

Supporting Information

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Arsenic Binding to Proteins

Shengwen Shen [†], Xing-Fang Li [†], William R. Cullen [‡], Michael Weinfeld [§], X. Chris Le ^{†*}

[†] Department of Laboratory Medicine and Pathology, 10-102 Clinical Sciences Building, University of Alberta, Edmonton, Alberta, Canada, T6G 2G3

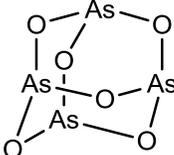
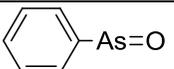
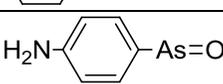
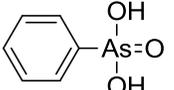
[‡] Department of Chemistry, University of British Columbia, 2036 Main Mall, Vancouver, British Columbia, Canada, V6T 1Z1

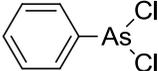
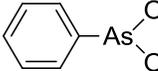
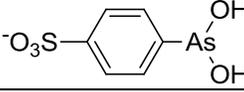
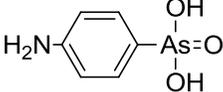
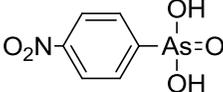
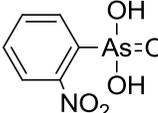
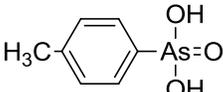
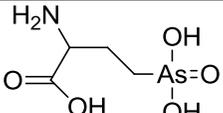
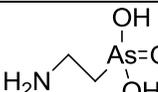
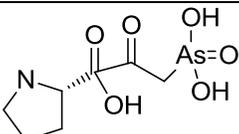
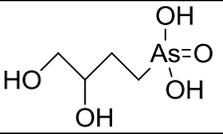
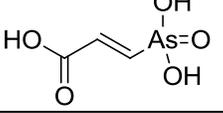
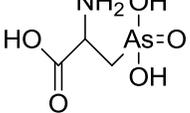
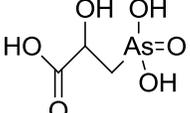
[§] Department of Oncology, University of Alberta, Cross Cancer Institute, 11560 University Avenue, Edmonton, Alberta, Canada, T6G 1Z2

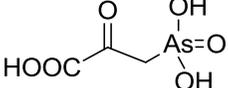
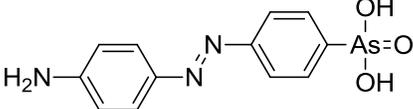
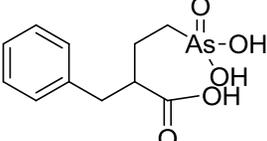
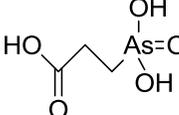
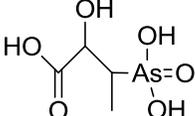
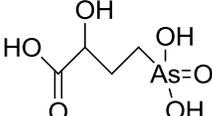
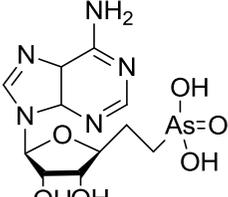
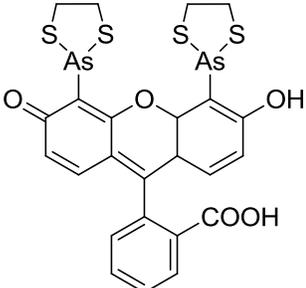
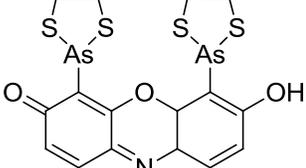
* Address correspondence to X.C. Le, Department of Laboratory Medicine and Pathology, Faculty of Medicine and Dentistry, University of Alberta, 10-102 Clinical Sciences Building, Edmonton, Alberta, Canada T6G 2G3.

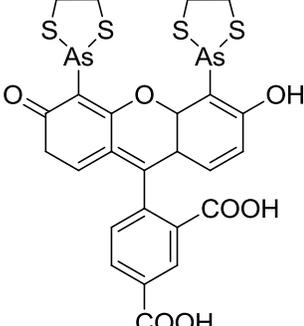
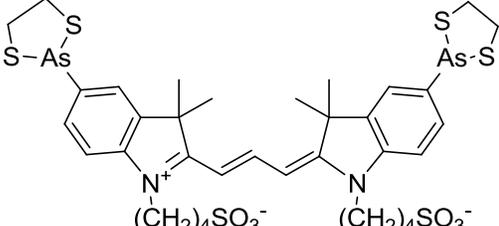
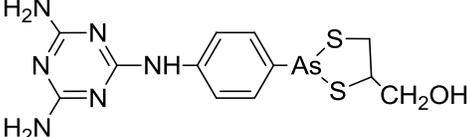
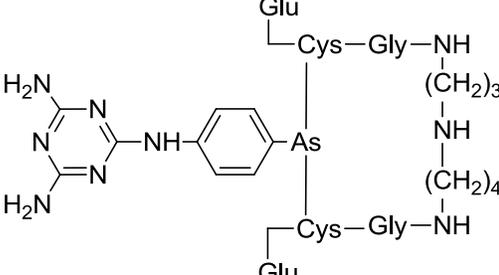
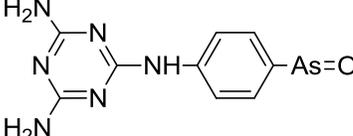
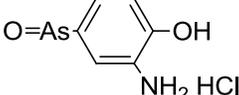
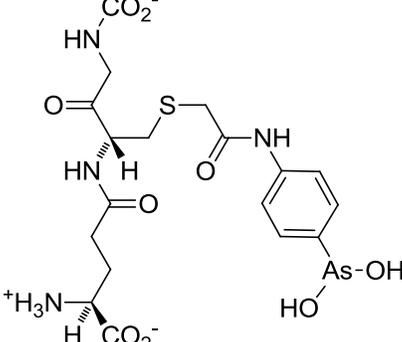
Telephone: (780) 492-6416. Fax: (780) 492-7800. E-mail: xc.le@ualberta.ca

Table S1. Chemical structures of arsenicals

Arsenical	Structure
arsenic trioxide	
arsenite	$\begin{array}{c} \text{OH} \\ \\ \text{HO}-\text{As}-\text{OH} \end{array}$
arsenate	$\begin{array}{c} \text{OH} \\ \\ \text{HO}-\text{As}-\text{OH} \\ \\ \text{O} \end{array}$
monomethylarsonous acid (MMA ^{III})	$\begin{array}{c} \text{OH} \\ \\ \text{HO}-\text{As}-\text{CH}_3 \end{array}$
dimethylarsinous acid (DMA ^{III})	$\begin{array}{c} \text{OH} \\ \\ \text{H}_3\text{C}-\text{As}-\text{CH}_3 \end{array}$
monomethylarsonic acid (MMA ^V)	$\begin{array}{c} \text{OH} \\ \\ \text{HO}-\text{As}-\text{CH}_3 \\ \\ \text{O} \end{array}$
dimethylarsinic acid (DMA ^V)	$\begin{array}{c} \text{OH} \\ \\ \text{H}_3\text{C}-\text{As}-\text{CH}_3 \\ \\ \text{O} \end{array}$
trimethylarsine oxide (TMAO)	$\begin{array}{c} \text{O} \\ \\ \text{H}_3\text{C}-\text{As}-\text{CH}_3 \\ \\ \text{CH}_3 \end{array}$
trimethylarsine (TMA)	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{As}-\text{CH}_3 \end{array}$
phenylarsine oxide (PAO)	
<i>p</i> -aminophenylarsine oxide (APA)	
arsenic triglutathione (ATG)	$\begin{array}{c} \text{SG} \\ \\ \text{GS}-\text{As}-\text{SG} \end{array}$
methylarsonous diglutathione (MADG)	$\begin{array}{c} \text{SG} \\ \\ \text{GS}-\text{As}-\text{CH}_3 \end{array}$
dimethylarsinous glutathione (DMAG)	$\begin{array}{c} \text{SG} \\ \\ \text{H}_3\text{C}-\text{As}-\text{CH}_3 \end{array}$
arsenobetaine (AsB)	$\begin{array}{c} \text{CH}_3 \quad \text{O}^- \\ \quad // \\ \text{H}_3\text{C}-\text{As}^+ \\ \\ \text{CH}_3 \end{array}$
arsenocholine (AsC)	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{As}^+ \\ \\ \text{CH}_3 \end{array}$
phenylarsinic acid (PAA)	

phenyl dichloroarsine (PDA)	
phenylarsonous acid	
4-sulfophenylarsonous acid	
Lewisite	$\text{Cl}-\text{CH}=\text{CHAs}(\text{Cl})_2$
<i>p</i> -arsanilate	
<i>p</i> -nitrophenylarsonate	
<i>m</i> -nitrophenylarsonate	
<i>p</i> -tolylarsonate	
2-amino-4- arsonobutyrate	
2-aminoethylarsonic acid	
2-arsonoacetyl-L-proline	
3,4-dihydroxybutylarsonic acid	
3-arsonoacrylate	
3-arsonoalanine	
3-arsonolactate	

3-arsonopyruvate	
4-(4-aminophenylazo)phenylarsonic acid	
4-arsono-2-benzylbutanoic acid	
arsonoacetate	
arsonomethyl analogue of 2-phosphoglycerate	
arsonomethyl analogue of 3-phosphoglycerate	
arsonomethyl analogue of AMP	
4,5-bis(1,3,2-dithiarsolan-2-yl)fluorescein (FlAsH)	
4,5-bis(1,3,2-dithiarsolan-2-yl)-resorufin (ReAsH)	

6-carboxy-FlAsH (CrAsH)	
3-(5-(1,3,2-dithiarsolan-2-yl)-3,3-dimethyl-1-(4-sulfobutyl)indolin-2-ylidene)prop-1-enyl)-5-(1,3,2-dithiarsolan-2-yl)-3,3-dimethyl-1-(4-sulfobutyl)-3H-indolium (AsCy3)	
Melarsaprol (Mel B)	
Mel T	
Melarsen oxide	
Mapharsen	
4-(N-(S-glutathionylacetyl)amino)phenyl arsenoxide (GSAO)	

