

Supplementary Information

Table S1. Number of pharmaceuticals detected at maximum concentrations in raw wastewater (See summary in Figure 2).

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
10–<100	Allopurinol	10	[1]
	Antipyrine	29	[2]
	Azithromycin	53	[3]
	Brompheniramine	40	[1]
	Cimetidine	14	[2]
	Clindamycin	13.3	[4]
	Diazepam	40	[1]
	Diltiazem	57	[2]
	Enalapril	35	[5]
	Hydrocodone	70	[2]
	Methamphetamine	34	[3]
	Norfluoxetine	58	[6]
	Simvastatin hydroxy acid	10	[5]
	Sulfisoxazole	22.1	[4]
100–<1,000	Aspirin	930	[7]
	Biosol	250	[8]
	Bisphenylol	900	[8]
	Carisoprodol	410	[1]
	p-Chloro-m-cresol	600	[8]
	p-Chloro-m-xlenol	400	[8]
	Chlorophene	750	[8]
	Chlortetracycline	260	[9]
	Chlofibric acid	420	[7]
	Clarithromycin	112	[3]
	Codeine	170	[2]
	Dilantin (Phenytoin)	450	[8]
	Doxycycline	220	[9]
	Fenofibrate	250	[1]
	Fluoxetine	600	[2]
	Gabapentin	130	[10]
	o-hydroxy atorvastatin	196	[5]
	p-hydroxy atorvastatin	280	[5]
	Metoprolol	770	[1]
	Oxytetracycline	330	[9]
	Phenobarbital	110	[10]
	Primidone	130	[1]
	Ranitidine	330	[2]
	Sulfadimethoxine	340	[9]
	Sulfamethazine	680	[9]
	Terbinafine	510	[1]
	Terbutaline	310	[11]
	Valproic acid	150	[10]
	Warfarin	170	[2]

Table S1. *Cont.*

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
>1,000	Acetaminophen	218,000	[7]
	Albuterol (Sulbutamol)	13,000	[2]
	Amitriptyline	>2,000	[1]
	Atenolol	3,060	[5]
	Atorvastatin	1,560	[12]
	Carbamazepine	2,100	[11]
	Caffeine	82,882	[6]
	Ciclopirox	1,410	[1]
	Ciprofloxacin	1,000	[13]
	Cotinine	7,800	[2]
	Democlocycline	1,140	[9]
	Diclofenac	3,200	[11]
	Erythromycin-H ₂ O	1,200	[14]
	Gemfibrozil	63,800	[15]
	Ketoprofen	1,500	[11]
	Ibuprofen	56,500	[7]
	Meprobamate	1,440	[5]
	Metformin	26,000	[2]
	Naproxen	23,210	[16]
	Nicotine	17,000	[2]
	Ofloxacin	1,000	[13]
	Paraxanthine	55,000	[2]
	Salicylic acid	8,036.10	[4]
	Simvastatin	1,230	[12]
	Sulfamethoxazole	2,060	[5]
	Tetracycline (TC)	1,200	[14]
	Triclocarban	50,000	[17]
	Triclosan	230,000	[18]
	Trimethoprim	7,000	[19]
	Tylosin	1,150	[20]

Table S2. Number of pharmaceuticals detected at maximum concentrations in treated wastewater (See summary in Figure 2).

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
0.1–<10	Enalapril	0.85	[5]
	Sulfachloropyridazine	1.7	[21]
	Sulfamethazine (SMT)	5	[21]
10–<100	Alprazolam	18	[22]
	Antipyrine	13	[2]
	Aspirin	70	[7]
	p-Chloro-m-xyleneol	80	[8]
	Chlofibric acid	81	[7]
	Chlortetracycline	50	[9]
	Clindamycin	32.5	[4]

Table S2. Cont.

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
10–<100	Dehydronifedipine	15	[23]
	Democlocycline	90	[9]
	Diazepam	40	[1]
	Doxycycline	90	[9]
	Glipizide	30	[22]
	10-hydroxy-amitriptyline	64	[22]
	Linuron	25	[5]
	Norfluoxetine	26	[6]
	Norverapamil	71	[22]
	Paroxetine	13	[22]
	Promethazine	16	[22]
	Propoxyphene	65	[22]
	Propranolol	77	[22]
	Salicylic acid	47.2	[4]
	Sertraline	87	[22]
	Simvastatin	90	[12]
	Sulfadimethoxine	67.3	[21]
	Sulfisoxazole	11.9	[4]
	Terbinafine	120	[1]
	Thiabendazole	32.9	[21]
	Tylosin	60	[20]
	Warfarin	50	[22]
100–<1,000	p-hydroxy atorvastatin	190	[24]
	o-hydroxy atorvastatin	170	[24]
	Atorvastatin	210	[12]
	Azithromycin	690.4	[21]
	Biphenylol	100	[8]
	Carbamazepine	800	[22]
	Carisoprodol	141	[1]
	Chlorophene	200	[8]
	Ciclopirox	321	[1]
	Cimetidine	410	[22]
	Ciprofloxacin	450	[19]
	Clarithromycin	610.6	[4]
	Codeine	170	[2]
	Desmethyldiltiazem	110	[22]
	Diclofenac	240	[10]
	Dilantin (Phenytoin)	340	[24]
	Diltiazem	200	[22]
	Diphenhydramine	588.8	[21]
	Enrofloxacin	100	[25]
	Erythromycin-H ₂ O	300	[14]
	17- α -ethinylestradiol	390	[26]
	Fluoxetine	560	[2]

