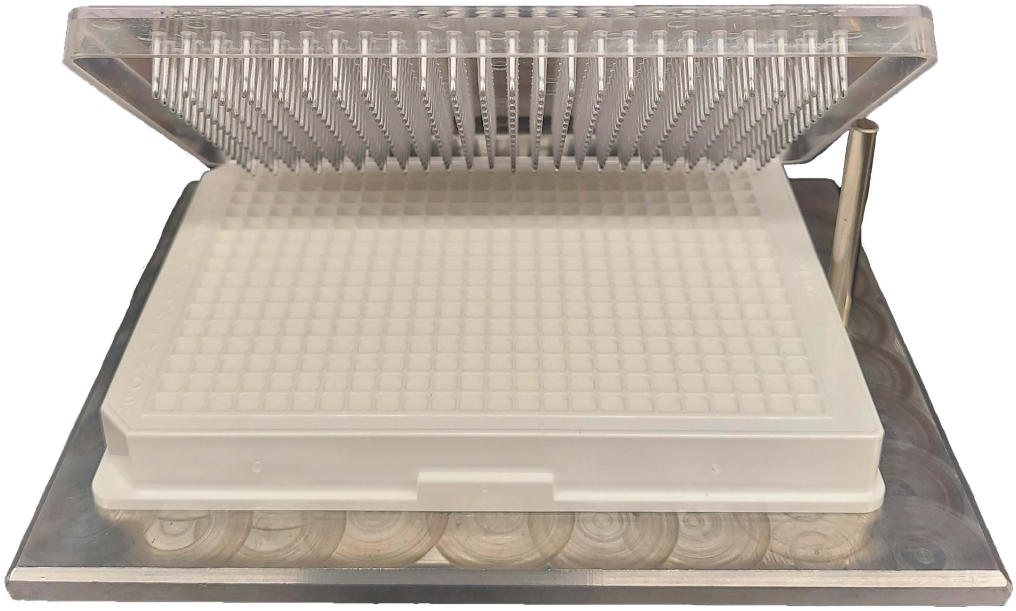
Supplementary Material

Development of a Bioprinter-based Method for Incorporating Metabolic Competence into High-throughput *In Vitro* Assays

Kristen Hopperstad, Chad Deisenroth*

***** Correspondence:** Chad Deisenroth: deisenroth.chad@epa.gov

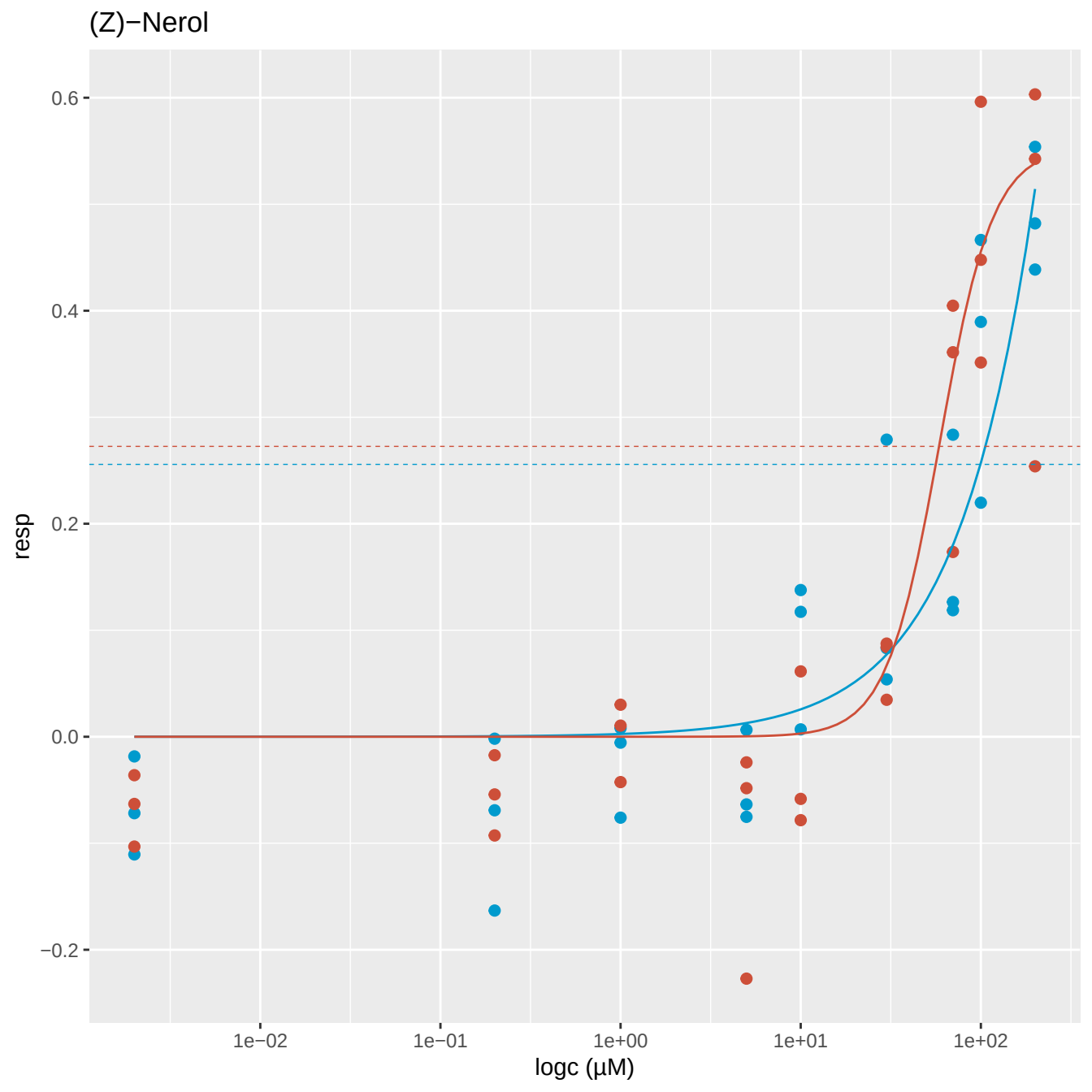
Supplementary Figure 1. Image of custom manufactured 384-well microplate pillar lid type utilized in lid-based AIME method. Pillars were functionalized with Matrigel, dipped into an S9-alginate mixture, and then dipped into 0.1 M barium chloride and 0.01% poly-L-lysine crosslinking solutions to form microspheres attached to solid supports.

