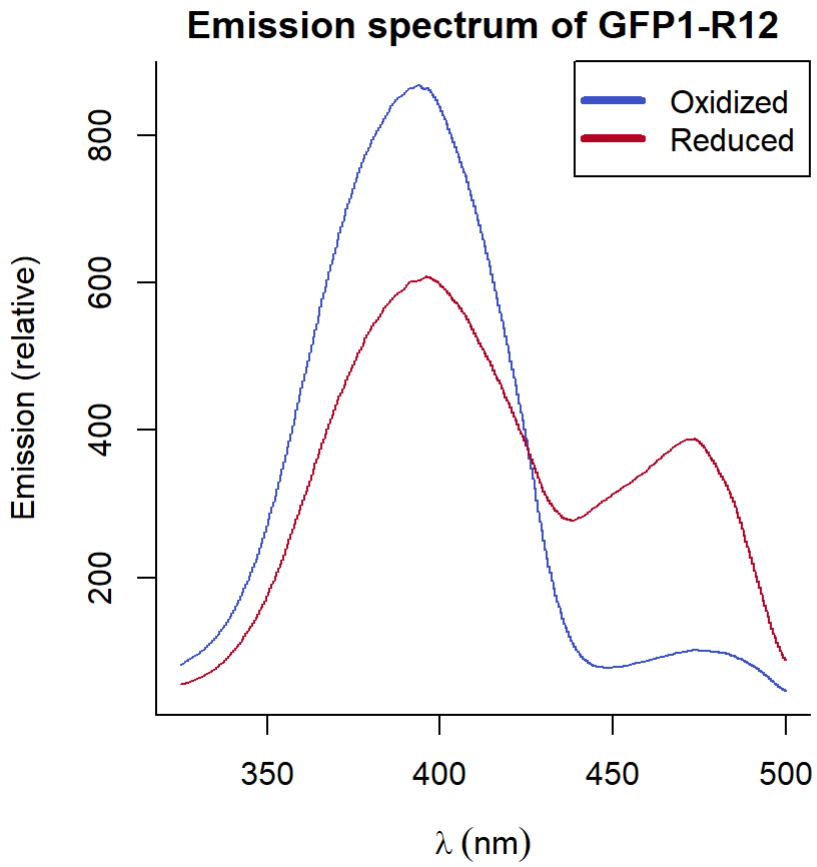
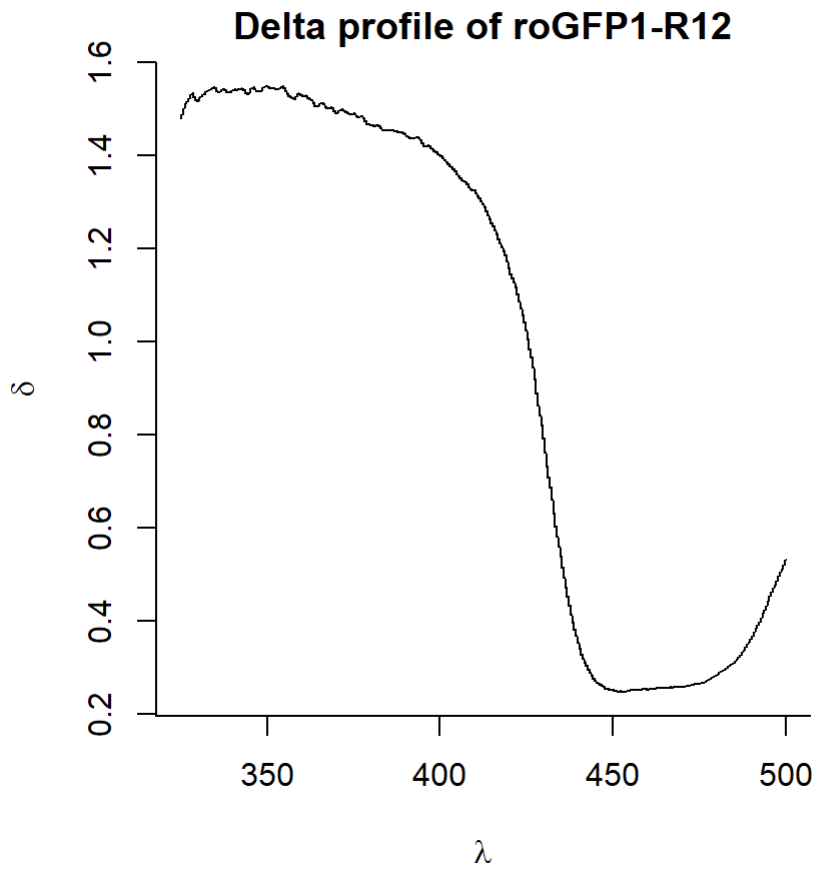
Excitation-emission profiles