Table S2. Cont.

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
100–<1,000	Furosemide	930	[22]
	Glyburide	120	[22]
	Hydrocodone	190	[22]
	2-hydroxy-ibuprofen	200	[22]
	Iopromide	580	[24]
	Ketoprofen	280	[8]
	Methamphetamine	350.1	[21]
	Metoprolol	650	[22]
	Ofloxacin	110	[13]
	Oxycodone	150	[22]
	Oxytetracycline	100	[9]
	Primidone	240	[27]
	Ranitidine	550	[22]
	Sulfamethazine	130	[9]
	Triamterene	440	[22]
	Verapamil	190	[22]
	Acetaminophen	11,000	[24]
	Albuterol (Salbutamol)	8,100	[2]
	Amitriptyline	1,490	[1]
	Atenolol	3,140	[24]
	Caffeine	15,200	[2]
	Cotinine	4,000	[2]
	Gemfibrozil	19,400	[15]
	Hydrochlorothiazide	2,950	[22]
	Ibuprofen	12,000	[24]
>1,000	Meprobamate	1,270	[5]
	Metformin	11,000	[2]
	Naproxen	24,600	[16]
	Nicotine	2,100	[2]
	Oxybenzone	3,600	[24]
	Paraxanthine	25,000	[2]
	Sulfamethoxazole	2,200	[22]
	Tetracycline	1,000	[28]
	Triclocarban	12,000	[17]
	Triclosan	5,370	[29]
	Triclosan methyl ester	1,330	[16]
	Trimethoprim	2,400	[19]
	Valsartan	1,500	[22]

Table S3. Number of pharmaceuticals detected at maximum concentrations in surface water (See summary in Figure 2).

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
0.1–<10	Atorvastatin	7.3	[5]
	Diazepam	2.6	[5]
	Duloxetine	2	[30]
	Enalapril	0.35	[5]
	Fluvoxamine	4.6	[31]
	o-hydroxy atorvastatin	6.9	[5]
	p-hydroxy atorvastatin	9.2	[5]
	Linuron	0.89	[5]
	Pentoxifylline	2.8	[32]
	Simvastatin hydroxy acid	0.74	[5]
10–<100	Cetirizine	70	[33]
	Clarithromycin	72	[34]
	Clindamycin	11	[34]
	Clofibric acid	10	[35]
	Dehydronifedipine	30	[36]
	Demethyl-dextrophan	10	[33]
	Desmethyldiltiazem	65	[22]
	Desvenlafaxine	84	[33]
	Dextrophan	50	[33]
	Diclofenac	42	[34]
	Doxycycline	80	[9]
	Enalaprilat	46	[36]
	Erythromycin anhydrate	62	[33]
	Fluoxetine	65	[33]
	Gabapentin	54	[33]
	Hydrochlorothiazide	75	[22]
	Hydrocodone	10	[22]
	Indomethacin	26	[34]
	Lamitrigine 2N-glucuronide	95	[33]
	Methamphetamine	62.6	[21]
	Metoprolol acid	74	[33]
	Nor-citalopram	74	[33]
	Norfluoxetine	13.6	[31]
	Norsertraline	26.7	[31]
	Paroxetine	90	[34]
	Primidone	62	[37]
	Propranolol	53	[33]
	Ranitidine	10	[36]
	Salicylic acid	47	[4]
	Sertraline	49	[30]
	Sulfachloropyridazine	10	[38]
	Sulfathiazole	80	[39]
	Triamterene	12	[22]

Table S3. Cont.

