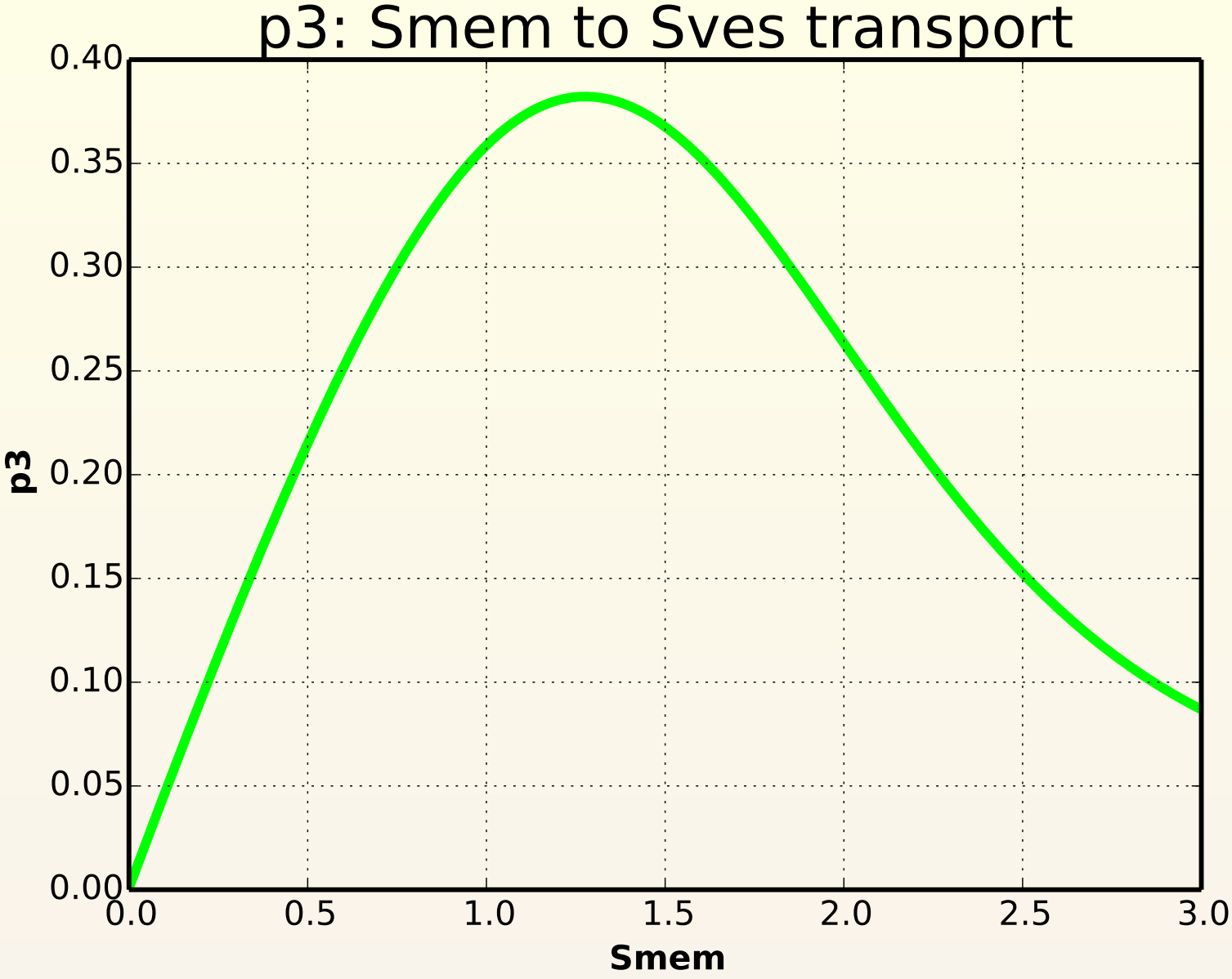