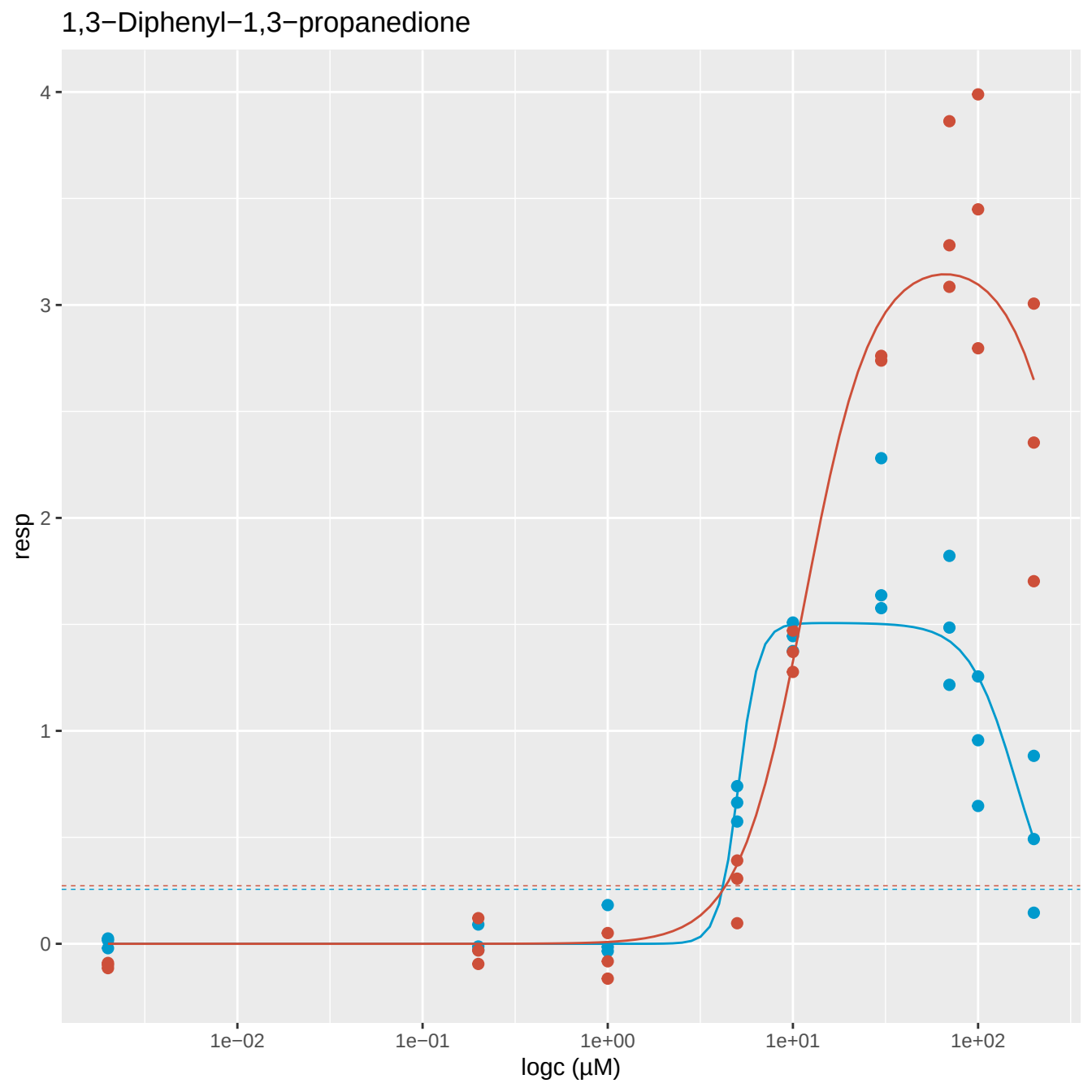


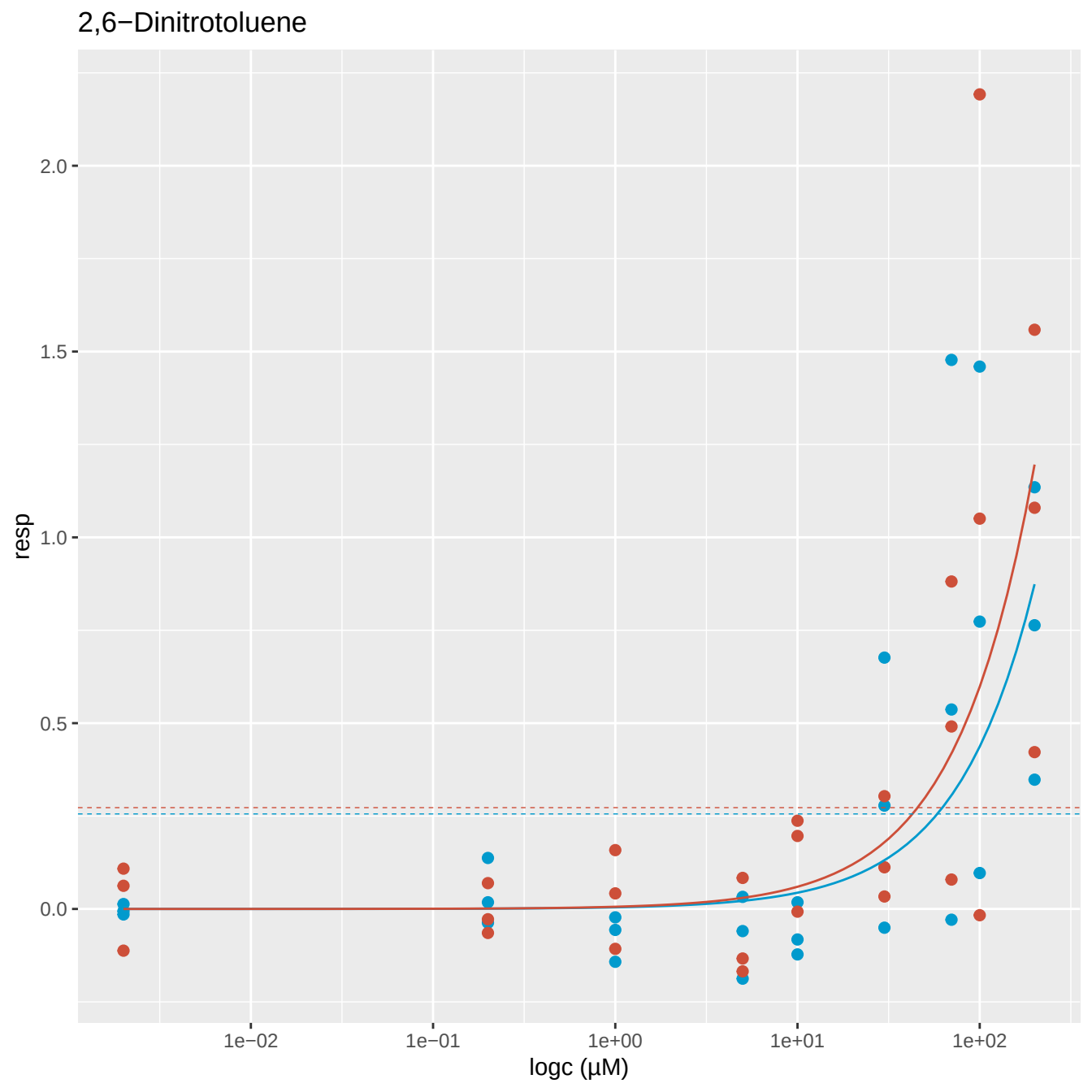
frontiers

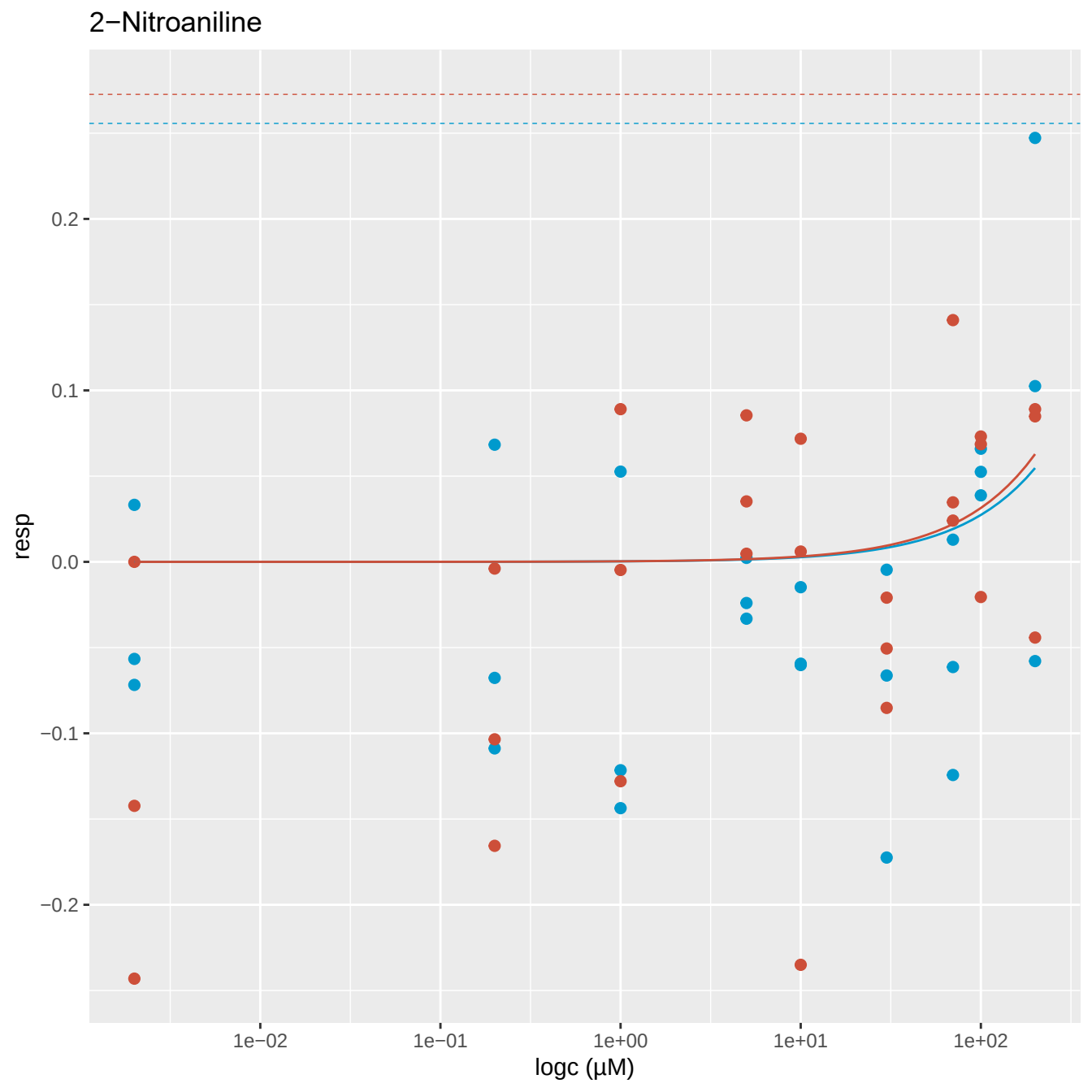
Supplementary Material

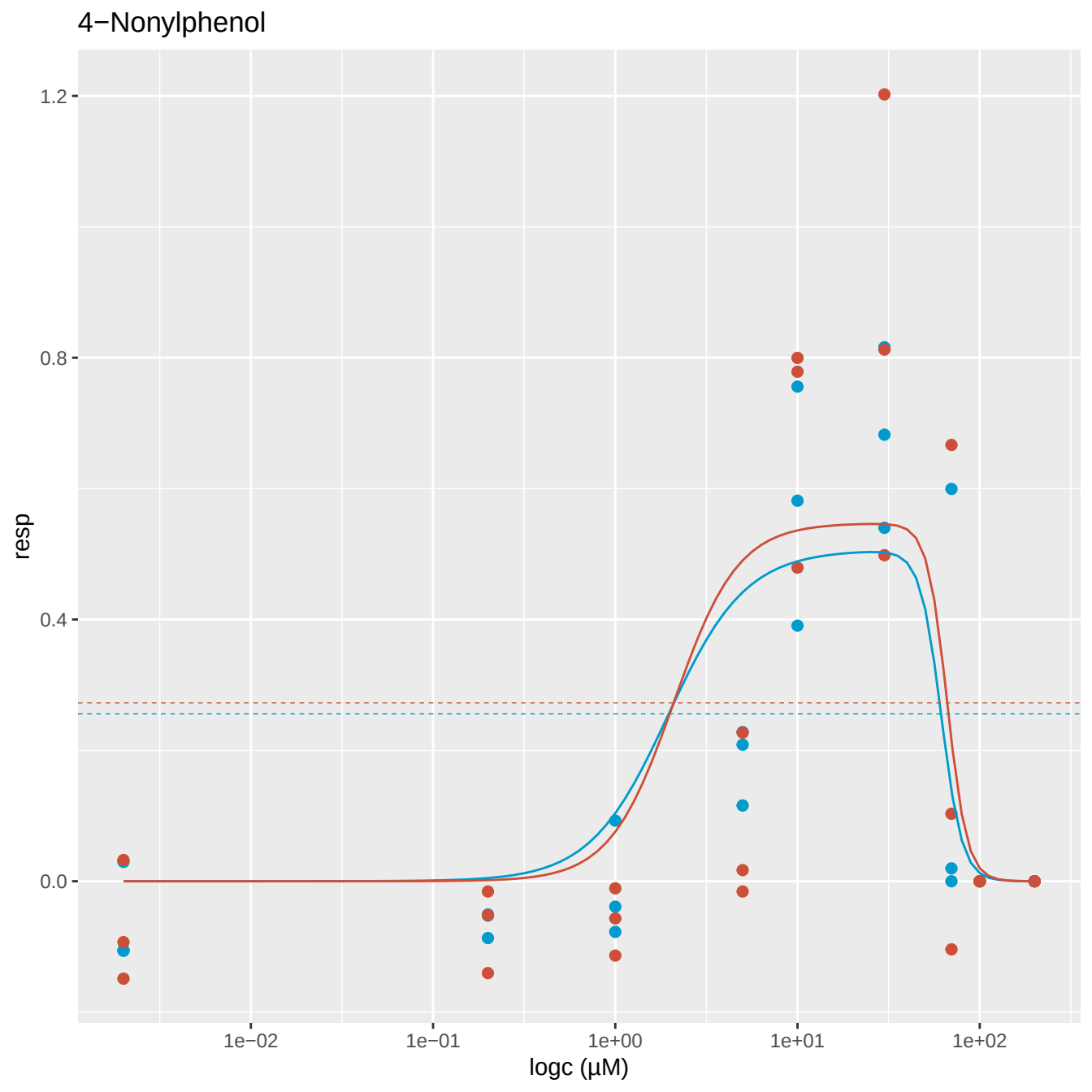
Supplementary Figure 2. Winning TCPL model curve fits for metabolism-negative (solid blue, dH_2O-alginate microspheres) and metabolism-positive (solid red, S9-alginate microspheres) ERTA assay modes. Plots are shown for all compounds screened in the ERTA assay. Horizontal lines indicate the efficacy cutoff (3*bmad) for metabolism-negative (dashed blue) and metabolism-positive (dashed red) modes. Compounds were screened in a 9-point titration series (0.002-200mM) and are represented as log10 concentration (logc) µM. Data points are zero-centered normalized responses (resp) plotted for all experimental replicates (n = 4).

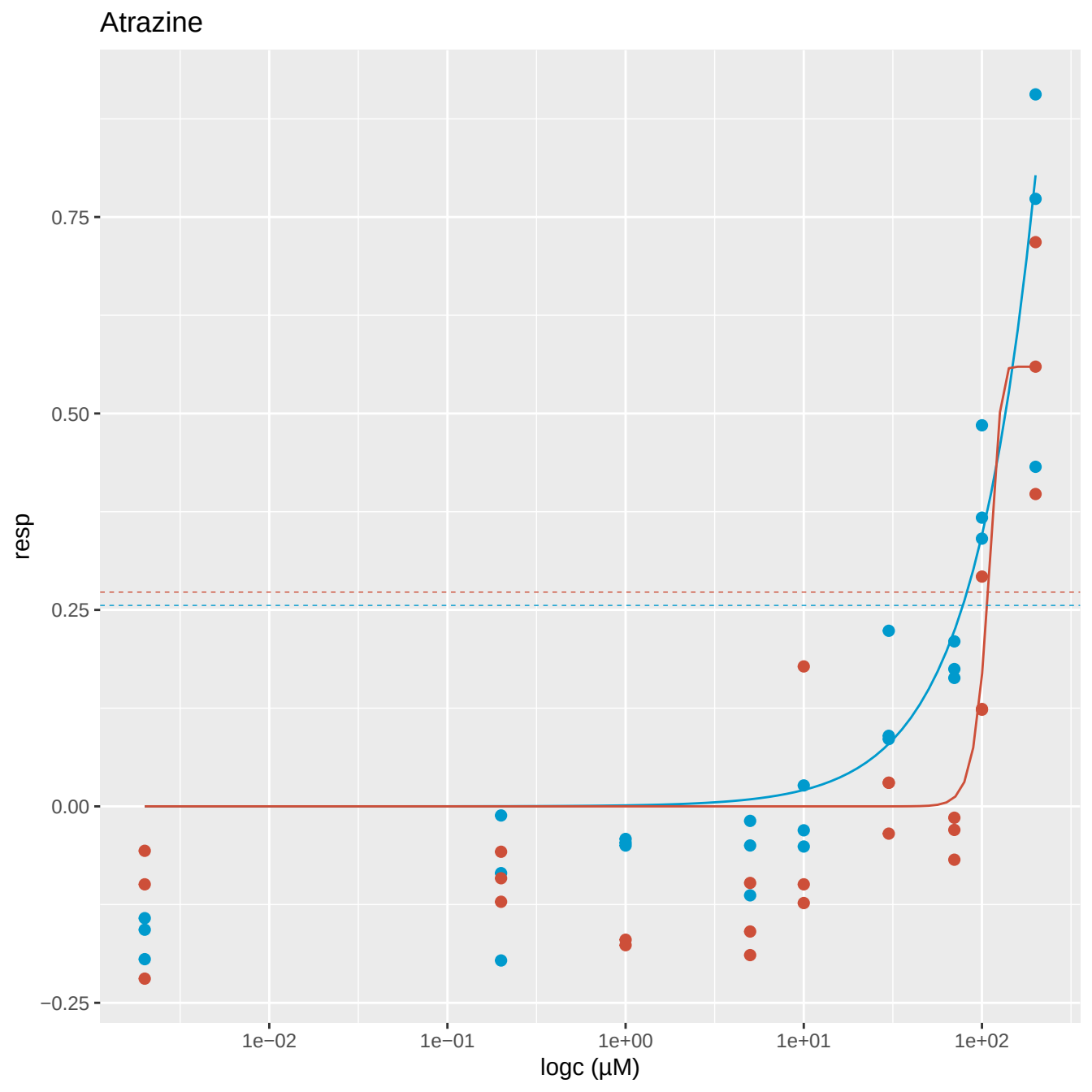

(Z)−Nerol
0.6
0.4
0.2
0.0
−0.2
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

