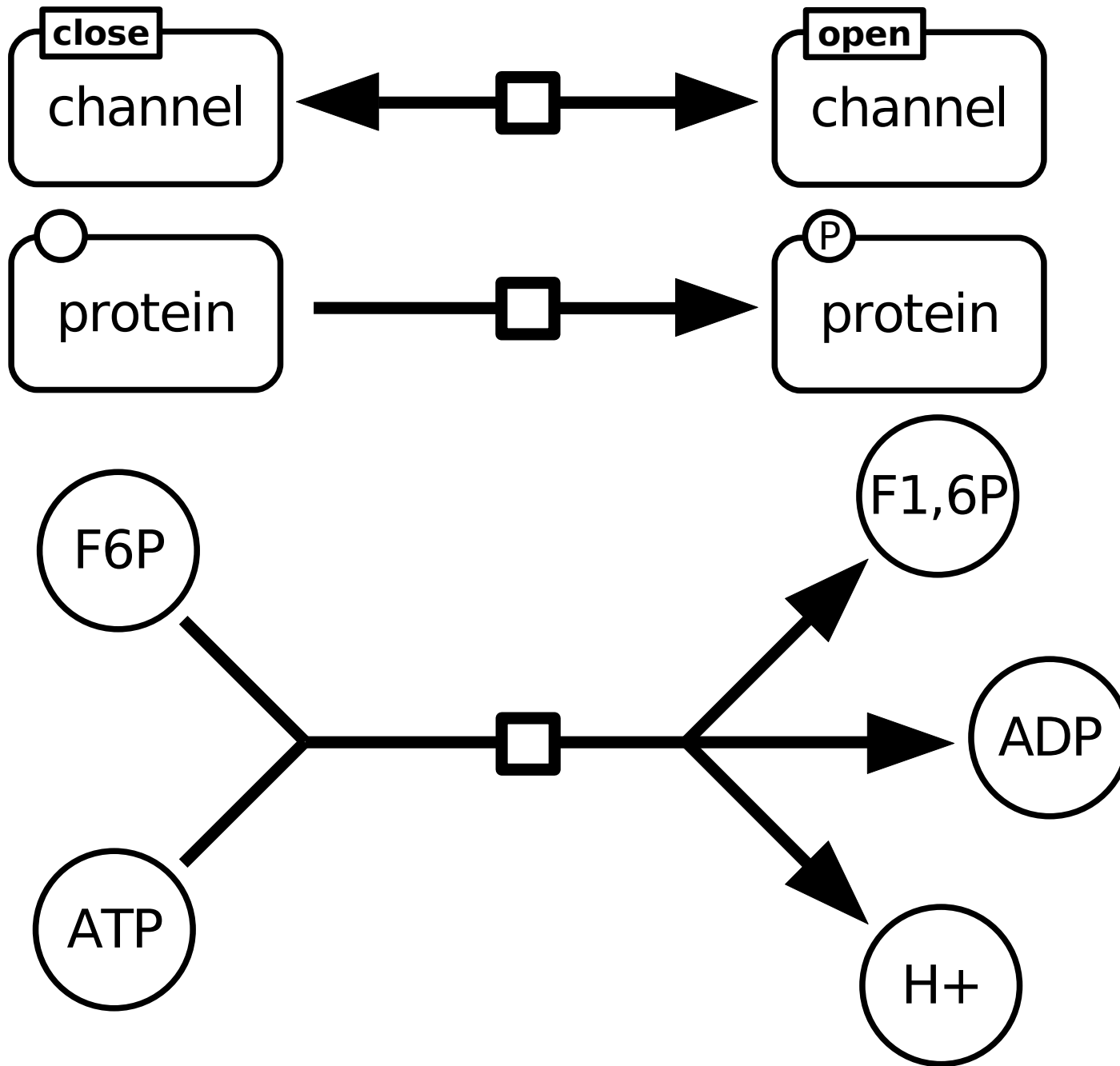
| | | | | | | | | |
|-------------|---|---|---|--|---|---|--|----------------------|
| \emptyset |  | | | | | | | Source SEN connector |
| | | | | | |  | | Target SEN connector |
| | | |  | | | | | basic trans. |
| | | |  | | | | | omitted trans. |
| | | |  | | | | | uncertain tr. |
| | | | | | |  | | stimulatory |
| | | | | | |  | | inhibitory |
| | |  | | | | | | association |
| | | | | |  | | | dissociation |
| | |  | | | | | | or |
| | |  | | | | | | and |
| | |  | | | | | | not |
| | |  | | | | | | xor |