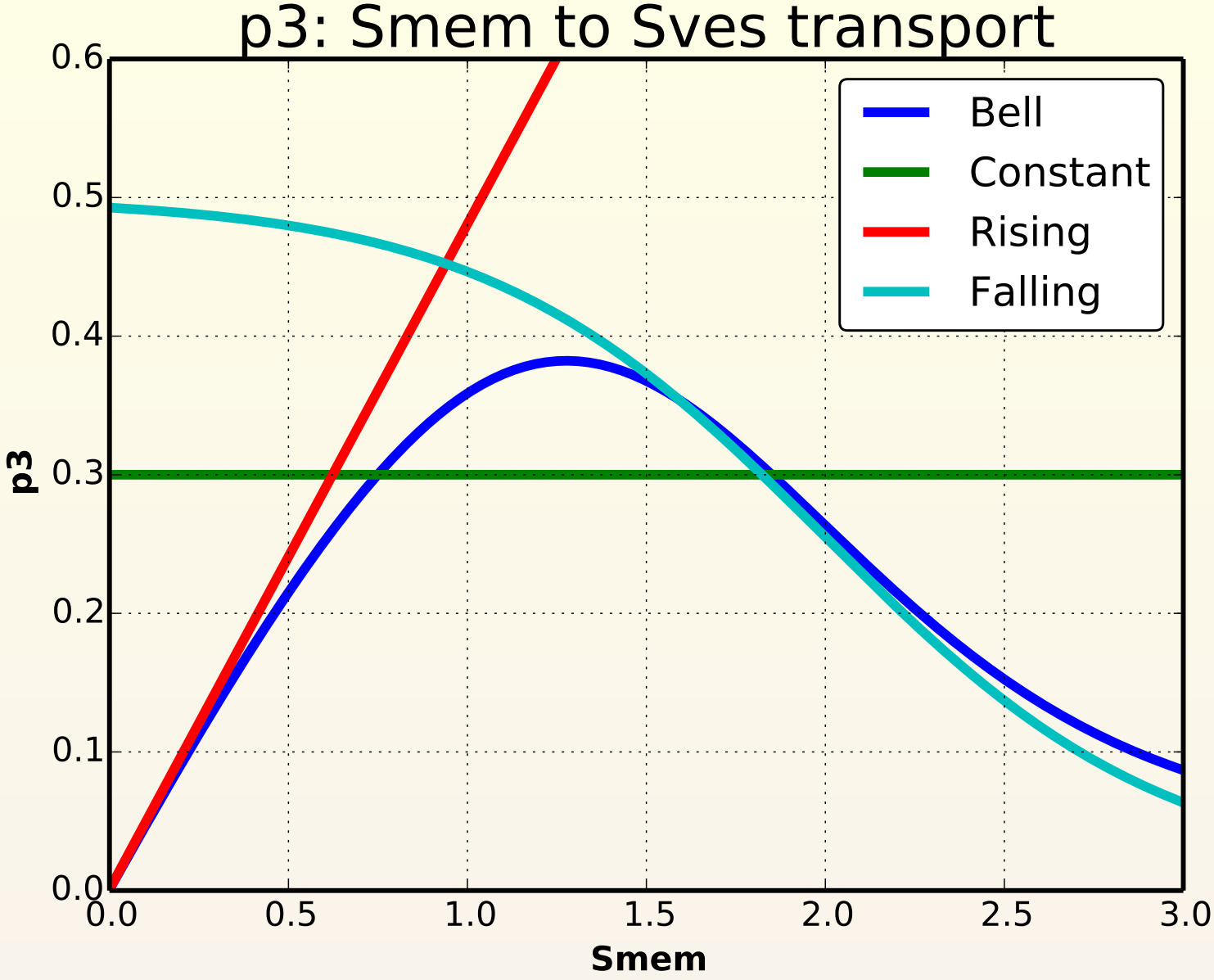
