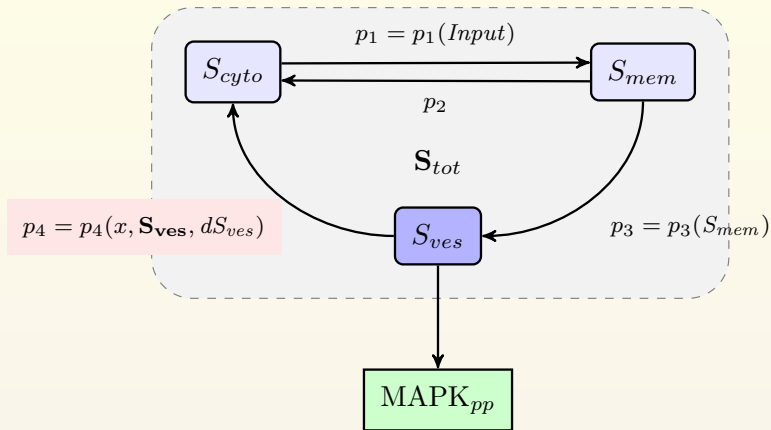
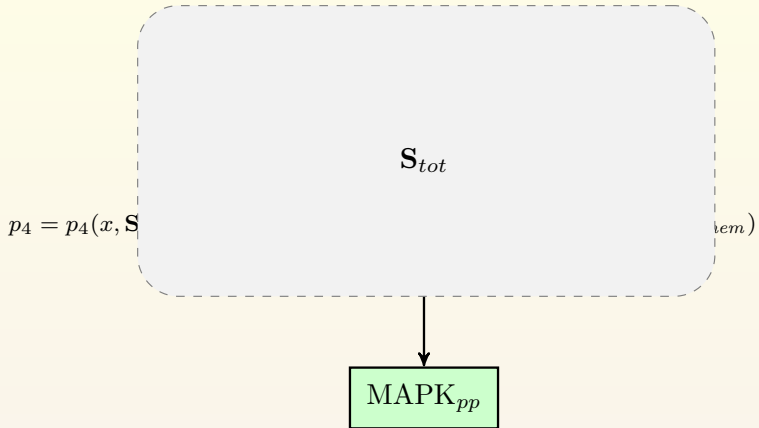


