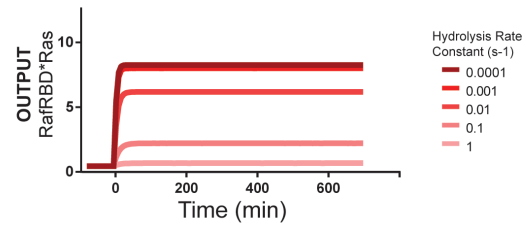
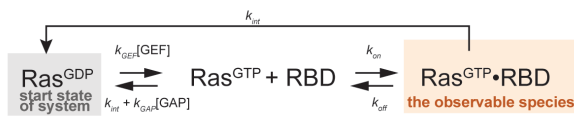


A

Simplest 2-State Ras-GTPase System

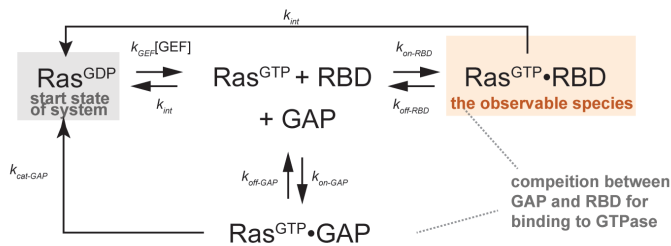
GAP tunes steady state level but cannot produce overshoot in any regime



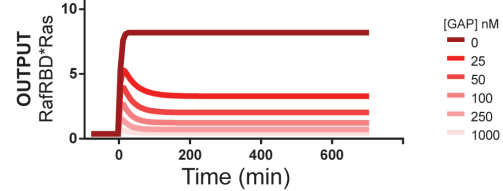
B

2-State Ras-GTPase System + GAP competition

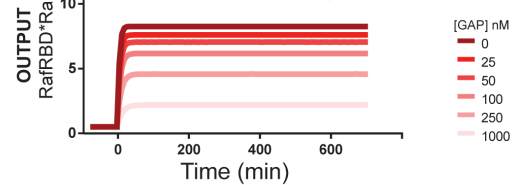
Competition between GEF and GAP can produce overshoot but only with nonphysiological parameters; also does not distinguish G12V from WT



non-physiologic: GAP binds more tightly than Raf-RBD and has little catalytic activity



physiologic: GAP binds less tightly than Raf-RBD and has strong catalytic activity



C

3-State Ras-GTPase System + GAP competition

Overshoot possible with physiologic parameters and distinguishes WT and G12V