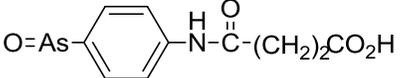
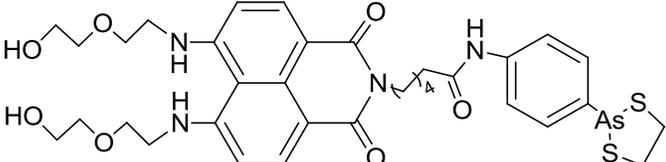
<p><i>p</i>-succinylamidephenyl arsenoxide (PSAO)</p>	
<p><i>N</i>-(4-(1,3,2-dithiarsolan-2-yl)phenyl)-6-(6,7-bis(2-(2-aminoethoxy)ethanol)-1,3-dioxo-1H-benzo[de]isoquinolin-2(3H)-yl)hexanamide (NPE)</p>	

Table S2. Chemical structures of small thiols

Thiol	Structure
glutathione	
dithiothreitol (DTT)	
dithioerythritol (DTE)	
6,8-thioctic acid (DHLA)	
1,3-dithioglycerol	
1,2-dithioglycerol; 2,3-dimercaptopropanol (BAL)	
2,3-dimercaptopropane-1-sulfonic acid (DMPS)	$\begin{array}{c} \text{CH}_2-\text{CH}-\text{CH}_2 \\ \quad \quad \\ \text{SH} \quad \text{SH} \quad \text{SO}_3\text{H} \end{array}$
2,3-dimercaptosuccinic acid; 2,3-dimercaptosuccinate (DMSA)	$\begin{array}{c} \text{O}=\text{C}-\text{CH}-\text{CH}-\text{C}=\text{O} \\ \quad \quad \quad \\ \text{OH} \quad \text{SH} \quad \text{SH} \quad \text{OH} \end{array}$
dihydrolipoamide	
dihydrotrypanothione	

Table S3. Binding affinity between arsenicals and proteins

Artenical	Protein	K_d or K_i (μM)	Method	Reference
$(\text{CH}_3)_2\text{AsSCH}_2\text{CONH}_2$	EcoRI methyl transferase (methylase)	0.053	Intrinsic tryptophan fluorescence	Tsao et al. ¹
Arsenite	Reduced xanthine oxidase	0.06	Enzyme activity of uric acid formation measured at 295 nm	Stewart et al. ²
PAO	Human thioredoxin	0.09	SEC-ICPMS	Wang et al. ³
PAO	<i>E. coli</i> thioredoxin	0.1	SEC-ICPMS	Wang et al. ³
MMA ^{III}	Thioredoxin reductase from mouse liver	~ 0.1	Enzyme activity of DTNB reduction at 412 nm	Lin et al. ⁴
NPE	Reduced BSA	0.14	Fluorescence polarization at 528 nm	Huang et al. ⁵
MMA ^{III}	Human thioredoxin	0.16	SEC-ICPMS	Wang et al. ³
MMA ^{III}	<i>E. coli</i> thioredoxin	0.23	SEC-ICPMS	Wang et al. ³
As ₂ O ₃	Human thioredoxin	0.24	SEC-ICPMS	Wang et al. ³
MMA ^{III}	Thioredoxin reductase from mouse liver	0.25	Enzyme activity of NADPH oxidation at 340 nm	Lin et al. ⁴
GSAO	Thioredoxin	0.37	Remaining RSH content assayed with DTNB	Donoghue et al. ⁶
Arsenite	Human serum albumin	0.65	Equilibrium microdialysis followed by LC HG-AFS	Jiang et al. ⁷
Melarsen oxide	6-phosphofructo-2-kinase of <i>T. brucei</i>	< 1	Enzyme activity of formation of fru(2,6)P ₂	Van Schaftingen et al. ⁸
PSAO	Reduced protein disulfide isomerase (PDI)	1.1	Intrinsic tryptophan fluorescence	Ramadan et al. ⁹

Arsenite	Mouse hepatocytes derived arsenic methyltransferase	1.26	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Kedderis et al. ¹⁰
Phenylarsine oxide	Hemoglobin from rat	1.9	SEC-ICPMS	Lu et al. ¹¹
Melarsen oxide	Fructose-2,6-bisphosphatase of <i>T. brucei</i>	2	Enzyme activity of the release of [³² P]P _i from [2- ³² P]fru(2,6)P ₂	Van Schaftingen et al. ⁸
DMA ^{III}	Human thioredoxin	2.22	SEC-ICPMS	Wang et al. ³
Arsenite	Arsenite oxidase AioX	2.4	Intrinsic tryptophan fluorescence	Liu et al. ¹²
DMA ^{III}	<i>E. coli</i> thioredoxin	3	SEC-ICPMS	Wang et al. ³
Arsenite	Galectin-1 (GAL1)	3.8	Capillary electrophoresis with UV detection at 208 nm	Lin et al. ¹³
DMA ^{III}	Hemoglobin from rat	4.5	SEC-ICPMS	Lu et al. ¹¹
Melarsen oxide	Glutathione reductase of <i>O. gutturosa</i>	4.5	Enzyme activity of NADPH oxidation at 340 nm	Muller et al. ¹⁴
¹⁴ C-phenyldichloroarsine	Rat hemoglobin	5	Equilibrium dialysis of ¹⁴ C-As binding	Chong et al. ¹⁵
Arsenite	MCF7 derived estrogen receptor- α	5	Binding assay with [³ H]estradiol	Stoica et al. ¹⁶
Mapharsen	Yeast aldehyde dehydrogenase	6	Enzyme activity of DPNH formation at 340 nm	Bradbury et al. ¹⁷
Arsenite	Rabbit hepatic aldehyde oxidase	6.3	Enzyme activity of oxidation of <i>N</i> -methylnicotinamide at 330 nm	Rajagopalan et al. ¹⁸
Arsenite	Oxidized xanthine oxidase	8	Enzyme activity of uric acid formation measured at 295 nm or absorbance at 380 nm	Stewart et al. ²
Arsenite	Galectin-1 (GAL1)	8.2	Intrinsic tryptophan fluorescence	Lin et al. ¹³

Mel T	Trypanothione reductase of <i>T. brucei</i>	9	Enzyme activity of NADPH oxidation at 340 nm	Fairlamb et al. ¹⁹
MMA ^{III} (GS) ₂	Yeast glutathione reductase	9	Enzyme activity of NADPH oxidation at 340 nm	Styblo et al. ²⁰
Mel T	Trypanothione reductase of <i>L. donovani</i>	9.3	Enzyme activity of NADPH oxidation at 340 nm	Cunningham et al. ²¹
Melarsen oxide	Glutathione reductase from human erythrocytes	9.6	Enzyme activity of NADPH oxidation at 340 nm	Cunningham et al. ²²
Arsenite	Acetylcholinesterase from electric eel	10–15	Enzyme activity of hydrolysis of acetylthiocholine at 412 nm	Page et al. ²³ and Wison et al. ²⁴
Arsenite	ArsR	12	Fluorescence anisotropy with fluorescently labeled DNA	Qin et al. ²⁵
Phenylarsine oxide	Hemoglobin from human	12.9	SEC–ICPMS	Lu et al. ¹¹
Mel T	Trypanothione reductase of <i>T. cruzi</i>	15.5	Enzyme activity of NADPH oxidation at 340 nm	Saravanamuthu et al. ²⁶
HO(CH ₂) ₄ AsCl ₂	Reduced thioredoxin	16	Intrinsic tryptophan fluorescence	Brown et al. ²⁷
MMA ^{III} (GS) ₂	Multidrug resistance protein 1 (MRP1) on membrane vesicle	16	Transport of 17β–estradiol 17–(β–D–glucuronide) by MRP1	Carew et al. ²⁸
Melarsen oxide	Trypanothione reductase of <i>C. fasciculata</i>	17.2	Enzyme activity of NADPH oxidation at 340 nm	Cunningham et al. ²²
Melarsen oxide	Recombinant <i>T. cruzi</i> trypanothione reductase	18	Enzyme activity of NADPH oxidation in a DTNB–coupled assay measured at 410 nm	Hamilton et al. ²⁹
Arsenite	Reduced protein disulfide isomerase (PDI)	18	Intrinsic tryptophan fluorescence	Ramadan et al. ⁹
MMA ^{III} (Cys) ₂	Yeast glutathione reductase	18	Enzyme activity of NADPH oxidation at 340 nm	Styblo et al. ²⁰

Arsenite	Oxidized desulfo xanthine oxidase	20	nm	Charge-transfer complex absorbance at 680 nm	Stewart et al. ²
PAO	Arsenate reductase of <i>L. major</i>	~ 20	nm	Enzyme activity of NADPH oxidation at 340 nm	Zhou et al. ³⁰
MMA ^{III}	Hemoglobin from rat	21	nm	SEC-ICPMS	Lu et al. ¹¹
Melarsen oxide	Glutathione reductase from human erythrocytes	23.7	nm	Enzyme activity of NADPH oxidation at 340 nm	Muller et al. ¹⁴
Arsenite	Oxidized xanthine oxidase	24	nm	Charge-transfer complex absorbance at 380 nm	Hille et al. ³¹
MMA ^{III}	Reduced protein disulfide isomerase (PDI)	25	nm	Intrinsic tryptophan fluorescence	Ramadan et al. ⁹
Arsenite	Bovine tubulin (whole protein, α and β units)	27.1	nm	Vacuum filtration binding assay	Kitchin et al. ³²
Mel T	Trypanothione reductase of <i>C. fasciculata</i>	36	nm	Enzyme activity of NADPH oxidation at 340 nm	Fairlamb et al. ¹⁹
Melarsen oxide	Glutathione reductase of <i>S. digitata</i>	38.3	nm	Enzyme activity of NADPH oxidation at 340 nm	Muller et al. ¹⁴
MMA ^{III}	Arsenic (iAs ^{III}) methyltransferase from rabbit liver	42	nm	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ³³
Arsenite	Arsenic (MMA ^{III}) methyltransferase from rabbit liver	44	nm	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ³³
Arsenite	Yeast aldehyde dehydrogenase	50	nm	Enzyme activity of DPNH formation at 340 nm	Bradbury et al. ¹⁷
DMA ^{III}	Yeast glutathione reductase	56	nm	Enzyme activity of NADPH oxidation at 340 nm	Styblo et al. ²⁰
Arsenite	ArsD	60	nm	Intrinsic tryptophan fluorescence	Chen et al. ³⁴

