# (a)                                   Monomer system

| **WT Homozygous** | **Heterozygous** | **Mutant Homozygous** | **Molecular parameters** |
|---|---|---|---|

Genotype

Protein activity

$a_A = 1$  $\qquad$  $a_A = 1$ $\qquad$ $a_B = 1 - r$ $\qquad$ $a_B = 1 - r$

$\Phi_{aa,m} = c_A a_A$

$\Phi_{ab,m} = c_A a_A + c_B a_B$

$\Phi_{bb,m} = c_B a_B$

Phenotype

$\omega_{aa,m} = f(\Phi_{aa,m}) = 1$

$\omega_{ab,m} = f(\Phi_{ab,m}) = 1 - h_m s_m$

$\omega_{bb,m} = f(\Phi_{bb,m}) = 1 - s_m$
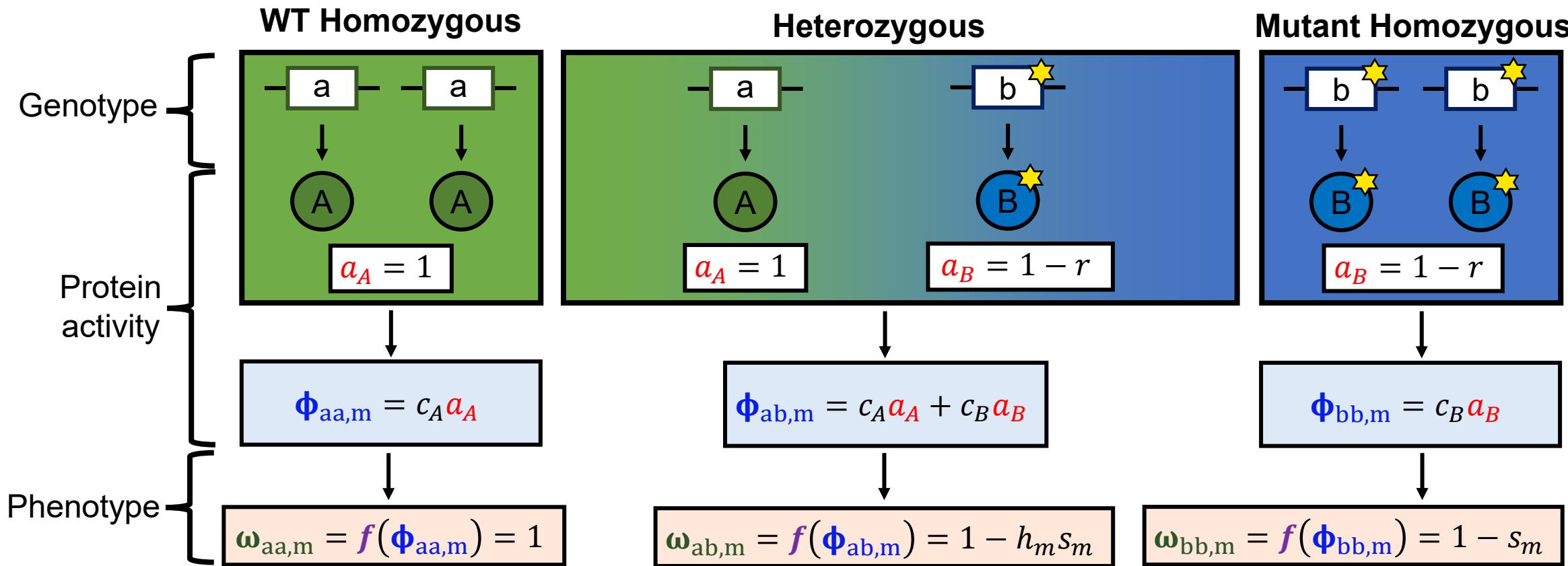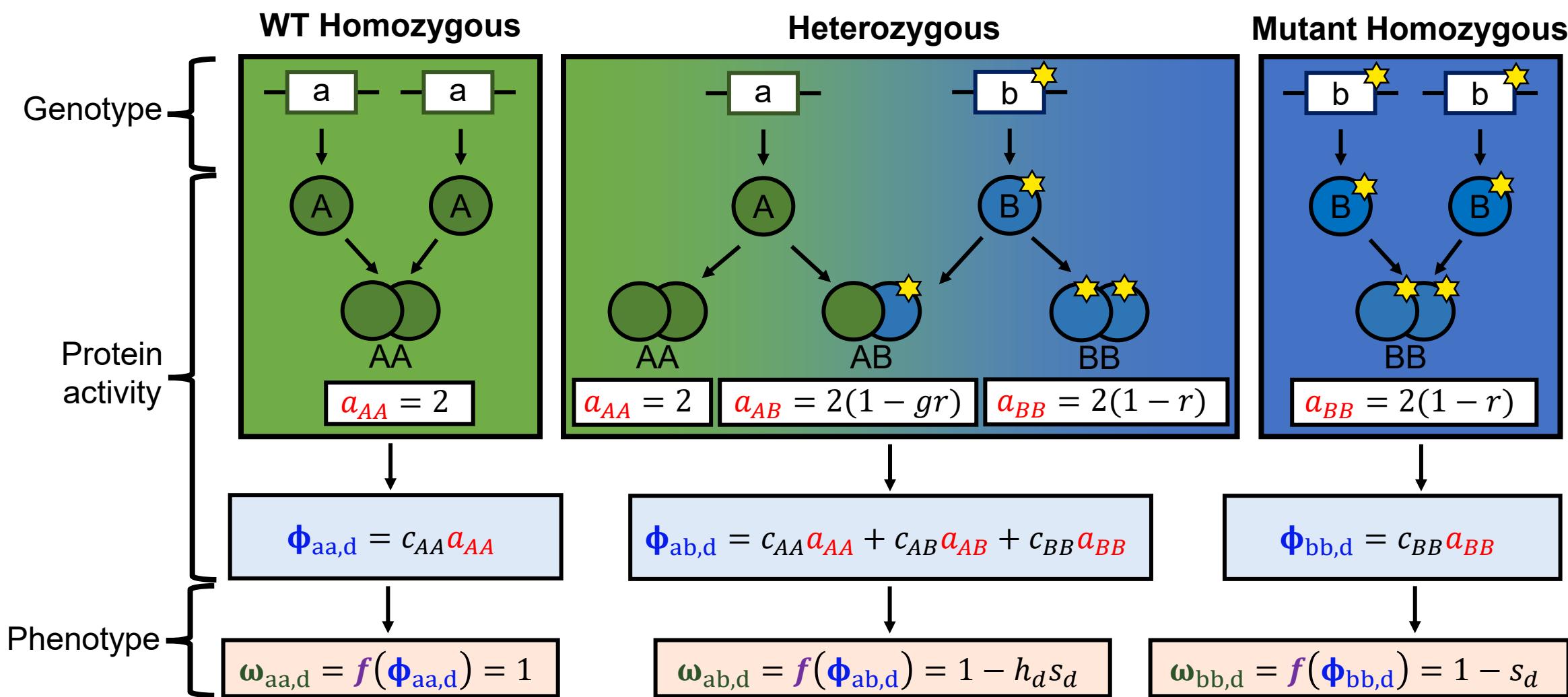
**Molecular parameters**