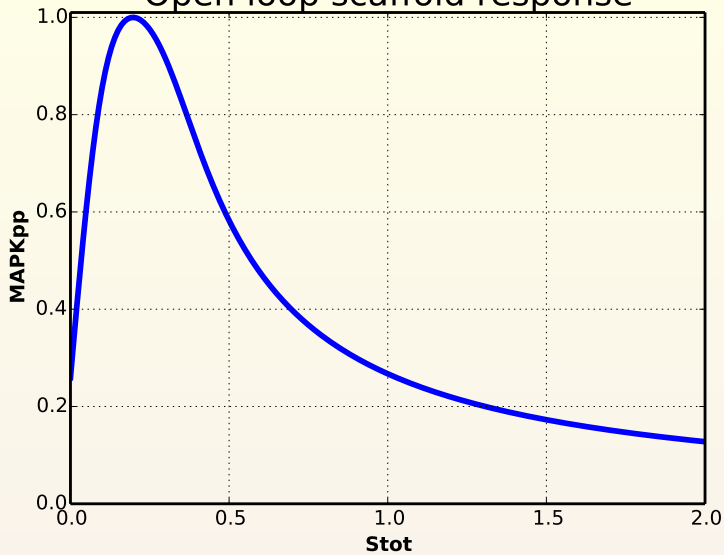
# Model Schematic



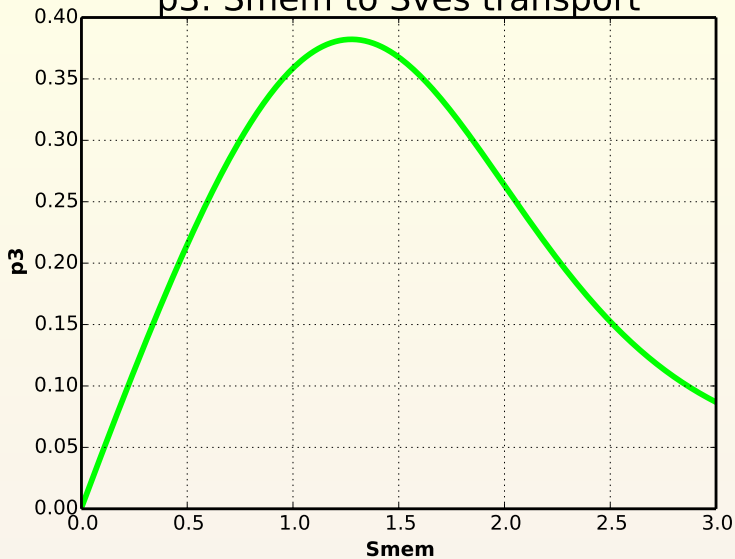
# Open Loop Response



## Open loop scaffold response



p3: Smem to Sves transport

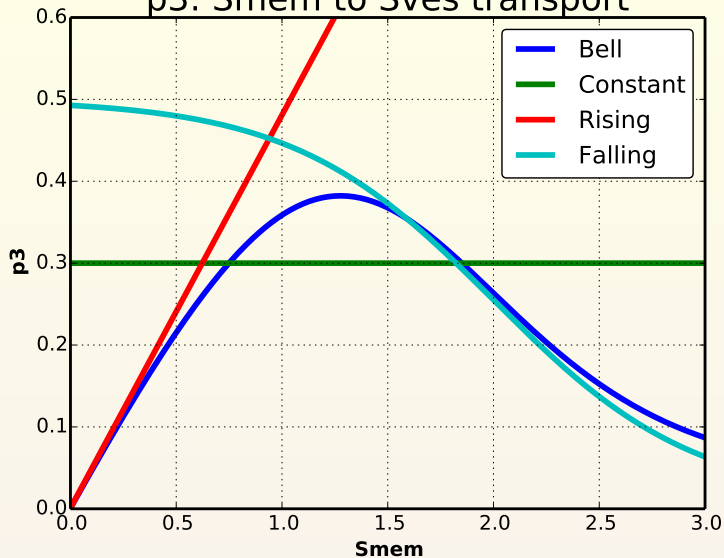


# Why is p3 a bell shaped response?

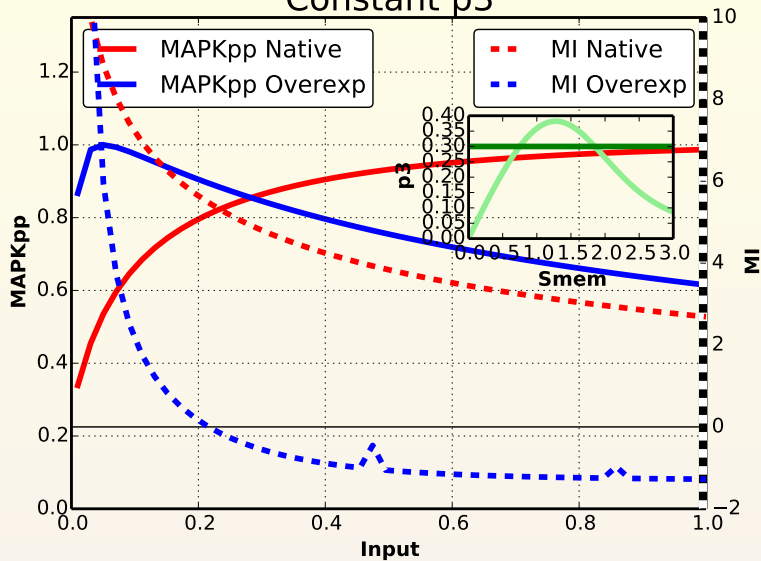
- Each part of the bell shaped curved is simulated to justify its use
  - Constant term
  - Linear rising term
  - Just the falling side
  - Bell shape
    - by combining the rising and falling terms