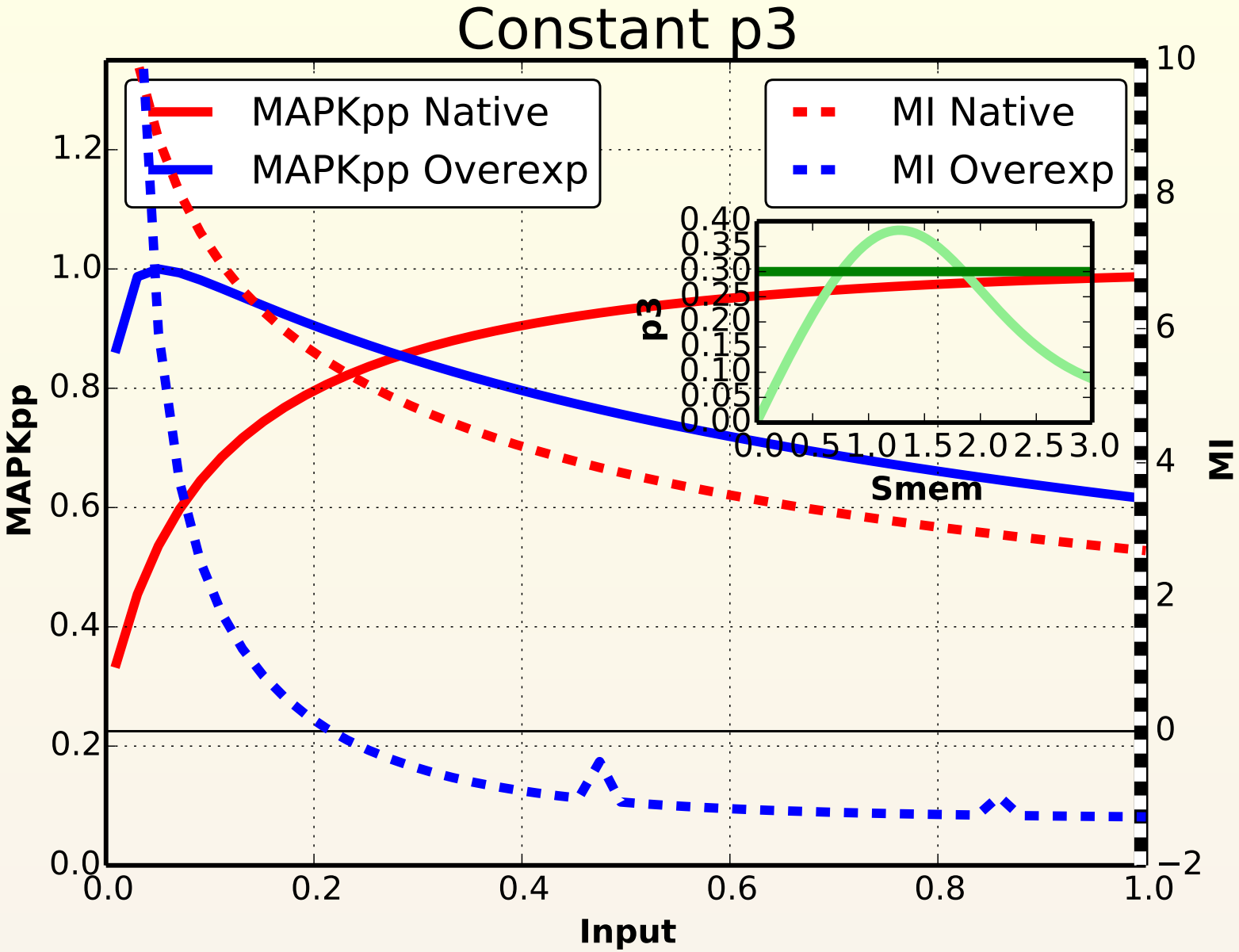

