

Supplementary Table s1. Spearman rank correlation among mouse three oxidative genes (Mouse without Gulo)

Spearman Rank Correlation (rho)

	<a href="#">Trait1</a>	<a href="#">Trait2</a>	<a href="#">Trait3</a>	<a href="#">Trait4</a>	<a href="#">Trait5</a>	<a href="#">Trait6</a>	<a href="#">Trait7</a>	<a href="#">Trait8</a>	<a href="#">Trait9</a>	<a href="#">Trait10</a>	<a href="#">Trait11</a>	<a href="#">Trait12</a>	<a href="#">Trait13</a>	<a href="#">Trait14</a>	<a href="#">Trait15</a>	<a href="#">Trait16</a>	<a href="#">Trait17</a>	
P e a r s o n  r	<a href="#">Trait 1: GSE16780 UCLA ML0911::1416429 a at A</a> Cat on Chr 2 @ 103.294184 Mb catalase distal 3' UTR	<b><u>n</u></b> <u>32</u>	<b><u>0.752</u></b> <u>32</u>	<u>0.141</u> <u>32</u>	<u>-0.324</u> <u>32</u>	<u>0.093</u> <u>32</u>	<u>0.209</u> <u>32</u>	<u>0.189</u> <u>32</u>	<u>0.404</u> <u>32</u>	<u>-0.044</u> <u>32</u>	<u>-0.072</u> <u>32</u>	<u>0.451</u> <u>32</u>	<u>-0.144</u> <u>32</u>	<b><u>0.514</u></b> <u>32</u>	<u>0.366</u> <u>32</u>	<u>0.178</u> <u>32</u>	<u>-0.318</u> <u>32</u>	<u>-0.367</u> <u>32</u>
	<a href="#">Trait 2: GSE16780 UCLA ML0911::1416430 at A</a> Cat on Chr 2 @ 103.29421 Mb catalase mid 3' UTR	<b><u>0.754</u></b> <u>32</u>	<b><u>n</u></b> <u>32</u>	<u>0.237</u> <u>32</u>	<u>-0.289</u> <u>32</u>	<u>-0.040</u> <u>32</u>	<u>0.035</u> <u>32</u>	<u>0.231</u> <u>32</u>	<u>0.180</u> <u>32</u>	<u>0.107</u> <u>32</u>	<u>-0.010</u> <u>32</u>	<u>0.349</u> <u>32</u>	<u>-0.044</u> <u>32</u>	<b><u>0.589</u></b> <u>32</u>	<u>0.464</u> <u>32</u>	<u>0.237</u> <u>32</u>	<u>-0.023</u> <u>32</u>	<u>-0.172</u> <u>32</u>
	<a href="#">Trait 3: GSE16780 UCLA ML0911::1460671 at A</a> Gpx1 on Chr 9 @ 108.241871 Mb	<u>0.152</u> <u>32</u>	<u>0.247</u> <u>32</u>	<b><u>n</u></b> <u>32</u>	<u>-0.144</u> <u>32</u>	<u>0.475</u> <u>32</u>	<b><u>0.537</u></b> <u>32</u>	<u>0.253</u> <u>32</u>	<u>-0.120</u> <u>32</u>	<u>0.137</u> <u>32</u>	<u>0.179</u> <u>32</u>	<u>0.366</u> <u>32</u>	<u>-0.135</u> <u>32</u>	<u>0.410</u> <u>32</u>	<u>0.416</u> <u>32</u>	<u>-0.162</u> <u>32</u>	<u>0.043</u> <u>32</u>	<u>-0.359</u> <u>32</u>