*this is a test*  
*another line ok*

p3: Smem to Sves transport



# Constant p3

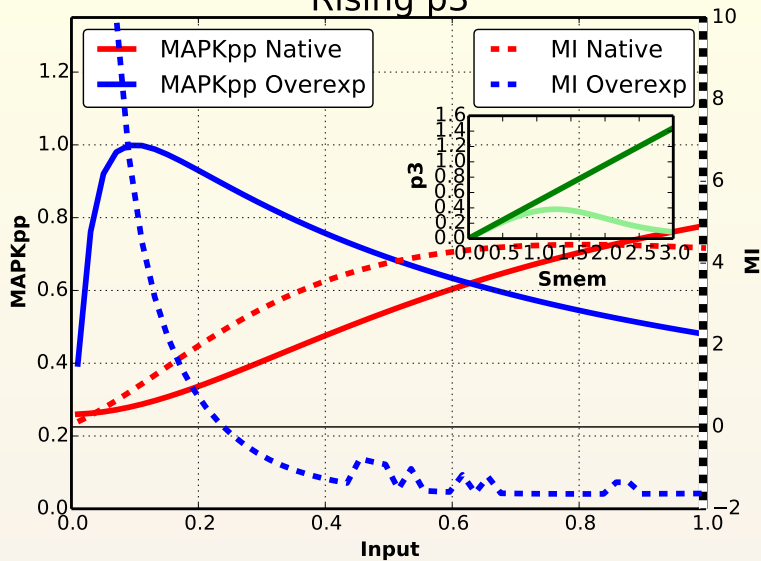


# Results for constant p3

- At native levels, we get a saturating increase in MAPKpp, producing a negatively sloping MI curve
  - Experimentally MI is constant w.r.t. dose
- At overexpressed levels, the simulation only produces negative MI values
  - Experimentally MI goes from negative to positive



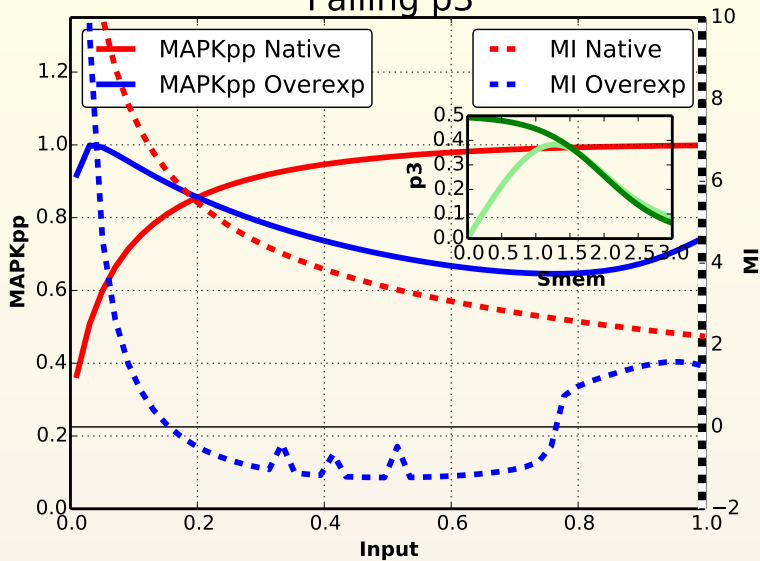
# Rising p3



# Results for rising p3

- At native levels, MAPKpp now rises linearly with dose, producing a flat MI response since it is the derivative
  - This is what is observed experimentally
- At overexpressed levels, the simulation still only produces negative MI values
  - Experimentally MI goes from negative to positive

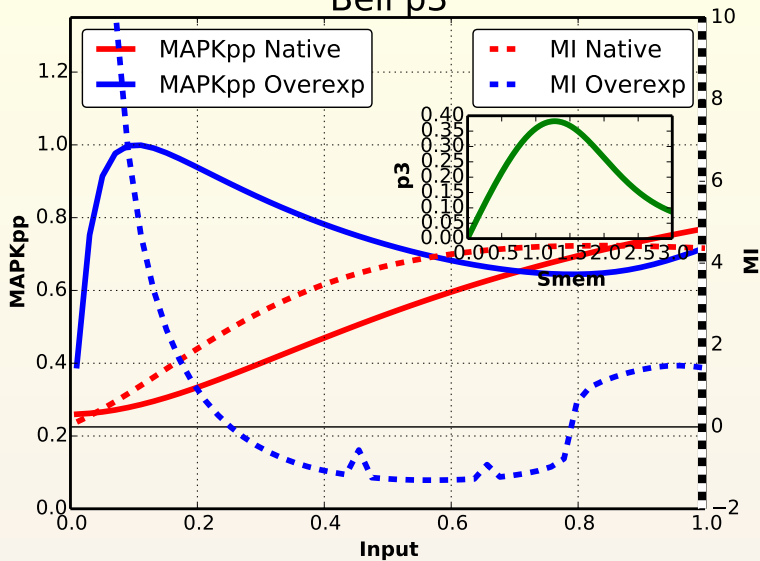
# Falling p3



## Results for falling p3

- At native levels, MAPKpp saturates rapidly just like the constant case, producing a decreasing MI response
  - MI should be constant
- At overexpressed levels, MAPKpp is now able to rise at high inputs after falling, producing a MI response that goes from negative to positive
  - Experimentally MI goes from negative to positive