Delta profiles



Approximate delta-wavelength values for GFP1-R12

Characteristic	GFP1-R12
Delta ~ 1	425.3
Delta minimized	453.3
Delta maximized	354.3

Choose two sets of wavelengths for each sensor.

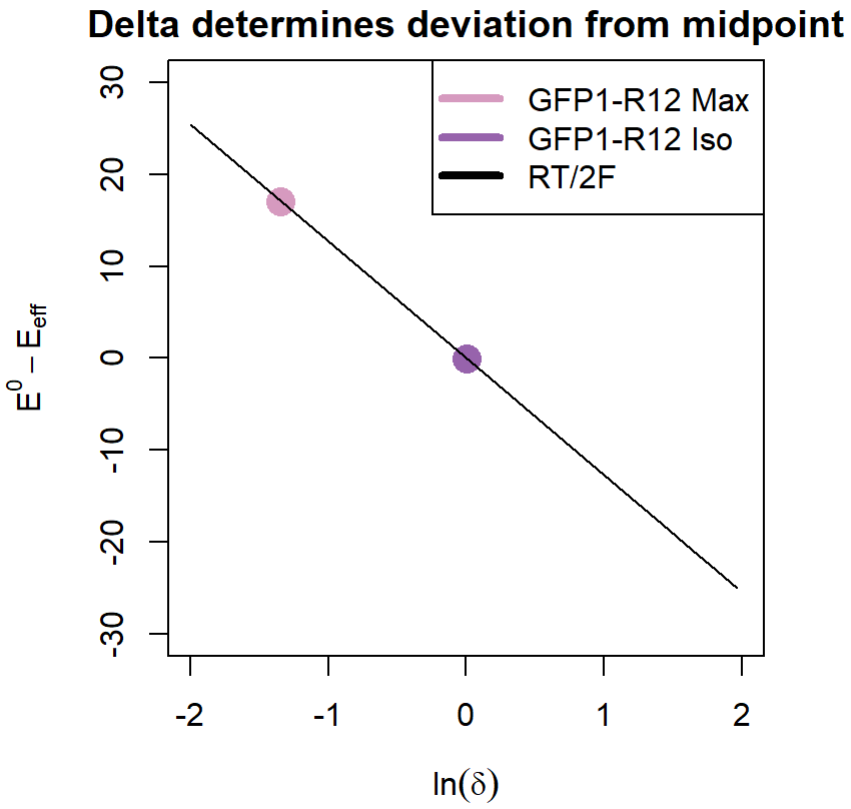
For GFP1-R12:

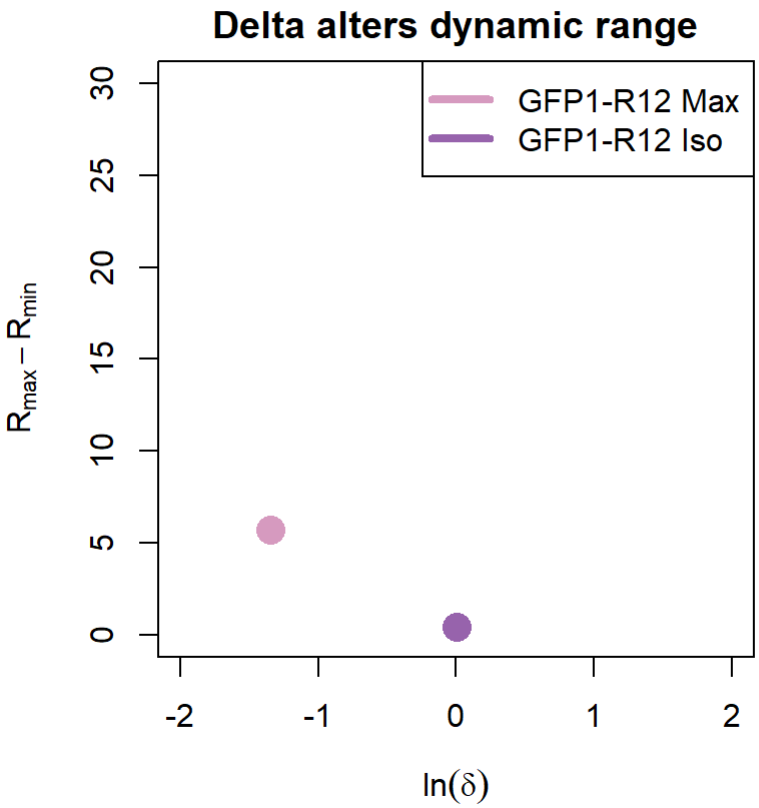
- Use $\frac{410+/-5nm}{425+/-5nm}$ for isobestic
- Use $\frac{410+/-5nm}{470+/-5nm}$ for maximum total dynamic range