DMA ^{III}	Hemoglobin from human	73.5	SEC-ICPMS	Lu et al. ¹¹
MMA ^{III}	Yeast glutathione reductase	74	Enzyme activity of NADPH oxidation at 340 nm	Stybło et al. ²⁰
As(Cys) ₃	Yeast glutathione reductase	76	Enzyme activity of NADPH oxidation at 340 nm	Stybło et al. ²⁰
Arsenite	TA3-derived cathepsin L	90	Enzyme activity with fluorogenic aminomethyl-coumarin	Harrison et al. ³⁵
Arsenite-2,3-dimercaprol	Adenylate cyclase from turkey erythrocyte membranes	100	Enzyme activity of generation of [³² P]cAMP	Spiegel et al. ³⁶
Arsenite	Arsenate reductase	100	Enzyme activity of NADPH oxidation at 340 nm	Gladysheva et al. ³⁷
Melarsen oxide	Pyruvate kinase of <i>T. brucei</i>	> 100	Enzyme activity of pyruvate formation at 340 nm	Van Schaftingen et al. ⁸
Arsenite	Cathepsin L	120	Enzyme activity with fluorogenic aminomethyl-coumarin	Harrison et al. ³⁵
Arsenite-BAL	Betaine aldehyde dehydrogenase of <i>P. aeruginosa</i>	128	Enzyme activity of NADPH formation at 340 nm	Gonzalez-Segura et al. ³⁸
Arsenite	Butyrylcholinesterase from human serum	129	Enzyme activity of hydrolysis of acetylthiocholine at 412 nm	Page et al. ³⁹
MMA ^{III}	Hemoglobin from human	200	SEC-ICPMS	Lu et al. ¹¹
Arsenite	Yeast aldehyde dehydrogenase	200	Enzyme activity of DPNH formation at 340 nm	Steinman et al. ⁴⁰
APA	Lecithin-cholesterol acyltransferase	230	Enzyme activity of cholesteryl ester formation	Jauhiainen et al. ⁴¹

Arsenite	Arsenate reductase of <i>L. major</i>	250	Enzyme activity of NADPH oxidation at 340 nm	Zhou et al. ³⁰
As(GS) ₃	Yeast glutathione reductase	325	Enzyme activity of NADPH oxidation at 340 nm	Styblo et al. ²⁰
As(GS) ₃	Yeast glutathione reductase	340	Enzyme activity of NADPH oxidation at 340 nm	Styblo et al. ²⁰
Arsenite	Arsenate reductase of <i>S. aureus</i>	377	Enzyme activity of NADPH oxidation at 340 nm	Messens et al. ⁴²
Arsenite	Hemoglobin from rat	430	SEC-ICPMS	Lu et al. ¹¹
DMA ^{III} (GS)	Yeast glutathione reductase	732	Enzyme activity of NADPH oxidation at 340 nm	Styblo et al. ²⁰
Arsenite	3-carboxy-4-carboxymethyl-4-hydroxycrotonolactone hydrolase from <i>A. niger</i>	800	Enzyme activity of conversion of β -carboxymuconolactone to 3-oxoadipate	Thatcher et al. ⁴³
DMA ^{III} (Cys)	Yeast glutathione reductase	834	Enzyme activity of NADPH oxidation at 340 nm	Styblo et al. ²⁰
Arsenite	Pterin derived arsenate reductase	1.2 mM	Enzyme activity of NADPH oxidation at 340 nm	Duan et al. ⁴⁴
Arsenite	Hemoglobin from human	1.3 mM	SEC-ICPMS	Lu et al. ¹¹
Arsenite	Catalytic Domain of human Cdc25B phosphatase	4 mM	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Bhattacharjee et al. ⁴⁵
Arsenite	Yeast glutathione reductase	5.7 mM	Enzyme activity of NADPH oxidation at 340 nm	Styblo et al. ²⁰
Phenylarsonous acid	Glutathione reductase	8 mM	Enzyme activity of NADPH oxidation at 340 nm	Knowles ⁴⁶
Arsenite	LMW acid phosphatase	17 mM	Enzyme activity of nitrophenol formation at 410 nm	Zhang et al. ⁴⁷

Arsenite	Alkaline phosphatase of <i>H. diminuta</i>	17.7 mM	Enzyme activity of nitrophenol formation at 410 nm	Pappas et al. ⁴⁸
Arsenite	Arsenic methyltransferase from rat liver	$K_m = 0.25 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Lin et al. ⁴⁹
As(GS) ₃	Multidrug resistance protein 1 (MRP1) on membrane vesicle	$K_m = 0.32 \mu\text{M}$	⁷³ As transport assay by a rapid filtraton method	Leslie et al. ⁵⁰
MMA ^{III}	Recombinant human arsenic methyltransferase (AS3MT)	$K_m = 1.5 \mu\text{M}$	Methylation products by HPLC-HG-AAS	Ding et al. ⁵¹
[(GS) ₂ AsSe] ⁻	Multidrug resistance protein 2 (MRP2) on membrane vesicle	$K_m = 1.7 \mu\text{M}$	⁷³ As transport assay by a rapid filtraton method	Carew et al. ⁵²
Arsenite	Arsenite methyltransferase from hamster liver	$K_m = 1.8 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Wildfang et al. ⁵³
MMA ^{III}	Arsenic methyltransferase from Chang Human hepatocytes	$K_m = 3 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ³³
Arsenite	Recombinant human AS3MT	$K_m = 3.16 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Geng et al. ⁵⁴
Arsenite	Arsenic methyltransferase from Chang Human hepatocytes	$K_m = 3.2 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ³³
MMA ^{III}	Arsenic methyltransferase from rhesus monkey liver	$K_m = 3.5 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ⁵⁵
Arsenite	Mouse hepatocytes derived arsenic methyltransferase	$K_m = 3.6 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Kedderis et al. ¹⁰
Arsenite	Recombinant human AS3MT	$K_m = 4.1 \mu\text{M}$	Methylation products by HPLC-HG-AAS	Ding et al. ⁵¹

As(GS) ₃	Multidrug resistance protein 2 (MRP2) on membrane vesicle	$K_m = 4.2 \mu\text{M}$	⁷³ As transport assay by a rapid filtration method	Carew et al. ⁵²
Arsenite	Recombinant human AS3MT	$K_m = 4.6 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Wood et al. ⁵⁶
Arsenite	Arsenic methyltransferase from rhesus monkey liver	$K_m = 5.5 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ⁵⁵
Arsenite	Arsenic methyltransferase from rabbit liver	$K_m = 5.5 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ³³
MMA ^{III}	Arsenic methyltransferase from rabbit liver	$K_m = 10 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ³³
MMA ^{III} (GS) ₂	Multidrug resistance protein 1 (MRP1) on membrane vesicle	$K_m = 11 \mu\text{M}$	Transport assay with ICPMS detection	Carew et al. ²⁸
Arsenite	Ars ATPase of <i>E. coli</i>	$K_m = 0.1 \text{ mM}$	⁷³ As transport assay by a rapid filtration method	Dey et al. ⁵⁷
As(GS) ₃	<i>L. tarentolae</i> derived plasma membrane transport protein on membrane vesicle	$K_m = 0.1\text{--}0.2 \text{ mM}$	⁷³ As transport assay by a rapid filtration method	Dey et al. ⁵⁸
MMA ^{III}	MMA ^{III} methyltransferase from hamster liver	$K_m = 0.8 \text{ mM}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Wildfang et al. ⁵³
Arsenate	Arsenate reductase of <i>S. aureus</i>	0.066	Enzyme activity of NADPH oxidation at 340 nm	Messens et al. ⁵⁹
4-(4-aminophenylazo)phenylarsonic acid	<i>E. coli</i> alkaline phosphatase	0.13	Enzyme activity of nitrophenol formation at 410 nm	Szajn et al. ⁶⁰

4-(4-aminophenylazo)phenylarsonic acid	<i>E. coli</i> alkaline phosphatase	0.15	Spectrophotometric titration measured at 400 nm	Szajn et al. ⁶⁰
Arsenate	Alkaline phosphatase of <i>A. nidulans</i>	0.15	Enzyme activity of nitrophenol formation at 410 nm	Dorn ⁶¹
Arsenate	Cobalt alkaline phosphatase	0.2	Enzyme activity of nitrophenol formation at 410 nm	Gottesman et al. ⁶²
Arsenate	Intestinal alkaline phosphatase	0.261	Enzyme activity of fluorogenic Attophos formation	Iqbal ⁶³
Arsenate	Zinc alkaline phosphatase	0.3	Enzyme activity of nitrophenol formation at 410 nm	Gottesman et al. ⁶²
Arsenate	Acid phosphatase from <i>Ipomoea</i> pH 6.0	0.46	Enzyme activity of nitrophenol formation at 410 nm	Zink et al. ⁶⁴
Arsenate	Mn(III)-containing acid phosphatase	0.5	Enzyme activity of nitrophenol formation at 410 nm	Sugiura et al. ⁶⁵
Arsenate	Membrane-bound or purified alkaline phosphatase	1.0–2.7	Enzyme activity of nitrophenol formation at 402 nm or pyrophosphate hydrolysis	Cyboron et al. ⁶⁶
Arsenate	Alkaline phosphatase on membrane vesicle	1.67	Enzyme activity of nitrophenol formation at 410 nm	Hirano et al. ⁶⁷
Arsenate	Zinc alkaline phosphatase	1.8	Equilibrium dialysis of ⁷⁴ As binding	Lazdunski et al. ⁶⁸
Arsenate	Alkaline phosphatase on membrane vesicle	2	³² P-phosphate transport by a filtration method	Shirazi et al. ⁶⁹
Arsenate	Zinc alkaline phosphatase	3.2	Equilibrium dialysis of ⁷⁴ As binding	Petitclerc et al. ⁷⁰
Arsenate	Cobalt alkaline phosphatase	3.4	Enzyme activity of nitrophenol formation at 410 nm	Petitclerc et al. ⁷⁰