# Bell p3

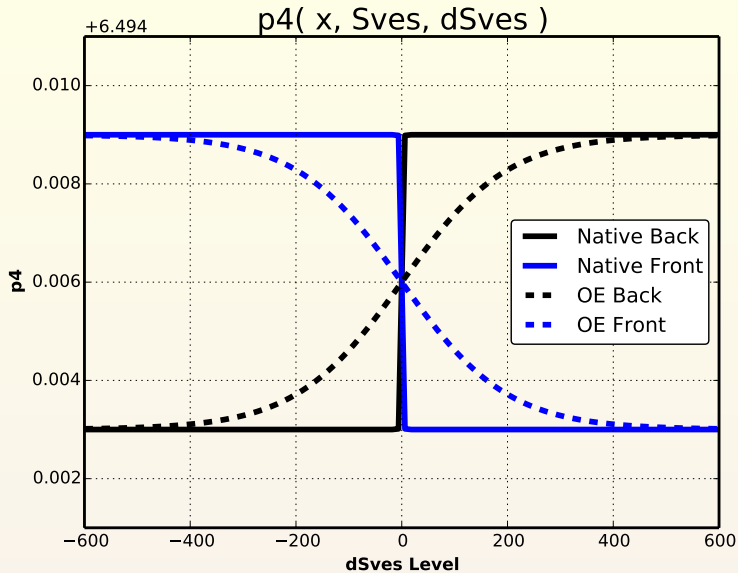


# Results for bell shaped p3

- Now the experimental results can be satisfied at both expression levels
- At native levels, MAPKpp rises linearly, producing constant MI
- At overexpressed levels, MAPKpp has an inverted bell response, producing a MI curve that changes sign

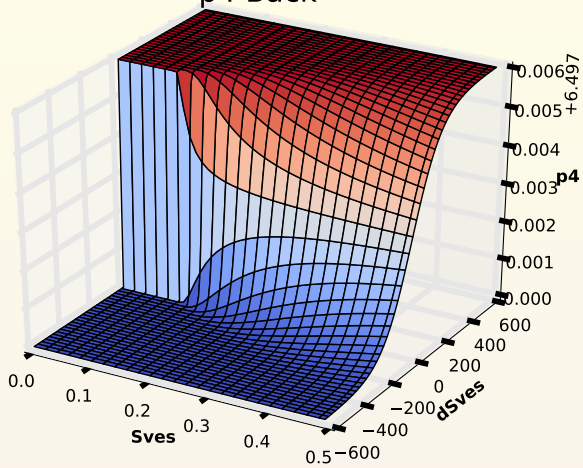
# p4 as a function of Sves and dSves

- Previously I've demonstrated why p4 had to be a function of dSves
- dSves serves as the polarity compass btw front and back of the cell
- Now I'm demonstrating why p4 needs to be a function of Sves as well
- Sves serves as sigmoidal strength factor
  - Low Sves: short transition range
  - High Sves: long transition range