glutathione peroxidase 1 exons 1 and 2 and proximal 3' UTR																	
<a href="#">Trait 4: GSE16780 UCLA ML0911::1449106 at A</a> Gpx3 on Chr 11 @ 54.723291 Mb glutathione peroxidase 3 3' UTR	<u><math>\frac{-0.445}{32}</math></u>	<u><math>\frac{-0.478}{32}</math></u>	<u><math>\frac{-0.335}{32}</math></u>	<b><u><math>\frac{n}{32}</math></u></b>	<u><math>\frac{-0.073}{32}</math></u>	<u><math>\frac{-0.096}{32}</math></u>	<u><math>\frac{-0.085}{32}</math></u>	<u><math>\frac{-0.268}{32}</math></u>	<u><math>\frac{0.254}{32}</math></u>	<u><math>\frac{-0.006}{32}</math></u>	<u><math>\frac{-0.471}{32}</math></u>	<u><math>\frac{0.177}{32}</math></u>	<u><math>\frac{-0.238}{32}</math></u>	<u><math>\frac{-0.173}{32}</math></u>	<u><math>\frac{-0.343}{32}</math></u>	<u><math>\frac{0.079}{32}</math></u>	<u><math>\frac{0.238}{32}</math></u>
<a href="#">Trait 5: GSE16780 UCLA ML0911::1451695 a at A</a> Gpx4 on Chr 10 @ 45.595286 Mb glutathione peroxidase 4 last five exons	<u><math>\frac{0.016}{32}</math></u>	<u><math>\frac{0.004}{32}</math></u>	<u><math>\frac{0.654}{32}</math></u>	<u><math>\frac{-0.125}{32}</math></u>	<b><u><math>\frac{n}{32}</math></u></b>	<u><math>\frac{0.666}{32}</math></u>	<u><math>\frac{0.220}{32}</math></u>	<u><math>\frac{0.248}{32}</math></u>	<u><math>\frac{-0.102}{32}</math></u>	<u><math>\frac{0.512}{32}</math></u>	<u><math>\frac{0.387}{32}</math></u>	<u><math>\frac{-0.289}{32}</math></u>	<u><math>\frac{0.194}{32}</math></u>	<u><math>\frac{0.258}{32}</math></u>	<u><math>\frac{0.076}{32}</math></u>	<u><math>\frac{0.084}{32}</math></u>	<u><math>\frac{-0.403}{32}</math></u>
<a href="#">Trait 6: GSE16780 UCLA ML0911::1456193 x at A</a> Gpx4 on Chr 10 @ 45.595578 Mb glutathione peroxidase 4 last exon and 3' UTR	<u><math>\frac{0.170}{32}</math></u>	<u><math>\frac{0.122}{32}</math></u>	<u><math>\frac{0.704}{32}</math></u>	<u><math>\frac{-0.195}{32}</math></u>	<u><math>\frac{0.804}{32}</math></u>	<b><u><math>\frac{n}{32}</math></u></b>	<u><math>\frac{0.429}{32}</math></u>	<u><math>\frac{0.115}{32}</math></u>	<u><math>\frac{-0.018}{32}</math></u>	<u><math>\frac{0.376}{32}</math></u>	<u><math>\frac{0.441}{32}</math></u>	<u><math>\frac{-0.262}{32}</math></u>	<u><math>\frac{0.328}{32}</math></u>	<u><math>\frac{0.458}{32}</math></u>	<u><math>\frac{-0.242}{32}</math></u>	<u><math>\frac{-0.125}{32}</math></u>	<u><math>\frac{-0.151}{32}</math></u>
<a href="#">Trait 7: GSE16780 UCLA ML0911::1420698 at A</a> Gpx5 on Chr 13 @ 21.378334 Mb glutathione peroxidase 5 distal 3' UTR	<u><math>\frac{0.137}{32}</math></u>	<u><math>\frac{0.248}{32}</math></u>	<u><math>\frac{0.326}{32}</math></u>	<u><math>\frac{-0.017}{32}</math></u>	<u><math>\frac{0.301}{32}</math></u>	<u><math>\frac{0.423}{32}</math></u>	<b><u><math>\frac{n}{32}</math></u></b>	<u><math>\frac{0.089}{32}</math></u>	<u><math>\frac{-0.061}{32}</math></u>	<u><math>\frac{0.009}{32}</math></u>	<u><math>\frac{0.113}{32}</math></u>	<u><math>\frac{-0.219}{32}</math></u>	<u><math>\frac{0.261}{32}</math></u>	<u><math>\frac{0.398}{32}</math></u>	<u><math>\frac{-0.361}{32}</math></u>	<u><math>\frac{0.173}{32}</math></u>	<u><math>\frac{0.212}{32}</math></u>

