Glutathione Peroxidase-like Activity of some organoselenium compounds

(ND = not determined; WS = without standard; WI = without information)

Comp.	NADPH consumption (GSH/GR)	RSSR formation	Source [**ROOH**]	Source [**RSH**]	catalyst [R**Se**]	ref.
2	240 ± 3 (**1**: 142±4) **μM min^{-1}**	PhSH oxidation 3.5 ± 0.4 (**1**: 7.5±0.3) **μM min^{-1}**	H_2O_2 (3.75 mM) or 1.6 mM (GR assay)	PhSH (1 mM) or GSH (2mM) and GR (0.67 U/mL)	80 μM	**164**
3	214 ± 2	9.9 ± 0.6				
4	210 ± 2	9.5 ± 1.0				
5	332 ± 4	129.9 ± 3.4				
6	121.3 ± 1.10 (**1**: 118±3) **μM min^{-1}**	-	H_2O_2 (1.6 mM)	GSH (2mM) and GR (1.3 U/mL)	80 μM	**45**
7	122.7 ± 3.69	-				
8	123.5 ± 10.9 (**1**: 121±1) **μM min^{-1}**	-	H_2O_2 (1.6 mM)	GSH (2mM) and GR (1.3 U/mL)	80 μM	**46**
9	236.0 ± 3.7 (**1**: 124±4) **μM min^{-1}**	-	H_2O_2 (1.6 mM)	GSH (2mM) and GR (1.3 U/mL)	80 μM	**168**
10	-	PhSH oxidation 1.37 (**1**: 1.16) **mM/s**	H_2O_2 (37.5 mM)	PhSH (10 mM)	1 mM	**173**
11	472.7 ± 3.5 (**1**:118.2 ± 2.9) **μM min^{-1}**	-	H_2O_2 (1.6 mM)	GSH (2mM) and GR (1.3 U/mL)	80 μM	**174**

12	-	PhSH oxidation 331 ± 2 (**1**:0.4 ± 0.02) **μM min^{-1}**	H_2O_2 (3.75 mM)	PhSH (1.0 mM)	0.01 mM	**175**
13	-	DTT oxidation 40% (**1**: 10%)	H_2O_2 (0.15 mmol)	DTT red (0.15 mmol)	0.015 mmol	**179**
14	-	100%				
15	-	100%				
16	-	90%				
17	425 ± 1 (**1**: 133±1) **μM min^{-1}**	-	H_2O_2 (1.6 mM)	GSH (2mM) and GR (1.3 U/mL)	80 μM	**191**
18	506 ± 4	-				
19	172 ± 5	-				
20	204 ± 3	-				
21	411 ± 1	-				
22	255 ± 6	-				
23	258.6 ± 0.6 (**1**: 118±3) **μM min^{-1}**	-	H_2O_2 (1.6 mM)	GSH (2mM) and GR (1.3 U/mL)	80 μM	**192**
24	273.5 ± 1.0	-				
25	235.2 ± 2.5	-				
26	55.02 ± 1.82 **μM min^{-1}**	-	H_2O_2 (1.6 mM)	GSH (2mM) and GR (1.7 U/mL)	80 μM	**193**
27	41.47 ± 0.27	-				
28	-	BnSH oxidation 5.5 h ($t_{1/2}$ (**h**))	H_2O_2 (35 mM)	BnSH (31 mM)	0.031 mmol	**194**
29	-	17 h				
30	-	21 h				
31	-	6.3 h				
32	-	17 h				
33	-	15 h				
34	16.4 ± 2.6 (**1**: 27.8±2) **μM min^{-1}**	-	H_2O_2 (26 mM)	GSH (50mM) and GR (1.3 U/mL)	2 mM	**196**
35	8.4 ± 0.24	-				
36	206.6±3.6	-	H_2O_2 (1.6 mM)	GSH (2mM) and	80 μM	**197**