Characteristics of GFP1-R12sensors

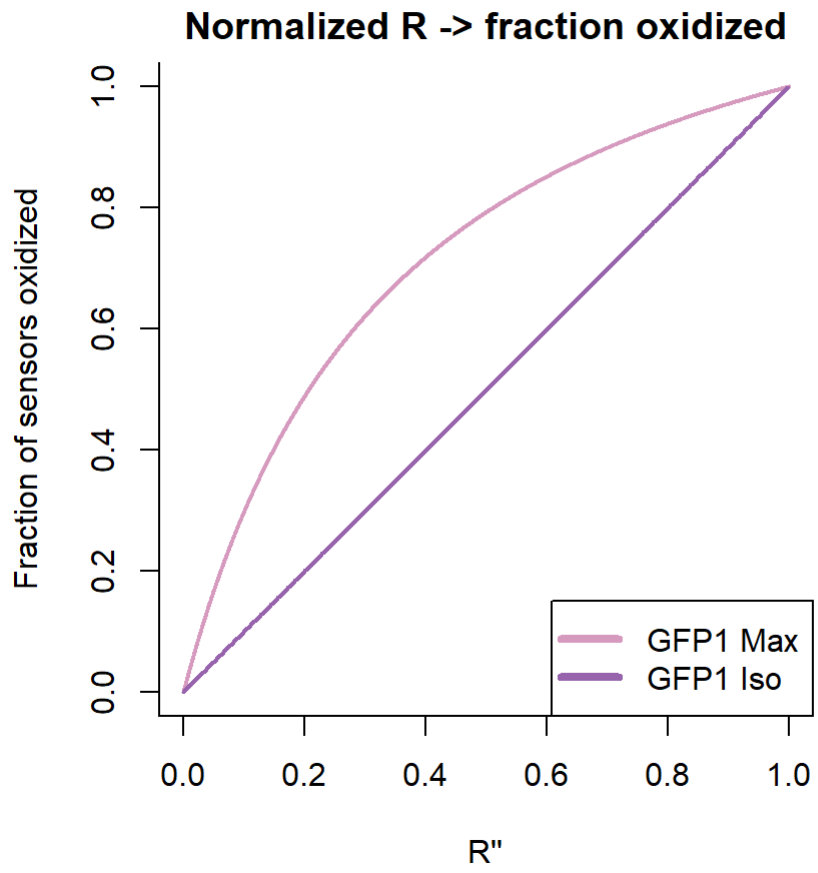
Characteristic	GFP1 Isobestic	GFP1 Max
Delta	1.0	0.3
Rmin	1.4	1.4
Rmax	1.8	7.1