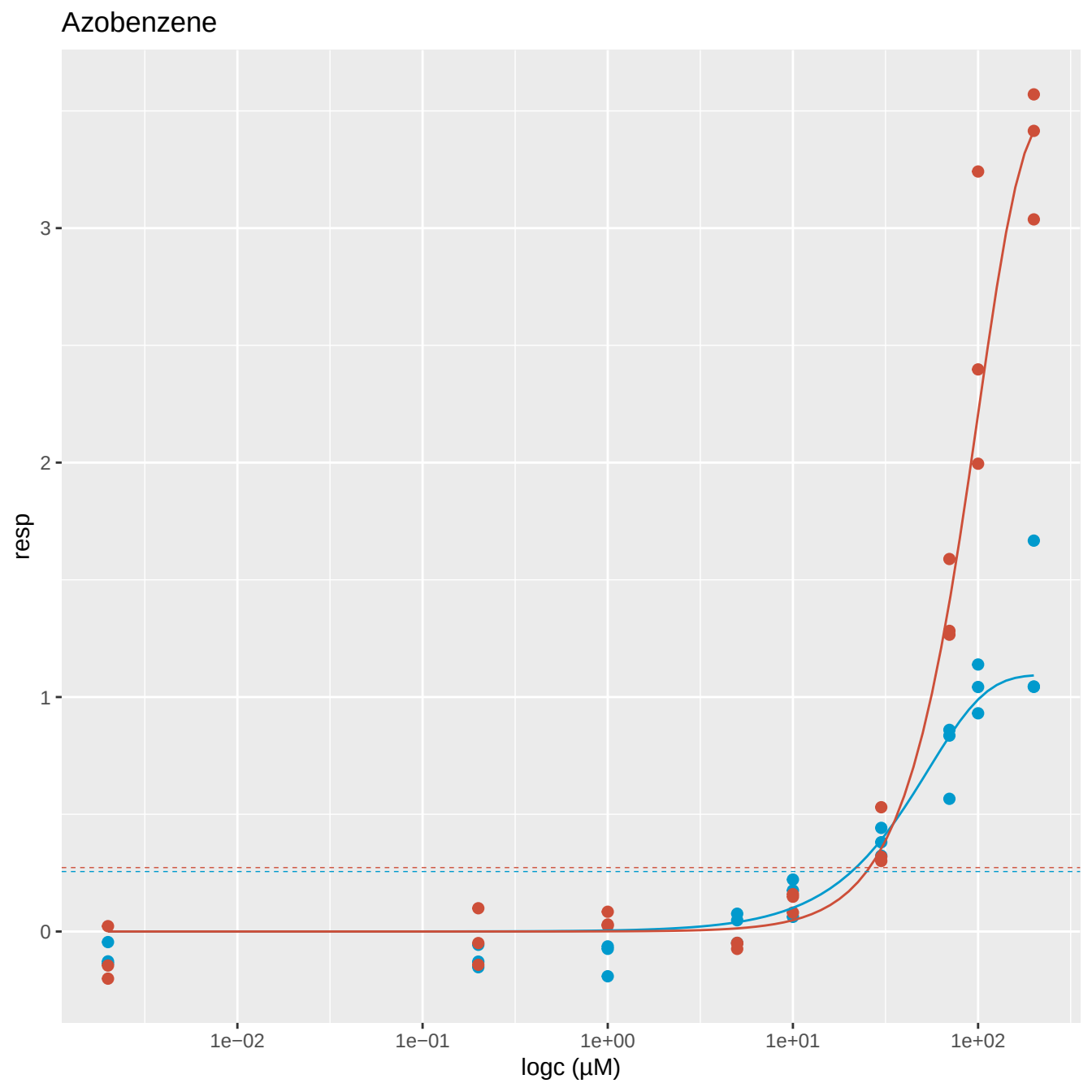

1,3−Diphenyl−1,3−propanedione
resp
4
3
2
1
0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

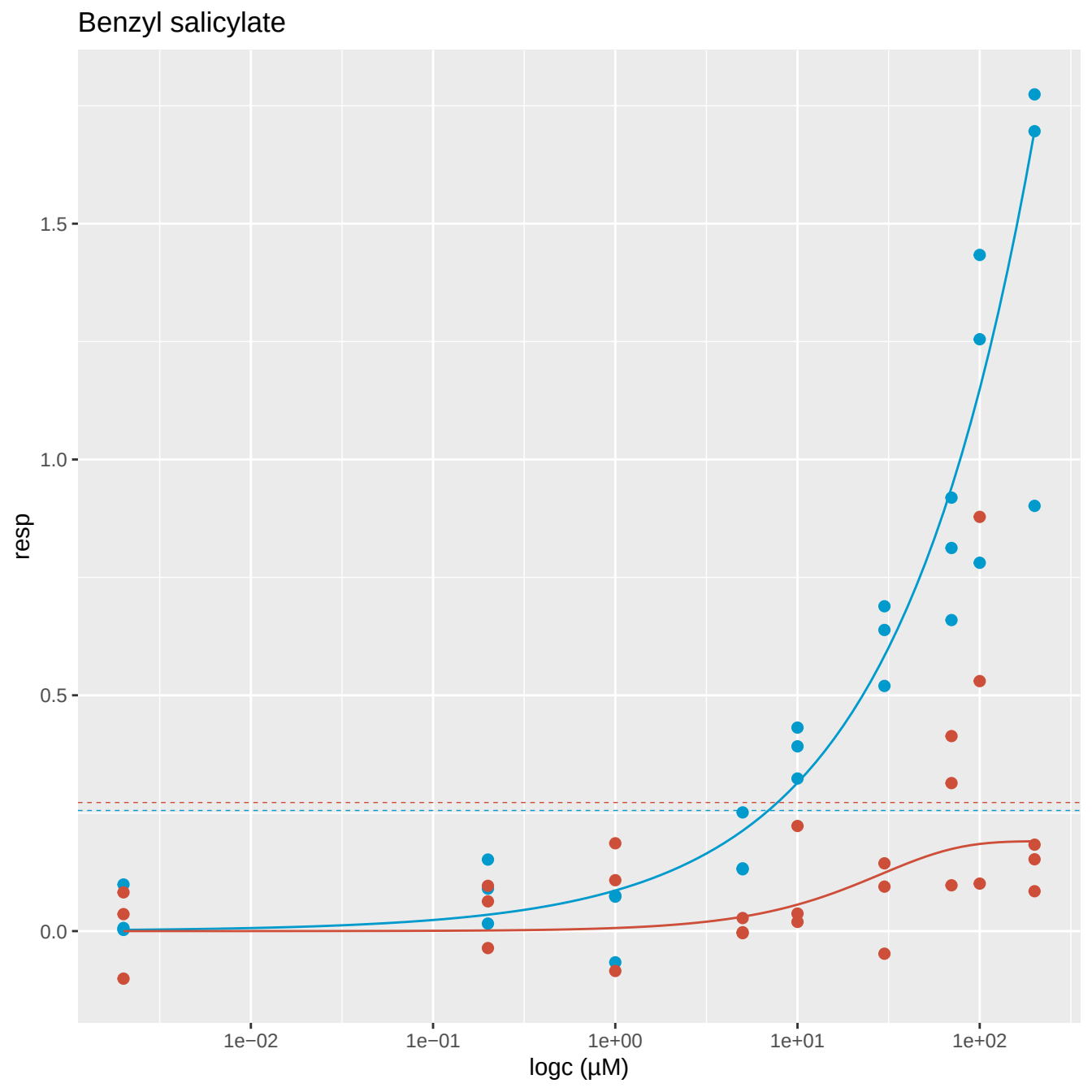

2,6−Dinitrotoluene
resp
2.0
1.5
1.0
0.5
0.0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

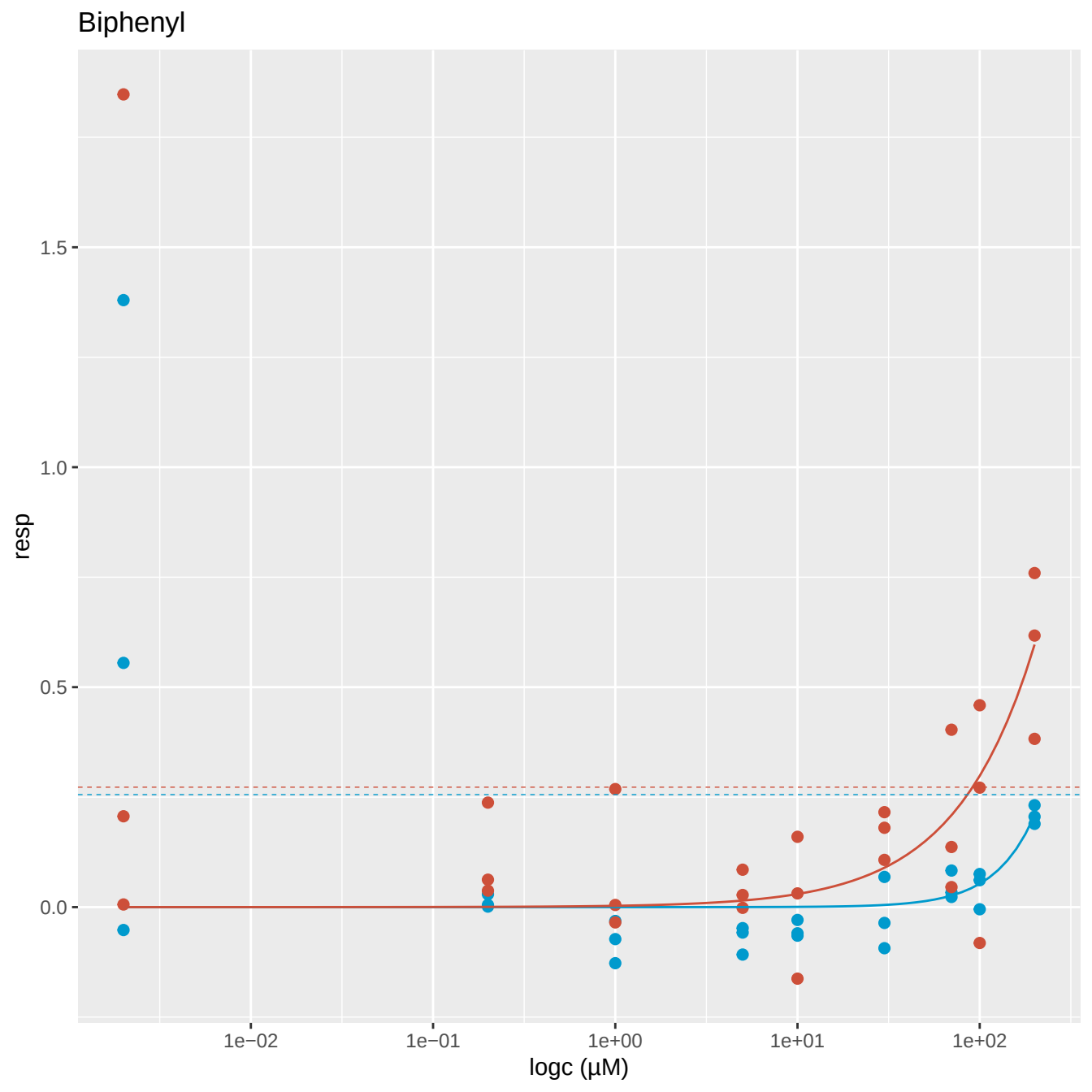

2−Nitroaniline
0.2
0.1
0.0
−0.1
−0.2
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

