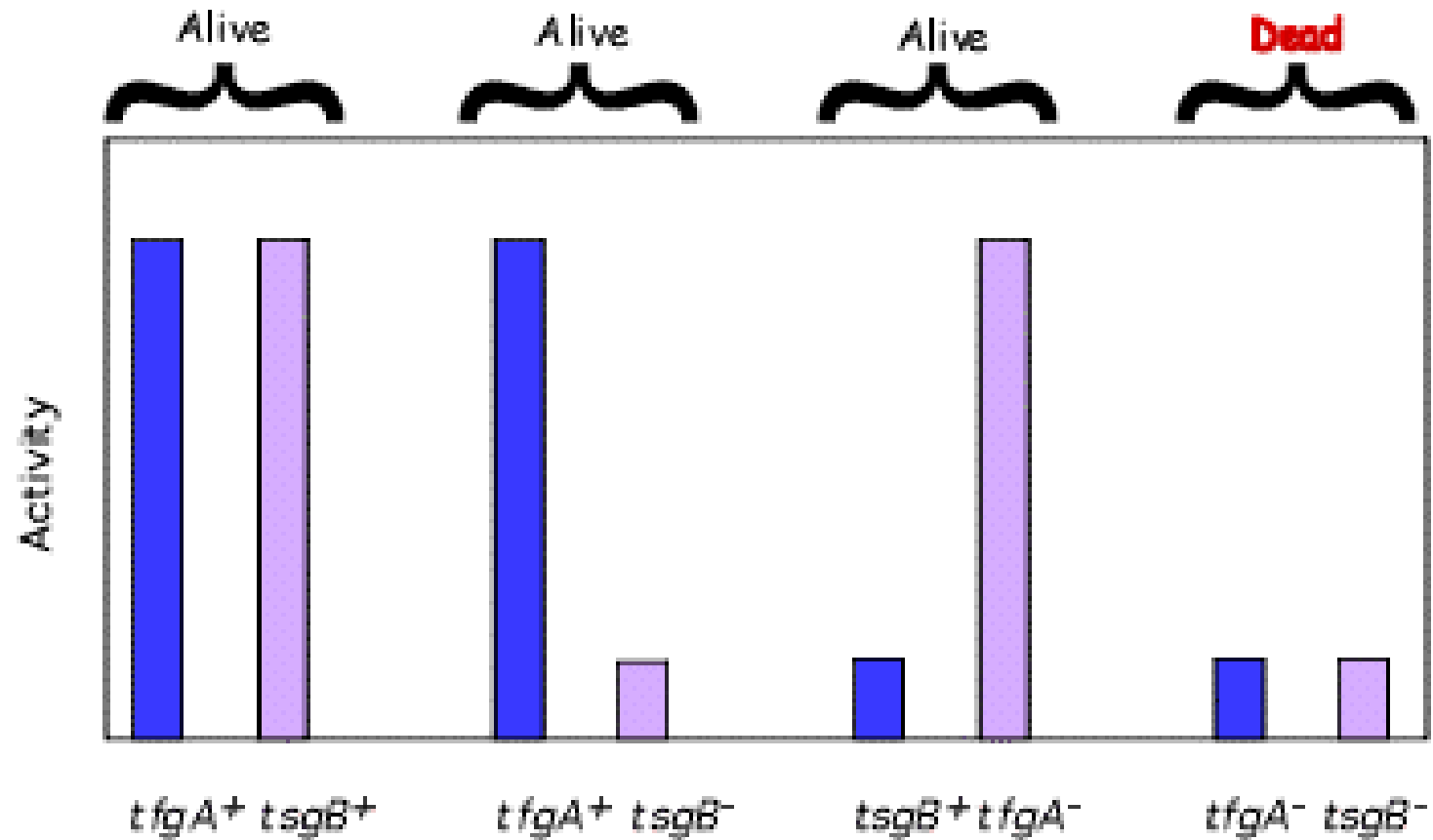


Level 4?  
Genetic Interactions

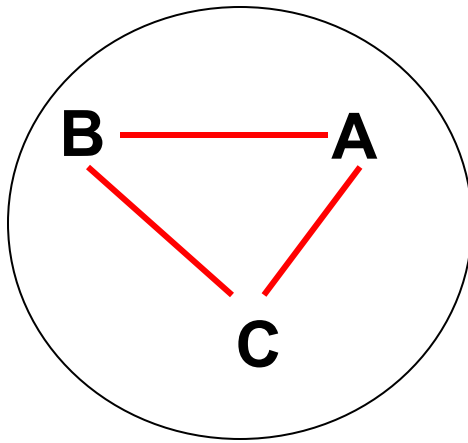
# Genetic Interactions

- Interactions between genes (genotype) that cause a change in phenotype
- Independent of all molecular biology
- Depends only on notion of genes, mutations and phenotype
- Basis of biology until 1950s
- Widely used in higher eukaryotic biology (rat, mouse, fly, worm)