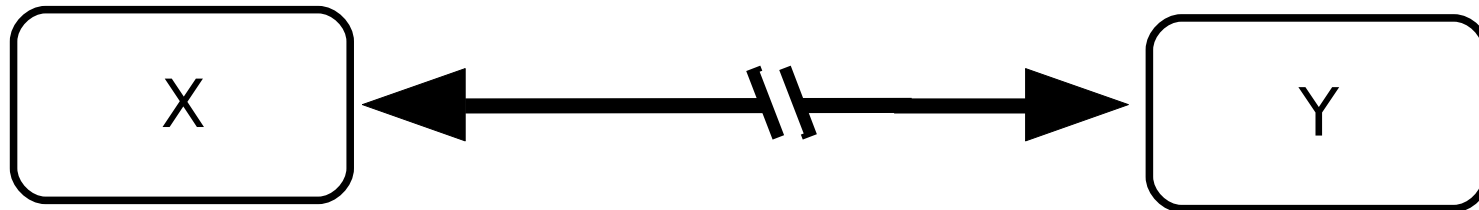
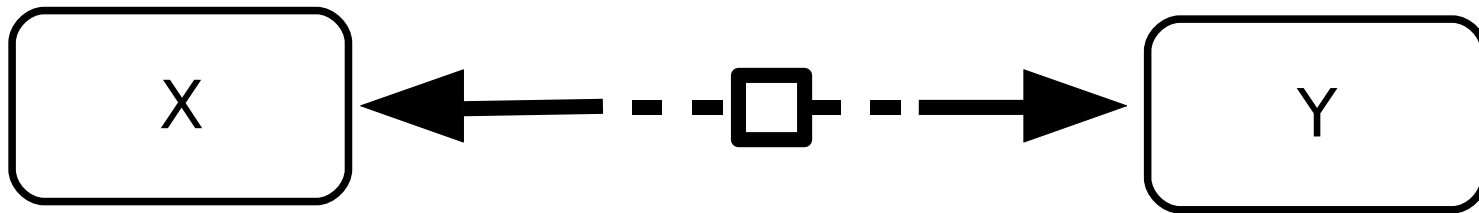


21+9

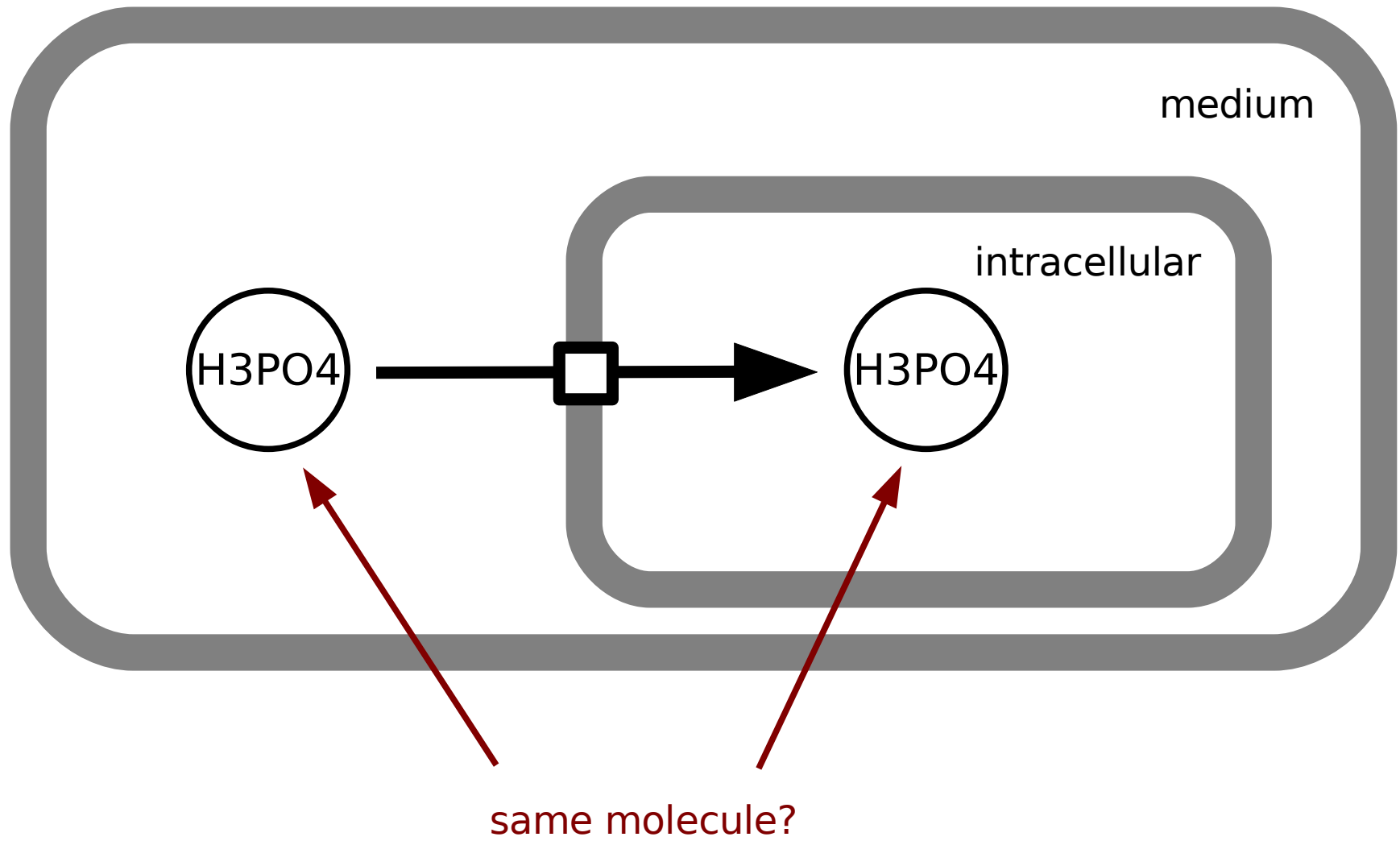
- Trigger (“absolute activation”, “requirement”)
- Resetting (“cleavage”)
-    