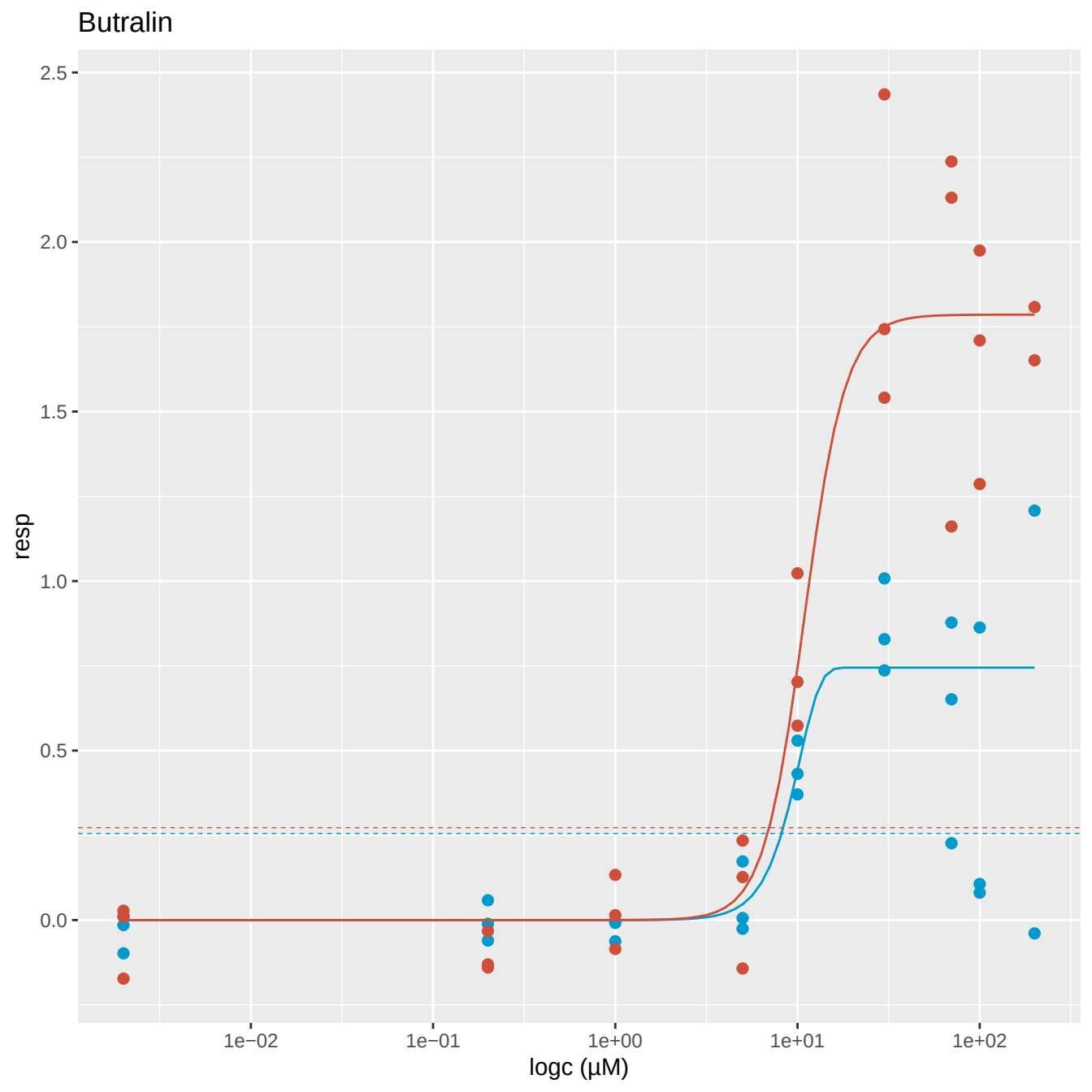

4−Nonylphenol
1.2
0.8
0.4
0.0
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

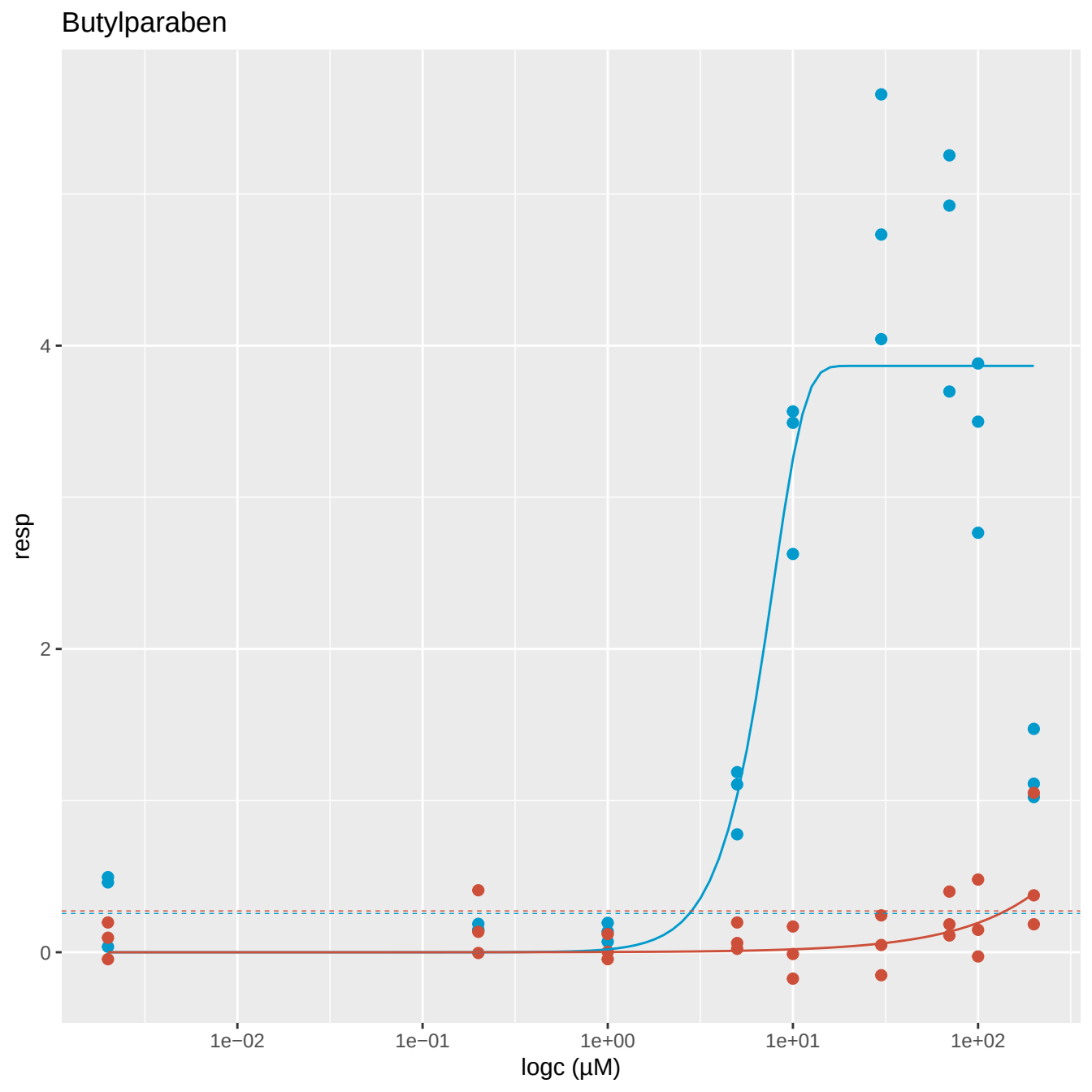

Atrazine
resp
0.75
0.50
0.25
0.00
−0.25
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