<a href="#">Trait 8: GSE16780 UCLA ML0911::1452135 at A</a> Gpx6 on Chr 13 @ 21.410881 Mb glutathione peroxidase 6	<u>0.417</u> 32	<u>0.329</u> 32	<u>-0.017</u> 32	<u>-0.255</u> 32	<u>0.148</u> 32	<u>0.043</u> 32	<u>0.245</u> 32	<b><i>n</i></b> 32	<u>-0.264</u> 32	<u>0.188</u> 32	<u>0.366</u> 32	<u>-0.182</u> 32	<u>0.153</u> 32	<u>0.049</u> 32	<u>0.139</u> 32	<u>-0.387</u> 32	<u>-0.283</u> 32
<a href="#">Trait 9: GSE16780 UCLA ML0911::1417836 at A</a> Gpx7 on Chr 4 @ 108.073058 Mb glutathione peroxidase 7	<u>-0.223</u> 32	<u>-0.037</u> 32	<u>0.046</u> 32	<u>0.270</u> 32	<u>-0.099</u> 32	<u>-0.058</u> 32	<u>0.021</u> 32	<u>-0.076</u> 32	<b><i>n</i></b> 32	<u>0.349</u> 32	<u>-0.422</u> 32	<u>-0.023</u> 32	<u>0.199</u> 32	<u>0.161</u> 32	<u>0.185</u> 32	<u>0.238</u> 32	<u>0.280</u> 32
<a href="#">Trait 10: GSE16780 UCLA ML0911::1424099 at A</a> Gpx8 on Chr 13 @ 113.833243 Mb glutathione peroxidase 8 last 2 exons and proximal 3' UTR	<u>-0.296</u> 32	<u>-0.186</u> 32	<u>0.239</u> 32	<u>0.014</u> 32	<u>0.472</u> 32	<u>0.429</u> 32	<u>-0.078</u> 32	<u>-0.012</u> 32	<u>0.462</u> 32	<b><i>n</i></b> 32	<u>0.125</u> 32	<u>-0.235</u> 32	<u>0.124</u> 32	<u>0.220</u> 32	<u>0.226</u> 32	<u>0.241</u> 32	<u>0.007</u> 32
<a href="#">Trait 11: GSE16780 UCLA ML0911::1451124 at A</a> Sod1 on Chr 16 @ 90.223027 Mb superoxide dismutase 1, soluble first four exons and 3' UTR	<u>0.433</u> 32	<u>0.376</u> 32	<b><u>0.503</u></b> 32	<b><u>-0.555</u></b> 32	<u>0.428</u> 32	<u>0.490</u> 32	<u>0.008</u> 32	<u>0.269</u> 32	<u>-0.362</u> 32	<u>0.107</u> 32	<b><i>n</i></b> 32	<u>-0.363</u> 32	<u>0.397</u> 32	<u>0.401</u> 32	<u>0.124</u> 32	<u>-0.261</u> 32	<u>-0.500</u> 32
<a href="#">Trait 12: GSE16780 UCLA ML0911::1435304 at A</a> Sod1 on Chr 16 @ 90.22488 Mb superoxide dismutase 1, soluble antisense in intron 3 and exon 4	<u>-0.028</u> 32	<u>-0.052</u> 32	<u>-0.087</u> 32	<u>0.092</u> 32	<u>-0.187</u> 32	<u>-0.151</u> 32	<u>-0.213</u> 32	<u>-0.116</u> 32	<u>-0.097</u> 32	<u>-0.224</u> 32	<u>-0.212</u> 32	<b><i>n</i></b> 32	<u>-0.113</u> 32	<u>-0.203</u> 32	<u>-0.053</u> 32	<u>-0.034</u> 32	<u>0.103</u> 32

