Plasmids

I. Structure and Properties

Circular (with exceptions: can also be linear)
Supercoiling
Size
Genes found on plasmids
  Rarely essential under all conditions
  Antibiotic Resistance genes
  Pathogenetic genes
  Bactericidal genes
  Unusual Carbon Source Metabolism genes
  Addiction genes
  Replicational regulation genes
  Repair genes
  Partitioning genes
(Biotech and Genetic Engineering: Gene expression, Gene fusions, many applications)

II. Replication

The replicon: oriV autonomously replicating sequence
  Theta (unidirectional or bidirectional), Rolling-circle
  Isolating the Origin Sequence
Host Range (broad vs narrow)
  How to determine host range
Copy Number (relaxed vs stringent)
  How to determine copy number
ColE1 plasmid regulation
R1 plasmid regulation
Iteron Plasmids

III. Partitioning

Resolution of Multimers (dif/cer)
par: partitioning genes

IV. Plasmid Compatibility

Replication vs Partitioning
  Determination of Compatibility Groups

V. Purifying Plasmids

Alkali Lysis purification
CsCl purification
Pulsed-Field Gel Electrophoresis

VI. Plasmid Cloning Vectors

Properties
Constructions
Uses