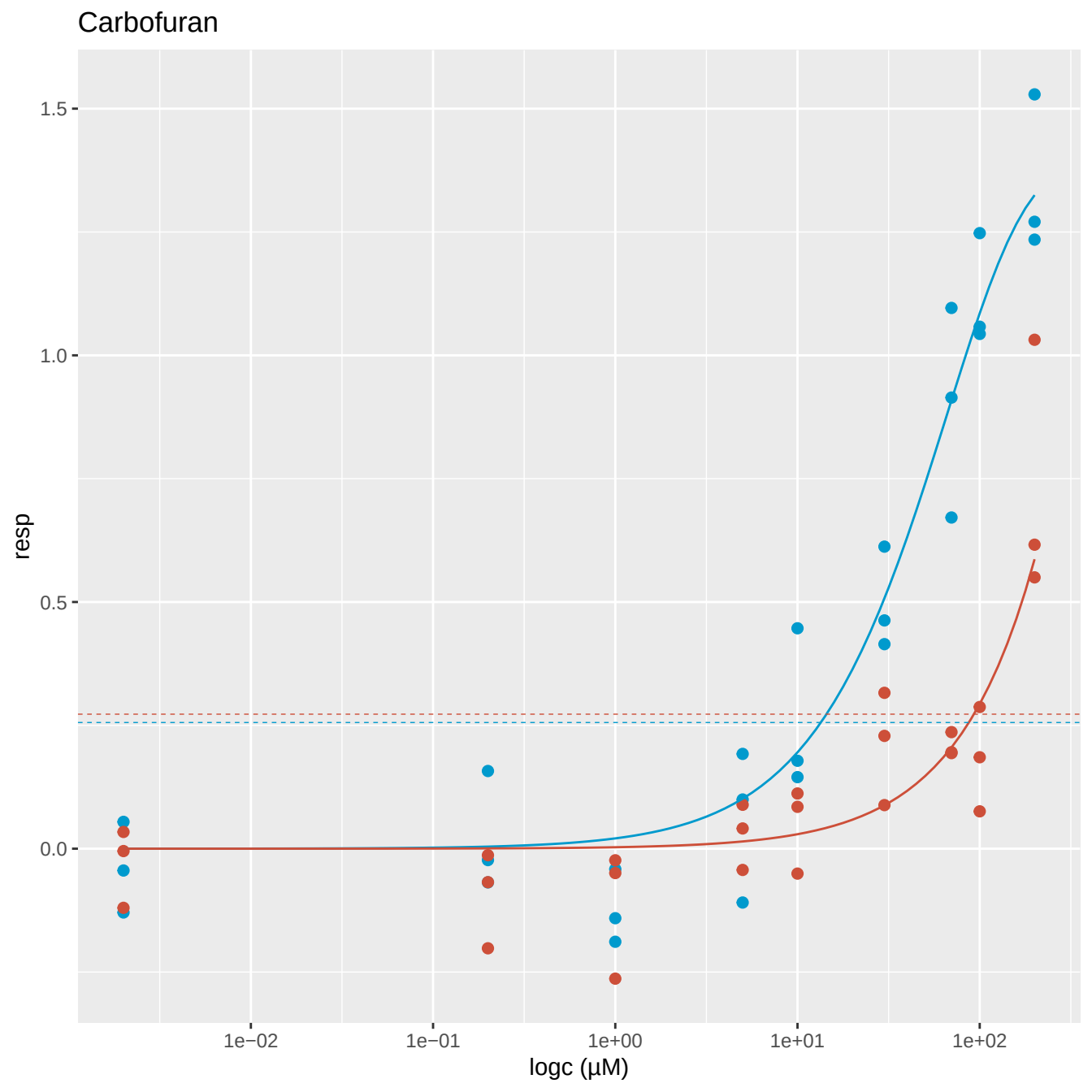

Azobenzene
resp
3
2
1
0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

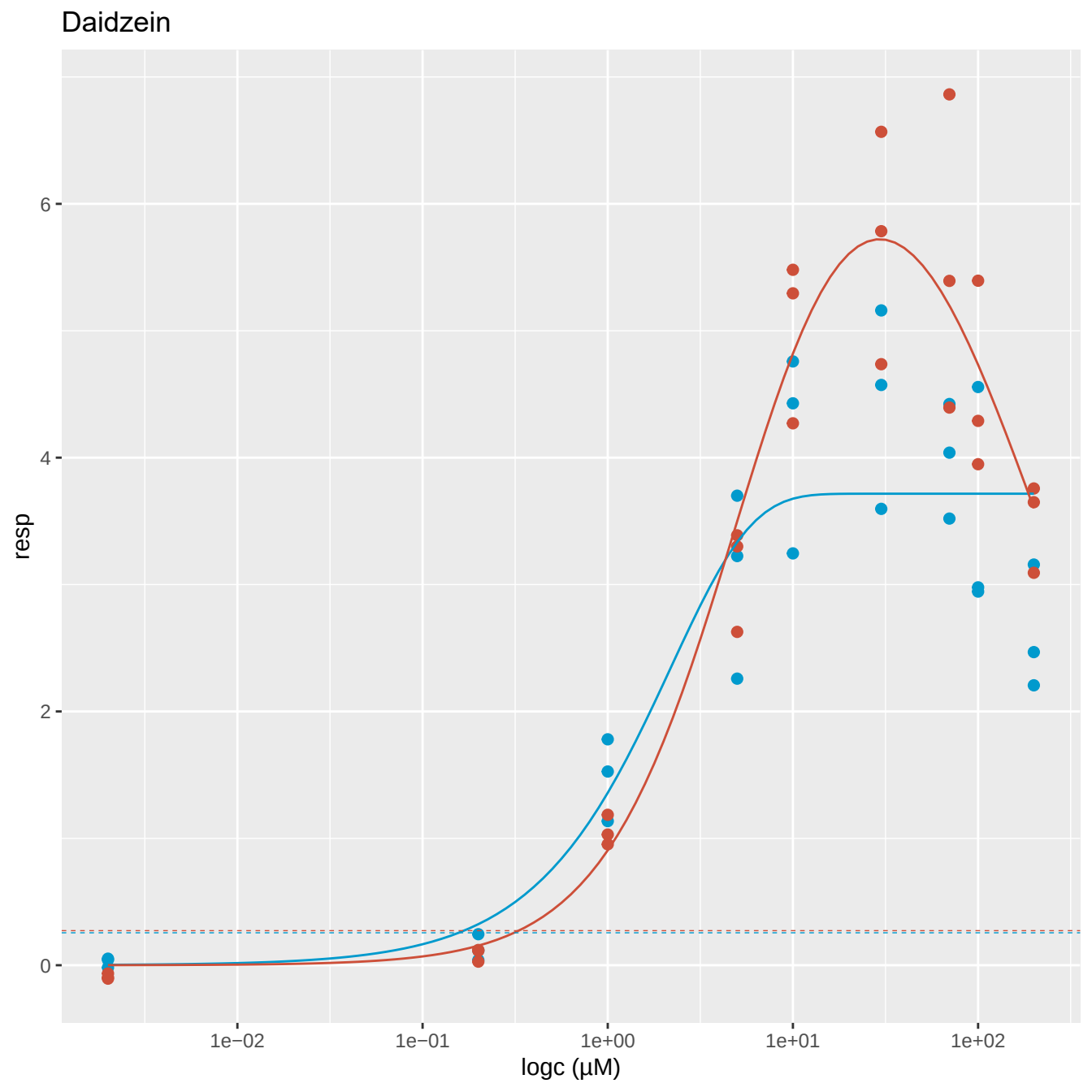

Benzyl salicylate
resp
1.5
1.0
0.5
0.0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

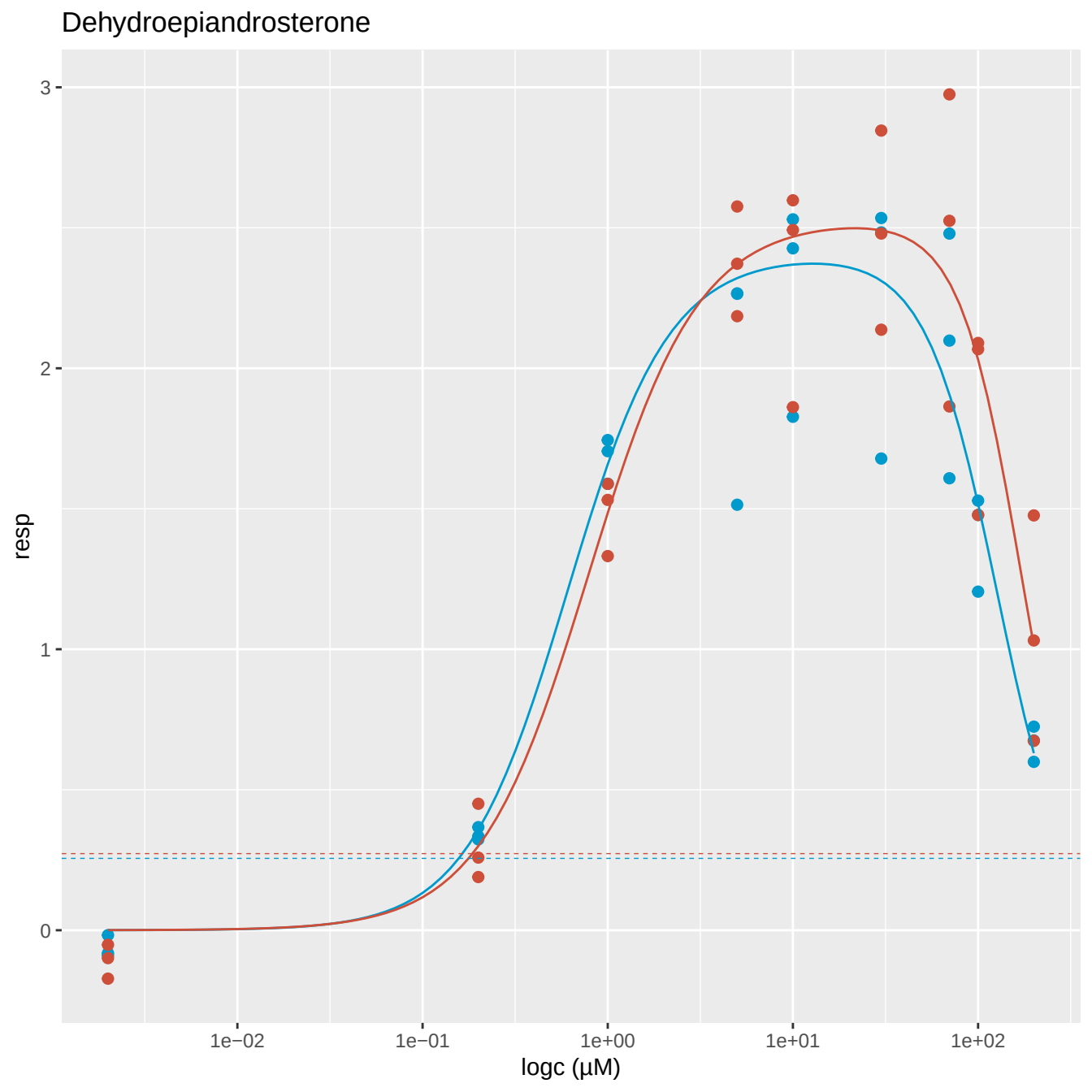

Biphenyl
resp
1.5
1.0
0.5
0.0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

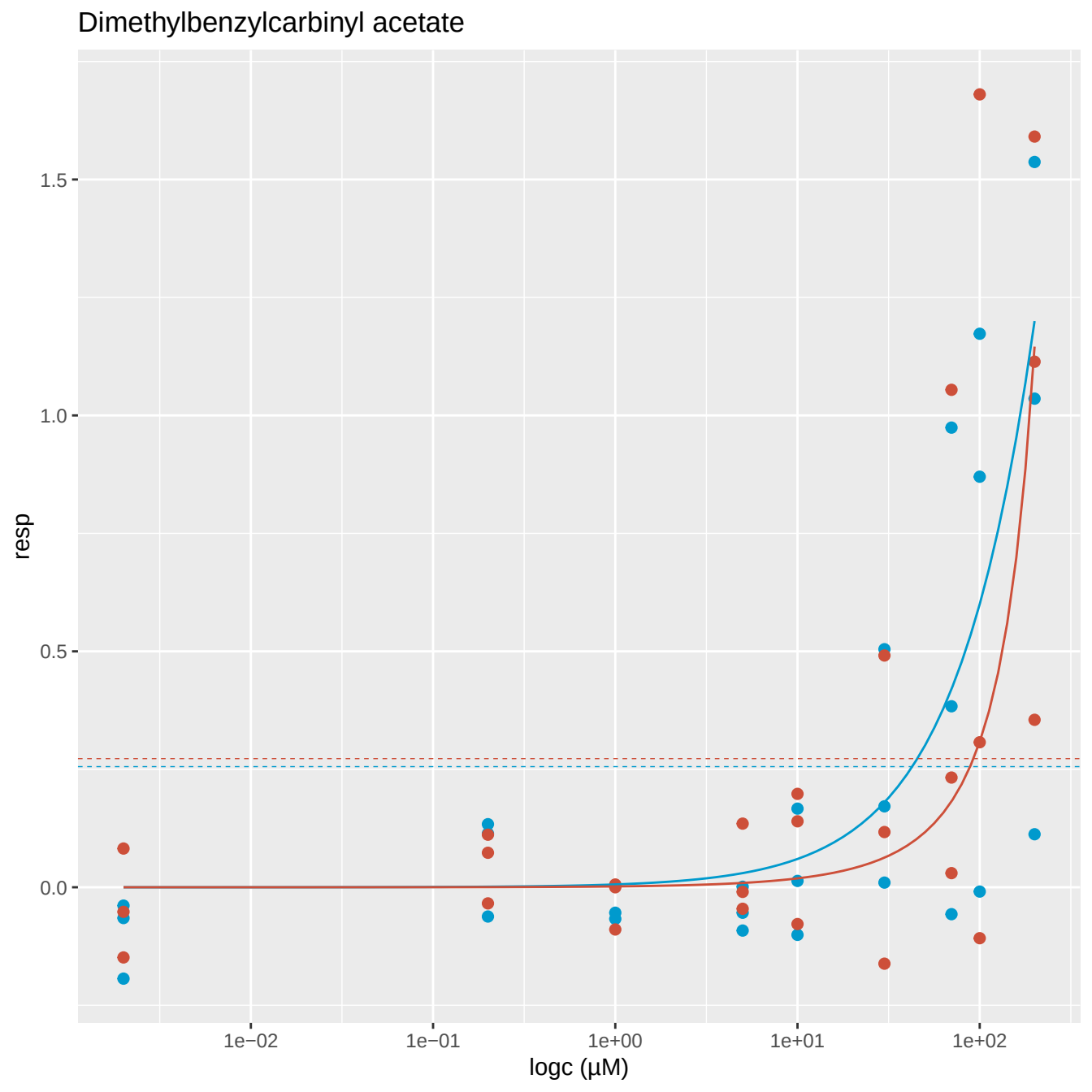

Butralin
resp
2.5
2.0
1.5
1.0
0.5
0.0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