p3: Smem to Sves transport
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
p3
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Smem

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

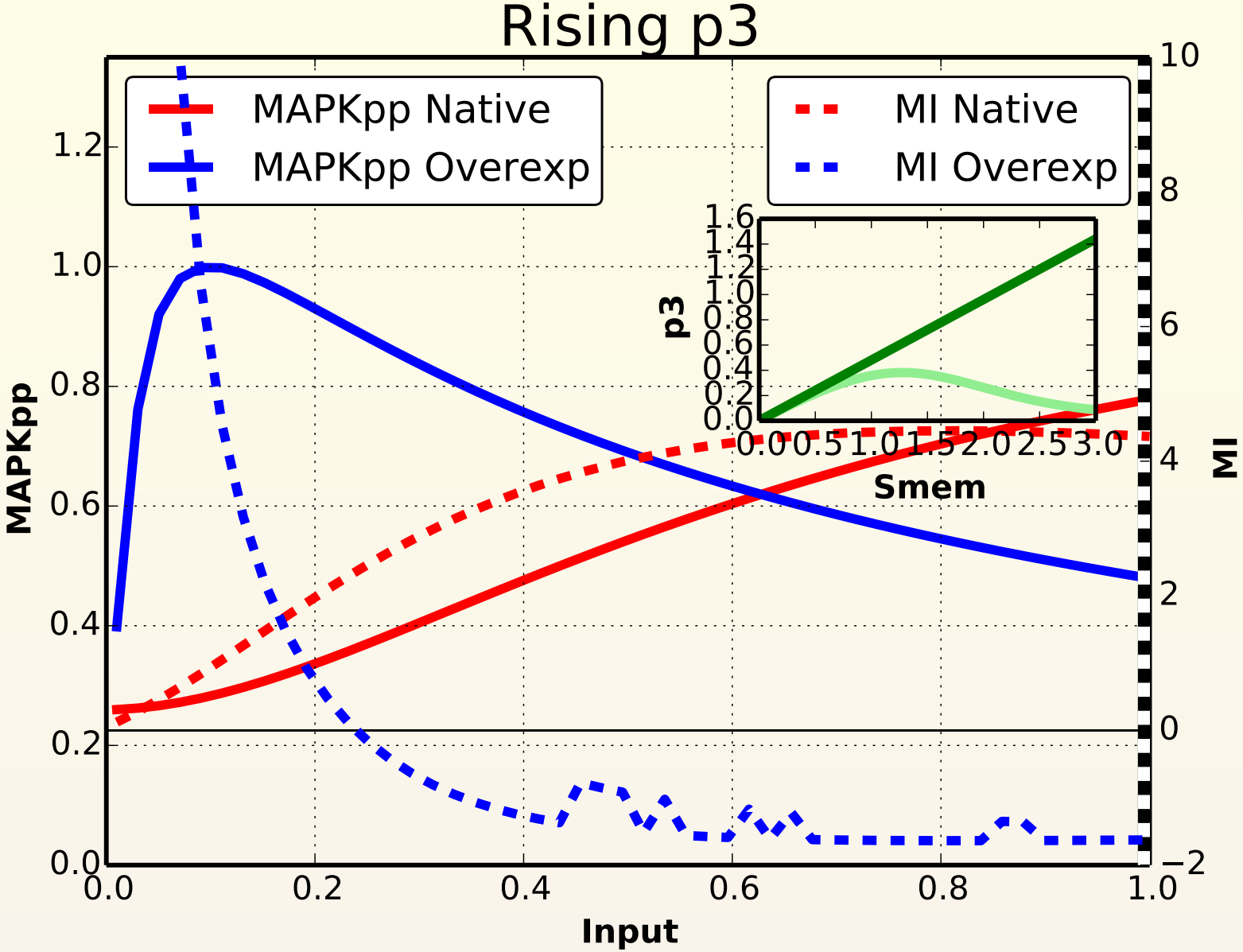
this is a test
another line ok


p3: Smem to Sves transport
Bell
Constant
Rising
Falling
p3
Smem
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.0
0.5
1.0
1.5
2.0
2.5
3.0


Constant p3
MAPKpp Native
MAPKpp Overexp
MI Native
MI Overexp
MAPKpp
MI
Input
p3
Smem
0.0
0.2
0.4
0.6
0.8
1.0
1.2
−2
0
2
4
6
8
10
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.5
1.0
1.5
2.0
2.5
3.0