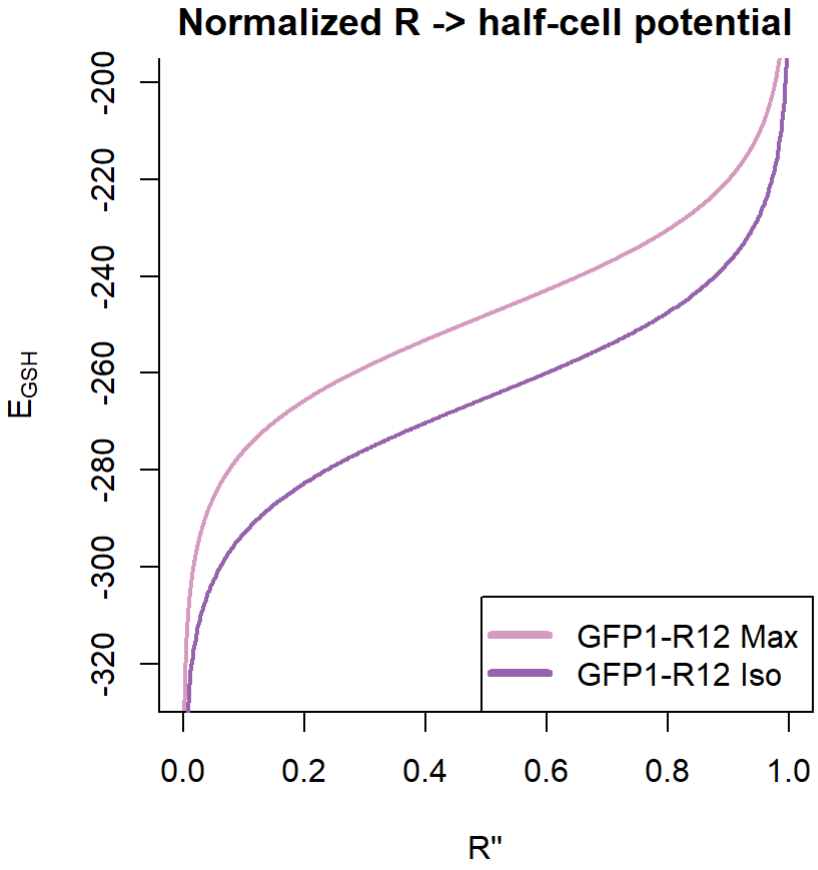
Characteristic	GFP1 Isobestic	GFP1 Max
E0	-265.0	-265.0
Adjusted E0	-265.1	-247.9
Rmax-Rmin	0.4	5.7
Rmax/Rmin	1.3	5.0