	(**1**: 106.4±4) **µM min^{-1}**			GR (1.6 U/mL)		
37	421.5±6.0	-				
38	-	BnSH oxidation 25 h ($t_{1/2}$ (**h**))	H_2O_2 (35 mM)	BnSH (31 mM)	10 mol %	**198**
39	-	ND				
40	-	21 h				
41	-	50 h				
42	-	BnSH oxidation 38 h (**1**: 24 h) ($t_{1/2}$ (**h**))	H_2O_2 (40 mM)	BnSH (29 mM)	2.9 mM (10 mol%)	**199**
43	-	BnSH oxidation 50 h (**41**= 53h) ($t_{1/2}$ (**h**))	H_2O_2 (35 mM)	BnSH (31 mM)	31 µM (10 mol%)	**200**
44	-	70 h				
45	-	49 h				
46	-	55 h				
47	-	45 h				
48	Lipid Peroxidation Assay 87 ± 2 IC_{50} (**µM**)	-	-	-	5 mM	**202**
49	23 ± 4	-	-	-		
50	18 ± 1	-	-	-		
51	25 ± 6	-	-	-		
52	34 ± 3	-	-	-		
53	Lipid Peroxidation Assay 70 ± 4 (**1**: 80±4) IC_{50} (**µM**)	-	-	-	5 mM	**203**
54	29 ± 6	-	-	-		
55	-	DTT oxidation 4% (200 min)	H_2O_2 0.15 mmol	DTT red (0.15 mmol)	0.015 mmol	**204**

56	-	50% (**53** ≈ 90%) (150 min)				
57	-	BnSH oxidation 4.8 h **1**: 42 h ($t_{1/2}$ (**h**))	tBuOOH 43 mM	BnSH 31mM	3.1 mM	**211**
58	-	BnSH oxidation 2.5-3.5 h = 100 % conv.	30% H_2O_2	WI	10 mol%	**212**
59	-					
60	-					
61	-					
62	-	BnSH oxidation 35 min ($t_{1/2}$ (**min**))	H_2O_2 (35 mM)	BnSH (31 mM)	3.1 mM (10 mol%)	**213**
63	-	36 min				
64	-	37 min				
65	-	55 min				
66	-	DTT oxidation 12 min ($t_{1/2}$ (**min**))	H_2O_2 (0.15 mmol)	DTT red (0.15 mmol)	0.0016 mmol	**214**
67	-	103 min			0.015 mmol	
68	-	GSH oxidation 168 **53** >300 ($t_{1/2}$ (**min**))	H_2O_2 (320 µM)	GSH (160 µM)	32 µM	**215**
69	-	242 min				
70	-	DTT oxidation 5 min ($t_{1/2}$ (**min**))	H_2O_2 (0.15 mM)	DTT red (0.15 mM)	1.6 µmol	**216**
71	-	< 3 min				
72	-	PhSH oxidation negligible	H_2O_2 (WI)	PhSH (10 mM)	200 and 400 µM $(PhSe)_2$ at 200 µM)	**218**
73	-	(400 µM) better than **53** (200 µM) like **53**				
74	-	(200-400 µM)				

		better than **53**				
75	-	no activity				
76	-	no activity				
77	-	DTT oxidation 128 s (**53**: 192 s) ($t_{1/2}$ (**s**))	H_2O_2 1 eq	DTT red (14 mM)	$1{,}4x10^3$ N	**219**
78	-	DTT oxidation 3.62 min (napth-Se-urea: 2.0 min) ($t_{1/2}$ (**min**))	H_2O_2 32.4µmol [CD_3OD (300µL)]	DTTred (32.4µmol)	3.24µmol	**220**
79	-	4.34 min				
80	-	34.8 (DPDS 0.67) µM min^{-1}	H_2O_2 (2 mM)	PhSH (1.0 mM)	0.01 mM	**221**
81	-	574 (**53**: 0.55) **µM min^{-1}**	H_2O_2 (3.75 mM)	PhSH (1.0 mM)	0.01 mM	**222**
82	-	466				
83	-	Inactive				
84	-	Inactive				
85	10.5 (**1**: 0.99) (**53**: 1.95) **µM min^{-1}**	-	H_2O_2 500 µM	GSH (1 mM) GR (1 U)	2-20 µM	**228**
86	11.1					
87	537.4±14.3 (**1**: 137.1±5.5) **µM min^{-1}**	-	H_2O_2 1.6 mM	GSH: 2.0 mM GR 1.7 units/ml	80.0 µM	**231**
88	410.2±9.5	-				
89	372.2±2.7	-				
90	691.3±3.8 **µM min^{-1}**	PhSH oxidation 37 ($t_{1/2}$ (**min**))	H_2O_2 1.6 mM (PhSH assay: H_2O_2 2.0 mM)	GSH (2.0 mM) GR (1.7 U/ml) (PhSH assay: PhSH 1.0 mM)	80.0 µM (PhSH assay: cat 5.0 µM)	**232**
91	488.1±1.0	66				
92	469.1±1.4	74				
93	468.4±0.8	118				