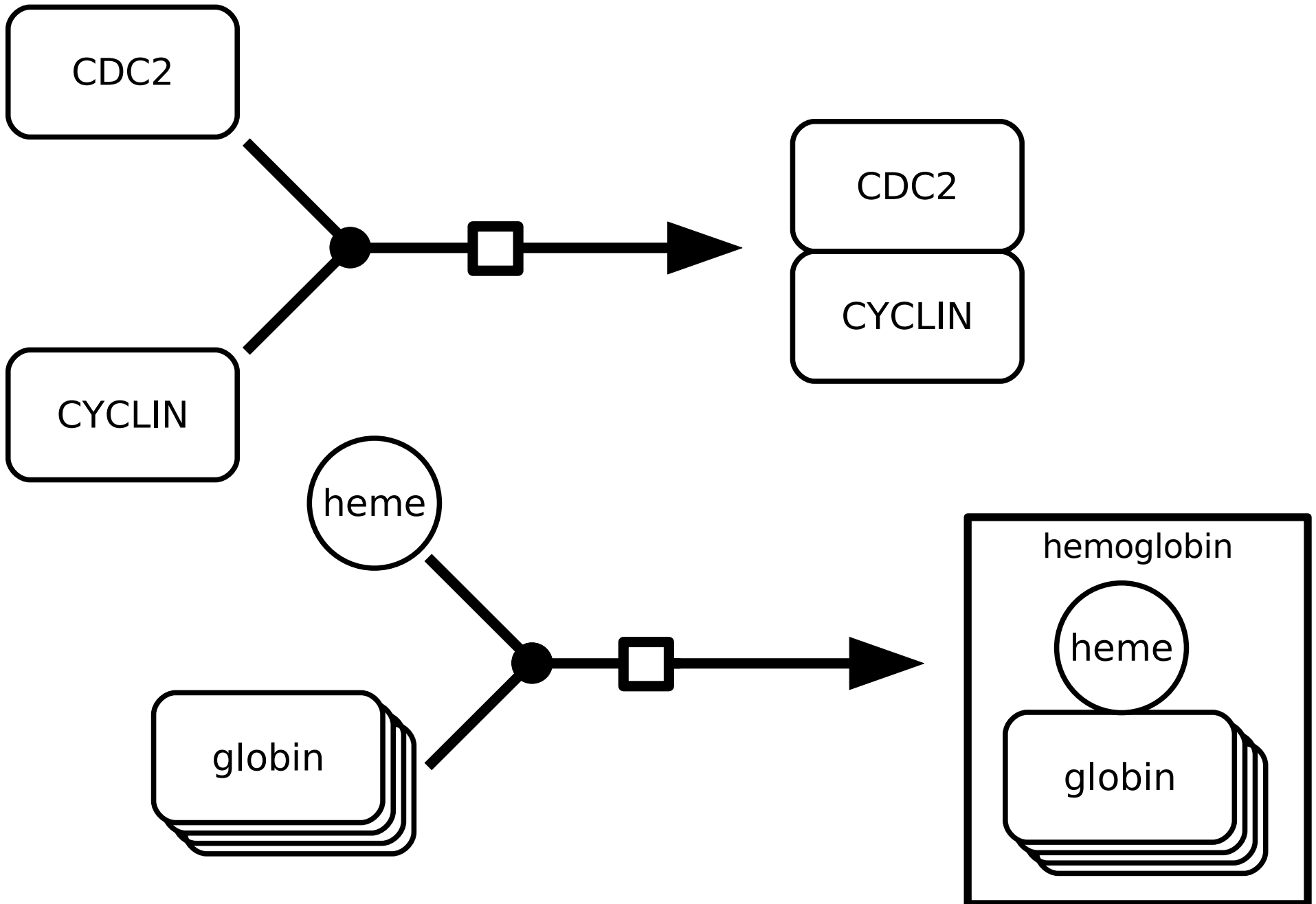
More discussion needed. We did not reach this point in the open discussion session.

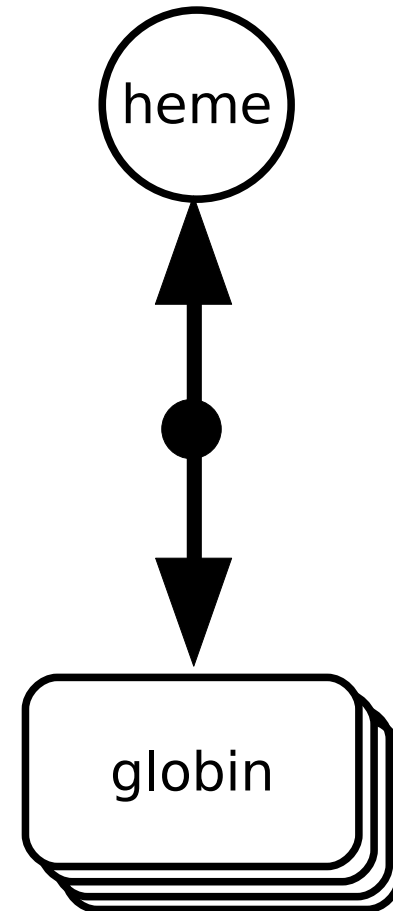
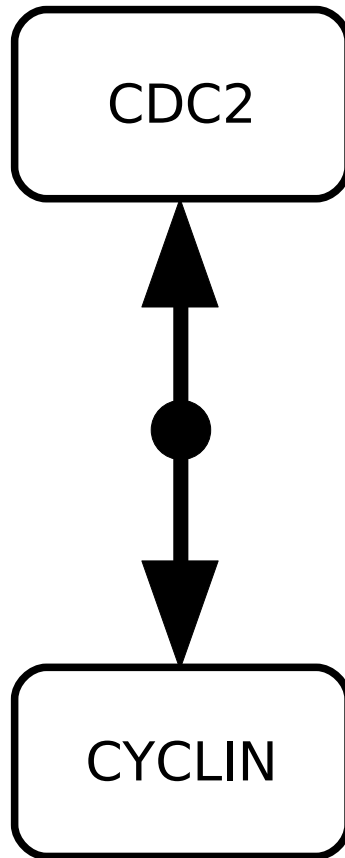