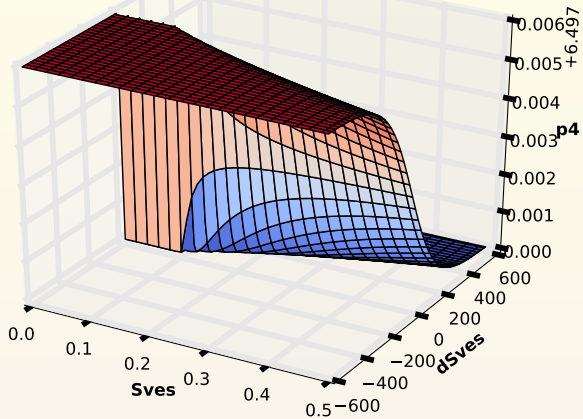




p4 Back



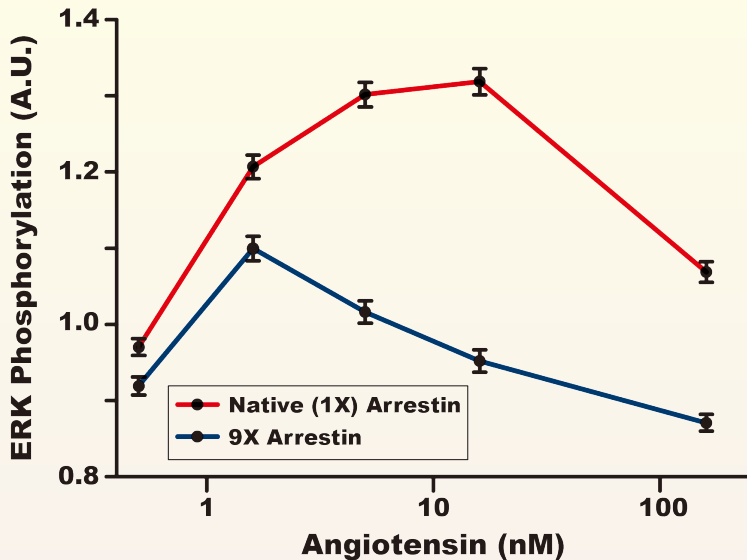
p4 Front



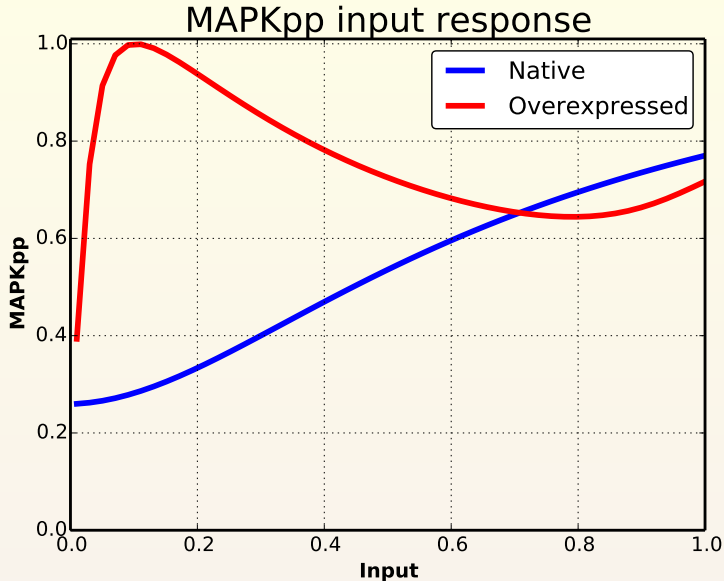
# Comparison with experiments

# MAPKpp Dose Response

**D**

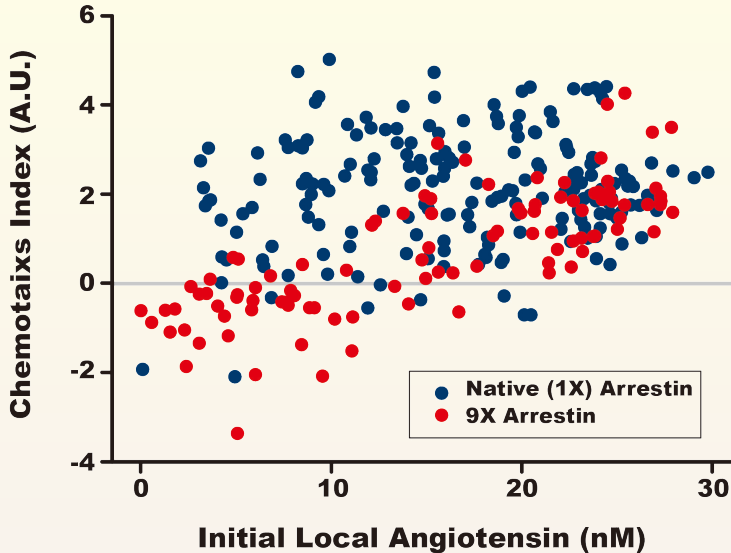