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
100–<1,000	Atenolol	859	[5]
	Bupropion	227	[31]
	Chlortetracycline	690	[36]
	Cimetidine	580	[36]
	Ciprofloxacin	116	[38]
	Citalopram	219	[31]
	Cotinine	900	[36]
	Democlocycline	440	[9]
	Dilantin (Phenytoin)	170	[5]
	Diltiazem	130	[34]
	Erythrohydrobupropion	180	[33]
	Erythromycin	438	[34]
	17- α -ethinylestradiol	831	[36]
	Gemfibrozil	790	[36]
	Lamotrigine	455	[33]
	Lincomycin	730	[36]
	Meprobamate	594	[5]
	Mestranol	407	[36]
	Metformin	150	[36]
	Metoprolol	237	[33]
	Naproxen	107	[40]
	Norfloxacin	120	[36]
	19-norethisterone	872	[36]
	Ofloxacin	281	[38]
	Oxytetracycline	340	[36]
	Roxithromycin	180	[36]
	Sulfamethazine (SMT)	220	[36]
	Sulfamethizole	130	[36]
	Tetracycline	140	[9]
	Thiabendazole	188	[33]
	Trimethoprim	710	[36]
	Tylosin	280	[36]
	Tetracycline (TC)	110	[36]
>1,000	Azithromycin	10,000	[36]
	Carbamazepine	2,356	[38]
	Caffeine	1,238	[34]
	Codeine	7,110	[41]
	Diphenhydramine	1,000	[36]
	Erythromycin-H ₂ O	1,410.60	[21]
	Ibuprofen	1,700	[36]
	Oxytetracycline	2,796	[34]
	Paraxanthine	1,340	[39]
	Sulfadimethoxine	3,100	[36]
	Sulfamethoxazole (SMX)	15,000	[39]

Table S3. *Cont.*

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
>1,000	Triclocarban	1,900	[36]
	Triclosan	5,600	[42]
	Venlafaxine	2,300	[36]
		1,310	[30]

Table S4. Number of pharmaceuticals detected at maximum concentrations in groundwater (See summary in Figure 2).

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
0.1–<10	Meprobamate	8.6	[43]
	Naproxen	0.7	[43]
	Oestriol	6.4	[43]
	Oestrone	1	[43]
	Oxybenzone	7.5	[43]
	Primidone	2.8	[44]
10–<100	Ciprofloxacin	45	[26]
	Dehydronifedipine	22	[45]
	Diclofenac	46	[43]
	Dilantin (Phenytoin)	22	[43]
	Diltiazem	28	[45]
	Fluoxetine	56	[45]
	Paraxanthine	57	[45]
	Pentoxifylline	34	[43]
	Sulfamerazine	54	[46]
	Sulfamethazole	40	[46]
	Triclosan	53	[26]
	Trimethoprim	18	[47]
100–<1,000	Caffeine	290	[47]
	Carbamazepine	420	[47]
	Codeine	214	[47]
	17- α -ethinylestradiol	230	[26]
	Oxytetracycline	130	[48]
	Sulfadimethoxine	130	[49]
	Sulfathiazole	305	[46]
	Tetracycline	500	[28]
>1,000	Acetaminophen	1,890	[47]
	Erythromycin	2,380	[46]
	Gemfibrozil	6,860	[15]
	Ibuprofen	3,110	[45]
	Lincomycin	1,900	[49]
	Sulfamethazine	3,600	[49]
	Sulfamethoxazole	1,110	[45]

Table S5. Number of pharmaceuticals detected at maximum concentrations in raw drinking water (See summary in Figure 2).

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
0.1–<10	Atorvastatin	1.4	[50]
	Diazepam	0.47	[50]
	Diclofenac	1.2	[50]
	17- α -ethinylestradiol	1.4	[50]
	Fluoxetine	3	[50]
	o-hydroxy atorvastatin	1.2	[50]
	p-hydroxy atorvastatin	2	[50]
10–<100	Atenolol	48	[51]
	Azithromycin	29	[52]
	Ciprofloxacin	30	[52]
	Codeine	10	[53]
	Dehydronifedipine	19	[52]
	Dilantin (Phenytoin)	40	[51]
	Diphenhydramine	23	[52]
	Enrofloxacin	40	[52]
	Erythromycin	40	[53]
	Gemfibrozil	38	[51]
	Lincomycin	60	[53]
	Meprobamate	73	[50]
	Naproxen	44	[51]
	Primidone	35	[37]
	Sarafloxacin	20	[52]
	Sulfadimethoxine	10	[53]
	Sulfamethazine	40	[53]
	Sulfathiazole	80	[53]
	Trimethoprim	20	[52]
100–<1000	Acetaminophen	160	[52]
	Caffeine	270	[52]
	Carbamazepine	600	[53]
	Clofibrate	900	[16]
	Clofibric acid	630	[16]
	Cotinine	100	[52]
	Erythromycin-H ₂ O	300	[52]
	Paraxanthine	300	[52]
	Sulfamethoxazole	173	[51]
	Triclosan	734	[16]
>1000	Ibuprofen	5850	[16]

Table S6. Number of pharmaceuticals detected at maximum concentrations in finished drinking water (See summary in Figure 2).