Arsenate	Alkaline phosphatase	8.6	Enzyme activity of fluorometric Attophos formation	Whisnant et al. ⁷¹
Arsenate	Intestinal alkaline phosphatase	8.91	Enzyme activity of fluorogenic Attophos formation by enzyme immobilized capillary electrophoresis	Iqbal ⁶³
Arsenate	Mitogen-activated protein kinase phosphatase 3	10	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Zhou et al. ⁷²
Arsenate	Acid phosphatase	10	Enzyme activity of 4-methylumbelliferyl phosphate hydrolysis	Saha et al. ⁷³
Arsenate	Rat bone alkaline phosphatase	12-26	Enzyme activity of nitrophenol formation at 410 nm	Fernandes et al. ⁷⁴
3-arsonoacrylate	Pig heart fumarate hydratase	14	Enzyme activity of fumarate degradation at 240 nm	Ali et al. ⁷⁵
Arsenate	Mitogen-activated protein kinase phosphatase 3	19	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Zhou et al. ⁷²
Arsenate	Alkaline phosphatase	21	Enzyme activity of fluorogenic Attophos formation by capillary electrophoresis in "transient-engagement" EMMA format	Whisnant et al. ⁷¹
Arsenate	VHR ERK phosphatase	21	Enzyme activity of nitrophenol formation at 405 nm	Usui et al. ⁷⁶
Arsenate	Purified PIPLC-released alkaline phosphatase	23	Enzyme activity of nitrophenol formation at 410 nm	Pizauro et al. ⁷⁷
3-arsonopyruvate	Phosphoenolpyruvate mutase	27	Enzyme activity of phosphoenolpyruvate formation at 340 nm	Chawla et al. ⁷⁸
Arsenate	Conidial alkaline phosphatase	31	Enzyme activity of nitrophenol formation at 410 nm	Say et al. ⁷⁹
Arsenate	Membrane-bound alkaline phosphatase	33.8	Enzyme activity of nitrophenol formation at 410 nm	Curti et al. ⁸⁰

3-arsenolactate	Pig heart fumarate hydratase	50	Enzyme activity of fumarate formation at 240 nm	Ali et al. ⁷⁵
Arsenate	Glycoprotein acid phosphatase of <i>C. albicans</i>	50	Enzyme activity of nitrophenol formation at ~405 nm	Odds et al. ⁸¹
4-(4-aminophenylazo)phenylarsonic acid	Novo subtilisin	57	Spectrophotometric titration measured at 478 nm	Glazer ⁸²
Arsenate	Human alkaline phosphatase	20-400	Enzyme activity of nitrophenol formation at 402 nm or pyrophosphate hydrolysis	Eaton et al. ⁸³
Arsenate	Rat osseous-plate alkaline phosphatase	60	Enzyme activity of nitrophenol formation at 410 nm	Rezende et al. ⁸⁴
Arsenate	Protein-tyrosine phosphatase 1B	81	Enzyme activity of nitrophenol formation at 410 nm	Sarmiento et al. ⁸⁵
Arsenate	Alkaline phosphatase of <i>H. diminuta</i>	87	Enzyme activity of nitrophenol formation at 410 nm	Pappas et al. ⁴⁸
Arsenate	Vacuolar alkaline phosphatase from yeast	100	Enzyme activity of nitrophenol formation at 410 nm	Fernandez et al. ⁸⁶
Arsenate	Mitogen-activated protein kinase phosphatase 3	110	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Zhou et al. ⁷²
Arsenate	Alkaline phosphatase on membrane vesicle	120	Enzyme activity of nitrophenol formation at 410 nm	Hirano et al. ⁶⁷
Arsenate	Membrane-bound alkaline phosphatase	150	Enzyme activity of nitrophenol formation at 410 nm	Cyboron et al. ⁸⁷
Arsenate	Protein tyrosine phosphatase 1B	150	Enzyme activity of nitrophenol formation at 410 nm	Zhang et al. ⁸⁸
Arsenate	Human liver acid phosphatase	180	Enzyme activity of nitrophenol formation at 410 nm	VanEtten et al. ⁸⁹

Arsenate	Bovine spleen purple acid phosphatase	180	Enzyme activity of nitrophenol formation at ~405 nm	Vincent et al. ⁹⁰
<i>p</i> -Arsanilate	α -chymotrypsin	202	Displacement of proflavine at 465 nm	Glazer ⁹¹
4-(4-aminophenylazo)phenylarsonic acid	Carlsberg subtilisin	220	Spectrophotometric titration measured at 478 nm	Glazer ⁸²
Arsenate	Protein tyrosine phosphatase 1B	230	Isothermal titration calorimetry	Zhang et al. ⁸⁸
Arsenate	LMW acid phosphatase	240	Enzyme activity of nitrophenol formation at 410 nm	Zhang et al. ⁴⁷
Arsenate	Catalytic domain of PTP α	250	Enzyme activity of nitrophenol formation at 410 nm	Wu et al. ⁹²
<i>p</i> -Arsanilate	α -chymotrypsin	276	Enzyme activity of <i>p</i> -nitrophenol formation at 410 nm	Glazer ⁹¹
Arsenate	Protein tyrosine phosphatase α	320	Enzyme activity of nitrophenol formation at 410 nm	Wu et al. ⁹²
Arsenate	Catalytic Domain of human Cdc25B phosphatase	400	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Bhattacharjee et al. ⁴⁵
4-arsono-2-benzylbutanoic acid	Angiotensin-converting enzyme from rabbit lung	500	Enzyme activity of histidyl-leucine formation with <i>o</i> -phthalaldehyde postlabeling	Galary et al. ⁹³
Arsenate	α -glucan phosphorylase of <i>E. coli</i>	540	Enzyme activity of NADPH formation at 340 nm in a coupled assay	Schinzel et al. ⁹⁴
Arsenate	Wheat germ acid phosphatase	610	Enzyme activity of nitrophenol formation at 410 nm	VanEtten et al. ⁸⁹
Arsenate	Uteroferrin (acid phosphatase)	0.62–2.5 mM	Enzyme activity of nitrophenol formation at ~405 nm	Crans et al.; Pyrz et al. ^{95,96}

<i>p</i> -Tolylarsonate	α -chymotrypsin	641	Displacement of proflavine at 465 nm	Glazer ⁹¹
Phenylarsonate	Novo subtilisin	680	Displacement of 4-(4'-aminophenylazo)phenylarsonate at 478 nm	Glazer ⁹¹
3-arsonoalanine	Aspartate ammonia lyase of <i>H. alvei</i>	700	Enzyme activity of fumarate formation at 240 nm	Ali et al. ⁷⁵
<i>p</i> -Tolylarsonate	α -chymotrypsin	798	Enzyme activity of <i>p</i> -nitrophenol formation at 410 nm	Glazer ⁹¹
Arsenate	Yersinia PTPase	882	Enzyme activity of nitrophenol formation at 410 nm	Zhang et al. ⁹⁷
Phenylarsonate	Carlsberg subtilisin	1.0 mM	Enzyme activity of <i>N</i> -benzoyl-L-arginine ethyl ester hydrolysis	Glazer ⁹¹
Arsenate	Acid phosphatase from Ipomoea pH 5.0	1 mM	Enzyme activity of nitrophenol formation at 410 nm	Zink et al. ⁶⁴
AsB	Butyrylcholinesterase from horse serum	~ 1 mM	Flow microcalorimetry	Fulladosa et al. ⁹⁸
AsC	Butyrylcholinesterase from horse serum	~ 1 mM	Flow microcalorimetry	Fulladosa et al. ⁹⁸
Arsenate	Protein tyrosine phosphatase of Yersinia	1.03 mM	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Keng et al. ⁹⁹
<i>p</i> -Nitrophenylarsonate	α -chymotrypsin	1.04 mM	Displacement of proflavine at 465 nm	Glazer ⁹¹
<i>p</i> -Arsanilate	Carlsberg subtilisin	1.1 mM	Enzyme activity of <i>N</i> -benzoyl-L-arginine ethyl ester hydrolysis	Glazer ⁹¹
Arsenate	Carbonic anhydrase (phosphatase activity)	1.17 mM	Enzyme activity of nitrophenol formation at 410 nm	Koester et al. ¹⁰⁰

Arsenate	Protein tyrosine phosphatase α	1.23–1.72 mM	Enzyme activity of nitrophenol formation at 410 nm	Zhao et al. ¹⁰¹
Arsenate	Ca-ATPase on muscle sarcoplasmic reticulum vesicle	1.2–1.8 mM	Ca efflux and phosphorylation of Ca-ATPase	Pick et al. ¹⁰²
Phenylarsonate	Novo subtilisin	1.3 mM	Enzyme activity of <i>N</i> -benzoyl-L-arginine ethyl ester hydrolysis	Glazer ⁹¹
Arsenate	Ubiquitin from bovine erythrocytes (phosphatase activity)	1.3 mM	Enzyme activity of nitrophenol formation at ~405 nm	Taniguchi et al. ¹⁰³
Arsenate	Protein tyrosine phosphatase of <i>S. cerevisiae</i>	1.5 mM	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Mukhopadhyay et al. ¹⁰⁴
<i>p</i> -Arsanilate	Novo subtilisin	1.7 mM	Enzyme activity of <i>N</i> -benzoyl-L-arginine ethyl ester hydrolysis	Glazer ⁹¹
<i>p</i> -Arsanilate	Novo subtilisin	1.8 mM	Displacement of 4-(4'-aminophenylazo)phenylarsonate at 478 nm	Glazer ⁹¹
<i>m</i> -nitrophenylarsonate	Serine protease of <i>P. maltophilia</i>	1.8 mM	Enzyme activity of hydrolysis of α - <i>N</i> -benzoyl-L-arginine ethyl ester	Boethling ¹⁰⁵
MMA ^V	Catalytic Domain of human Cdc25B phosphatase	2 mM	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Bhattacharjee et al. ⁴⁵
<i>p</i> -Tolylarsonate	Carlsberg subtilisin	2.3 mM	Enzyme activity of <i>N</i> -benzoyl-L-arginine ethyl ester hydrolysis	Glazer ⁹¹
Arsenate	Pea seed triosephosphate isomerase	3 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Tomlinson et al. ¹⁰⁶
Arsenate	Membrane-bound acid phosphatase	3.45 mM	Enzyme activity of nitrophenol formation at 410 nm	Pappas ¹⁰⁷
Arsanilic acid	Alkaline phosphatase	3.8 mM	Enzyme activity of nitrophenol formation at 410 nm	Brenna et al. ¹⁰⁸
Arsenate	Leishmanial antimonate reductase	4 mM	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Zhou et al. ¹⁰⁹