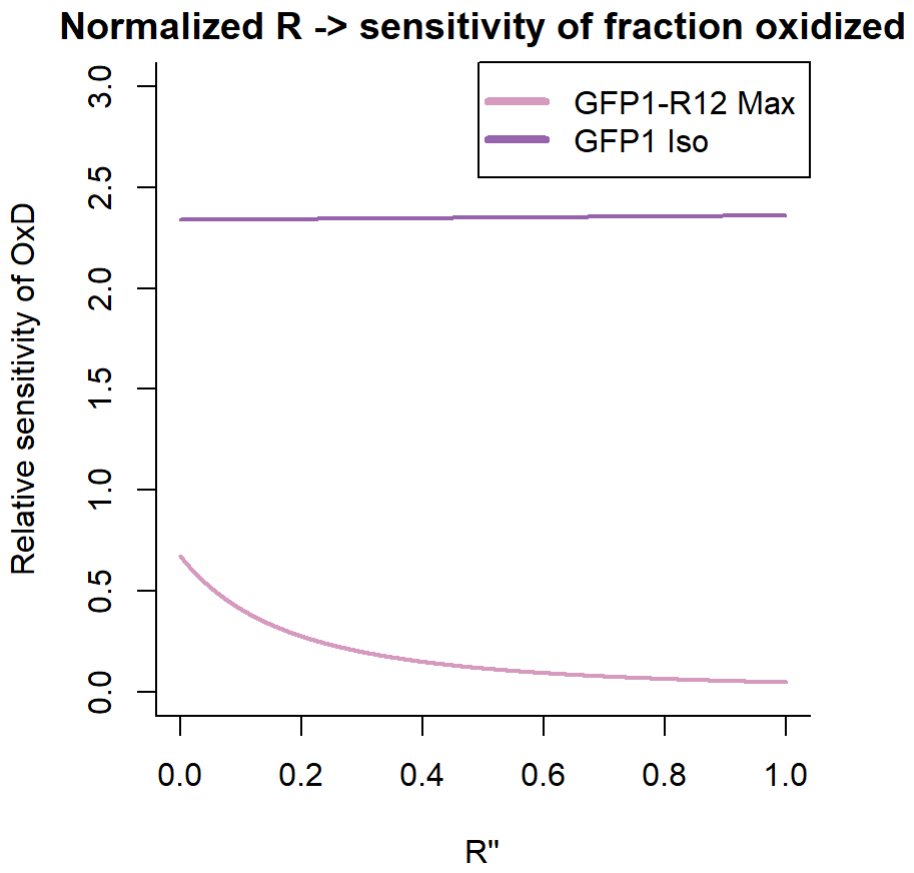


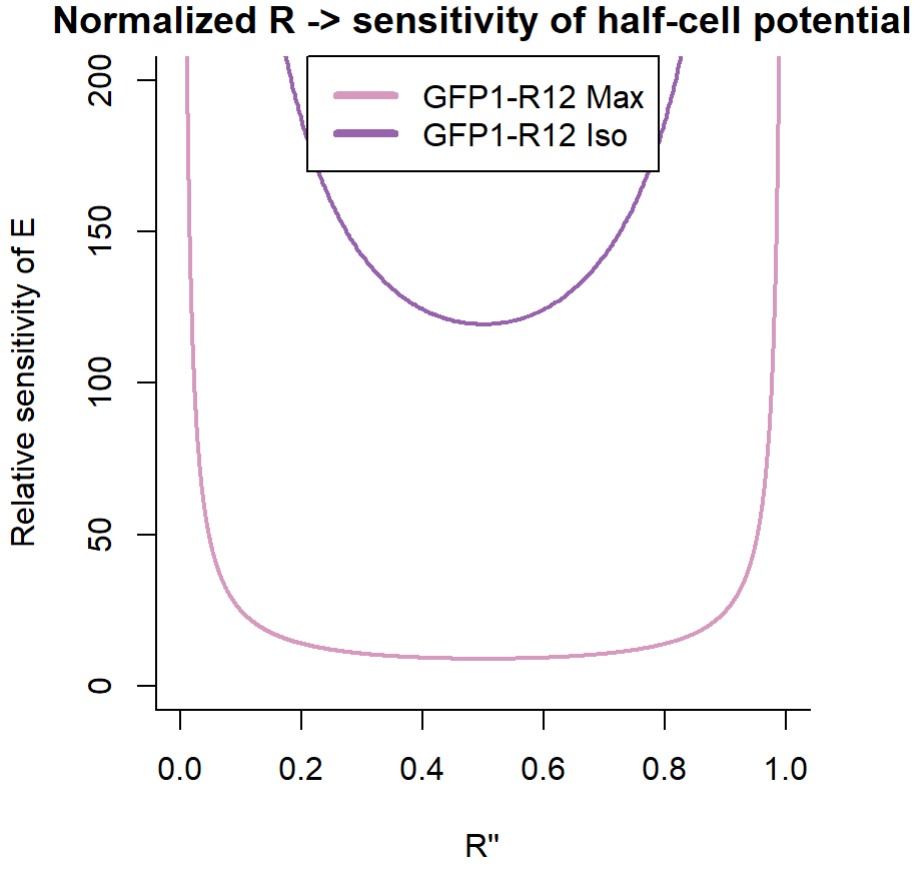


Fraction oxidized and redox potential

