

# eeid2009 - midterm.pdf

## RED QUEEN dynamics coevolutionary dynamics

"all the running you can do stay in the same place"

cyclic

new alleles or genotypes are arising frequently  
(mutation, standing variation)

FREQUENCY-DEPENDENT selection

hosts have alleles for resistance against particular paras genotypes  
paras " " for overcoming resistance of particular host genot

	paras		
	1	2	3
host 1	*		
host 2		*	
host 3			*

matching alleles

hosts are all 2  
paras are all 1

↳ mut 1 → 2

paras allele 2 spreads

↳ host 2 → 3

cycling

DILUTION effect



• Self - non self recognition •

• local adaptation •

	parasite	
	1	2
host 1		*
host 2	*	
host 3	*	*

INVERSE matching alleles

vertebrate immune system.  
(antibodies vs antigen)

RQ dynamics

• RECOGNITION systems •

• EFFECTOR systems •

↳ arms race/trench warfare

resistance builds up until benefits are balanced by costs.

resistance alleles polymorphic.

short-term stabilizing selection

long-term - cycling again

in freq/strength of resistance