Results for constant p3

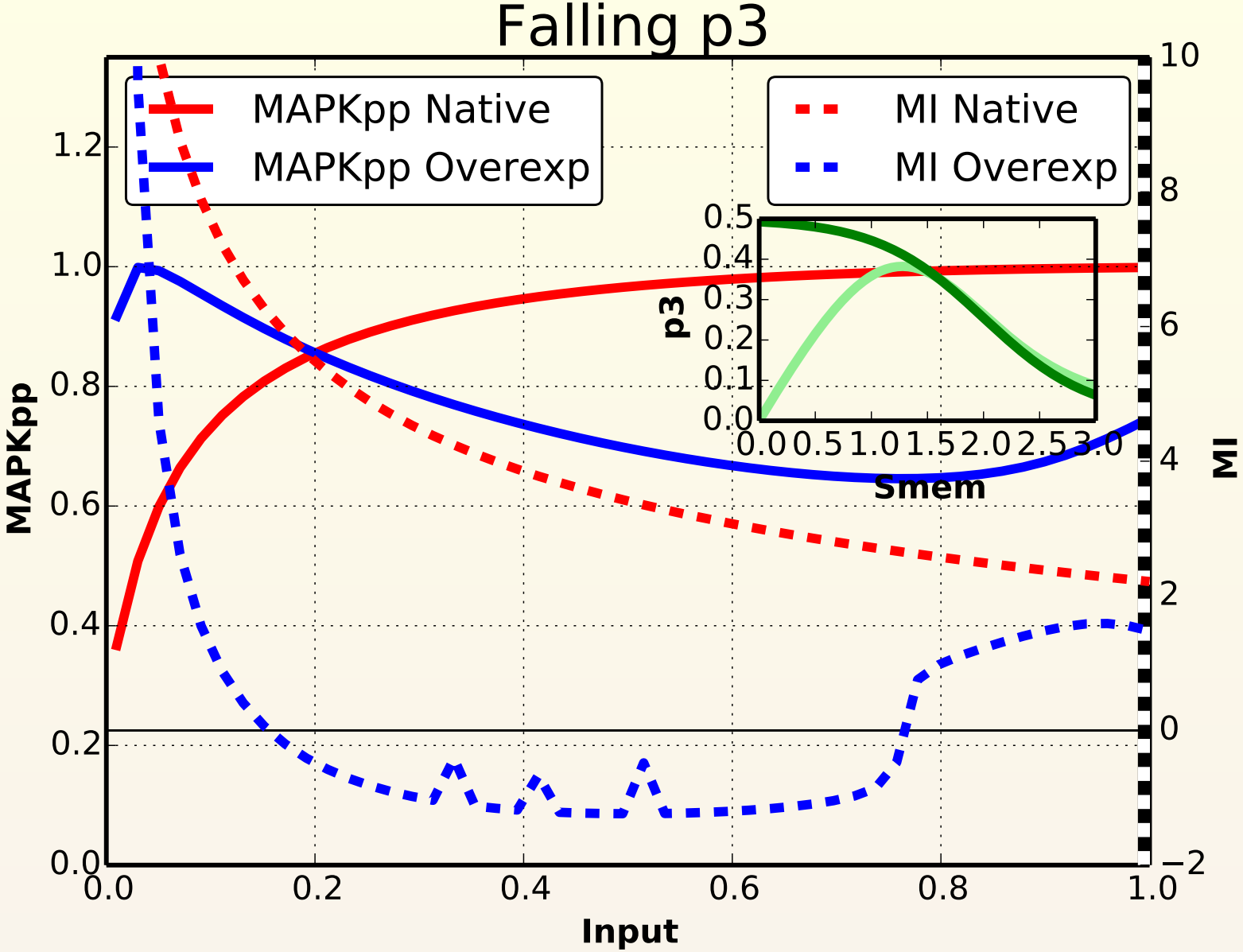
- At native levels, we get a saturating increase in MAPKpp, producing a negatively sloping MI curve
  - Experimentally MI is constant w.r.t. dose
- At overexpressed levels, the simulation only produces negative MI values
  - Experimentally MI goes from negative to positive


Rising p3
MAPKpp Native
MAPKpp Overexp
MI Native
MI Overexp
MAPKpp
MI
Input
p3
Smem
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0.5
1.5
2.0
2.5
3.0
2
4
6
8
10
−2

