

Techniques in Molecular Genetics

2009 edition

H.E. Schellhorn

Day 2

- Fire Safety/Chemical Spills
- Discussion sigma factors (brief) and protein expression
- Biosafety HS1A6
- SDS Page (1:30pm-BSB130E)
- Set up and pour gels, inoculate cultures (lab)

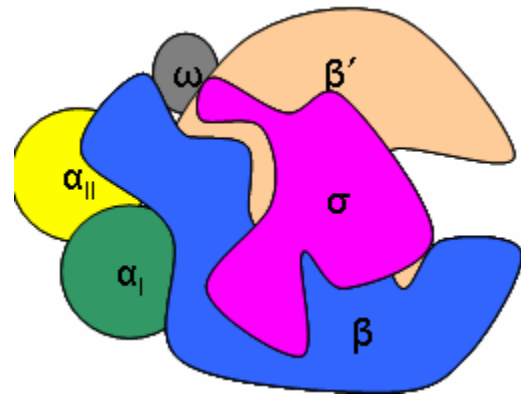
Sigma Factors of *Escherichia coli*

E. coli produces several sigma factors

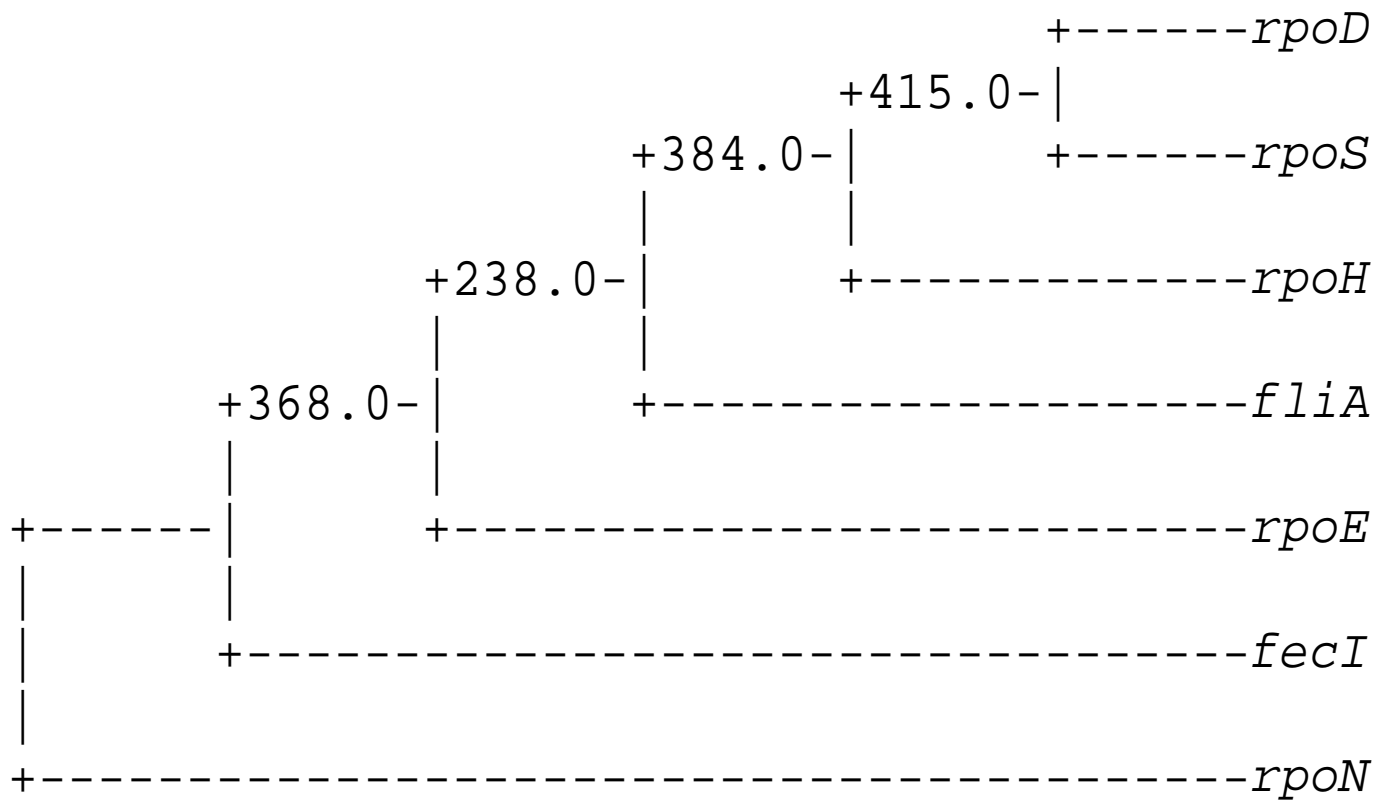
- RpoD - main sigma factor, transcribes most genes
- RpoN - nitrogen-limitation sigma factor
- RpoS – alternative starvation/stationary phase sigma factor
- RpoH - heat shock sigma factor
- RpoF - flagellar sigma factor
- PpoE - extracytoplasmic/extreme heat stress sigma factor
- Fecl - the ferric citrate sigma factor regulating iron transport

Escherichia coli RNA Polymerase

Parts of the Procaryotic
RNA polymerase



E. coli sigma factors: Phylogenetic relationship



Sigma Factors of *Escherichia coli*

E. coli produces several sigma factors

- RpoD - main sigma factor, transcribes most genes
- RpoN - nitrogen-limitation sigma factor
- RpoS – alternative starvation/stationary phase sigma factor
- RpoH - heat shock sigma factor
- RpoF - flagellar sigma factor
- PpoE - extracytoplasmic/extreme heat stress sigma factor
- Fecl - the ferric citrate sigma factor regulating iron transport

Sigma Factors of *Escherichia coli*

Expression of sigma factors is not independent

e.g. RpoD controls RpoS, RpoS negatively controls RpoF, RpoN may regulate RpoS etc

In addition, presence of a given sigma factor may affect amount of core polymerase available for other sigma factors → sigma factor competition.

Protein Expression- General Considerations

Had a discussion of factors to consider in
expressing proteins