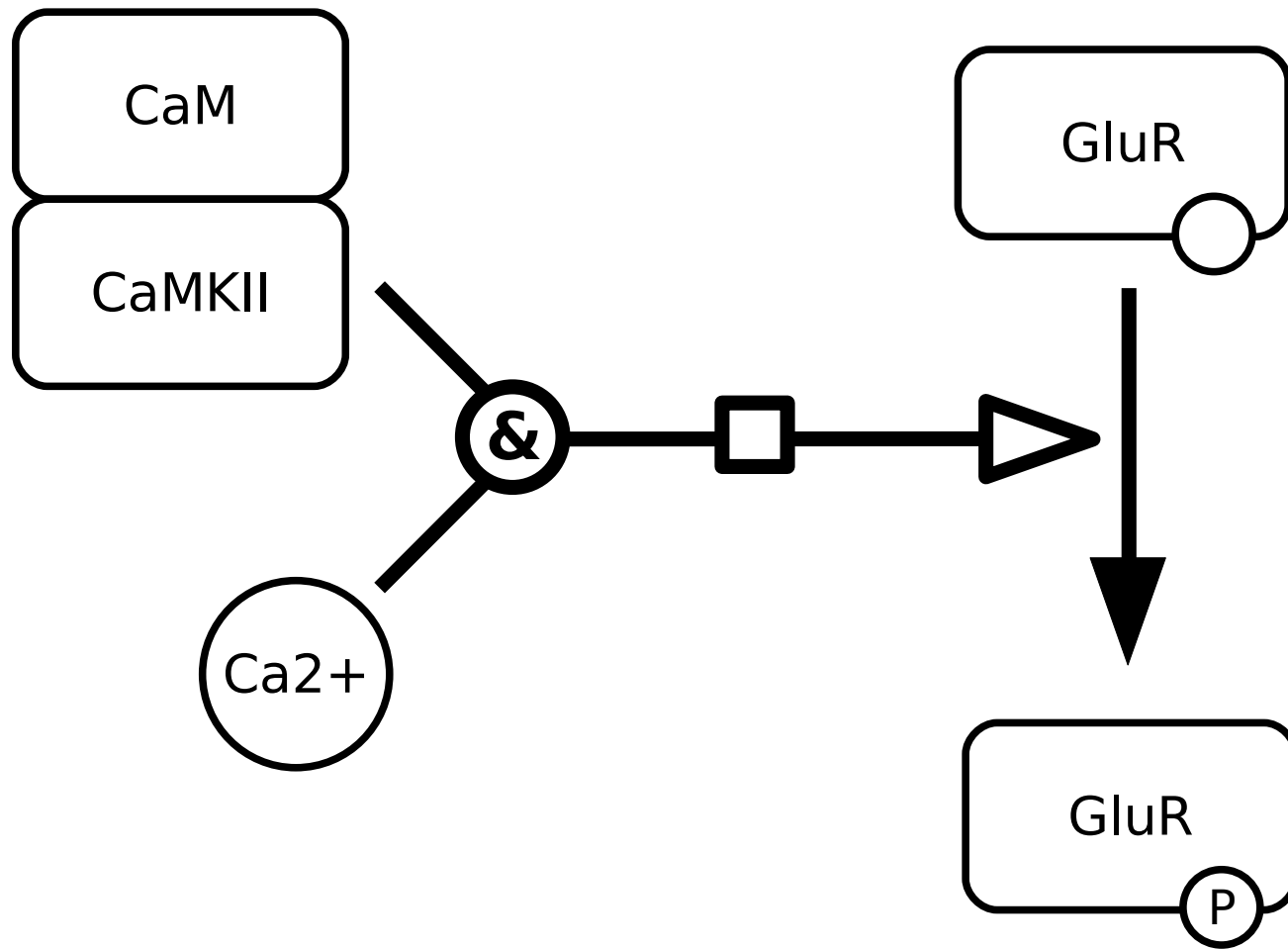


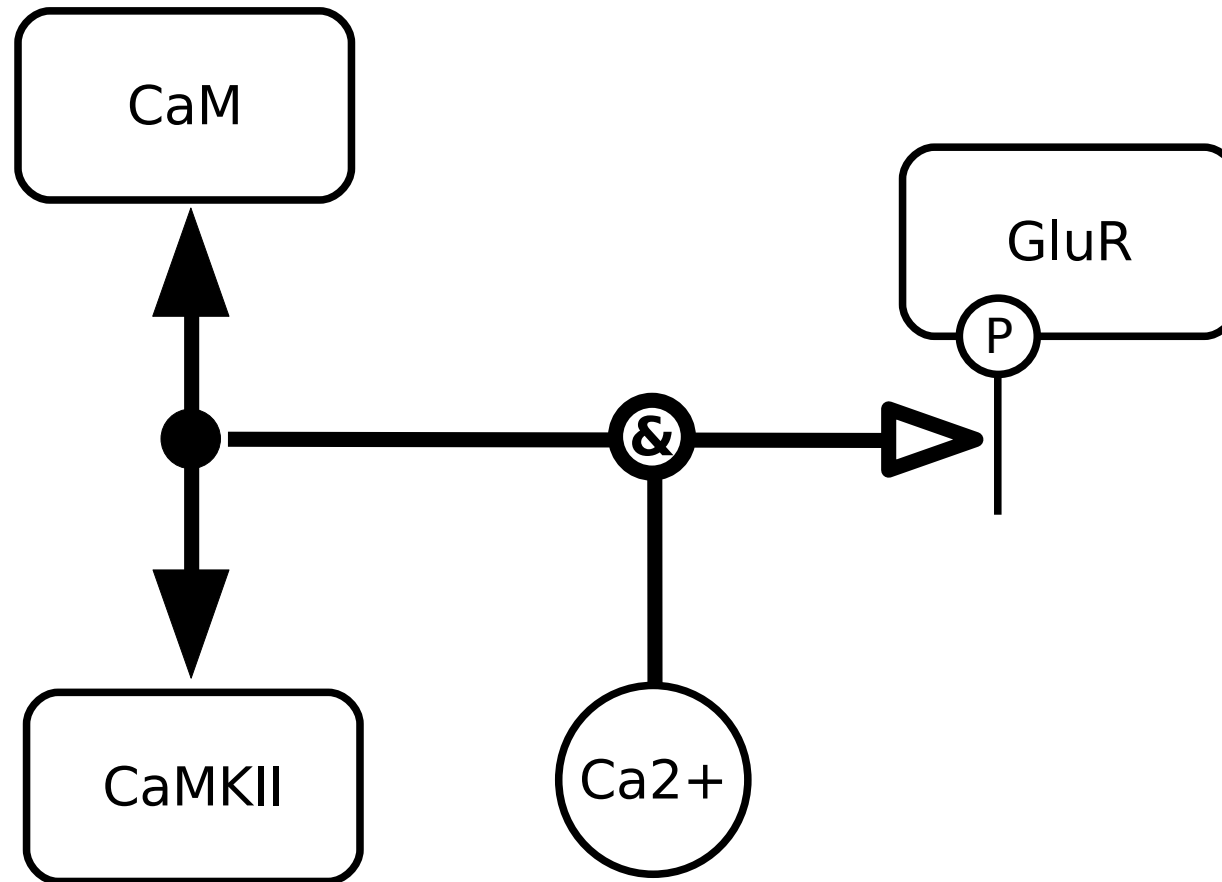
22+9

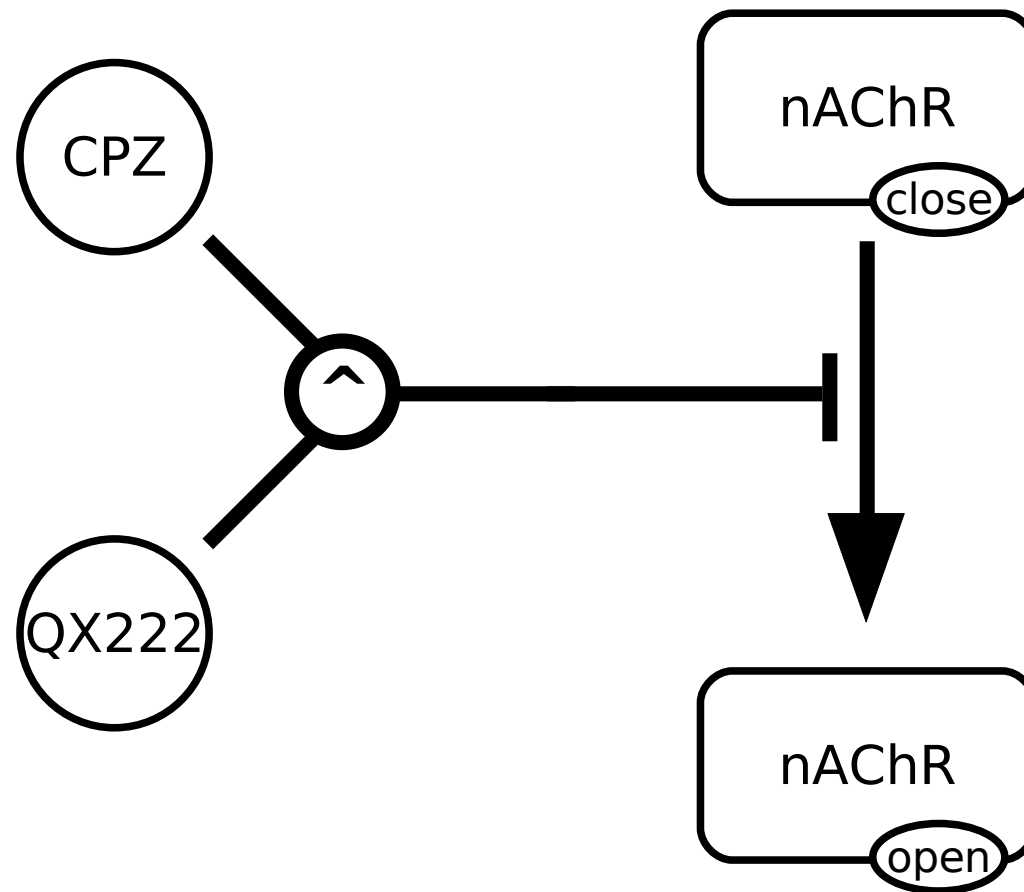


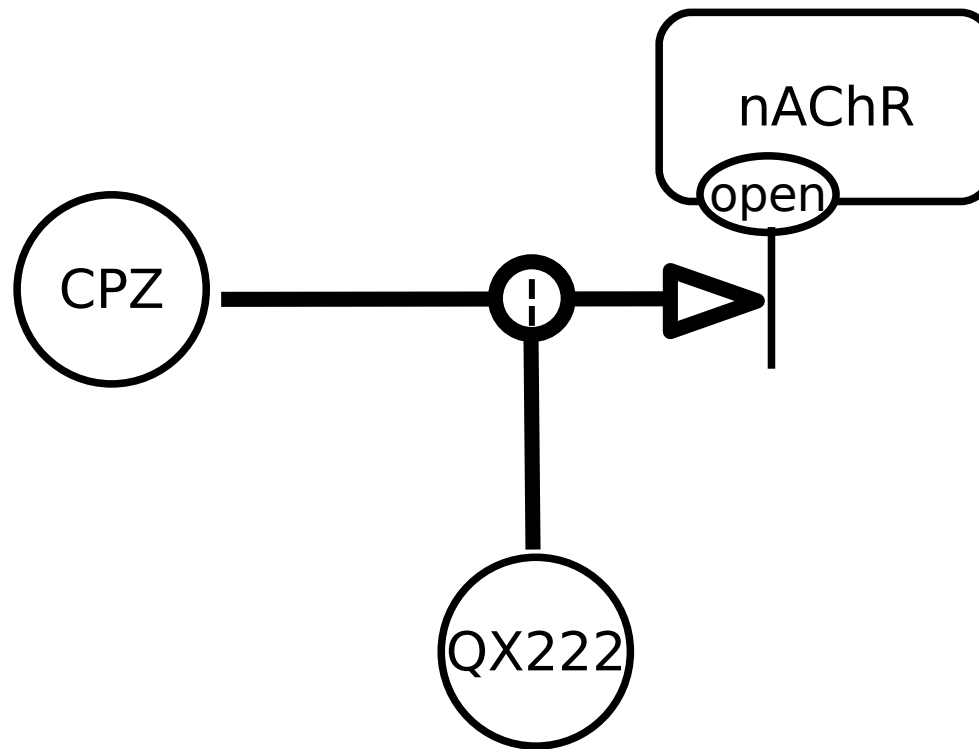


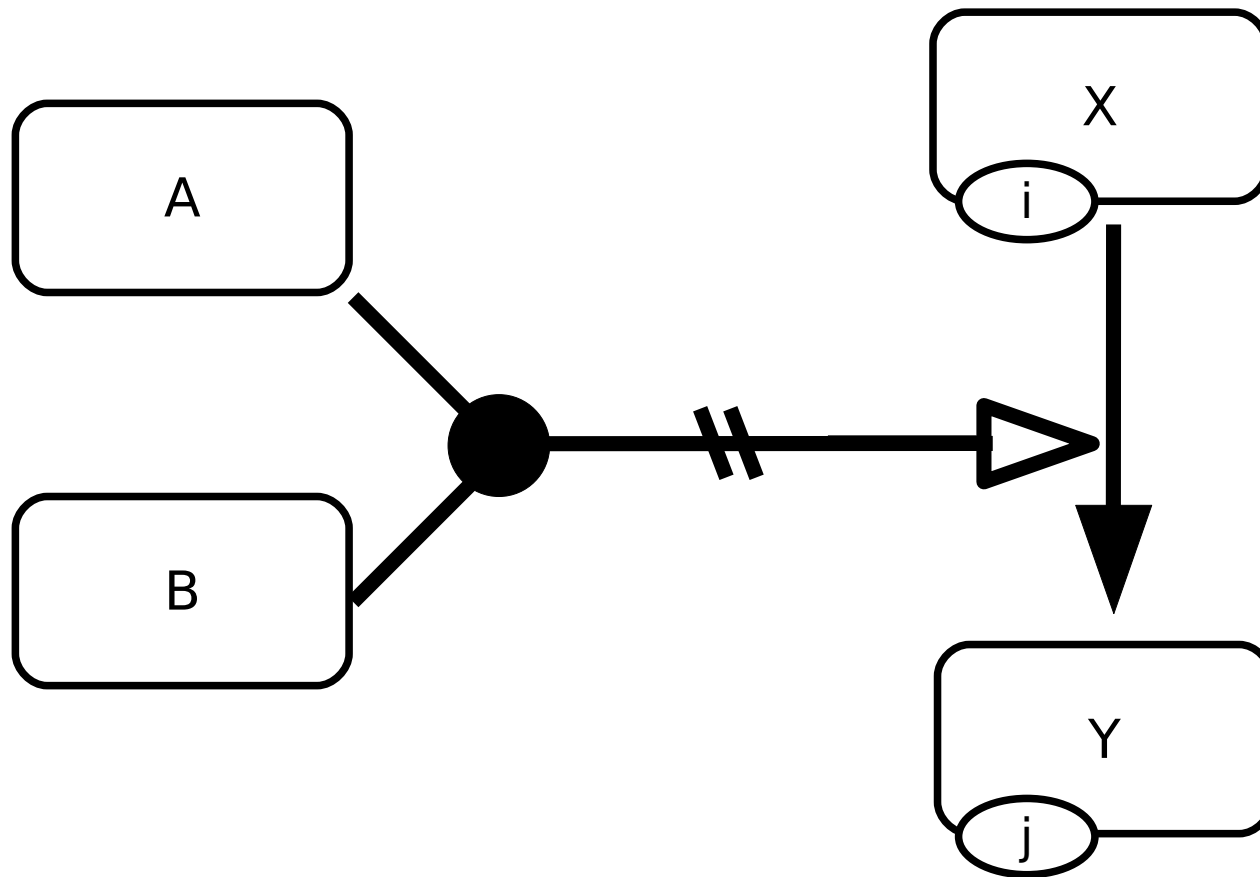












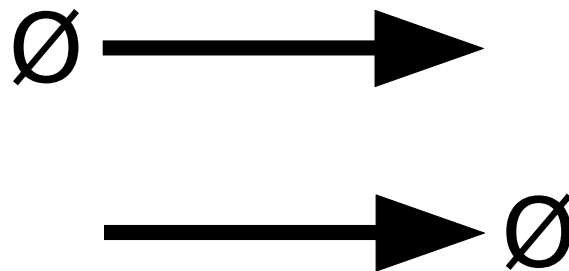
