

5.6 Multiple Alleles and ABO Blood Group System

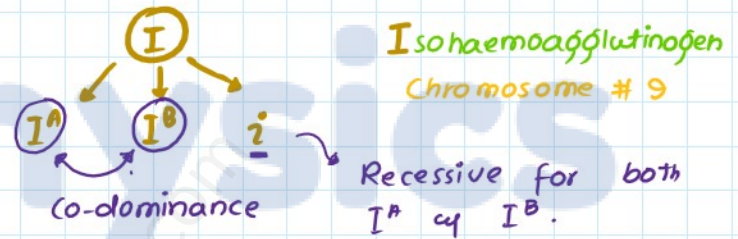
Multiple Alleles and ABO Blood Group System

MULTIPLE ALLELES → More than ②
 Population level
 Product of mutation (3) → 300
 min. max.

Gamete → n
 Only 1 copy of gene
Individual → $2n$
 2 alleles
Population → More than ⑤

ABO BLOOD GROUP SYSTEM (3 alleles)
 → Karl Landsteiner (1901)

→ Bernstein (1925)
 Genetic basis of
 ABO blood group system

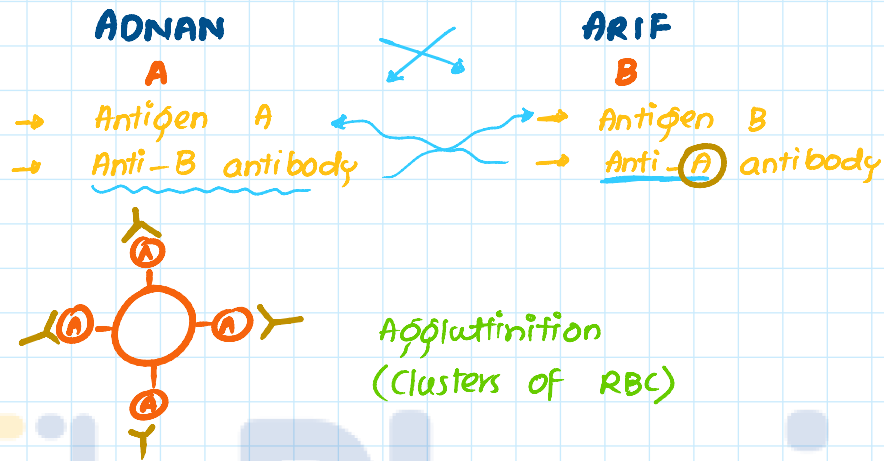


ABO Blood Groups				
Antigen (on RBC)	Antigen A	Antigen B	Antigens $A+B$	Neither A or B
Antibody (in plasma)	Anti-B Antibody	Anti-A Antibody	Neither Antibody	Both Antibodies
Blood Type	Type A Cannot have B or AB blood Can have A or O blood	Type B Cannot have A or AB blood Can have B or O blood	Type AB Can have any type of blood Is the universal recipient	Type O Can only have O blood Is the universal donor

GENOTYPE : $I^A I^A$ ✓
 $I^A i$ ✓
 $I^B I^B$ ✓
 $I^B i$ ✓
 $I^A I^B$ Always Heterozygous
 ii Always Homozygous
PHENOTYPE → ④ A, B, AB, O

UNIVERSAL DONOR → Blood Group ① (Always in Small Amount)
UNIVERSAL RECIPIENT → Blood Group ② (AB)

UNIVERSAL RECIPIENT → Blood Group (AB)



BLOOD GROUP

A
 B
 AB
 O

DONATED TO

A, AB
 B, AB
 AB
 A, B, AB, O

RECEIVED FROM

A, O
 B, O
 A, B, AB, O
 O

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