Arsenate	(Protein tyrosine phosphatase) Acid phosphatase	> 4 mM	Enzyme activity of 4-methylumbelliferyl phosphate hydrolysis	Saha et al. ⁷³
Arsenate	α -glucan phosphorylase of <i>T. thermophilus</i>	4.1 mM	Enzyme activity of NADPH formation at 340 nm in a coupled assay	Boeck et al. ¹¹⁰
Arsenate	<i>Neurospora crassa</i> glycogen phosphorylase	4–9 mM	Enzyme activity of ¹⁴ C-glycogen formation	Shepherd et al. ¹¹¹
<i>p</i> -Tolylarsonate	Novo subtilisin	4.5 mM	Enzyme activity of <i>N</i> -benzoyl-L-arginine ethyl ester hydrolysis	Glazer ⁹¹
Arsenate	Triosephosphate isomerase from <i>T. brucei</i>	4.6 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Lambeir et al. ¹¹²
Arsenate	Protein tyrosine phosphatase of <i>Yersinia</i>	4.66 mM	Enzyme activity of <i>p</i> NPP hydrolysis at 405 nm	Keng et al. ⁹⁹
Arsenate	Bovine spleen purple acid phosphatase	5 mM	Enzyme activity of 2-naphthyl phosphate hydrolysis at ~ 540 nm	Dietrich et al. ¹¹³
Arsenate	Ornithine carbamoyltransferase of <i>E. coli</i>	5 mM	Enzyme activity of citrulline formation at 490 nm	Wargnies et al. ¹¹⁴
Arsenate	Ornithine carbamoyltransferase of <i>E. coli</i> W	5.1 mM	Enzyme activity of citrulline formation at 490 nm	Legrain et al. ¹¹⁵
Arsenate	Triosephosphate isomerase from rabbit	5.5 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Burton et al. ¹¹⁶
Arsenate	Rabbit-muscle triosephosphate isomerase	5.5–6.2 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Lambeir et al. ¹¹²
Arsenate	Subforms of triosephosphate isomerase from rabbit	5.7–7.3 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Krietsch et al. ¹¹⁷
Arsenate	Mn ²⁺ -stimulated λ protein phosphatase	6.0 mM	Enzyme activity of nitrophenol formation at 410 nm	Reiter et al. ¹¹⁸

Arsenate	Triosephosphate isomerase from rabbit	6.2–6.3 mM	Enzyme activity of (R)–glyceraldehyde phosphate formation	Krietsch et al. ¹¹⁹
DMA ^V	MMA ^V reductase from rabbit liver	6.5 mM	Enzyme activity of [¹⁴ C]MMA ^{III} formation	Zakharyan et al. ¹²⁰
Phenylarsonate	α–chymotrypsin	6.5 mM	Displacement of proflavine at 465 nm	Glazer ⁹¹
Arsenate	Rabbit skeletal muscle phosphorylase	6.5–14.2 mM	Enzyme activity of NADPH formation at 340 nm in a coupled assay	Helmreich et al. ¹²¹
Arsonoacetate	Succinate dehydrogenase	6.7 mM	Enzyme activity of succinate oxidation at 420 nm	Seaman ¹²²
Phenylarsonate	α–chymotrypsin	6.88 mM	Enzyme activity of <i>p</i> –nitrophenol formation at 410 nm	Glazer ⁹¹
2–amino–4–arsonobutyrate	Glutamate dehydrogenase	7.3 mM	Enzyme activity of NADH oxidation at 340 nm	Couee et al. ¹²³
Arsenate	Distal domain of PTPα	8.1 mM	Enzyme activity of nitrophenol formation at 410 nm	Wu et al. ⁹²
<i>p</i> –Tolylarsonate	Novo subtilisin	8.1 mM	Displacement of 4–(4'–aminophenylazo)phenylarsonate at 478 nm	Glazer ⁹¹
Arsenate	Yeast triosephosphate isomerase of <i>E. coli</i>	9.6 mM	Enzyme activity of (R)–glyceraldehyde phosphate formation	Nickbarg et al. ¹²⁴
<i>p</i> –Nitrophenylarsonate	Carlsberg subtilisin	9.7 mM	Enzyme activity of <i>N</i> –benzoyl–L–arginine ethyl ester hydrolysis	Glazer ⁹¹
<i>p</i> –Nitrophenylarsonate	Novo subtilisin	9.8 mM	Displacement of 4–(4'–aminophenylazo)phenylarsonate at 478 nm	Glazer ⁹¹

Arsenate	Galactose-binding protein dependent transport in <i>S. typhimurium</i> proteoliposomes	10 mM	[³ H]-galactose transport assay	Richarme ¹²⁵
Arsenate	Chicken triosephosphate isomerase	11 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Zhang et al. ¹²⁶
Arsenate	Triosephosphate isomerase from chicken	11.1 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Putman et al. ¹²⁷
Arsenate	Triosephosphate isomerase from brewers' yeast	12 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Nickbarg et al. ¹²⁴
Arsenate	Triosephosphate isomerase from yeast	12 mM	Enzyme activity of (R)-glyceraldehyde phosphate formation	Krietsch et al. ¹¹⁹
DMA ^V	Acetyl esterase	~ 12 mM	Enzyme activity of phenol formation at 270 nm	Zhu et al. ¹²⁸
<i>p</i> -Nitrophenylarsonate	Novo subtilisin	12.1 mM	Enzyme activity of <i>N</i> -benzoyl-L-arginine ethyl ester hydrolysis	Glazer ⁹¹
Arsenate	MMA ^V reductase from rabbit liver	14 mM	Enzyme activity of [¹⁴ C]MMA ^{III} formation	Zakharyan et al. ¹²⁰
2-arsonoacetyl-L-proline	Angiotensin-converting enzyme from rabbit lung	18 mM	Enzyme activity of histidyl-leucine formation with <i>o</i> -phthalaldehyde postlabeling	Galardy et al. ⁹³
Arsenate	Dual-specific protein tyrosine phosphatase	20.9 mM	Enzyme activity of nitrophenol formation at 405 nm	Zhou et al. ¹²⁹
Arsenate	Angiotensin-converting enzyme from rabbit lung	27 mM	Enzyme activity of histidyl-leucine formation with <i>o</i> -phthalaldehyde postlabeling	Galardy et al. ⁹³
DMA ^V	Angiotensin-converting enzyme from rabbit lung	70 mM	Enzyme activity of histidyl-leucine formation with <i>o</i> -phthalaldehyde postlabeling	Galardy et al. ⁹³

Arsenate	Catabolic ornithine carbamoyltransferase of <i>P. putida</i>	85 mM	Enzyme activity of citrulline formation at 490 nm	Wargnies et al. ¹¹⁴
Arsenate	Arsenate reductase of <i>S. aureus</i>	$K_m = 1 \mu\text{M}$	Enzyme activity of NADPH oxidation at 340 nm	Ji et al. ¹³⁰
Arsenate	Arsenate reductase of Shewanella	$K_m = 5 \mu\text{M}$	Enzyme activity of methyl viologen oxidation at 600 nm	Malasarn et al. ¹³¹
Arsenate	Arsenate reductase of <i>S. aureus</i> plasmid pI258	$K_m = 9\text{--}81 \mu\text{M}$	Enzyme activity of NADPH oxidation at 340 nm	Roos et al. ¹³²
3-arsenopyruvate	Phosphoenolpyruvate mutase	$K_m = 20 \mu\text{M}$	Enzyme activity of pyruvate formation at 340 nm	Chawla et al. ⁷⁸
Arsenate	Arsenate reductase of <i>B. seleitireducens</i>	$K_m = 34 \mu\text{M}$	Enzyme activity of methyl viologen oxidation at 600 nm	Afkar et al. ¹³³
Arsenate	Arsenate reductase of <i>B. subtilis</i>	$K_m = 47\text{--}64 \mu\text{M}$	Enzyme activity of NADPH oxidation at 340 nm	Roos et al. ¹³²
Arsenate	Arsenate reductase of <i>S.aureus</i>	$K_m = 68 \mu\text{M}$	Enzyme activity of NADPH oxidation at 340 nm	Messens et al. ⁴²
MMA ^V	Arsenic methyltransferase from rabbit liver	$K_m = 70 \mu\text{M}$	Enzyme activity of [methyl- ³ H]Adomet methyl transfer	Zakharyan et al. ³³
Arsenate	Arsenate reductase of SES-3	$K_m = 0.2 \text{mM}$	Enzyme activity of methyl viologen oxidation at 600 nm	Newman ¹³⁴
Arsenate	Arsenate reductase of <i>C.arsenatis</i>	$K_m = 0.3 \text{mM}$	Enzyme activity of benzyl viologen oxidation at 546 nm	Krafft et al. ¹³⁵
Arsenate	Pseudomonas derived arsenate reductase	$K_m = 0.4 \text{mM}$	Enzyme activity of NADPH oxidation at 340 nm	Joshi et al. ¹³⁶

3,4-dihydroxybutylarsonic acid	Glycerol-3-phosphate dehydrogenase	$K_m = 0.55 \text{ mM}$	Enzyme activity of NADH formation at 340 nm	Mutenda et al. ¹³⁷
Arsenate	ATP-synthase from beef heart submitochondrial particles	$K_m = 0.8 \text{ mM}$	Enzyme activity of NADPH formation at 340 nm in a coupled assay	Moore et al. ¹³⁸
Arsenate	Human liver arsenate reductase	$K_m = 0.81\text{--}1.8 \text{ mM}$	Enzyme activity of [⁷³ As]arsenate reduction by HPLC	Radabaugh et al. ¹³⁹
Arsenate	Cellobiose phosphorylase from <i>C. uda</i>	$K_m = 0.9 \text{ mM}$	Enzyme activity of D-glucose release by glucoanalysis	Nidetzky et al. ¹⁴⁰
Arsenate	Catalytic Domain of human Cdc25C phosphatase (arsenate reductase)	$K_m = 0.9\text{--}1.7 \text{ mM}$	Enzyme activity of NADPH oxidation	Bhattacharjee et al. ⁴⁵
Arsenate	Succinic thiokinase	$K_m = 1 \text{ mM}$	Enzymatic activity of succinyl-CoA arsenolysis	Cha et al. ¹⁴¹
Arsenate	Arsenate reductase of <i>Synechocystis</i>	$K_m = 1.25 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Li et al. ¹⁴²
Arsenate	Aspartate-β-semialdehyde dehydrogenase	$K_m = 1.6 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Kish et al. ¹⁴³
Arsenate	Purine nucleoside phosphorylase from human erythrocytes	$K_m = 1.8 \text{ mM}$	Enzyme activity of inosine monophosphate formation in a xanthine oxidase-coupled assay	De Verdier et al. ¹⁴⁴
Arsenate	Ornithine carbamoyltransferase of <i>E. coli</i> W	$K_m = 1.8 \text{ mM}$	Enzyme activity of citrulline degradation	Legrain et al. ¹¹⁵