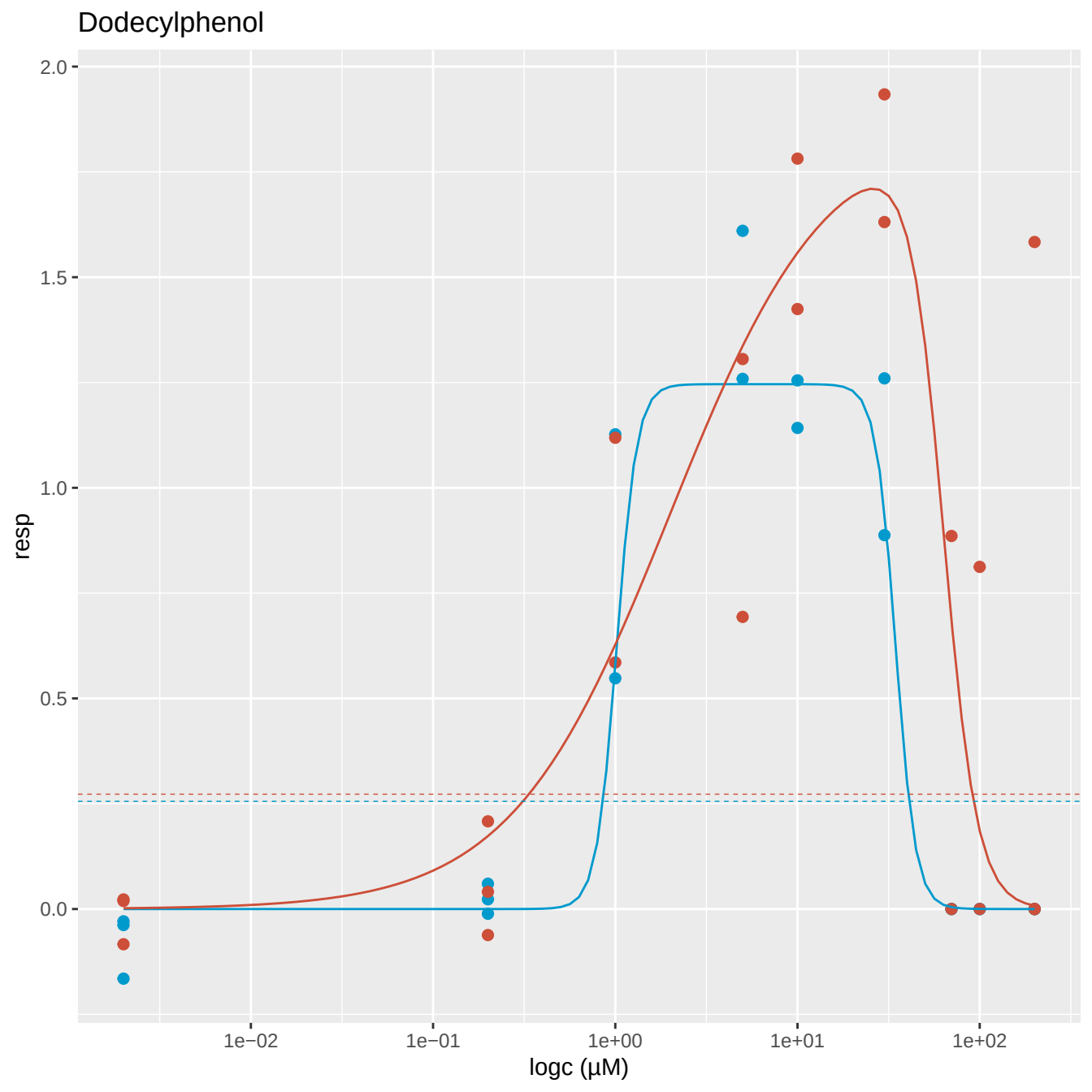

Butylparaben
resp
4
2
0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

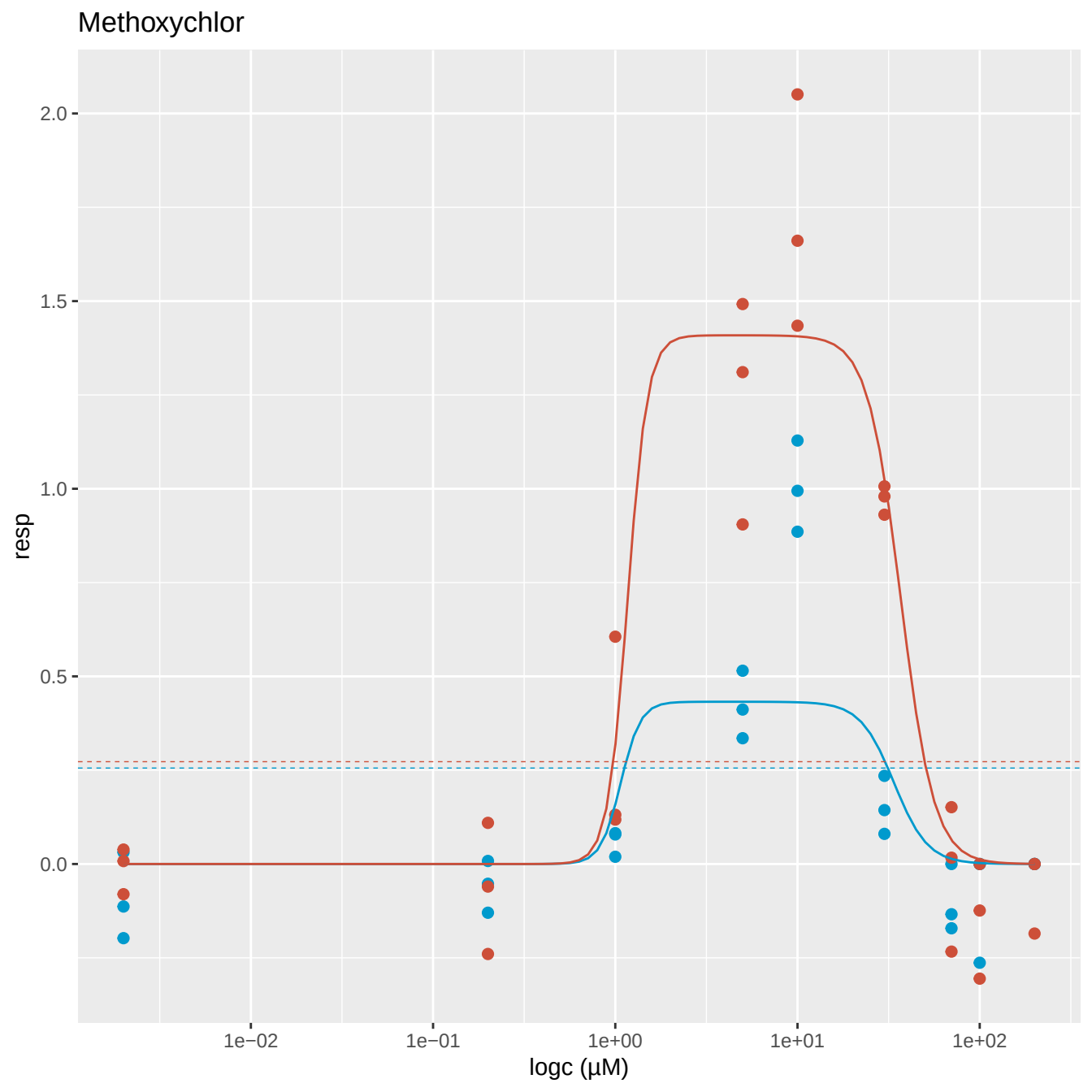

Carbofuran
1.5
1.0
0.5
0.0
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

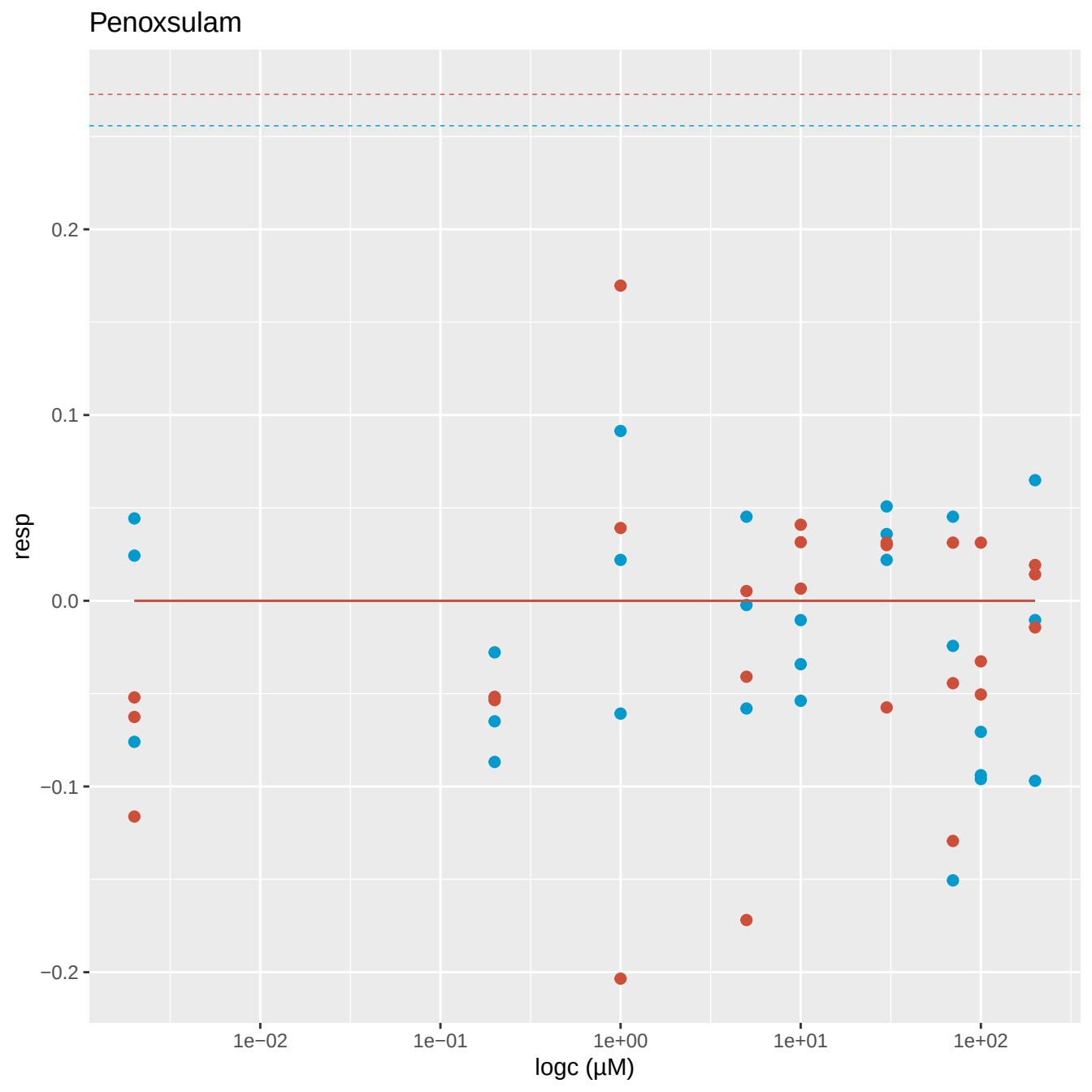

Daidzein
resp
6
4
2
0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

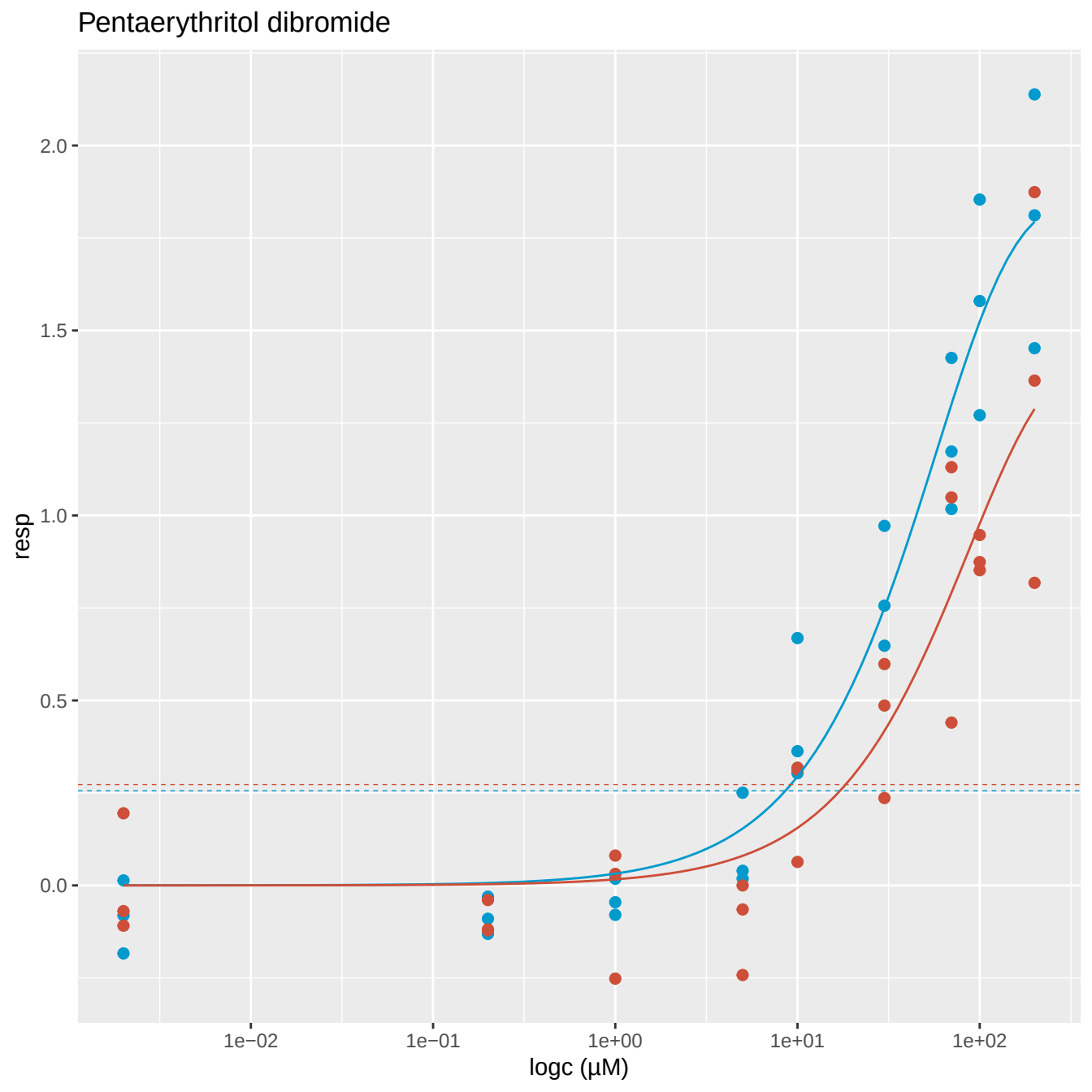

Dehydroepiandrosterone
resp
3
2
1
0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