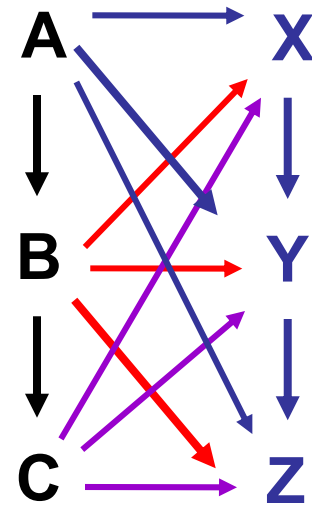
# E.g. Synthetic Lethal



# Relationship to Pathways



**Complex**



**Parallel  
Pathways**

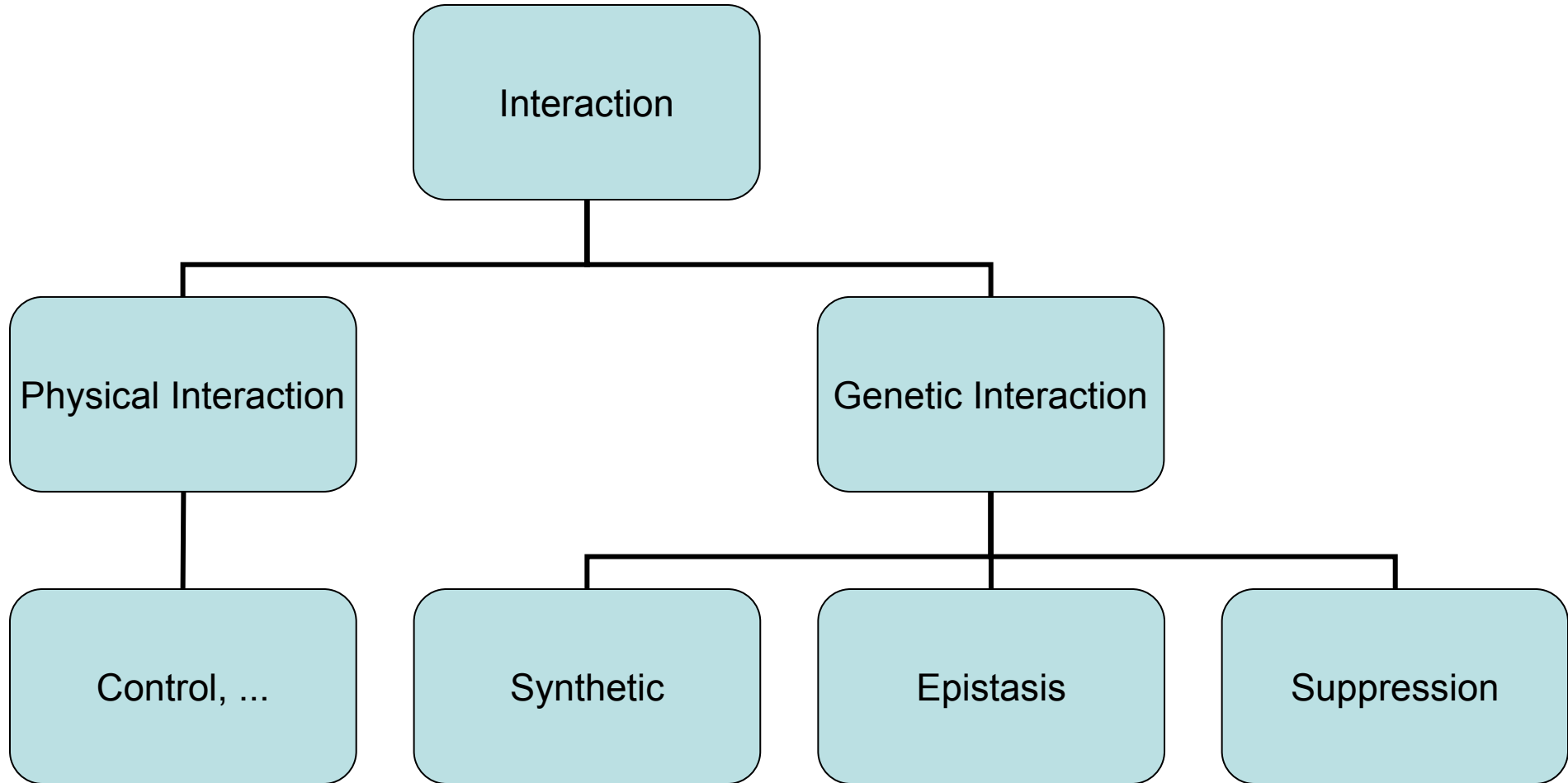
# Genetic Interactions

- Synthetic phenotype (e.g. lethal)
- Epistasis
  - Mutation of A doesn't alter phenotype of mutant B.  
Conclude that gene A is downstream of B.
- Suppression
  - Mutation completely or partially restores the mutant phenotype of another mutation
- Enhancement
- Two-hybrid (technically genetic)
- Others, more esoteric

# Data sources

- MIPS genetic interaction tables
- BIND – SGA data (4500 intx)
- Flybase
- See PRL for others

# BioPAX Proposal



Gene A, B, C (Participants), Phenotype