# MAPKpp Dose Response

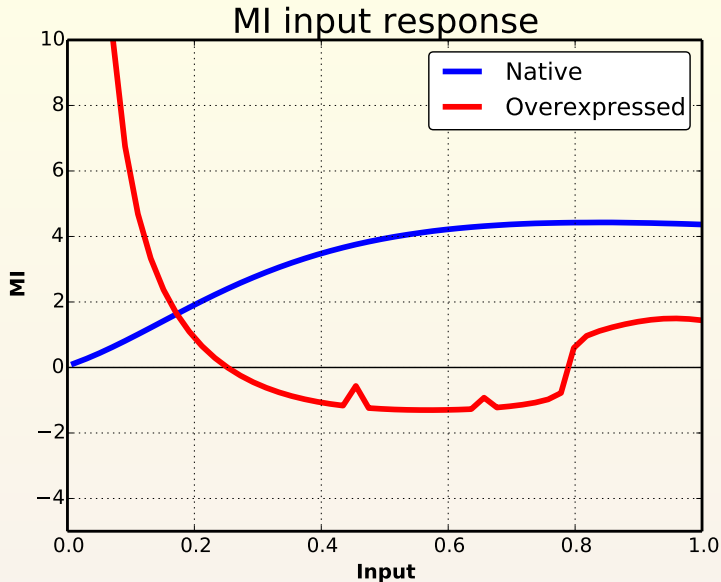


# MI Dose Response

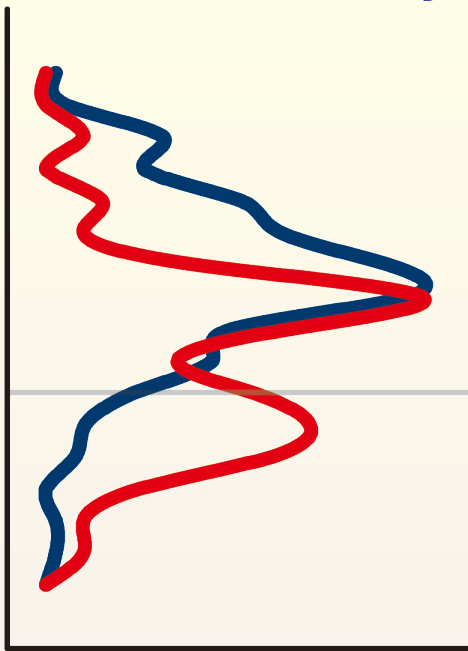
**B**



# MI Dose Response

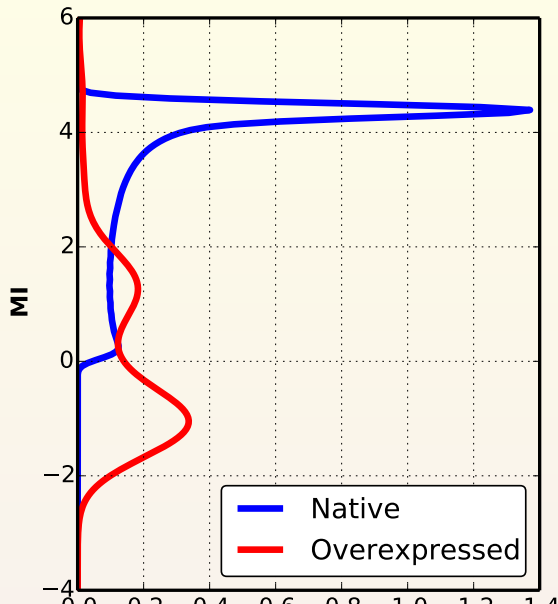


# MI Density Response

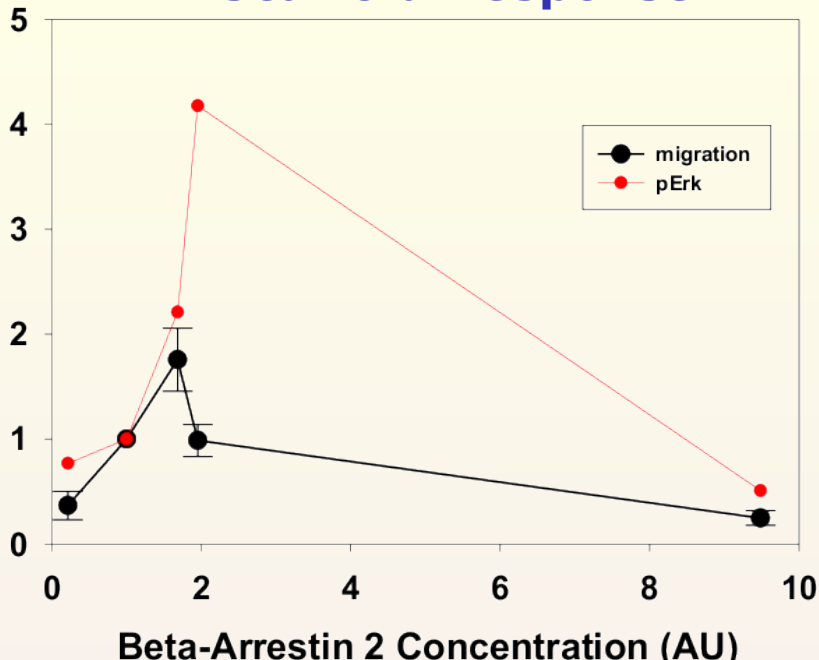




