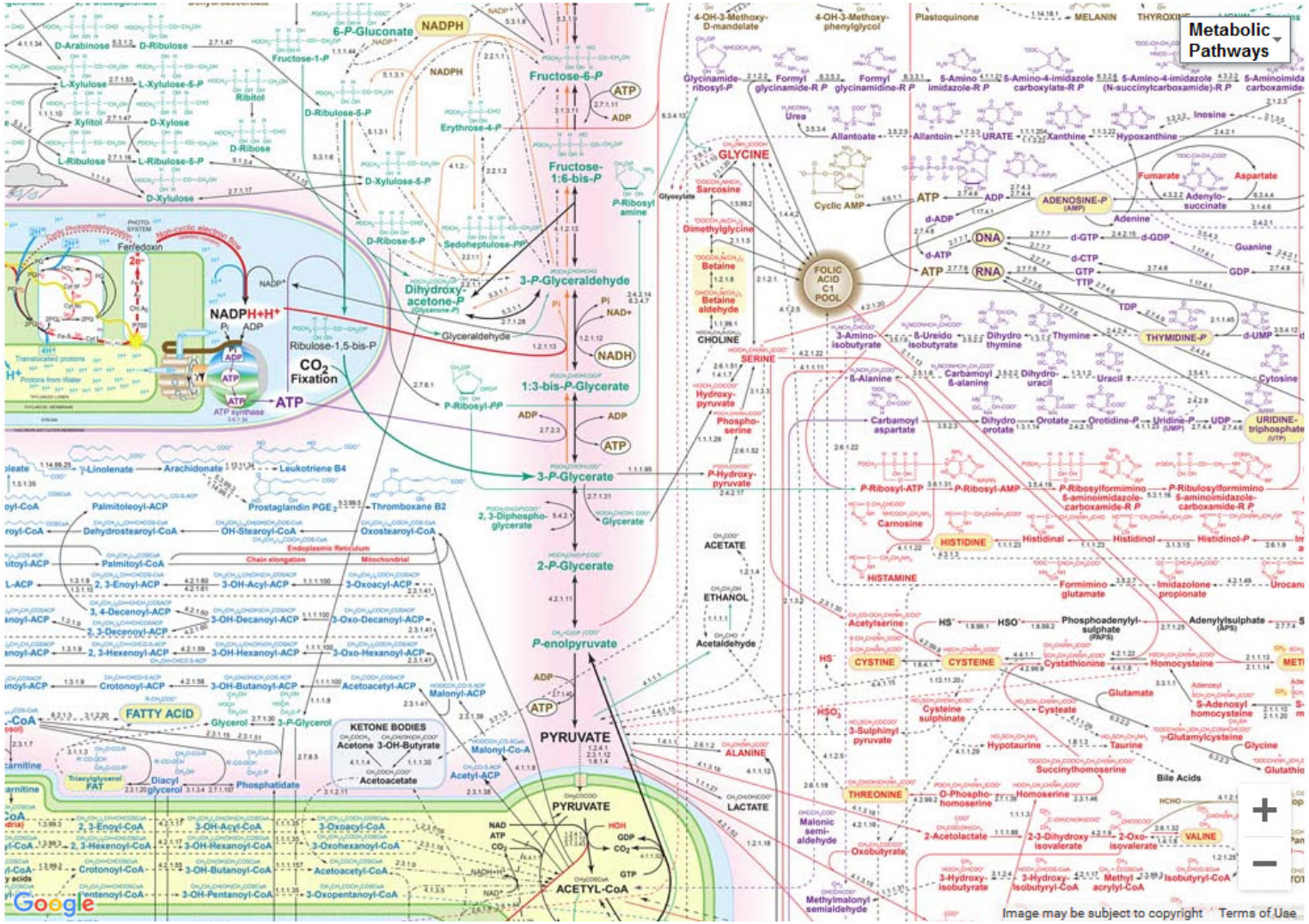