<a href="#">Trait 13: GSE16780 UCLA ML0911::1417193 at A</a> Sod2 on Chr 17 @ 13.206311 Mb superoxide dismutase 2, mitochondrial last three exons and proximal 3' UTR	<u>0.500</u> 32	<u>0.678</u> 32	<u>0.467</u> 32	<u>-0.426</u> 32	<u>0.328</u> 32	<u>0.449</u> 32	<u>0.307</u> 32	<u>0.325</u> 32	<u>0.024</u> 32	<u>0.076</u> 32	<u>0.549</u> 32	<u>-0.124</u> 32	<b>n</b> 32	<u>0.906</u> 32	<u>0.114</u> 32	<u>-0.134</u> 32	<u>-0.355</u> 32
<a href="#">Trait 14: GSE16780 UCLA ML0911::1448610 a at A</a> Sod2 on Chr 17 @ 13.208027 Mb superoxide dismutase 2, mitochondrial last exon and proximal 3' UTR	<u>0.356</u> 32	<u>0.522</u> 32	<u>0.525</u> 32	<u>-0.310</u> 32	<u>0.422</u> 32	<u>0.586</u> 32	<u>0.433</u> 32	<u>0.214</u> 32	<u>0.039</u> 32	<u>0.205</u> 32	<u>0.514</u> 32	<u>-0.206</u> 32	<u>0.909</u> 32	<b>n</b> 32	<u>0.025</u> 32	<u>-0.020</u> 32	<u>-0.249</u> 32
<a href="#">Trait 15: GSE16780 UCLA ML0911::1417194 at A</a> Sod2 on Chr 17 @ 13.20865 Mb superoxide dismutase 2, mitochondrial	<u>0.219</u> 32	<u>0.200</u> 32	<u>-0.094</u> 32	<u>-0.295</u> 32	<u>0.049</u> 32	<u>-0.153</u> 32	<u>-0.237</u> 32	<u>0.314</u> 32	<u>0.204</u> 32	<u>0.168</u> 32	<u>0.246</u> 32	<u>-0.066</u> 32	<u>0.244</u> 32	<u>0.123</u> 32	<b>n</b> 32	<u>0.140</u> 32	<u>-0.216</u> 32
<a href="#">Trait 16: GSE16780 UCLA ML0911::1417634 at A</a> Sod3 on Chr 5 @ 52.759404 Mb superoxide dismutase 3, extracellular	<u>-0.401</u> 32	<u>-0.011</u> 32	<u>0.022</u> 32	<u>-0.081</u> 32	<u>0.082</u> 32	<u>-0.105</u> 32	<u>0.193</u> 32	<u>-0.281</u> 32	<u>0.141</u> 32	<u>0.207</u> 32	<u>-0.225</u> 32	<u>-0.244</u> 32	<u>-0.115</u> 32	<u>-0.045</u> 32	<u>-0.057</u> 32	<b>n</b> 32	<u>0.346</u> 32
<a href="#">Trait 17: GSE16780 UCLA ML0911::1417633 at A</a> Sod3 on Chr 5 @ 52.760191 Mb superoxide dismutase 3, extracellular	<u>-0.362</u> 32	<u>-0.326</u> 32	<u>-0.400</u> 32	<u>0.295</u> 32	<u>-0.407</u> 32	<u>-0.276</u> 32	<u>0.163</u> 32	<u>-0.260</u> 32	<u>0.082</u> 32	<u>-0.055</u> 32	<u>-0.465</u> 32	<u>0.084</u> 32	<u>-0.542</u> 32	<u>-0.409</u> 32	<u>-0.402</u> 32	<u>0.400</u> 32	<b>n</b> 32

Supplementary Table s2. Spearman rank correlation of three oxidative genes among humans (Human liver)

Spearman Rank Correlation (rho)

	Trait1	Trait2	Trait3	Trait4	Trait5	Trait6	Trait7	Trait8	Trait9	Trait10	Trait11	Trait12	Trait13	Trait14	Trait15
<a href="#">Trait 1: HLC_0311::10023826334</a> CAT on Chr 11 @ 34.493607 Mb catalase	<b>n</b> 427	<u>-0.488</u> 427	<u>-0.473</u> 427	<u>-0.458</u> 427	<u>0.516</u> 427	<u>0.077</u> 427	<u>-0.149</u> 426	<u>0.152</u> 426	<u>0.008</u> 427	<u>-0.336</u> 427	<u>-0.415</u> 427	<u>0.800</u> 426	<u>0.849</u> 427	<u>-0.712</u> 427	<u>-0.237</u> 427
<a href="#">Trait 2: HLC_0311::10023814607</a> GPX1 on Chr 3 @ 49.394608 Mb glutathione peroxidase 1	<u>-0.438</u> 427	<b>n</b> 427	<u>0.467</u> 427	<u>0.495</u> 427	<u>-0.093</u> 427	<u>-0.361</u> 427	<u>0.195</u> 426	<u>-0.063</u> 426	<u>-0.146</u> 427	<u>0.302</u> 427	<u>0.340</u> 427	<u>-0.535</u> 426	<u>-0.519</u> 427	<u>0.391</u> 427	<u>-0.058</u> 427
<a href="#">Trait 3: HLC_0311::10023809881</a> GPX2 on Chr 14 @ 65.405871 Mb glutathione peroxidase 2 (gastrointestinal)	<u>-0.359</u> 427	<u>0.463</u> 427	<b>n</b> 427	<u>0.332</u> 427	<u>-0.073</u> 427	<u>-0.306</u> 427	<u>0.207</u> 426	<u>-0.174</u> 426	<u>-0.134</u> 427	<u>0.263</u> 427	<u>0.417</u> 427	<u>-0.330</u> 426	<u>-0.366</u> 427	<u>0.337</u> 427	<u>0.032</u> 427
<a href="#">Trait 4: HLC_0311::10023805643</a> GPX3 on Chr 5 @ 150.408554 Mb	<u>-0.388</u> 427	<u>0.500</u> 427	<u>0.616</u> 427	<b>n</b> 427	<u>-0.019</u> 427	<u>-0.233</u> 427	<u>0.285</u> 426	<u>-0.037</u> 426	<u>-0.181</u> 427	<u>0.127</u> 427	<u>0.050</u> 427	<u>-0.430</u> 426	<u>-0.443</u> 427	<u>0.440</u> 427	<u>0.180</u> 427