Reduced notations

22+10

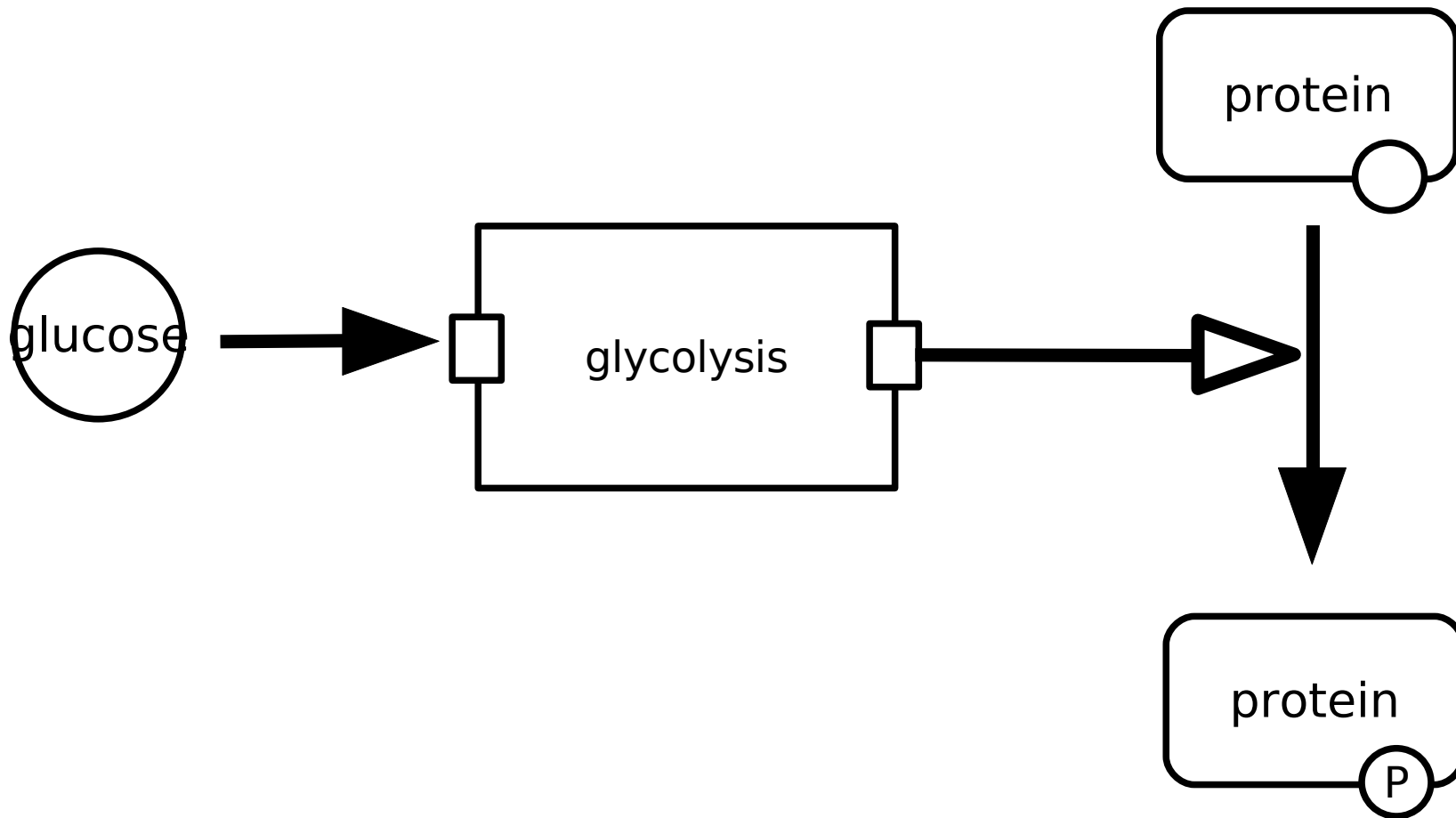


22+11

Suggestion: creation of an “empty set” state node

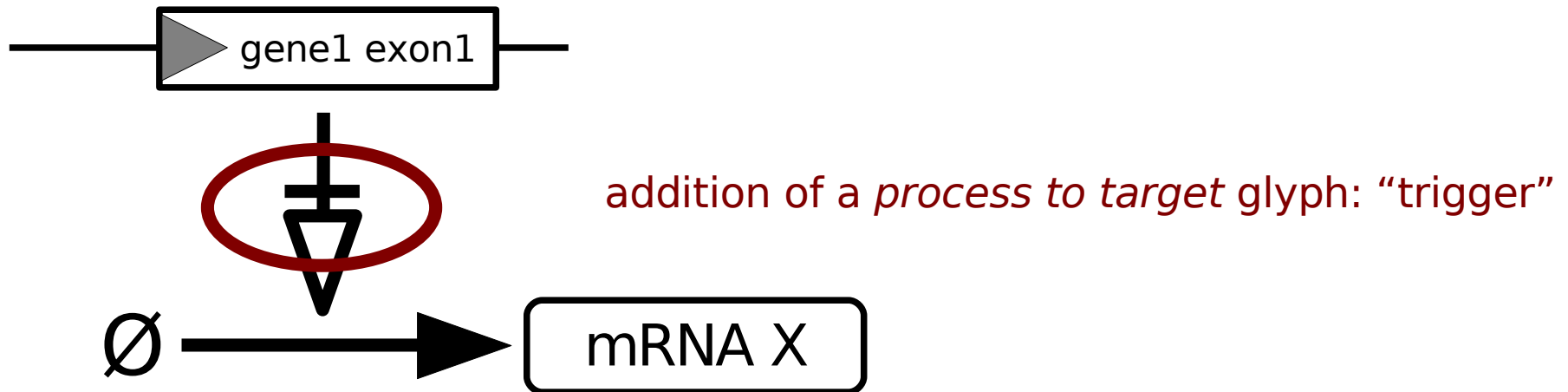
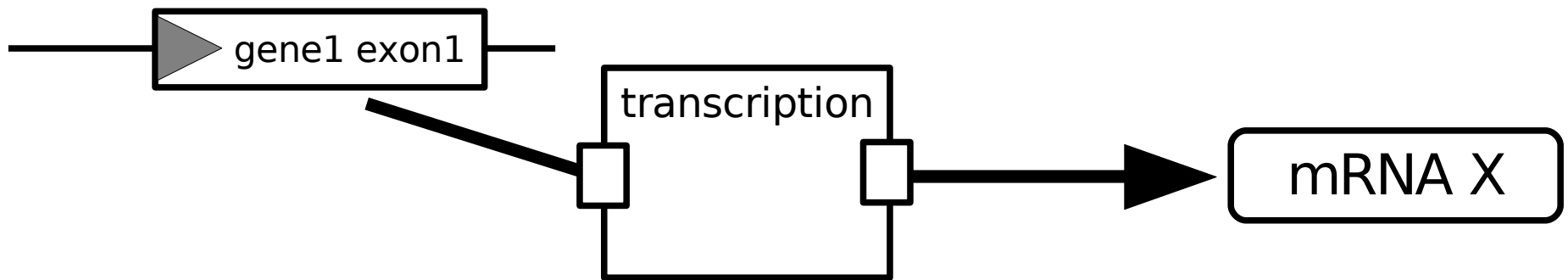


23+11