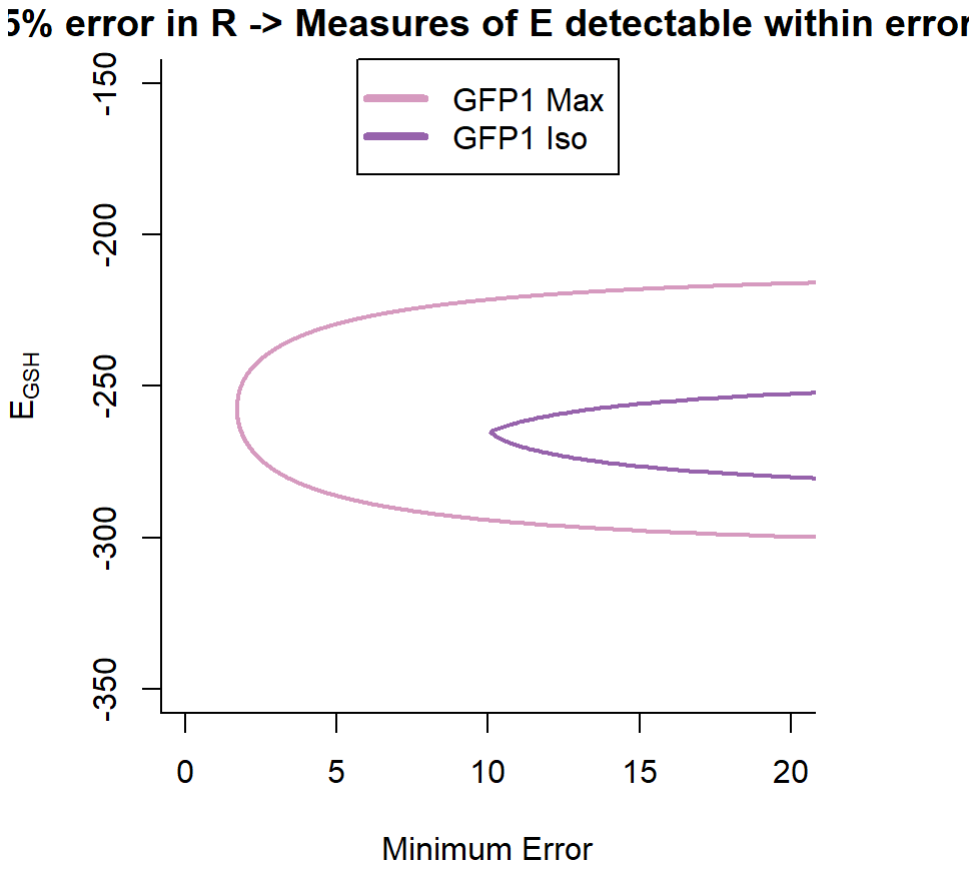

Normalized R -> fraction oxidized
Fraction of sensors oxidized
0.0
0.2
0.4
0.6
0.8
1.0
GFP1 Max
GFP1 Iso
R"