MMA ^V	MMA ^V reductase from rabbit liver	$K_m = 2.2 \text{ mM}$	Enzyme activity of [¹⁴ C]MMA ^{III} formation	Zakharyan et al. ¹²⁰
Arsenate	Pteria derived arsenate reductase	$K_m = 2.3 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Duan et al. ⁴⁴
Arsenate	Catalytic Domain of human Cdc25B phosphatase (arsenate reductase)	$K_m = 2.5\text{--}5 \text{ mM}$	Enzyme activity of NADPH oxidation	Bhattacharjee et al. ⁴⁵
2-aminoethylarsonic acid	Ethanolamine-phosphate cytidylyltransferase	$K_m \sim 3 \text{ mM}$	Enzyme activity of CTP hydrolysis at 280 nm	Visedo-Gonzalez et al. ¹⁴⁵
Arsenate	Rabbit skeletal muscle phosphorylase	$K_m = 3\text{--}9 \text{ mM}$	Enzyme activity of glucose release involving glucose dehydrogenase	Helmreich et al. ¹⁴⁶
Arsenate	Ornithine carbamoyltransferase of <i>S. cerevisiae</i>	$K_m = 3.4 \text{ mM}$	Enzyme activity of citrulline degradation	Simon et al. ^{147,148}
Arsenate	Trehalose phosphorylase from <i>S. commune</i>	$K_m = 3.8 \text{ mM}$	Enzyme activity of D-glucose release by glucoanalysis	Eis et al. ¹⁴⁹
Arsenate	Arsenate reductase of <i>L. major</i>	$K_m = 6 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Zhou et al. ³⁰
Arsonomethyl analogue of 3-phosphoglycerate	Phosphoglycerate kinase	$K_m = 6.1 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Adams et al. ¹⁵⁰
Arsonomethyl analogue of 2-phosphoglycerate	Enolase	$K_m = 6.5 \text{ mM}$	Enzyme activity of dehydration at 240 nm	Chawla et al. ¹⁵¹
Arsenate	Arsenate reductase	$K_m = 8 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Gladysheva et al. ³⁷

Arsenate	Arsenate reductase of OsACR2.2	$K_m = 9.2 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Duan et al. ¹⁵²
Arsonomethyl analogue of AMP	Adenylate kinase	$K_m = 10 \text{ mM}$	Enzyme activity of NADH formation at 340 nm in a coupled assay	Adams et al. ^{150,153}
Arsenate	Arsenate reductase of OsACR2.1	$K_m = 12.2 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Duan et al. ¹⁵²
Arsenate	Arsenate reductase of <i>E. coli</i> plasmid R773	$K_m = 15.2 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Shi et al. ¹⁵⁴
Arsenate	Rabbit skeletal muscle phosphorylase	$K_m = 16\text{--}43 \text{ mM}$	Enzyme activity of glucose release involving glucose dehydrogenase	Helmreich et al. ¹⁴⁶
DMA ^V	MMA ^V reductase from rabbit liver	$K_m = 20.9 \text{ mM}$	Enzyme activity of [¹⁴ C]MMA ^{III} formation	Zakharyan et al. ¹²⁰
MMA ^V	Recombinant human GSTO1-1	$K_m = 23.5 \text{ mM}$	Enzyme activity of [¹⁴ C]MMA ^{III} formation	Zakharyan et al. ¹⁵⁵
MMA ^V	MMA ^V reductase from human liver	$K_m = 23.6 \text{ mM}$	Enzyme activity of [¹⁴ C]MMA ^{III} formation	Zakharyan et al. ¹⁵⁵
Arsenate	Arsenate reductase of <i>P. vittata</i>	$K_m = 28 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Ellis et al. ¹⁵⁶
DMA ^V	Recombinant human GSTO1-1	$K_m = 30.6 \text{ mM}$	Enzyme activity of [¹⁴ C]DMA ^{III} formation	Zakharyan et al. ¹⁵⁷
Arsenate	Recombinant human GSTO1-1	$K_m = 34.8 \text{ mM}$	Enzyme activity of arsenite formation determined by HPLC-ICPMS	Zakharyan et al. ¹⁵⁷
Arsenate	Arsenate reductase of <i>S. cerevisiae</i>	$K_m = 35 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Mukhopadhyay et al. ¹⁵⁸

MMA ^V	Human glutathione S-transferase omega GSTO1-1	$K_m = 42 \text{ mM}$	Enzyme activity of NADPH oxidation at 340 nm	Sampayo-Reyes et al. ¹⁵⁹
MMA ^V	Recombinant human GSTO1-1	$K_m = 53.6 \text{ mM}$	Enzyme activity of [¹⁴ C]MMA ^{III} formation	Zakharyan et al. ¹⁵⁷
Arsenate	MMA ^V reductase from rabbit liver	$K_m = 109 \text{ mM}$	Enzyme activity of [¹⁴ C]MMA ^{III} formation	Zakharyan et al. ¹²⁰

N.B. Only gene-encoded wild-type polypeptides (proteins) are included in the table. Tetracysteine fused proteins as investigated in ref [160, 161], and mutated proteins as investigated in the cited articles and in ref [162–168] are excluded from the table.

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Table S4. Binding affinity between arsenicals and peptides/small thiols

Artenical	Peptide/Small thiol	K_d (μM)	Method	Reference
⁷³ As-labeled arsenite	Arsenic(+3)methyltransferase YYGCGLVIPEHLENCWILDLGSGSGRDCYVLK	2	Vacuum filtration binding assay	Kitchin et al. ¹
⁷³ As-labeled arsenite	Thioredoxin reductase ASILQAGCCEGGK	12.5	Vacuum filtration binding assay	Kitchin et al. ¹
⁷³ As-labeled arsenite	Keap-1 KYDCEQRRFYVQALLRAVRCHSLTNFLQ MQLQKCEILQSDSRCKDY	2.6	Vacuum filtration binding assay	Kitchin et al. ¹
⁷³ As-labeled arsenite	β domain of human metallothionein II MDPNCSCAAGDSCTCCGSCCKCKECKCTSCKKSK	3.1	Vacuum filtration binding assay	Kitchin et al. ¹
⁷³ As-labeled arsenite	RYCAVCNDYASGYHYGV	2.71	Vacuum filtration binding assay	Kitchin et al. ²
⁷³ As-labeled arsenite	RYCAVCNDYASGYHYGVWSCEGCKA	2.2	Vacuum filtration binding assay	Kitchin et al. ²
⁷³ As-labeled arsenite	RYCAVCNDYASGYHYGVWSCEGGKA	4.28	Vacuum filtration binding assay	Kitchin et al. ²
⁷³ As-labeled arsenite	RVCAVGNDYASGYHYGV	190	Vacuum filtration binding assay	Kitchin et al. ²
⁷³ As-labeled arsenite	RYGAVGNDYASGYHYGV	>9600	Vacuum filtration binding assay	Kitchin et al. ²
⁷³ As-labeled arsenite	LEGAWQGKGVVEGTEHLYSCKCKNV	3.27	Vacuum filtration binding assay	Kitchin et al. ³

⁷³ As-labeled arsenite	LEGAWQGKGVEGTECLYSMKCKNV	5.63	Vacuum filtration binding assay	Kitchin et al. ³
⁷³ As-labeled arsenite	LEGAWQGKGVCSTEHLYSMKCKNV	20.1	Vacuum filtration binding assay	Kitchin et al. ³
⁷³ As-labeled arsenite	LEGAWCGKGVEGTEHLYSMKCKNV	9.06	Vacuum filtration binding assay	Kitchin et al. ³
⁷³ As-labeled arsenite	LECAWQGKGVEGTEHLYSMKCKNV	123	Vacuum filtration binding assay	Kitchin et al. ³
⁷³ As-labeled arsenite	LEGAWQGKGVEGTEHLYSMKCKNV	124	Vacuum filtration binding assay	Kitchin et al. ³
⁷³ As-labeled arsenite	LECAWQGKCVTEGTEHLYSMKCKNV	1.3	Vacuum filtration binding assay	Kitchin et al. ²
⁷³ As-labeled arsenite	LEGAWQGKGVEGTEHLYSMKGKNV	>9600	Vacuum filtration binding assay	Kitchin et al. ²
Arsenite	Glucocorticoid receptor DNA binding domain	2.5	Isothermal titration calorimetry	Spunches et al. ⁴
MMA ^{III}	Glucocorticoid receptor DNA binding domain	0.625	Isothermal titration calorimetry	Spunches et al. ⁴
PSAO	Ac-YGGKAAAANKAAAACCA-NH ₂	0.074	UV absorbance at 300 nm	Cline et al. ⁵
PSAO	Ac-YGGKAAAANKAAAACACA-NH ₂	0.03	UV absorbance at 300 nm	Cline et al. ⁵
PSAO	Ac-YGGKAAAANKAAAACKACAA-NH ₂	0.05	UV absorbance at 300 nm	Cline et al. ⁵
PSAO	Ac-YGGKAAAANKAAAACKAACA-NH ₂	0.198	UV absorbance at 300 nm	Cline et al. ⁵
PSAO	Ac-YGGKAAAANKACCAKAAAA-NH ₂	0.13	UV absorbance at 300 nm	Cline et al. ⁵
PSAO	Ac-YGGKAAAANKCACAKAAAA-NH ₂	0.015	UV absorbance at 300 nm	Cline et al. ⁵