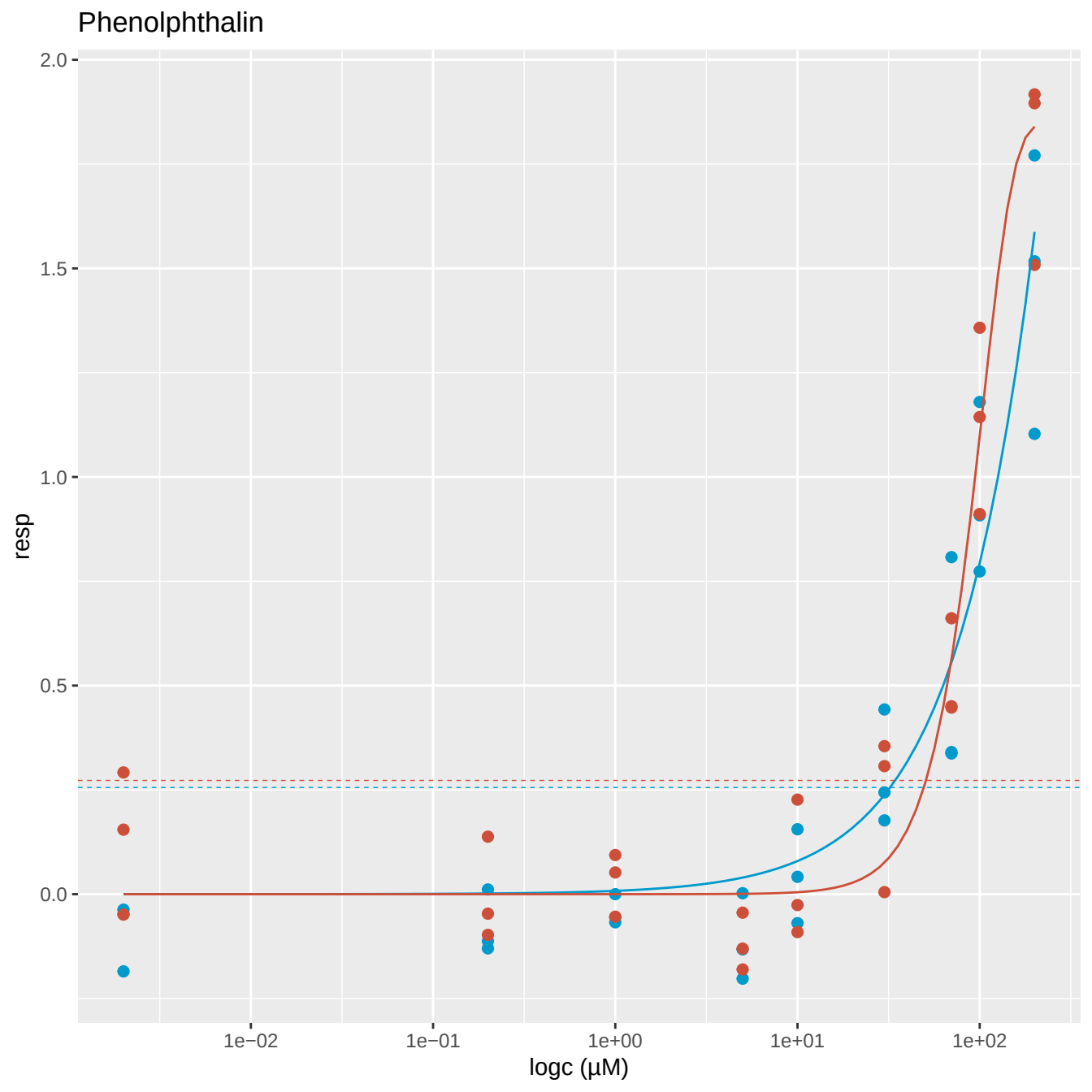

Dimethylbenzylcarbinyl acetate
resp
1.5
1.0
0.5
0.0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

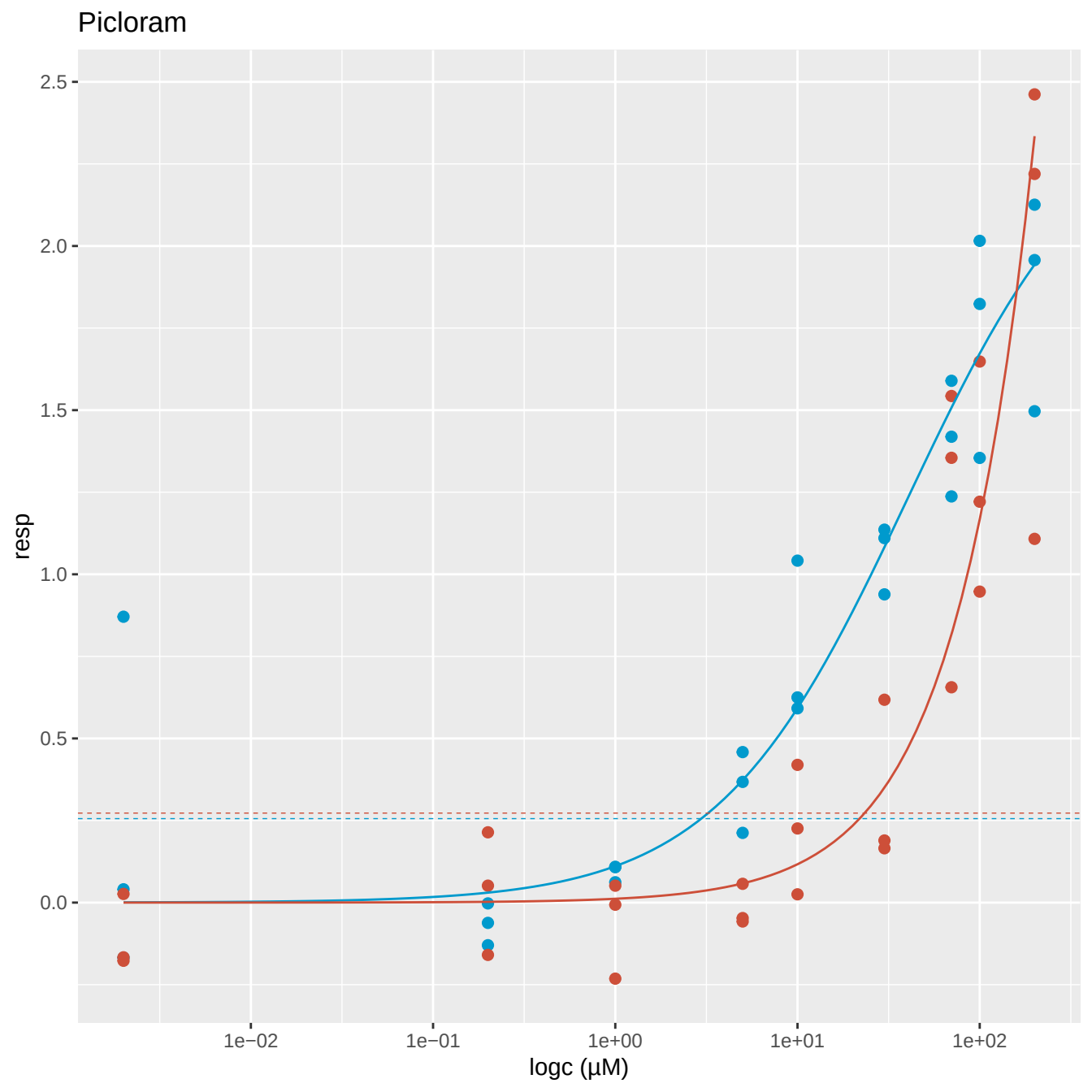

Dodecylphenol
2.0
1.5
1.0
0.5
0.0
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

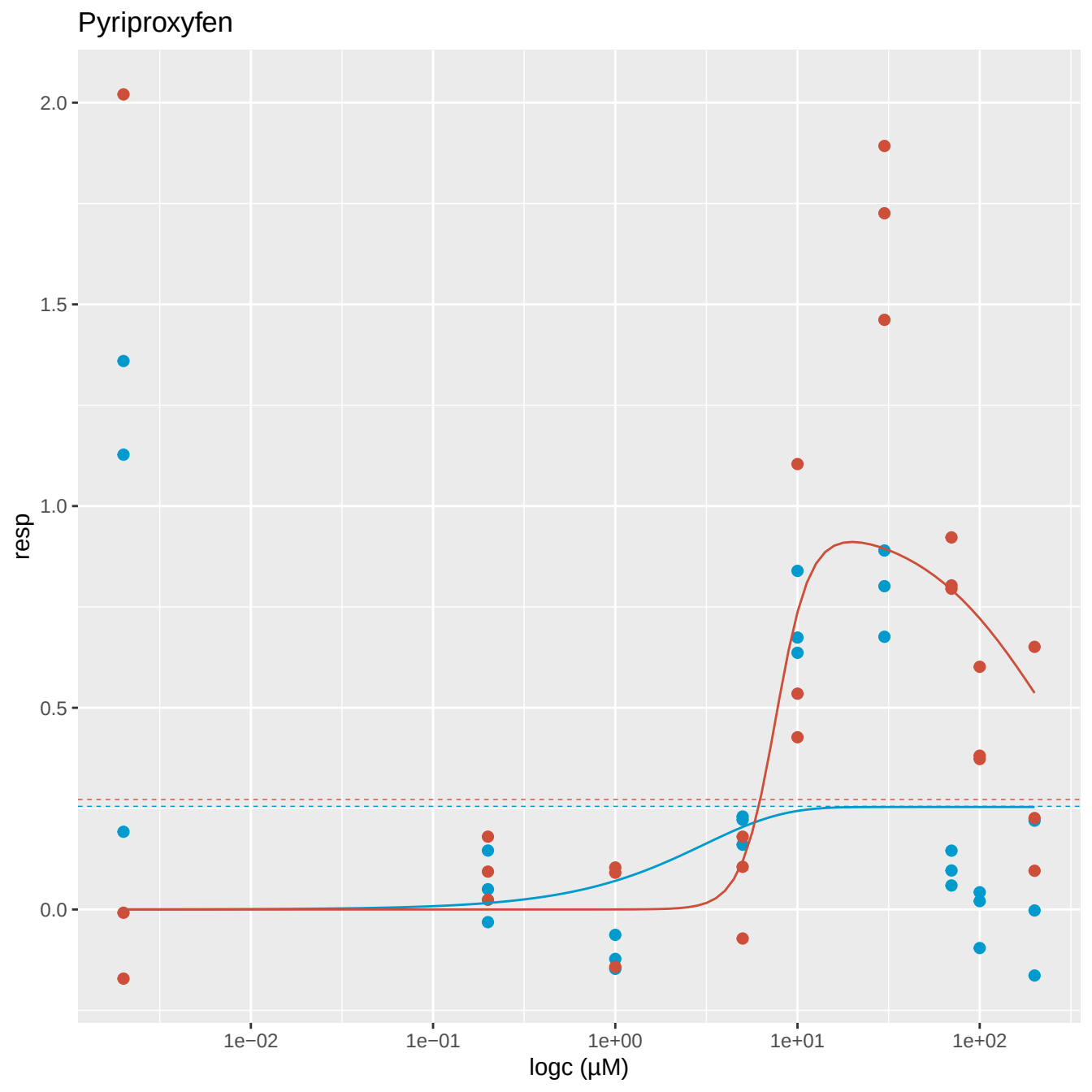

Methoxychlor
2.0
1.5
1.0
0.5
0.0
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