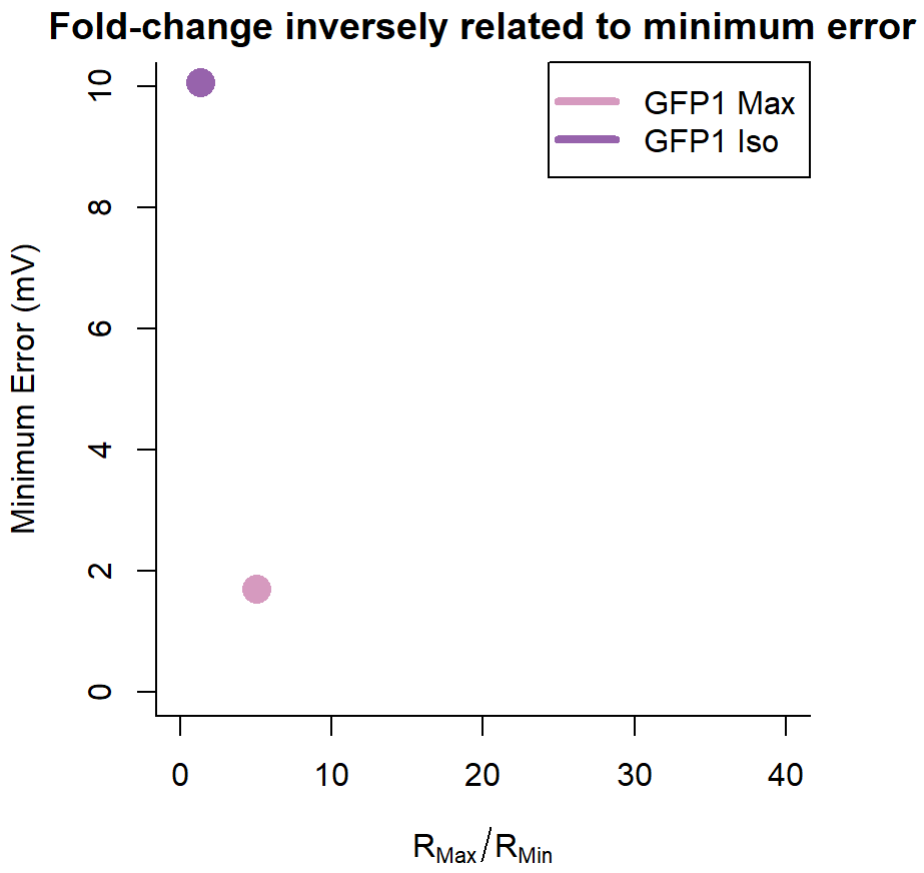

Normalized R -> half-cell potential
E_{GSH}
-200
-220
-240
-260
-280
-300
-320
GFP1-R12 Max
GFP1-R12 Iso
0.0
0.2
0.4
0.6
0.8
1.0
R"

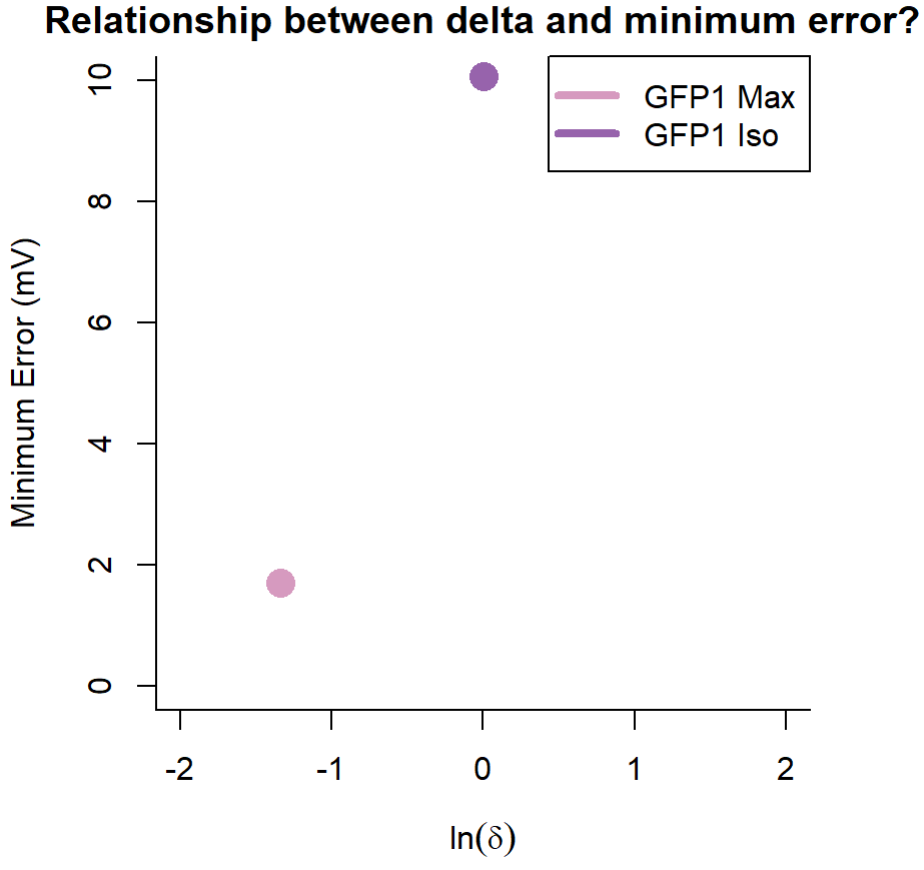

Normalized R -> sensitivity of fraction oxidized
GFP1-R12 Max
GFP1 Iso
Relative sensitivity of OxD
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0.0
0.2
0.4
0.6
0.8
1.0
R"


Normalized R -> sensitivity of half-cell potential
GFP1-R12 Max
GFP1-R12 Iso
Relative sensitivity of E
0
50
100
150
200
0.0
0.2
0.4
0.6
0.8
1.0
R"

Error in half-cell potential readout given a 5% error in R




Fold-change inversely related to minimum error
GFP1 Max
GFP1 Iso
Minimum Error (mV)
0
2
4
6
8
10
0
10
20
30
40
R_{Max}/R_{Min}


Relationship between delta and minimum error?
GFP1 Max
GFP1 Iso
Minimum Error (mV)
0
2
4
6
8
10
-2
-1
0
1
2
ln(δ)