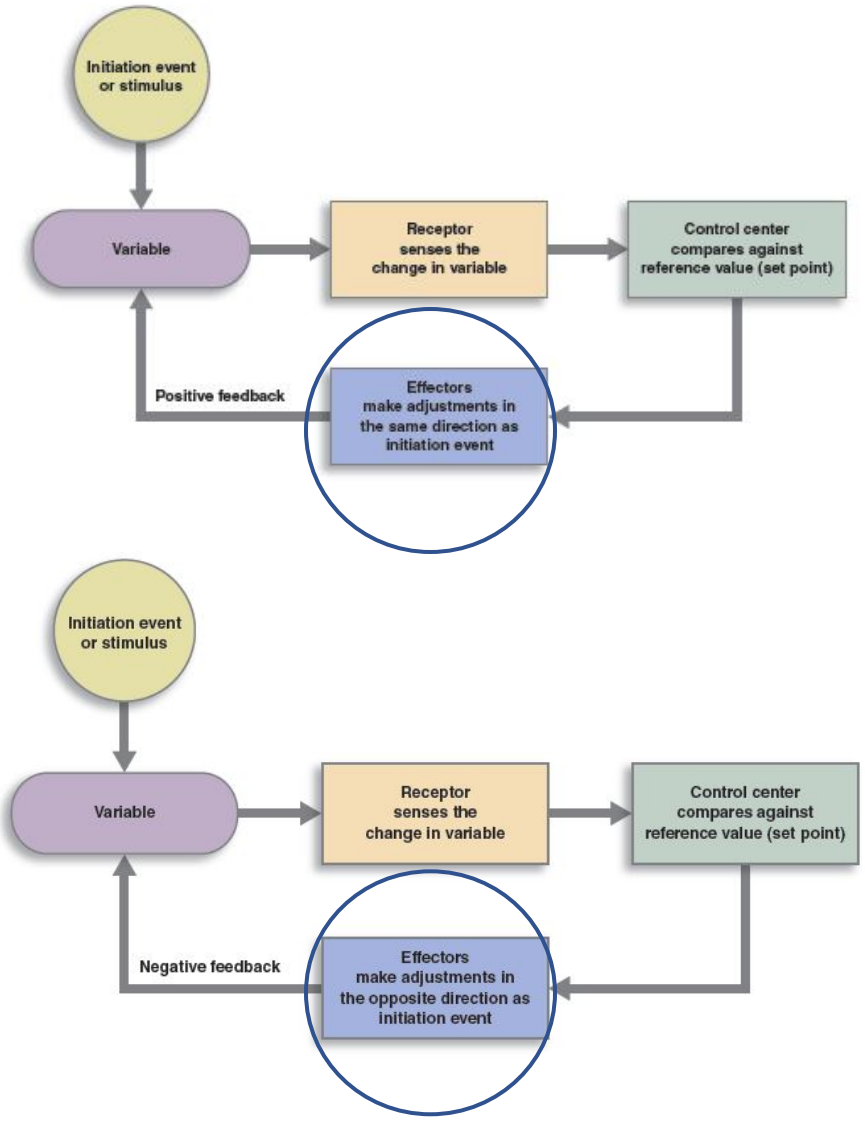
# Lesson 6
# Pathways