94	-	PhSH oxidation **94** is ≈ 2-fold higher than **53**	H_2O_2 (3.75 mM)	PhSH (1 mM)	20 μM	**233**
95	-	PhSH oxidation **95** is ≈ 2-fold higher than **53**	H_2O_2 (3.75 mM)	PhSH (1 mM)	20 μM	**234**
96	-	PhSH oxidation 82 ($t_{1/2}$ (**min**))	H_2O_2 (2.0 mM)	PhSH (1.0 mM)	10 μM	**235**
97	-	136				
98	-	175				
99	-	168				
100	≈ 250 (**1** ≈ 150) (**μM min^{-1}**)	-	H_2O_2 (1.6 mM)	GSH (2.0 mM) GR (1.7 U/mL)	80 μM	**236**
101	≈ 175					
102	≈ 150					
103	≈ 150					
104	-	PhSH oxidation **104**: 3.39±0.37 (**53**: 0.55±0.18) (μmol/mL min)	H_2O_2 (3.75 mM)	PhSH (1.0 mM)	0.01 mM	**237**
105	1828 (**1**: 613) (**53**: 1600) (% Catalysis)	-	H_2O_2 (1.0 mM)	GSH (1.0 mM) GR (1.0 U/mL)	50 μM	**238**
106	1928					
107	1877					
108	1800					
109	1487					
110	2397					
111	1893					
112	2337					
113	1400					
114	1916					

115	1028					
116	(H_2O_2: 7.9±0.4) (t-BuOOH:12.3± 0.3) (CumOOH: 18.3±0.5) (**1** (H_2O_2): 0.99) (**min^{-1}**)	-	H_2O_2 (0.5 mM)	GSH (1.0 mM) GR (1.0 U/mL)	5 μM	**239**
117	-	PhSH oxidation 51.38±2.45 (**53**: 51.80±2.83) (T_{50} (**min**))	H_2O_2 (8.8 mM)	PhSH (1.9 mM)	0.025 mM	**240**
118	-	45.15±3.17				
119	-	BnSH oxidation 7.4 h (**53**: 129 h) ($t_{1/2}$(**h**))	H_2O_2 (0.035 M)	BnSH (0.031 M)	3.1 mM	**241**
120	-	5.9 h				
121	-	PhSH oxidation 16.33±1.30 (**53**: 187.3±7.53) (T_{50} (**min**))	H_2O_2 (10 mM)	PhSH (5 mM)	0.05 mM	**242**
122	-	244.27±25.0				
123	-	48.75±5.47				
124	0.5 (Km (**mM^{-1}**))	-	CmOOH (180 μM)	GSH (0.5–17 mM) GR (0.4 U/mL)	50 μM (**126**: 100μM)	**144**
125	0.4					
126	10.2					
127	0.9					
128	-	GSH oxidation 81.64	H_2O_2 (320 mM)	GSH (160 mM)	10 μM	**245**

		(**1**: 220.5) (SeCys: 147) (T_{50} (**min**))				
129	-	35.65				
130	100.1±1.7 (**1**: 60.5±1.9) (**μM min^{-1}**)	-	H_2O_2 (0.8 mM)	GSH (1.0 mM) GR (1.3 U/mL)	20 μM	**247**
131	217.1±1.6 (**1**: 60.5±1.9) (**μM min^{-1}**)	*PhSH oxidation inactive (**1**: 1.3±0.2) (**μM min^{-1}**)	H_2O_2 (0.8 mM) or *(H_2O_2 (3.75 mM))	GSH (1.0 mM) GR (1.3 U/mL) or *(PhSH (1 mM))	20 μM *(0.01 mM)	**248**
132	-	PhSH oxidation 0.1 (**53**: 0.3) (Δ abs at 2.5 min)	H_2O_2 (2.0 mM)	PhSH (5.0 mM)	100 μM	**249**
133	-	PhSH oxidation 44.76±0.52 (**1**: 152.17±3.35) (T_{50} (**min**))	H_2O_2 (5.0 mM)	PhSH (2.0 mM)	0.1 mM	**250**
134	-	PhSH oxidation 34.0 (**53**: 9.96) (Δ/Minutes × 1000)	H_2O_2 (5.0 mM)	PhSH (2.0 mM)	0.1 mM	**251**
135	-	29.73 ±0.16	H_2O_2 (5.0 mM)	PhSH (2.0 mM)	0.1 mM	**128**
136	-	16.87 ±0.33 (**1**: 154.26 ±6.4) (**53**: 55.04 ±3.5) (T_{50} (**min**))				

137	≈ 2.0 (**1**: ≈7.0) (**μM min^{-1}**)	-	H_2O_2 (0.8 mM)	GSH (0.24μmol) GR (12 U) (0.1 mL)	41 μM	**252**