PSAO	Ac-YGGKAAACKACAACAAAA-NH2	0.088	UV absorbance at 300 nm	Cline et al. ⁵
PSAO	Ac-YGGKAAACKAACAKAAAA-NH2	0.028	UV absorbance at 300 nm	Cline et al. ⁵
PSAO	TCTTRYVEVDPGOKILQTTCT-NH2	0.032	UV absorbance at 300 nm	Ramadan et al. ⁶
PSAO	TTCTRYVEVDPGOKILQCTTT-NH2	0.013	UV absorbance at 300 nm	Ramadan et al. ⁶
PSAO	TCTTRYVEVDPGOKILCTTTT-NH2	0.052	UV absorbance at 300 nm	Ramadan et al. ⁶
PSAO	TTTCRYCEVDPGOKILQTTTT-NH2	0.106	UV absorbance at 300 nm	Ramadan et al. ⁶
MMA ^{III}	XPA zinc finger acetyl-DYVICEECGKEFMDSYLMNHFDLPTCDNC RDADDKHK-amide (zinc-associated)	33	ESI-MS	Piatek et al. ⁷
Arsenite	HIV nucleocapsid NCp7 zinc finger KGCWKCGKEGHQMKDCTE (zinc-associated)	0.48–2.3 mM	ESI-MS	Demicheli et al. ⁸
Arsenite	Sp1-zf2 (f565–595) RPFMCTWSYCGKRFRSDELQRHKRTHHTGEK	235	Intrinsic tryptophan fluorescence	Zhao et al. ⁹
Arsenite	NCp7-zf2 (f34–52) KGCWKCGKEGHQMKDCTER	3.3	Intrinsic tryptophan fluorescence	Zhao et al. ⁹
Arsenite	ER α -zf1 (f180–214) KETRYCAVCNDYASGYHYGVWSCEGCKAFFKR SIQ	2.4	Intrinsic tryptophan fluorescence	Zhao et al. ⁹
Arsenite	Sp1 f530–623	5.8	Intrinsic tryptophan fluorescence	Zhao et al. ⁹
Arsenite	NCp7 f12–55	4.4	Intrinsic tryptophan fluorescence	Zhao et al. ⁹

Arsenite	ER α fl180–241	3.6	Intrinsic tryptophan fluorescence	Zhao et al. ⁹
FlAsH	Ac–WDCCCCK–NH ₂	1800 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCACCK–NH ₂	67 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCGCCK–NH ₂	100 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCPCCK–NH ₂	150 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WEAAAREACCRECCARA–NH ₂	70 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCAECCK–NH ₂	72 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCSECCK–NH ₂	42 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCDECCK–NH ₂	41 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCPGCCK–NH ₂	4 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCGPCCK–NH ₂	72 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
FlAsH	Ac–WDCCDEACCK–NH ₂	92000 pM	Fluorescence intensity at 530 nm	Adams et al. ¹⁰
CrAsH	Ac–AREACCPGCCK–NH ₂	407 nM	Fluorescence intensity at around 530 nm	Cao et al. ¹¹
ReAsH	Ac–AREACCPGCCK–NH ₂	1.3	Fluorescence intensity at 608 nm	Chen et al. ¹²
ReAsH	Ac–AREACCKACCK–NH ₂	3.3	Fluorescence intensity at 608 nm	Chen et al. ¹²
FlAsH	Ac–AREACCPGCCK–NH ₂	0.24	Fluorescence intensity at 530 nm	Chen et al. ¹²
FlAsH	Ac–AREACCKACCK–NH ₂	0.85	Fluorescence intensity at 530 nm	Chen et al. ¹²
AsCy3	Ac–CCKAEAACC–NH ₂	80 nM	Fluorescence intensity at 568 nm	Cao et al. ¹³
FlAsH	Ac–FLNCCPGCCMEP–NH ₂	0.48	Fluorescence intensity at 530 nm	Luedtke et al. ¹⁴
FlAsH	Ac–FLNCCPPPPPPPPCCMEP–NH ₂	>111	Fluorescence intensity at 530 nm	Luedtke et al. ¹⁴

FIAsH	Ac-FLNCCPSQPTYPGDDAPVEDLIRFYDNLQQY LNVCCMEP-NH2	5.8	Fluorescence intensity at 530 nm	Luedtke et al. ¹⁴
FIAsH	Ac-FLNCCEWTWDDATKTWTWTCCMEP-NH2	0.62	Fluorescence intensity at 530 nm	Luedtke et al. ¹⁴
FIAsH	Ac-CCGGQLEDKVEELLSKNYHLENEVARLKKL VG-NH2	25	Fluorescence intensity at 530 nm	Luedtke et al. ¹⁴
FIAsH	Ac-WRIARLEEKVKTLKAQNSELASTANMLREQ VAQLKQKVCC-NH2	1.8	Fluorescence intensity at 530 nm	Luedtke et al. ¹⁴
ReAsH	Ac-FLNCCPGCCMEP-NH2	0.37	Fluorescence intensity at 630 nm	Luedtke et al. ¹⁴
ReAsH	Ac-FLNCCPPPPPPPPCCMEP-NH2	>111	Fluorescence intensity at 630 nm	Luedtke et al. ¹⁴
ReAsH	Ac-FLNCCPSQPTYPGDDAPVEDLIRFYDNLQQY LNVCCMEP-NH2	3.4	Fluorescence intensity at 630 nm	Luedtke et al. ¹⁴
ReAsH	Ac-FLNCCEWTWDDATKTWTWTCCMEP-NH2	0.38	Fluorescence intensity at 630 nm	Luedtke et al. ¹⁴
ReAsH	Ac-CCGGQLEDKVEELLSKNYHLENEVARLKKL VG-NH2	28	Fluorescence intensity at 630 nm	Luedtke et al. ¹⁴
ReAsH	Ac-WRIARLEEKVKTLKAQNSELASTANMLREQ VAQLKQKVCC-NH2	10	Fluorescence intensity at 630 nm	Luedtke et al. ¹⁴

GSAO	Protein disulfide isomerase WCGHCK	0.87	Remaining RSH content assayed with DTNB	Donoghue et al. ¹⁵
GSAO	Thioredoxin WCGPCK	1.42	Remaining RSH content assayed with DTNB	Donoghue et al. ¹⁵
GSAO	2,3-dimercapto-1-propanol (BAL)	0.13	Remaining RSH content assayed with DTNB	Donoghue et al. ¹⁵
GSAO	6,8-thioctic acid (DHLA)	0.2	Remaining RSH content assayed with DTNB	Donoghue et al. ¹⁵
GSAO	Dithiothreitol (DTT)	0.42	Remaining RSH content assayed with DTNB	Donoghue et al. ¹⁵
Arsenite	Glutathione	0.556	Isothermal titration calorimetry	Spuches et al. ¹⁶
MMA ^{III}	Glutathione	0.077	Isothermal titration calorimetry	Spuches et al. ¹⁶
Arsenite	2,3-dimercaptosuccinic acid (DMSA)	1.2 nM	Isothermal titration calorimetry	Spuches et al. ¹⁶
MMA ^{III}	2,3-dimercaptosuccinic acid (DMSA)	0.1	Isothermal titration calorimetry	Spuches et al. ¹⁶
Arsenite	6,8-thioctic acid (DHLA)	0.25 aM	UV absorbance at 270 nm	Spuches et al. ¹⁶
MMA ^{III}	6,8-thioctic acid (DHLA)	0.091	Isothermal titration calorimetry	Spuches et al. ¹⁶
Arsenite	Dithiothreitol (DTT)	1.05	Isothermal titration calorimetry	Spuches et al. ¹⁶

MMA ^{III}	Dithiothreitol (DTT)	1.21	Isothermal titration calorimetry	Spuches et al. ¹⁶
Arsenite	Dithiothreitol (DTT)	0.33	Remaining RSH content assayed with DTNB	Zahler et al. ¹⁷
Arsenite	Dithioerythritol (DTE)	0.37	Remaining RSH content assayed with DTNB	Zahler et al. ¹⁷
Arsenite	1,3-dithioglycerol	0.49	Remaining RSH content assayed with DTNB	Zahler et al. ¹⁷
Arsenite	1,2-dithioglycerol (BAL)	0.26	Remaining RSH content assayed with DTNB	Zahler et al. ¹⁷
APA	Dithiothreitol (DTT)	2.2	Remaining RSH content assayed with DTNB	Dou et al. ¹⁸
¹⁴ C-phenyldichloroarsine	Glutathione	0.27 nM	Equilibrium dialysis of ¹⁴ C-As binding in intact human erythrocytes	Chong et al. ¹⁹
PAO	Glutathione	0.1 – 0.5 nM	ESI-MS	Schmidt et al. ²⁰
Melarsen oxide	Dihydrotrypanothione	0.083	Remaining RSH content assayed with DTNB	Fairlamb et al. ²¹
Melarsen oxide	2,3-dimercaptopropanol(BAL)	12.6 pM	Remaining RSH content assayed with DTNB	Fairlamb et al. ²¹
Melarsen oxide	2,3-dimercaptosuccinate (DMSA)	22.2 pM	Remaining RSH content assayed with DTNB	Fairlamb et al. ²¹
Melarsen oxide	Dihydrolipoic acid (DHLA)	0.22 nM	Remaining RSH content assayed with DTNB	Fairlamb et al. ²¹
Melarsen oxide	Dihydrolipoamide	0.18 nM	Remaining RSH content assayed with DTNB	Fairlamb et al. ²¹

N.B. Mutated protein domains, as investigated in ref [14], are not included in the table.