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glutathione peroxidase 3 (plasma)																
<a href="#">Trait 5: HLC_0311::10023815372</a>																
GPX4 on Chr 19 @ 1.106787 Mb glutathione peroxidase 4 (phospholipid hydroperoxidase)	<u>0.459</u> 427	<u>-0.022</u> 427	<u>0.139</u> 427	<u>0.215</u> 427	<b>n</b> 427	<u>-0.273</u> 427	<u>-0.157</u> 426	<u>-0.091</u> 426	<u>-0.376</u> 427	<u>-0.303</u> 427	<u>-0.379</u> 427	<u>0.385</u> 426	<u>0.437</u> 427	<u>-0.451</u> 427	<u>-0.200</u> 427	
<a href="#">Trait 6: HLC_0311::10023813546</a>																
GPX5 on Chr 6 @ 28.502728 Mb glutathione peroxidase 5 (epididymal androgen-related protein)	<u>0.066</u> 427	<u>-0.398</u> 427	<u>-0.401</u> 427	<u>-0.366</u> 427	<u>-0.264</u> 427	<b>n</b> 427	<u>-0.076</u> 426	<u>0.149</u> 426	<u>0.612</u> 427	<u>0.098</u> 427	<u>0.129</u> 427	<u>0.168</u> 426	<u>0.091</u> 427	<u>-0.096</u> 427	<u>0.129</u> 427	
<a href="#">Trait 7: HLC_0311::10023819620</a>																
GPX5 on Chr 6 @ 28.502728 Mb glutathione peroxidase 5 (epididymal androgen-related protein)	<u>-0.088</u> 426	<u>0.097</u> 426	<u>0.207</u> 426	<u>0.179</u> 426	<u>-0.017</u> 426	<u>-0.004</u> 426	<b>n</b> 426	<u>0.131</u> 425	<u>0.022</u> 426	<u>0.102</u> 426	<u>0.059</u> 426	<u>-0.030</u> 425	<u>-0.061</u> 426	<u>0.230</u> 426	<u>-0.162</u> 426	
<a href="#">Trait 8: HLC_0311::10025911877</a>																
GPX6 on Chr 6 @ 28.471072 Mb glutathione peroxidase 6 (olfactory)	<u>0.139</u> 426	<u>-0.090</u> 426	<u>-0.236</u> 426	<u>-0.142</u> 426	<u>-0.105</u> 426	<u>0.191</u> 426	<u>-0.102</u> 425	<b>n</b> 426	<u>0.225</u> 426	<u>0.066</u> 426	<u>0.019</u> 426	<u>0.174</u> 425	<u>0.174</u> 426	<u>-0.026</u> 426	<u>-0.077</u> 426	
<a href="#">Trait 9: HLC_0311::10023821927</a>																
GPX7 on Chr 1 @ 53.074723 Mb glutathione peroxidase 7	<u>0.143</u> 427	<u>-0.312</u> 427	<u>-0.518</u> 427	<u>-0.660</u> 427	<u>-0.439</u> 427	<u>0.603</u> 427	<u>-0.109</u> 426	<u>0.214</u> 426	<b>n</b> 427	<u>0.214</u> 427	<u>0.337</u> 427	<u>0.069</u> 426	<u>-0.007</u> 427	<u>-0.075</u> 427	<u>0.148</u> 427	