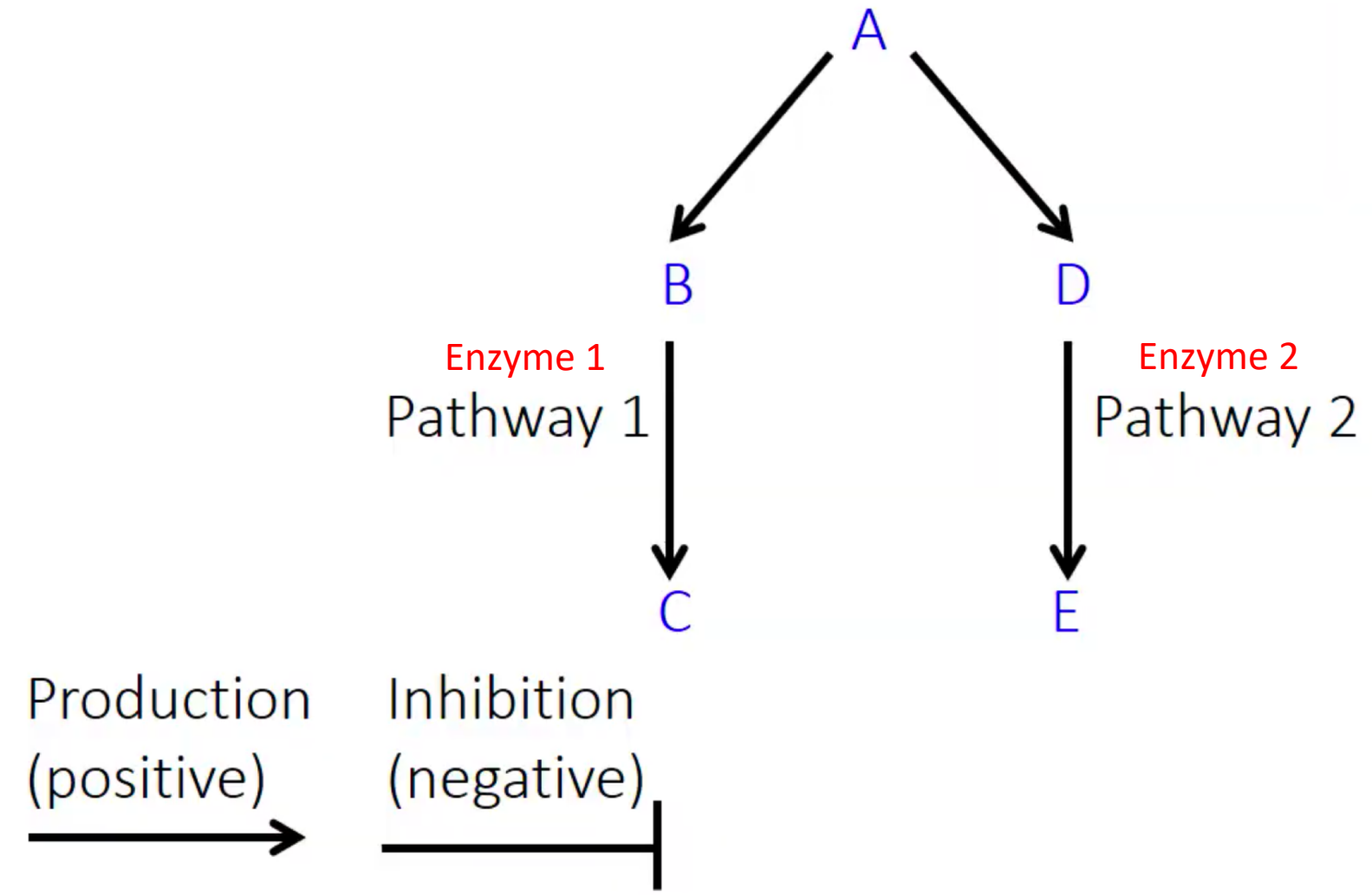


# Pathways

- Cellular chemical reactions are often linked into **pathways**
  - Ordered sequence of chemical reactions
- Pathways = the "cell production line"
  - Starting from point A → land up with a particular product that the cell really needs
- Enzyme reactions are organized into multistep pathways
- Cellular pathways are governed by internal feedback mechanisms
  - **Positive feedback** = make more product(s) along that particular pathway
  - **Negative feedback** = make less and/or stop producing product(s) along that particular pathways
- Cellular pathways can also be mastered by external control signals

