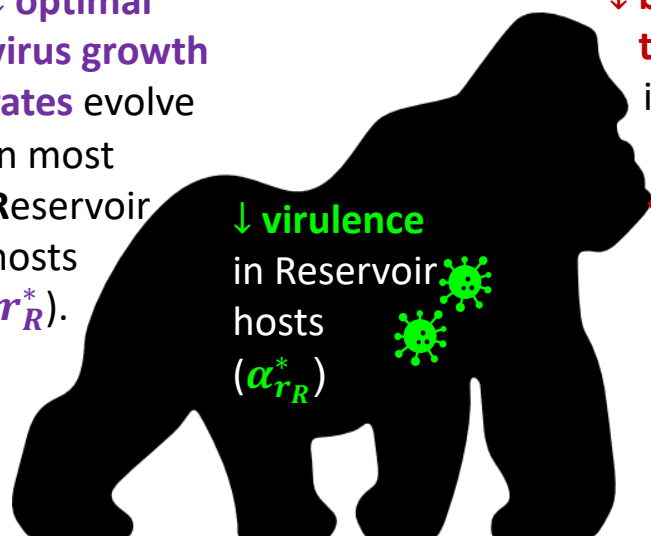
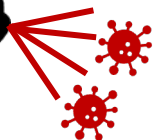


A

↓ **optimal virus growth rates** evolve in most **Reservoir** hosts (r_R^*).

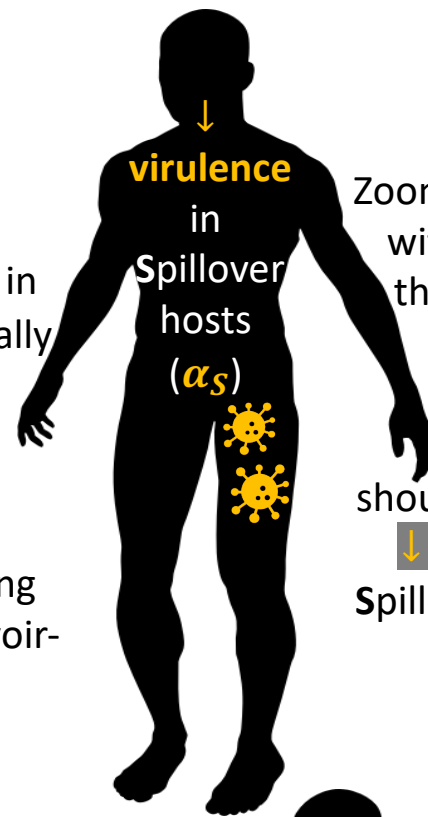


↓ **between-host transmission** in **Reservoir** hosts ($\beta_{r_R}^*$)



↑ **Spillover host tolerance** (T_{vS}) of viruses evolves in phylogenetically related **Reservoirs**.

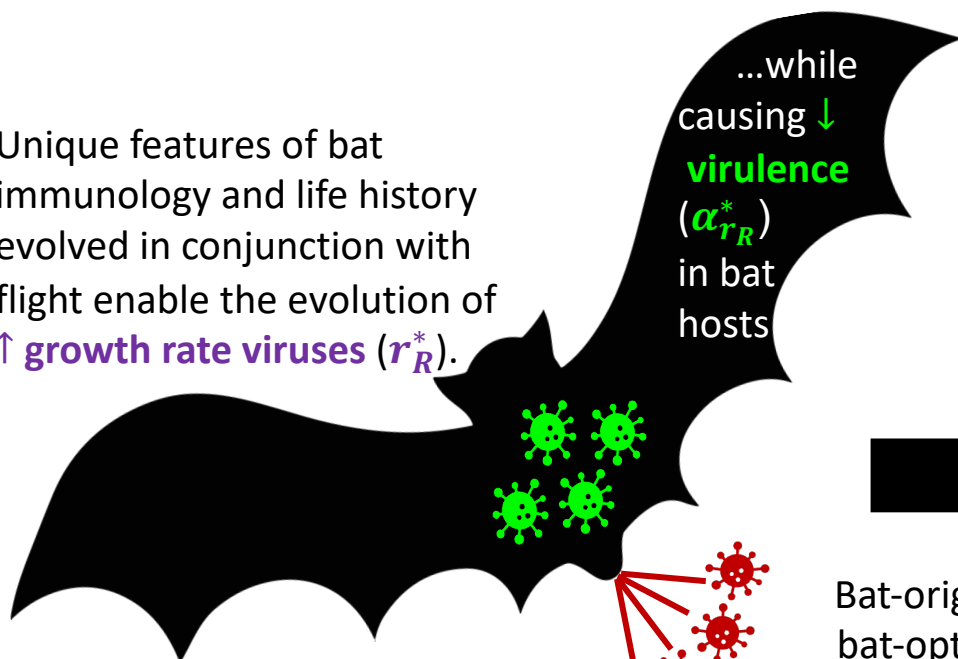
Zoonotic viruses transmit to human **Spillover** hosts, generating acute infections that retain ↓ **Reservoir-optimized growth rates** (r_R^*).



Zoonotic viruses with ↓ r_R^* and those evolved in hosts yielding ↑ T_{vS} should generate ↓ **virulence** in **Spillover** human hosts (α_S).

B

Unique features of bat immunology and life history evolved in conjunction with flight enable the evolution of ↑ **growth rate viruses** (r_R^*).

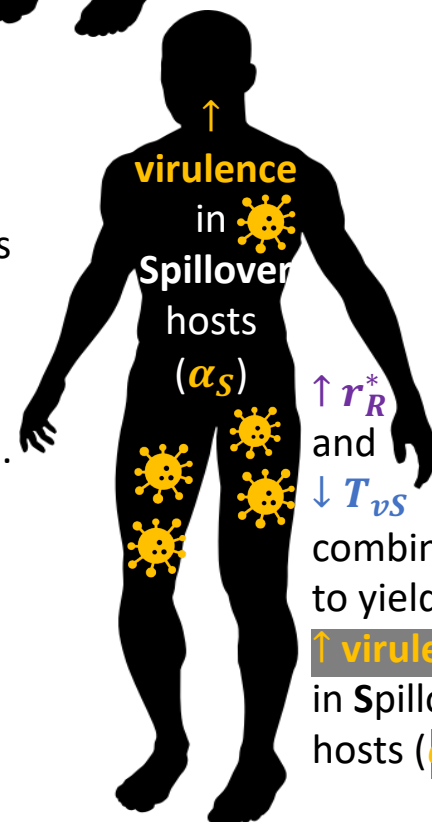


Bat-evolved ↑ r_R^* viruses maximize **between-host transmission** (↑ $\beta_{r_R}^*$) ...

...while causing ↓ **virulence** ($\alpha_{r_R}^*$) in bat hosts

↓ **Spillover host tolerance** for viruses evolves in phylogenetically distant bat **Reservoirs** (T_{vS}).

Bat-origin zoonoses retain ↑ bat-optimized **growth rates** (r_R^*) upon spillover to humans.



↑ r_R^* and ↓ T_{vS} combine to yield ↑ **virulence** in **Spillover** hosts (α_S).