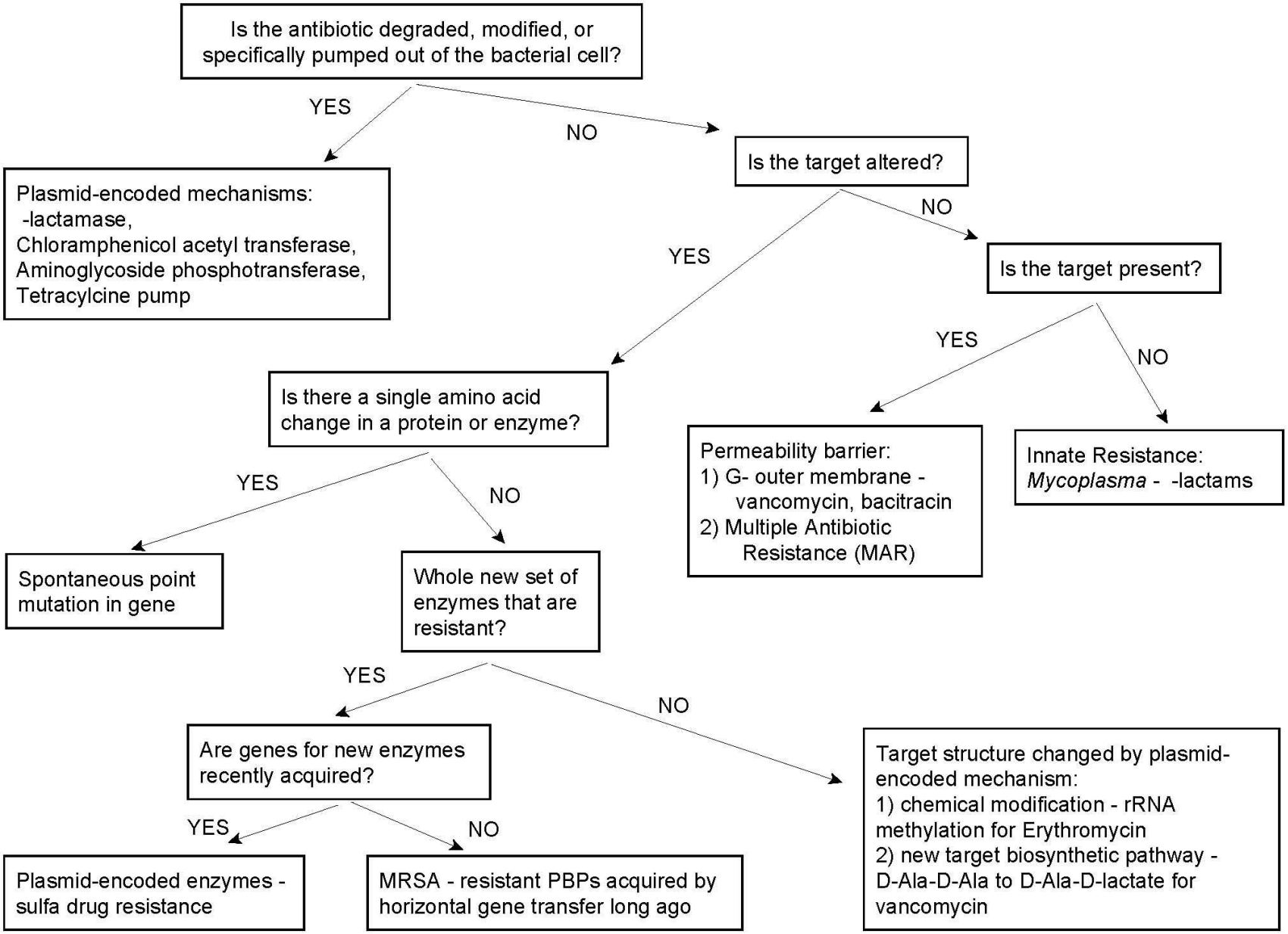
Is the antibiotic degraded, modified, or specifically pumped out of the bacterial cell?
YES
NO
Plasmid-encoded mechanisms:
-lactamase,
Chloramphenicol acetyl transferase,
Aminoglycoside phosphotransferase,
Tetracylcine pump
Is the target altered?
NO
YES
Is the target present?
YES
NO
Is there a single amino acid change in a protein or enzyme?
Permeability barrier:
1) G- outer membrane -
vancomycin, bacitracin
2) Multiple Antibiotic
Resistance (MAR)
Innate Resistance:
Mycoplasma - -lactams
YES
NO
Spontaneous point mutation in gene
Whole new set of enzymes that are resistant?
YES
NO
Are genes for new enzymes recently acquired?
Target structure changed by plasmid-encoded mechanism:
1) chemical modification - rRNA methylation for Erythromycin
2) new target biosynthetic pathway - D-Ala-D-Ala to D-Ala-D-lactate for vancomycin
YES
NO
Plasmid-encoded enzymes - sulfa drug resistance
MRSA - resistant PBPs acquired by horizontal gene transfer long ago