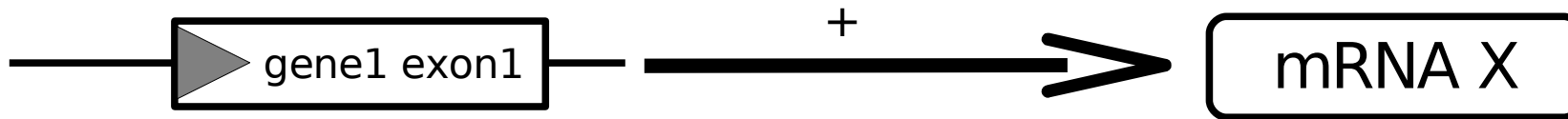
24+11

- Do we need special glyphs in Level 1?



24+13

- Represent them as modulation



New *process to target* glyph: “generation”

Would represent a process that produces something without affecting the source.

- New *process* glyphs for transcription and translation
- Should-we postpone until Level 2?

DISCUSSION!

- About SBGN views and glyphs
- Languages and standard descriptions
 - Language to describe SBGN in a formal and parsable way
 - Description of the glyphs
 - Description of the grammar (only needed if next point)
 - Language to encode an SBGN diagram
 - Exchange, validation ...
 - Logic only or logic plus layout
- Auto-layout: who? How?
 - Need to coordination
 - Lack of free (as in freedom) solution