<a href="#">Trait 10: HLC_0311::10025907159</a> GSR on Chr 8 @ 30.535579 Mb glutathione reductase	<u>-0.296</u> 427	<u>0.268</u> 427	<u>0.077</u> 427	<u>-0.062</u> 427	<u>-0.272</u> 427	<u>0.100</u> 427	<u>0.037</u> 426	<u>0.004</u> 426	<u>0.252</u> 427	<b>n</b> 427	<u>0.513</u> 427	<u>-0.204</u> 426	<u>-0.243</u> 427	<u>0.284</u> 427	<u>-0.077</u> 427
<a href="#">Trait 11: HLC_0311::10025903928</a> GSS on Chr 20 @ 33.516235 Mb glutathione synthetase	<u>-0.353</u> 427	<u>0.297</u> 427	<u>0.240</u> 427	<u>-0.071</u> 427	<u>-0.346</u> 427	<u>0.140</u> 427	<u>0.032</u> 426	<u>0.015</u> 426	<u>0.329</u> 427	<u>0.487</u> 427	<b>n</b> 427	<u>-0.293</u> 426	<u>-0.354</u> 427	<u>0.177</u> 427	<u>0.126</u> 427
<a href="#">Trait 12: HLC_0311::10023815327</a> SOD1 on Chr 21 @ 33.041243 Mb superoxide dismutase 1, soluble (amyotrophic lateral sclerosis 1 (adult))	<u>0.803</u> 426	<u>-0.512</u> 426	<u>-0.348</u> 426	<u>-0.514</u> 426	<u>0.283</u> 426	<u>0.220</u> 426	<u>-0.048</u> 425	<u>0.150</u> 425	<u>0.344</u> 426	<u>-0.124</u> 426	<u>-0.198</u> 426	<b>n</b> 426	<u>0.962</u> 426	<u>-0.575</u> 426	<u>-0.224</u> 426
<a href="#">Trait 13: HLC_0311::10033668826</a> SOD1 on Chr 21 @ 33.041243 Mb superoxide dismutase 1, soluble (amyotrophic lateral sclerosis 1 (adult))	<u>0.842</u> 427	<u>-0.492</u> 427	<u>-0.369</u> 427	<u>-0.524</u> 427	<u>0.324</u> 427	<u>0.152</u> 427	<u>-0.065</u> 426	<u>0.155</u> 426	<u>0.292</u> 427	<u>-0.161</u> 427	<u>-0.252</u> 427	<u>0.971</u> 426	<b>n</b> 427	<u>-0.585</u> 427	<u>-0.254</u> 427
<a href="#">Trait 14: HLC_0311::10023816501</a> SOD2 on Chr 6 @ 160.102754 Mb superoxide dismutase 2, mitochondrial	<u>-0.696</u> 427	<u>0.372</u> 427	<u>0.249</u> 427	<u>0.327</u> 427	<u>-0.416</u> 427	<u>-0.092</u> 427	<u>0.099</u> 426	<u>-0.041</u> 426	<u>-0.119</u> 427	<u>0.264</u> 427	<u>0.120</u> 427	<u>-0.548</u> 426	<u>-0.554</u> 427	<b>n</b> 427	<u>0.078</u> 427

<a href="#">Trait 15: HLC_0311::10023810228</a>															
SOD3 on Chr 4 @ 24.802467 Mb	$\frac{-0.219}{427}$	$\frac{-0.091}{427}$	$\frac{0.018}{427}$	$\frac{0.133}{427}$	$\frac{-0.180}{427}$	$\frac{0.086}{427}$	$\frac{-0.038}{426}$	$\frac{-0.095}{426}$	$\frac{0.076}{427}$	$\frac{-0.080}{427}$	$\frac{0.113}{427}$	$\frac{-0.235}{426}$	$\frac{-0.254}{427}$	$\frac{0.021}{427}$	<b><i>n</i></b> $\frac{427}{427}$
superoxide dismutase 3, extracellular															