# MI Density Response

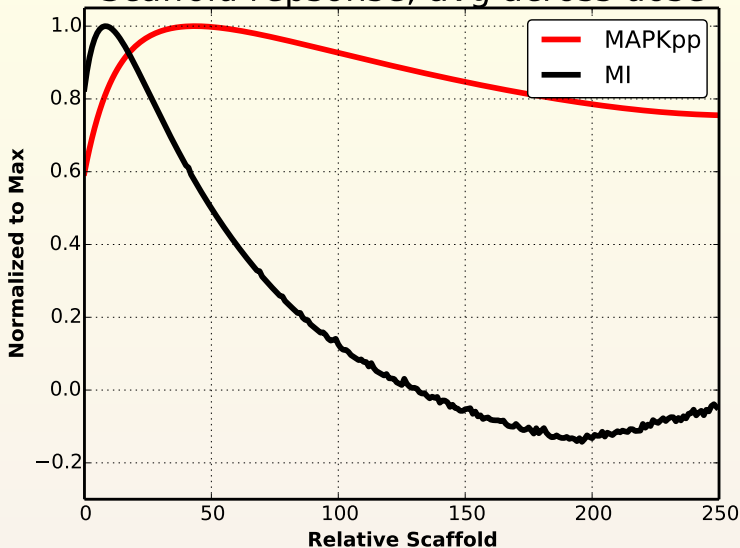


# Scaffold Response

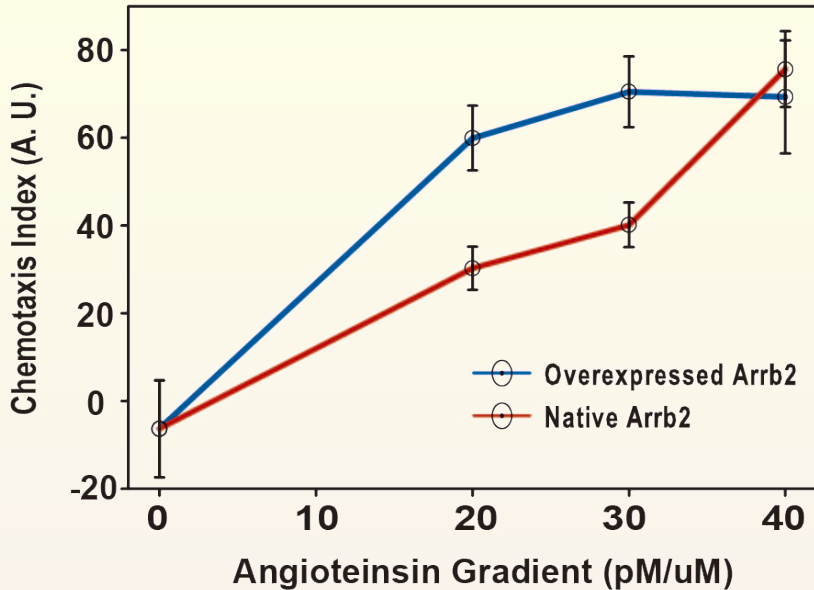


# Scaffold Response

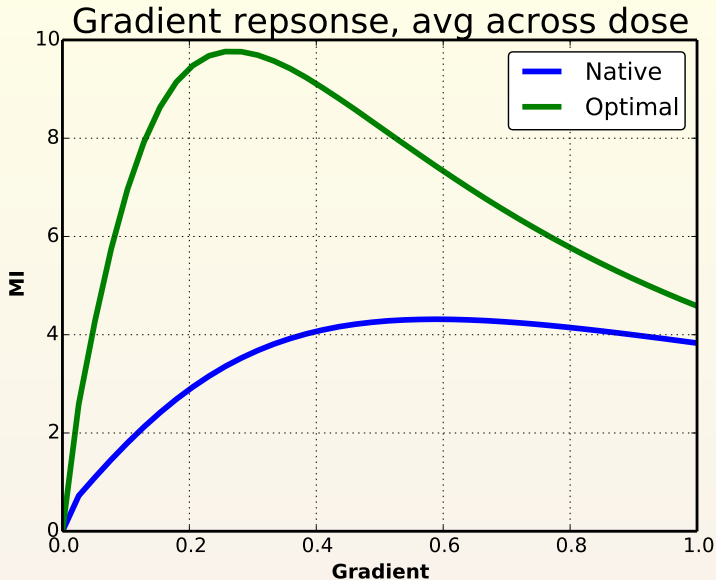
Scaffold response, avg across dose



# Gradient Response

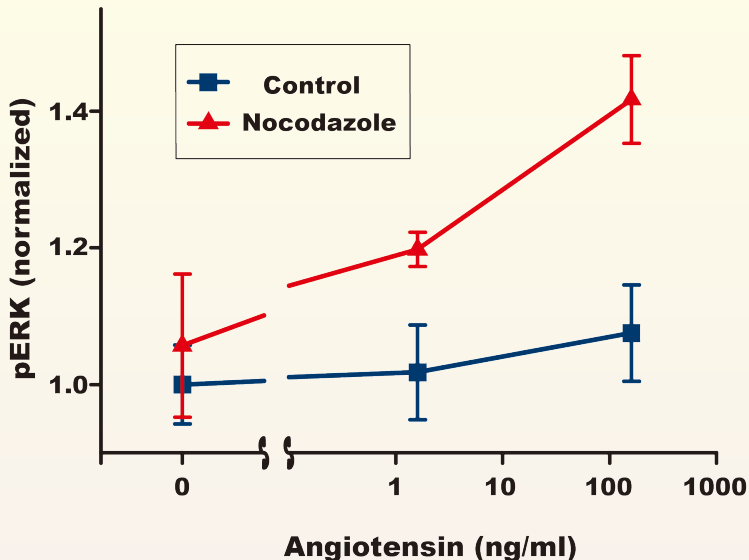