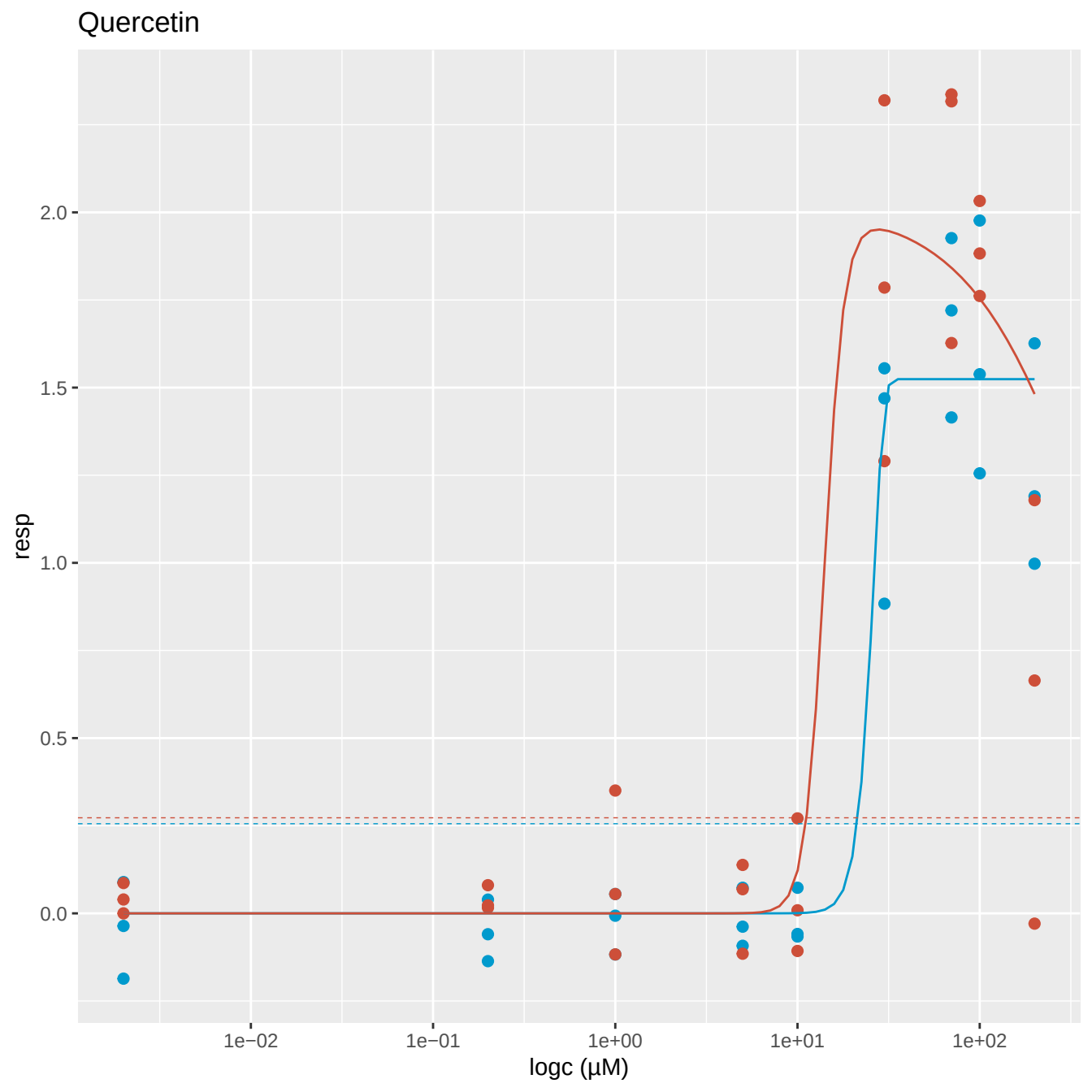

Penoxsulam
resp
0.2
0.1
0.0
−0.1
−0.2
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

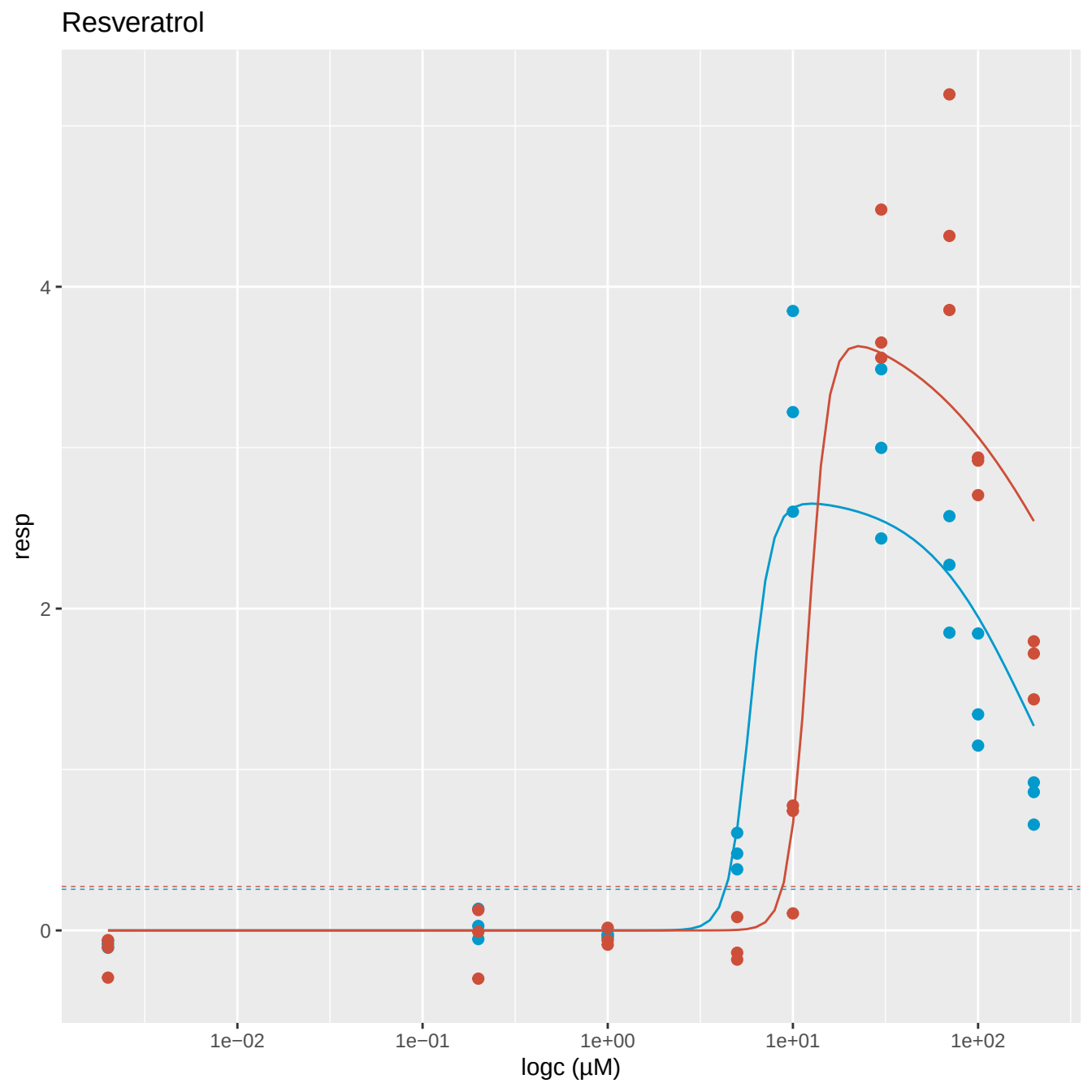

Pentaerythritol dibromide
resp
2.0
1.5
1.0
0.5
0.0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)

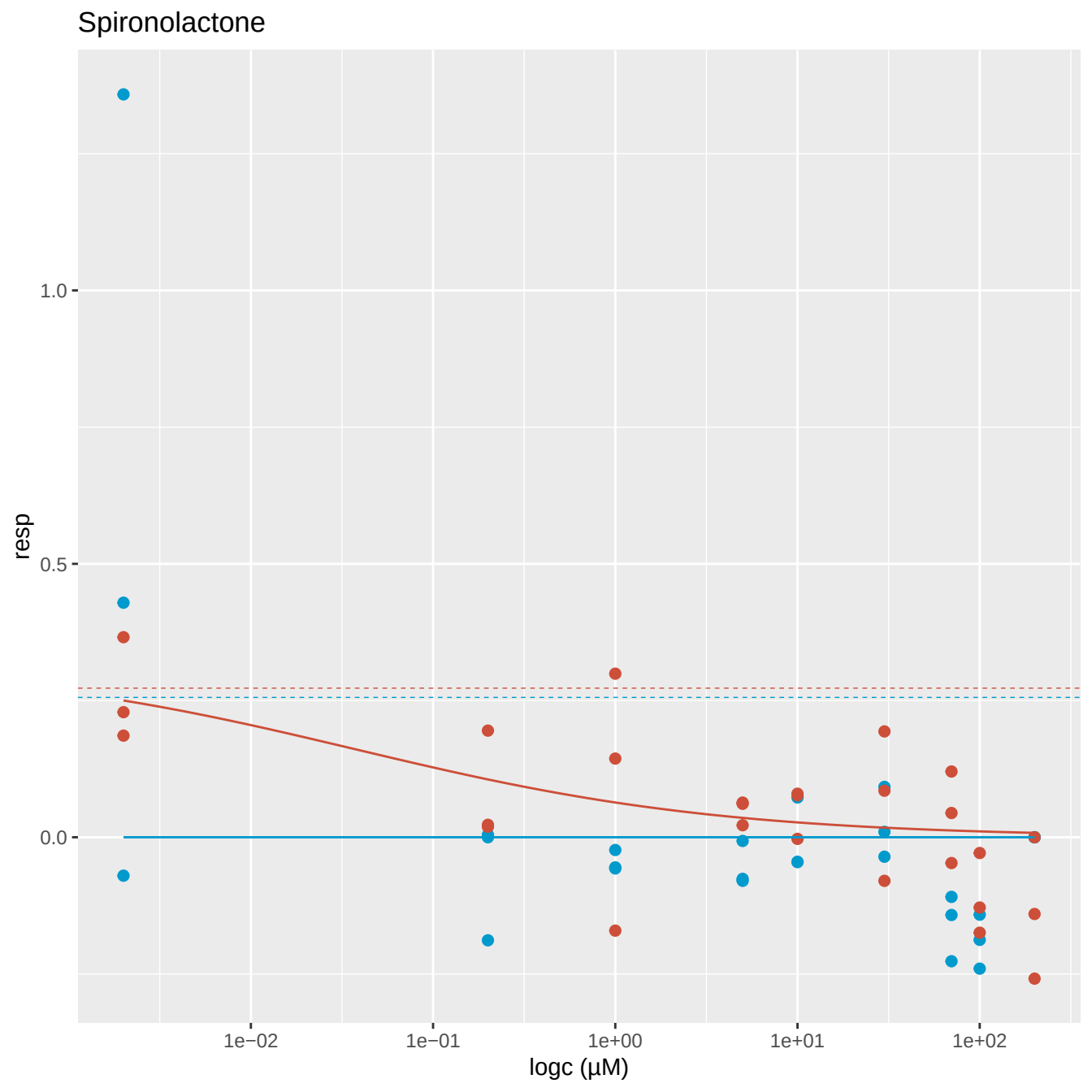

Phenolphthalin
2.0
1.5
1.0
0.5
0.0
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)


Picloram
2.5
2.0
1.5
1.0
0.5
0.0
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)


Pyriproxyfen
2.0
1.5
1.0
0.5
0.0
resp
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)


Quercetin
resp
2.0
1.5
1.0
0.5
0.0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)


Resveratrol
resp
4
2
0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)


Spironolactone
resp
1.0
0.5
0.0
1e−02
1e−01
1e+00
1e+01
1e+02
logc (µM)