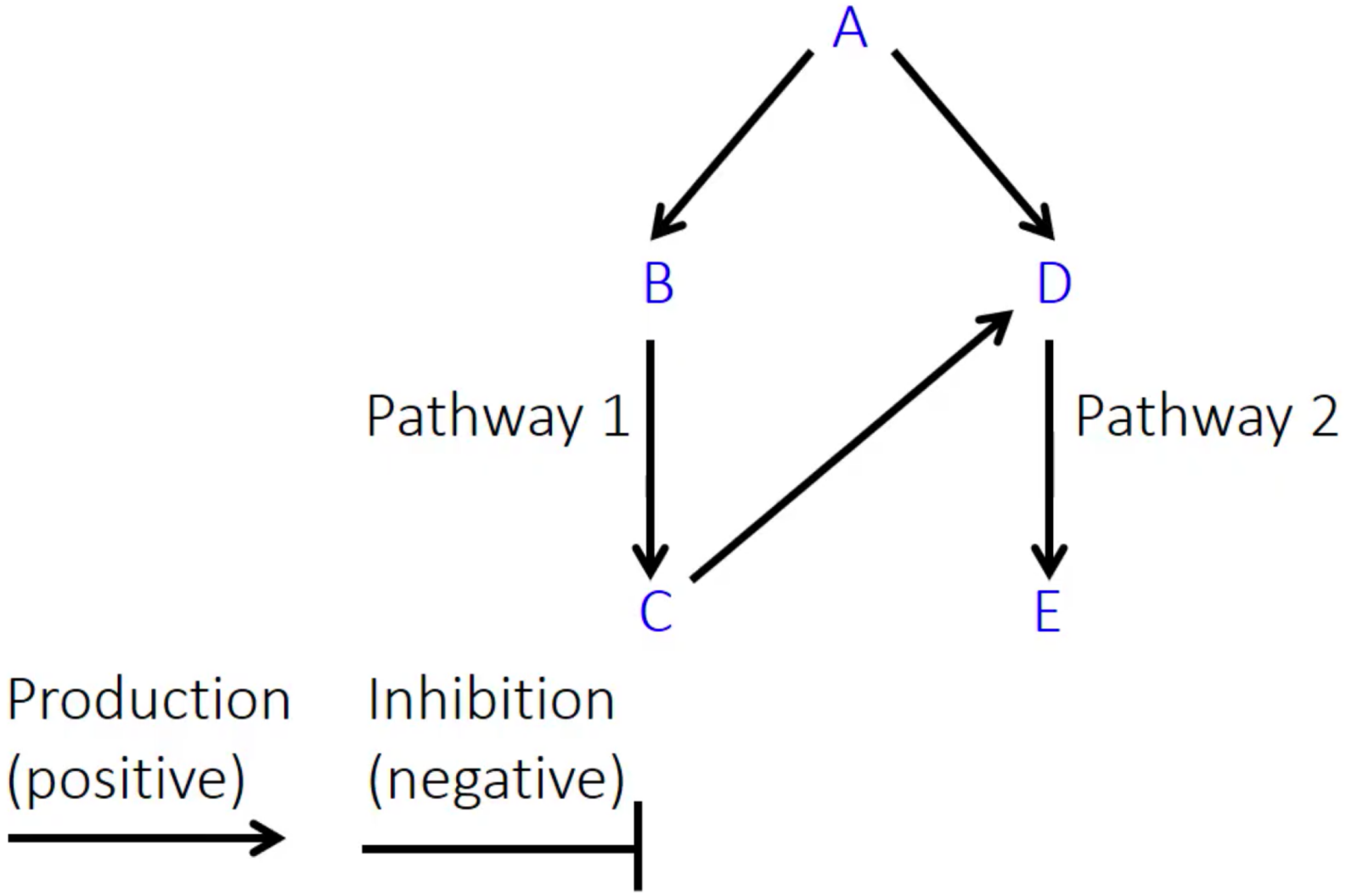


# Pathways and feedback loops



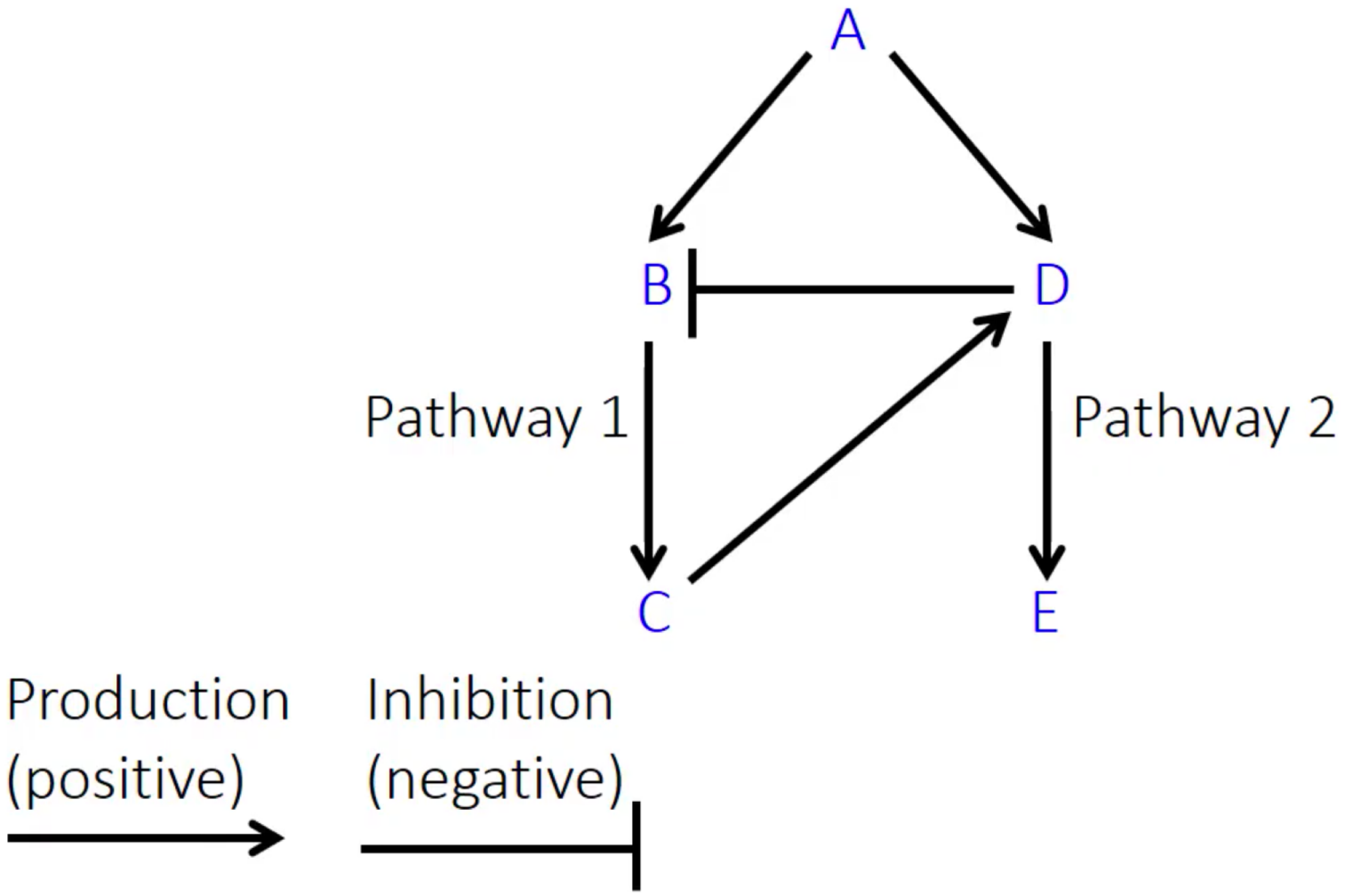
# Positive feedback example

- Problem 1: when the cell gets a lot of product C it also needs a lot of product E
- Solution:
  - C (whatever the molecule is) speeds up the production of D
  - Increased D levels will increase the production of E