# Gradient Response



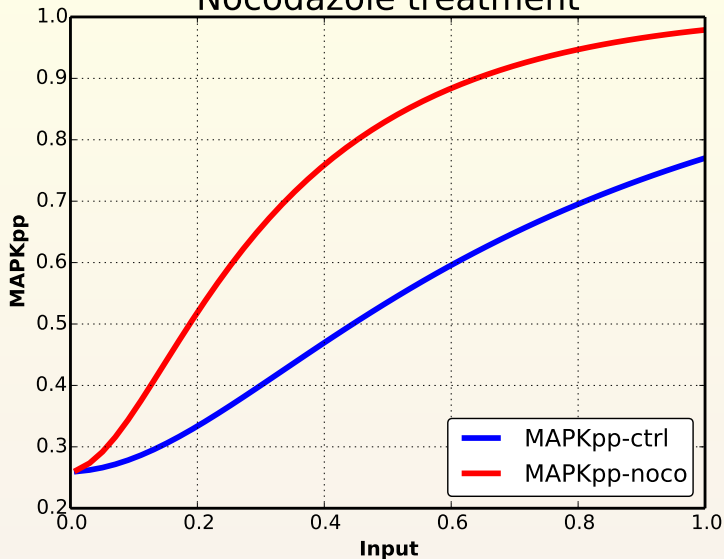
# Nocodazole treatment

**E**



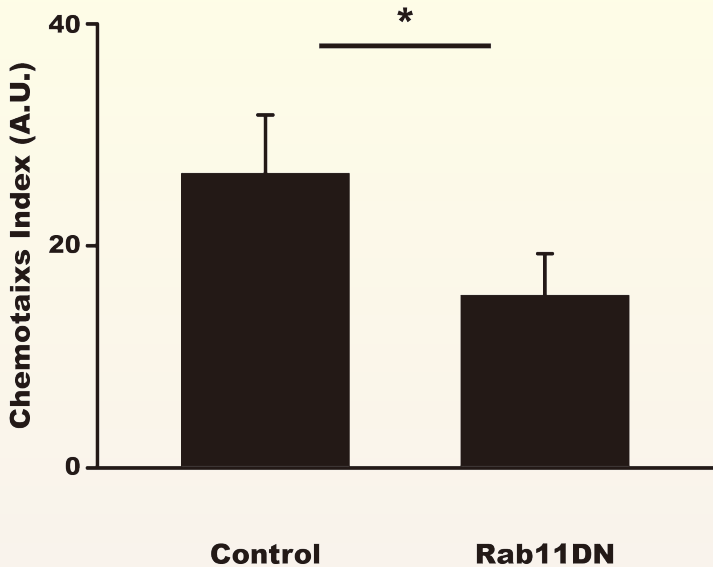
$S_{ves} \rightarrow S_{cyto}, 20\%p_4$

Nocodazole treatment



## Rab11-DN

**F**





# Rab11-DN