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Table S5. Rate constants of the binding between arsenicals and proteins/peptides/small thiols

Artenical	Protein/Peptide/Small thiol	k_{on} ($M^{-1}s^{-1}$)	k_{off} (s^{-1})	Method	Reference
Arsenite	Oxidized xanthine oxidase	0.9	2×10^{-5}	Charge-transfer complex absorbance at 380 nm (cyanolysis of inactivated enzyme)	Hille et al. ¹
Arsenite	Oxidized xanthine oxidase	2.9×10^3	2×10^{-5}	Charge-transfer complex absorbance at 380 nm (cyanolysis of inactivated enzyme)	Stewart et al. ²
Arsenite	Reduced xanthine oxidase	~ 100	0.6×10^{-5} (calculated)	Enzyme activity of uric acid formation measured at 295 nm	Stewart et al. ²
Arsenite	Oxidized desulfo xanthine oxidase	<u>0.005</u>	1×10^{-5}	Recovery of enzyme activity with dilution or charge-transfer complex absorbance at 380 nm with cyanolysis after removing arsenite	Stewart et al. ²
Arsenite	Reduced xanthine oxidase	98		Enzyme activity of uric acid formation measured at 295 nm	George et al. ³
Arsenite	Oxidized xanthine oxidase	2.38		Charge-transfer complex absorbance at 380 nm	George et al. ³
PAO	LMW phosphotyrosyl protein phosphatase	14		Enzyme activity for <i>p</i> -nitrophenol at 410 nm	Zhang et al. ⁴
Arsenite–BAL	Betaine aldehyde dehydrogenase	26	3.3×10^{-3}	Enzyme activity of NADPH formation at 340 nm (recovery of enzyme activity with DTT or β -ME)	Gonzalez–Segura et al. ⁵
Arsenite	Acetylcholinesterase from electric eel	2.2	3.2×10^{-5} (calculated)	Enzyme activity of hydrolysis of acetylthiocholine at 412 nm	Wilson et al. ⁶
Arsenite	Butyrylcholinesterase from human serum	5.7	7.3×10^{-4}	Enzyme activity of hydrolysis of acetylthiocholine at 412 nm (recovery of inactivated enzyme with extensive dilution)	Page et al. ⁷
Arsenite	Butyrylcholinesterase from horse serum	1.2		Flow microcalorimetry	Fulladosa et al. ⁸
MMA ^{III}	Reduced riboflavin binding protein	2350		Stopped-flow fluorescence at 295 nm	Ramadan et al. ⁹
PAO	Lipoamide dehydrogenase	9		Enzyme activity of NADH oxidation at 340 nm	Knowles ¹⁰
MMA ^{III}	Lipoamide dehydrogenase	94		Enzyme activity of NADH oxidation at 340 nm	Knowles ¹⁰

Arsenite	apo-human metallothionein	$k_{1\beta\alpha} = 25$ $k_{2\beta\alpha} = 24$ $k_{3\beta\alpha} = 19$ $k_{4\beta\alpha} = 14$ $k_{5\beta\alpha} = 8.7$ $k_{6\beta\alpha} = 3.7$	Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS	Ngu et al. ¹¹
Arsenite	apo-human metallothionein α domain	$k_{1\alpha} = 5.5$ $k_{2\alpha} = 6.3$ $k_{3\alpha} = 3.9$	Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS	Ngu et al. ¹²
Arsenite	apo-human metallothionein β domain	$k_{1\beta} = 3.6$ $k_{2\beta} = 2.0$ $k_{3\beta} = 0.8$	Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS	Ngu et al. ¹²
Arsenite	apo-F.vesiculosus metallothionein	$k_{1\gamma} = 19.8$ $k_{2\gamma} = 1.4$ $k_{1\beta} = 16.3$ $k_{2\beta} = 9.1$ $k_{3\beta} = 2.2$	Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS	Ngu et al. ¹³
Arsenite	concatenated human metallothionein triple α domains	$k_{1\alpha\alpha\alpha} = 52$ $k_{2\alpha\alpha\alpha} = 45$ $k_{3\alpha\alpha\alpha} = 46$ $k_{4\alpha\alpha\alpha} = 42$ $k_{5\alpha\alpha\alpha} = 38$ $k_{6\alpha\alpha\alpha} = 36$ $k_{7\alpha\alpha\alpha} = 29$ $k_{8\alpha\alpha\alpha} = 25$ $k_{9\alpha\alpha\alpha} = 14$ $k_{10\alpha\alpha\alpha} = 6$	Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS	Ngu et al. ¹⁴

Arsenite	concatenated human metallothionein triple β domains	$k_{1\beta\beta\beta} = 40$ $k_{2\beta\beta\beta} = 36$ $k_{3\beta\beta\beta} = 37$ $k_{4\beta\beta\beta} = 26$ $k_{5\beta\beta\beta} = 27$ $k_{6\beta\beta\beta} = 17$ $k_{7\beta\beta\beta} = 12$ $k_{8\beta\beta\beta} = 6$ $k_{9\beta\beta\beta} = 1$		Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS Time-resolved ESI-MS	Ngu et al. ¹⁴
PSAO	Ac-YGGKAAAAKAAAAK ACCA-NH2	14430	<u>1.1×10^{-3}</u>	Stopped-flow absorbance at 300 nm	Cline et al. ¹⁵
PSAO	Ac-YGGKAAAAKAAAAK CACA-NH2	10970	<u>3.3×10^{-4}</u>	Stopped-flow absorbance at 300 nm	Cline et al. ¹⁵
PSAO	Ac-YGGKAAAAKAAACK ACAA-NH2	14250	<u>7.1×10^{-4}</u>	Stopped-flow absorbance at 300 nm	Cline et al. ¹⁵
PSAO	Ac-YGGKAAAAKAAACK AACA-NH2	14080	<u>2.8×10^{-3}</u>	Stopped-flow absorbance at 300 nm	Cline et al. ¹⁵
PSAO	Ac-YGGKAAAAKACCAK AAAA-NH2	27670	<u>3.6×10^{-3}</u>	Stopped-flow absorbance at 300 nm	Cline et al. ¹⁵
PSAO	Ac-YGGKAAAAKCAKAK AAAA-NH2	21580	<u>3.2×10^{-4}</u>	Stopped-flow absorbance at 300 nm	Cline et al. ¹⁵
PSAO	Ac-YGGKAAACKACA AAAA-NH2	23910	<u>2.1×10^{-3}</u>	Stopped-flow absorbance at 300 nm	Cline et al. ¹⁵
PSAO	Ac-YGGKAAACKAACAK AAAA-NH2	26550	<u>7.4×10^{-4}</u>	Stopped-flow absorbance at 300 nm	Cline et al. ¹⁵
PSAO	TCTTRYVEVDPGOKILQT TCT-NH2	16190	<u>5.2×10^{-4}</u>	Stopped-flow absorbance at 300 nm	Ramadan et al. ¹⁶
PSAO	TTCTRYVEVDPGOKILQC TTT-NH2	21680	<u>2.8×10^{-4}</u>	Stopped-flow absorbance at 300 nm	Ramadan et al. ¹⁶

PSAO	TCTTRYVEVDPGOKILCTT TT-NH2	10310	5.4×10^{-4}	Stopped-flow absorbance at 300 nm	Ramadan et al. ¹⁶
PSAO	TTTCRYCEVDPGOKILQTT TT-NH2	16440	1.7×10^{-3}	Stopped-flow absorbance at 300 nm	Ramadan et al. ¹⁶
ReAsH	Ac-AREACCPGCCCK-NH2	12500	1.6×10^{-2}	Fluorescence intensity at 608 nm	Chen et al. ¹⁷
ReAsH	Ac-AREACCKACCK-NH2	8470	2.8×10^{-2}	Fluorescence intensity at 608 nm	Chen et al. ¹⁷
FIAsH	Ac-AREACCPGCCCK-NH2	124000	3.0×10^{-2}	Fluorescence intensity at 530 nm	Chen et al. ¹⁷
FIAsH	Ac-AREACCKACCK-NH2	143000	0.12	Fluorescence intensity at 530 nm	Chen et al. ¹⁷
FIAsH	Ac-WDCCCK-NH2	46000	8.2×10^{-5}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCACCK-NH2	57000	3.8×10^{-6}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCGCCCK-NH2	35000	3.6×10^{-6}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCPCCK-NH2	100000	1.5×10^{-5}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WEAAAREACCRECCA RA-NH2	65000	4.5×10^{-6}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCAECCK-NH2	25000	1.8×10^{-6}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCSECCK-NH2	50000	2.1×10^{-6}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCDECCK-NH2	32000	1.3×10^{-6}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCPGCCCK-NH2	310000	1.2×10^{-6}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCGPCCK-NH2	50000	3.6×10^{-6}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸
FIAsH	Ac-WDCCDEACCK-NH2	65000	6.0×10^{-3}	Fluorescence intensity at 530 nm (exchange of HPLC purified complex with ReAsH)	Adams et al. ¹⁸

⁷³ As–label ed arsenite	RVCAVGNDYASGYHYGV	$k_1 = 4500$ (calculated) $k_2 = 30.7$ (calculated) $k_3 = 0.6$ (calculated)	$k_{-1} = 0.85$ $k_{-2} = 5.8 \times 10^{-3}$ $k_{-3} = 1.2 \times 10^{-4}$	Exchange of binding complex with cold arsenite followed by vacuum filtration binding assay Exchange of binding complex with cold arsenite followed by vacuum filtration binding assay Exchange of binding complex with cold arsenite followed by vacuum filtration binding assay	Kitchin et al. ¹⁹
⁷³ As–label ed arsenite	LECAWQGKCVTEHLY SMKCKNV	$k_1 = 2500$ (calculated) $k_2 = 6830$ (calculated) $k_3 = 58.3$ (calculated)	$k_{-1} = 0.3$ $k_{-2} = 8.9 \times 10^{-3}$ $k_{-3} = 7.5 \times 10^{-5}$	Exchange of binding complex with cold arsenite followed by vacuum filtration binding assay Exchange of binding complex with cold arsenite followed by vacuum filtration binding assay Exchange of binding complex with cold arsenite followed by vacuum filtration binding assay	Kitchin et al. ¹⁹
Arsenite	Dithiothreitol (DTT)	4.7×10^2	1.5×10^{-4}	Remaining RSH content assayed with DTNB	Zahler et al. ²⁰
Arsenite	Dithioerythritol (DTE)	4.5×10^2	1.7×10^{-4}	Remaining RSH content assayed with DTNB	Zahler et al. ²⁰
Arsenite	1,3–dithioglycerol	1.2×10^3	5.7×10^{-4}	Remaining RSH content assayed with DTNB	Zahler et al. ²⁰
Arsenite	1,2–dithioglycerol	3.0×10^2	7.7×10^{-5}	Remaining RSH content assayed with DTNB	Zahler et al. ²⁰

N.B. Underlined values were calculated based on reported binding affinity data. Mutated proteins as investigated in ref [21] are not included in the table.

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