$a_i$ = specific activity of species $i$

$c_i$ = concentration at equilibrium of species $i$

$r$ = reduction in specific activity

$g$ = molecular dominance coefficient

$\Phi$ = total activity

# (b)                                   Dimer system

| **WT Homozygous** | **Heterozygous** | **Mutant Homozygous** | **Phenotypic parameters** |
|---|---|---|---|

Genotype

Protein activity

$a_{AA} = 2$

$a_{AA} = 2$ $\quad$ $a_{AB} = 2(1 - gr)$ $\quad$ $a_{BB} = 2(1 - r)$

$a_{BB} = 2(1 - r)$

$\Phi_{aa,d} = c_{AA} a_{AA}$

$\Phi_{ab,d} = c_{AA} a_{AA} + c_{AB} a_{AB} + c_{BB} a_{BB}$

$\Phi_{bb,d} = c_{BB} a_{BB}$

Phenotype

$\omega_{aa,d} = f(\Phi_{aa,d}) = 1$

$\omega_{ab,d} = f(\Phi_{ab,d}) = 1 - h_d s_d$

$\omega_{bb,d} = f(\Phi_{bb,d}) = 1 - s_d$

**Phenotypic parameters**

$\omega$ = fitness

$f$ = fitness function

$s_m$ = selection coefficient (monomers)

$h_m$ = phenotypic dominance coefficient (monomers)

$s_d$ = selection coefficient (dimers)

$h_d$ = phenotypic dominance coefficient (dimers)