Concentration Range (ng/L)	Pharmaceutical	Maximum Concentration (ng/L)	References
0.1–<10	Dehydronifedipine	4	[54]
	Diazepam	0.33	[50]
	Erythromycin	1.3	[55]
	Fluoxetine	0.82	[50]
	Gemfibrozil	6.5	[55]
	Genistein	2.9	[51]
	Lincomycin	4.4	[56]
	Naproxen	8	[55]
	Primidone	1.3	[57]
	Trimethoprim	1.7	[56]
10–<100	Acetaminophen	28	[56]
	Atenolol	26	[51]
	Codeine	30	[53]
	Cotinine	25	[54]
	Dilantin (Phenytoin)	32	[51]
	Iopromide	31	[55]
	Meprobamate	43	[51]
	Sulfamethoxazole	20	[55]
	Sulfathiazole	10	[53]
100–<1000	Caffeine	180.8	[56]
	Carbamazepine	258	[54]
	Triclosan	734	[16]
>1000	Ibuprofen	1350	[16]

Table S7. Number of pharmaceuticals detected at maximum concentrations in sewage sludge (See summary in Figure 4A).

Concentration Range (µg/kg)	Pharmaceutical	Maximum Concentration (µg/kg)	References
0.1–<10	Ormetoprim	5.91	[58]
10–<100	Albuterol (Salbutamol)	23.3	[58]
	Aspirin	75	[7]
	Clarithromycin	35	[59]
	Dehydronifedipine	24.6	[58]
	Enrofloxacin	66	[58]
	4-Epioxytetracycline	54.9	[58]
	Ketoprofen	27	[7]
	Lincomycin	33.4	[58]
	Lomefloxacin	39.8	[58]
	Oxolinic acid	39.4	[58]
	Roxithromycin	22.8	[58]
	Sulfachloropyridazine	58.7	[58]
	Sulfadimethoxine	62.2	[58]
	Sulfathiazole	21	[58]
	Sulfisoxazole	21.9198	[4]

Table S7. Cont.

Concentration Range (µg/kg)	Pharmaceutical	Maximum Concentration (µg/kg)	References
100–<1,000	Anhydrochlortetracycline	125	[58]
	Clofibric acid	135	[7]
	Codeine	328	[58]
	Cotinine	690	[58]
	Demeclocycline	200	[58]
	Diclofenac	187	[7]
	Diltiazem	225	[58]
	4-Epichlortetracycline	974	[58]
	Erythromycin (total)	180	[58]
	Erythromycin-H ₂ O	183	[60]
	17- α -ethinylestradiol	355	[58]
	Norfluoxetine	426	[59]
	Oestriol	232	[58]
	Oestrone	965	[58]
	Oxytetracycline	765.3	[61]
	Paroxetine	519	[59]
	Salicylic acid	252.8679	[4]
	Sulfadiazine	623.6	[61]
	Sulfamerazine	714.3	[61]
	Sulfamethazine	144.8	[61]
	Sulfamethoxazole	651	[58]
	Thiabendazole	370	[60]
	Trimethoprim	204	[58]
	Virginiamycin	469	[58]
1,000–<10,000	Acetaminophen	1,300	[58]
	Anhydrotetracycline	1,960	[58]
	Azithromycin	6,530	[58]
	Caffeine	1,110	[58]
	Carbamazepine	6,030	[58]
	Chlortetracycline	1,010	[58]
	Cimetidine	9,780	[58]
	Clindamycin	5,090	[58]
	Doxycycline	5,090	[58]
	4-Epianhydrotetracycline	2,160	[58]
	4-Epitetracycline	4,380	[58]
	Fluoxetine	4,700	[62]
	Gemfibrozil	2,650	[58]
	Isochlortetracycline	3,140	[58]
	Metformin	1,160	[58]
	Miconazole	9,210	[58]
	Minocycline	8,650	[58]
	Naproxen	1,020	[58]
	Norfloxacin	1,290	[58]
	Paraxanthine	9,580	[58]

Table S7. Cont.

Concentration Range (µg/kg)	Pharmaceutical	Maximum Concentration (µg/kg)	References
1,000–<10,000	Ranitidine	2,250	[58]
	Sarafloxacin	1,980	[58]
	Tetracycline	5,270	[58]
>10,000	Ciprofloxacin	47,500	[58]
	Diphenhydramine	22,000	[62]
	Ibuprofen	11,900	[58]
	Ofloxacin	58,100	[58]
	Sulfanilamide	15,600	[58]
	Triclocarban	441,000	[58]
	Triclosan	133,000	[58]

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