

**Antagonism/competition:**

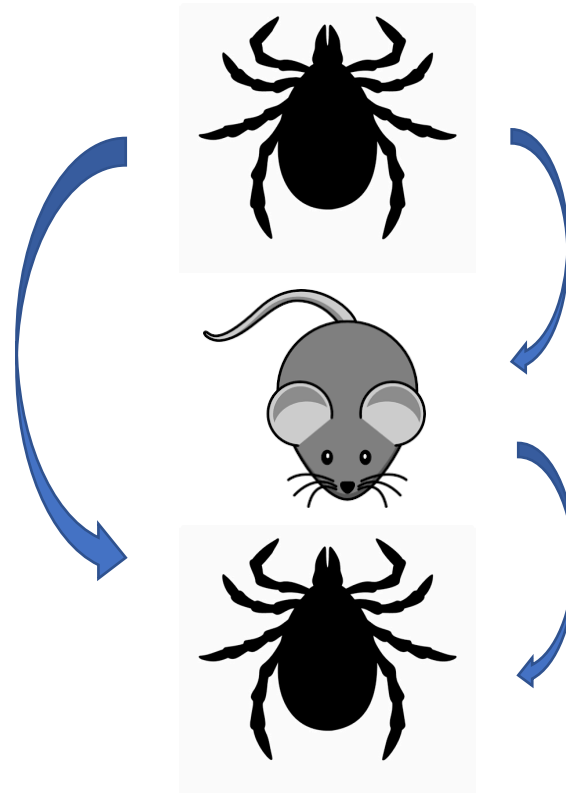
- Conflict of co-infecting genotypes for location
- Resource competition/nutrients
- Cross-immunity

**Co-operation/synergy:**

- Immune modulation
- Immune suppression
- Shared siderophores
- Genetic exchange



Tick to tick transmission  
(co-feeding)



Tick to host transmission

Vertebrate to tick transmission



Sequential or simultaneous infection

