# Appendix S2

### Derivation of the requirement that sequestered iRBC must have a growth advantage over non-sequestered iRBC

Let *A* be the “advantage” a parasite has by sequestering, and define .

We first consider how the ratio, *R*, changes as the parameter g*t* changes. Let . Then when *Z* increases, *R* decreases, and visa-versa (provided that *s* remains constant). We can establish that:



and therefore whenever

 S.1

the change in *R* is in the same direction as the change in *gt*.

We next consider how the equilibrium growth rate in blood and tissue, *γ*, changes as the parameters *r* and *s* change. We can establish that:

. S.2

Using equation S.2 we see that when *A* < 0 then > 0 and when *A* > 0 then  < 0. A similar expression can be used to show that when *A* < 0 then  < 0 and when *A* > 0 then  > 0.