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

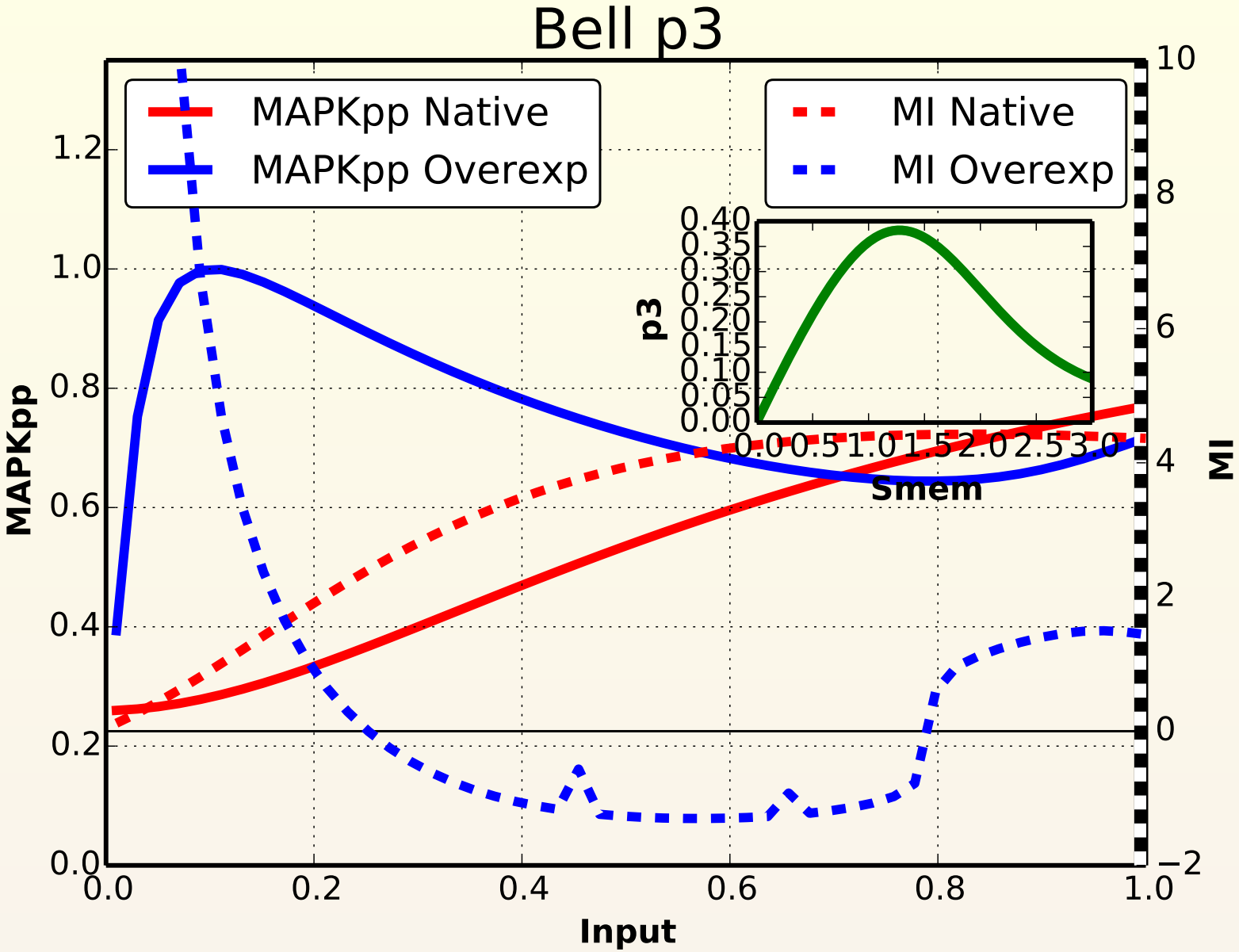


Falling p3
MAPKpp Native
MAPKpp Overexp
MI Native
MI Overexp
MAPKpp
MI
Input
p3
Smem
0.0
0.2
0.4
0.6
0.8
1.0
1.2
10
8
6
4
2
0
−2
0.5
0.4
0.3
0.2
0.1
0.0
0.5
1.0
1.5
2.0
2.5
3.0

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
MAPKpp Native
MAPKpp Overexp
MI Native
MI Overexp
p3
Smem
MAPKpp
MI
Input
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.5
1.5
2.0
2.5
3.0
−2
0
2
4
6
8
10

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