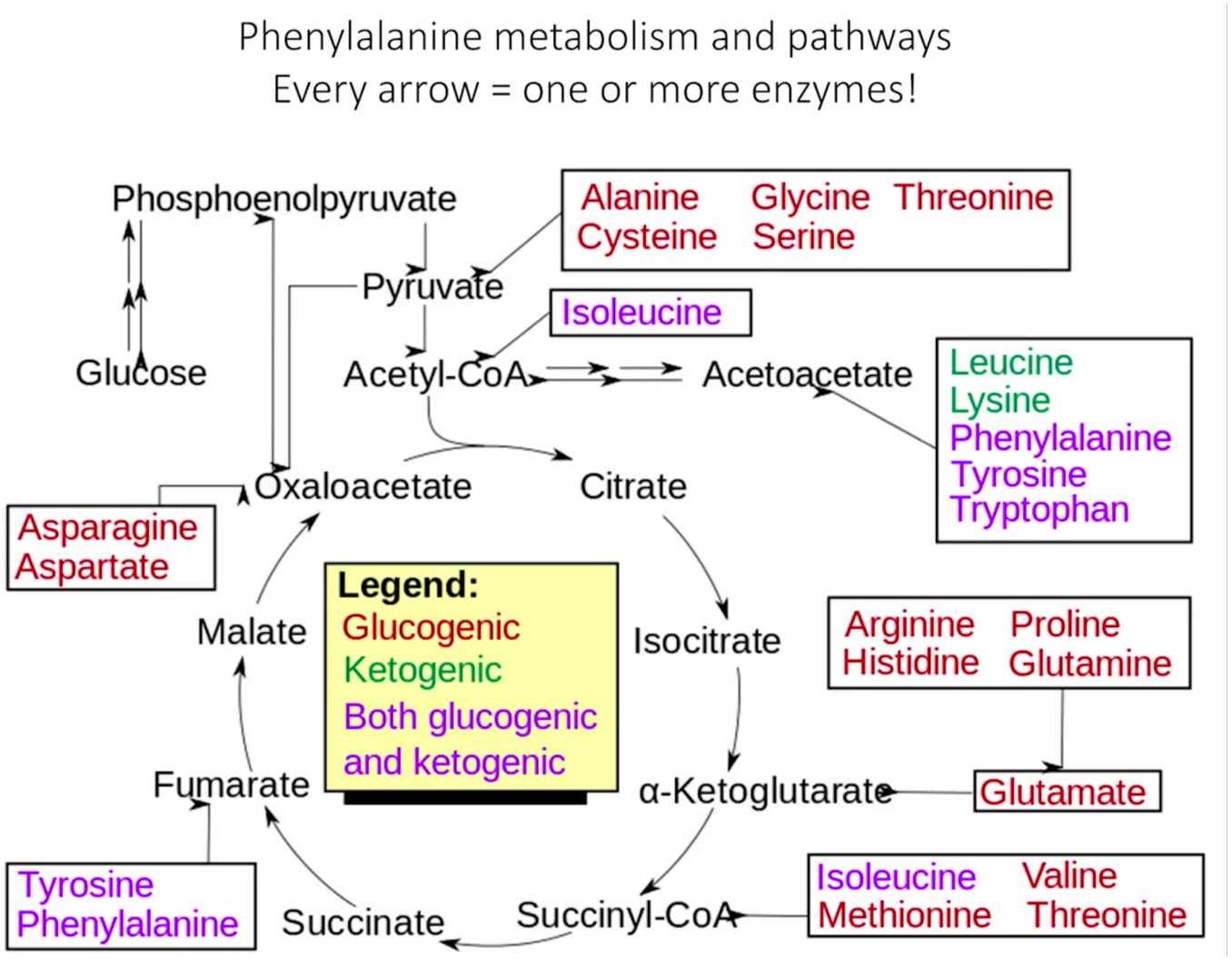


# Negative feedback example

- Problem: the cell has enough D and now wants to produce E only by pathway 2
- Solution:
  - it turns off pathway 1
    - D inhibits production of B and hence of C
    - D is no longer produced via C
    - E is only produced via pathway 2



# Real cellular pathway example



# Pathways

- Take assignment 6: Pathways