

Analyte	Q1 Mass (amu)	Q3 Mass (amu) <sup>1</sup>	DP <sup>2</sup> (V)	CE <sup>3</sup> (eV)	CXP <sup>4</sup> (V)	RT <sup>5</sup> (min)
Glutathione (reduced)	308.1	<u>76.1</u>	51	37	4	2.10
		162.1	51	25	12	
		179.0	51	19	14	
Glutathione (oxidized)	613.2	<u>355.1</u>	81	33	10	2.64
		484.1	81	25	4	
		231.0	81	49	12	

**Supplementary Table 1:** LC/MS/MS parameters and retention time for the determination of reduced and oxidized glutathione. <sup>1</sup> The quantification transition is underlined; <sup>2</sup> Declustering potential; <sup>3</sup> Collision energy; <sup>4</sup> Collision cell exit potential; <sup>5</sup> Retention time

Data:

Mesophyll volume: 697.681  $\mu\text{l/gFW}$   
Biochemistry: 371.57 nmol/gFW

	$R_{\text{comp}}$	Corresponding Labeling density (gold particle/ $\mu\text{m}^2$ )	$V_{\text{comp}}$ ( $\mu\text{l/gFW}$ )
Mitochondria	0.0047 (=0.47%)	601.1	3.279
Plastids	0.1563 (=15.63%)	46.9	109.076
Nuclei	0.0047 (=0.47%)	259.8	3.279
Peroxisomes	0.0014 (=0.14%)	178.8	1.003
Cytosol	0.0410 (=4.10%)	181.5	28.602
Vacuole	0.7919 (=79.19%)	3.2	552.512

	#goldparticles* $r_{\text{Komp}}$	$g_{\text{Komp}}$	nmol/gFW	conc (mM)
Mitochondria	2.83	0.131 (=13.1%)	48.68	<b>14.85</b>
Plastids	7.33	0.339 (=33.9%)	125.96	<b>1.16</b>
Nuclei	1.22	0.057 (=5.7%)	21.18	<b>6.46</b>
Peroxisomes	0.26	0.014 (=1.4%)	4.4	<b>4.39</b>
Cytosol	7.44	0.343 (=34.3%)	128.0	<b>4.48</b>
Vacuole	2.52	0.116 (=11.6%)	43.3	<b>0.08</b>
	<b><math>\Sigma=21.6</math></b>	1 (=100%)	371.5	

**Supplementary Table 2:** Example for the calculations of glutathione concentrations in mM according to material and methods. Small differences in the final concentration are due to rounding errors. The final values shown in fig. 3 were calculated with all decimal places whereas in this calculation we have only used 1-3 decimal places for each individual calculation in order to simplify the calculation.