INTRO

* Evidence that phenotypes are suppressed at low growth (pronounced at fast)
* Molecular mechanisms serve to couple protein synthesis with protein demand
* Evidence that phenotypes suppression is tied to the ability to synthesize proteins (PPX paper)
* What about the ability to tightly regulate proteins? Particularly important to transient processes where more than just making lots of protein matters
* Important class of transient processes: developmental programs
* Focus on a case where transcription factors are heavily regulated -> transient pulses with fine-tuned dynamics
* Major finding: added regulatory mechanisms enable faster developmental rates

RESULTS

* Fig 1: Principle: systems with faster dynamics are more sensitive to perturbation
  + Simple model of a transient pulse subject to regulation
  + Simulation and comparison method 🡪 quantifying the impact of a mutation
  + Overview of possible scenarios: metabolism affects synthesis + feedback > degradation
* Fig 2: miR-7 enables faster eye development by attenuating yan expression
  + Eyes are roughened without miR-7 (phenotype)
  + Phenotype originates at the protein level (measured dynamics)
  + miR-7 null Eyes are normal when metabolism is slow
  + Protein levels are indistinguishable under slow conditions (measured dynamics)
* Fig 3: Linear model predicts that phenotype suppression is a general result
  + Linear model of gene regulation at multiple levels
  + Extension to all pairs of repressors
* Fig4: Slow metabolism results in all tissues
* Fig5: Slow translation results in all tissues
* Fig6: Dicer/Ago results

DISCUSSION