Electronic Supplementary Material (ESI) for Dalton Transactions

Supplementary information

Figure 7 data:

Enzyme origin	Enzyme	Substrate	Type of catalysis	k_{cat}/K_m ($M^{-1}s^{-1}$)
Natural	Superoxide disumutase	Superoxide	Oxidoreductase	7.0×10^9 [1]
Natural	Crotonase	2-trans-enoyl-CoA	Hydratase	2.8×10^8 [2]
Natural	Triose phosphate isomerase	Dihydroxyacetone phosphate and D-glyceraldehyde 3-phosphate	Isomerase	2.4×10^8 [3]
Natural	Fumarase	Fumarate	Hydratase	1.6×10^8 [4]
Natural	Ach esterase	Acetylcholine	Hydrolase	1.6×10^8 [5]
Natural	Human carbonic anhydrase	CO_2	Hydratase	1.5×10^8 [6]
Natural	β lactamase	Cefoxitin	Hydrolase	1.0×10^8 [7]
Natural	P450 BM3	Palmitate	Oxidoreductase	6.0×10^7 [8]
Natural	Catalase	H_2O_2	Oxidoreductase	4.0×10^7 [9]
Natural	Fumarate reductase	Fumarate	Oxidoreductase	2.1×10^7 [10]
Natural	P450 BM3	Myristate	Oxidoreductase	8.2×10^6 [8]
Natural	Horseradish peroxidase	H_2O_2	Oxidoreductase	5.1×10^6 [11]
Natural	Manganese peroxidase	H_2O_2	Oxidoreductase	4.3×10^6 [12]
Natural	Xanthine oxidase	Xanthine	Oxidoreductase	1.9×10^6 [13]
Natural	Urease	Urea	Hydrolase	4.8×10^5 [14]
Natural	Indoleamine 2,3-diooxygenase	L-tryptophan	Oxidoreductase	2.0×10^5 [15]
Natural	Nitric oxide synthase	L-arginine	Oxidoreductase	1.8×10^5 [16]
Natural	Tryptophan 2,3 diooxygenase	L-trptophan	Oxidoreductase	1.7×10^5 [17]
Natural	Nitrogenase	Acetylane	Oxidoreductase	3.0×10^4 [18]
De novo scaffold/activity	di-Fe(III)-DF3 (phenol oxidase)	3,5-ditert-butyl-catechol	Oxidoreductase	100 [19]
De novo scaffold/activity	MID1-zinc (carboxyesterase and phosphoesterase)	4-nitrophenyl acetate	Oxidoreductase	630 [20]
De novo scaffold/activity	S-836 (peroxidase)	H_2O_2	Oxidoreductase	39 [21]
De novo scaffold/activity	TRIL9CL23H	PNP acetate	Hydrolase	23 [22]
Natural scaffold/de novo activity	Diels alderase (DA2010)	4-carboxybenzyl trans-1,3-butadiene-1-carbamate and N,N-dimethylacrylamide	Diels alderase	*4.7 [23]
Natural scaffold/de novo activity	Diels alderase (CE6)	4-carboxybenzyl trans-1,3-butadiene-1-carbamate and N,N-dimethylacrylamide	Diels alderase	*87 [23]
Natural scaffold/de novo activity	Organophosphate (PT3)	Diethyl 7-hydroxycoumarinyl phosphate	Hydrolase	4.0 [24]
Natural scaffold/de novo activity	Organophosphate (PT3.3)	Diethyl 7-hydroxycoumarinyl phosphate	Hydrolase	9.8×10^3 [24]
Natural scaffold/de novo activity	Kemp eliminase (KE70)	5-nitrobenzisoxazole	Kemp elimination	130 [25]
Natural scaffold/de novo activity	Kemp eliminase (R6 4/8B)	5-nitrobenzisoxazole	Kemp elimination	5.7×10^4 [25]
Natural scaffold/de novo activity	AlleyCat	Benzisoxazole	Kemp elimination	5.8 [26]

*units are $M^{-1}M^{-1}s^{-1}$

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