Supplementary Table 4: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for Pb (µg/g)

Lab Code	Youden plot ID	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
110	**1**	0.487 ± 0.018	0.749 ± 0.024	1.169 ± 0.025	3.610 ± 0.041	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
156	**2**	0.4787 ± 0.0017	0.7453 ± 0.0087	1.1683 ± 0.0085	3.797 ± 0.017	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
179	**3**	† 0.5041 ± 0.0080	† 0.8122 ± 0.0022	1.288 ± 0.036	3.952 ± 0.095	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, NaCl, $CaCl_2$; 80°C	Undried; 0.23-0.268g
293	**4**	0.552 ± 0.050	0.885 ± 0.011	1.3809 ± 0.0046	4.105 ± 0.047	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 150°C	Dried; 0.2g
312	**5**	0.5117 ± 0.0072	0.824 ± 0.021	1.397 ± 0.079	3.640 ± 0.074	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
391	**6**	0.583 ± 0.012	1.11 ± 0.22 ↑	1.283 ± 0.040	3.68 ± 0.22	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
399	**7**	0.4679 ± 0.0096	0.789 ± 0.026	1.198 ± 0.032	3.711 ± 0.078	ICP-MS	Microwave (open)	HNO_3, H_2O_2; 200°C	Undried; 0.5g
421	**8**	0.498 ± 0.040	0.744 ± 0.043	1.127 ± 0.039	3.291 ± 0.094	CC/DRC-ICP-MS	Hot plate/ block	HNO_3; 145°C	Moisture-correction; 0.25g
427	**9**	0.5079 ± 0.0043	0.792 ± 0.013	1.230 ± 0.018	3.85 ± 0.17	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 190°C	Undried ; 0.25g
501	**10**	0.557 ± 0.017	0.776 ± 0.017	1.228 ± 0.047	3.689 ± 0.018	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
502	**11**	0.5773 ± 0.0013	0.8104 ± 0.0072	1.4046 ± 0.0035	3.7544 ± 0.0038	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
504	**12**	0.429 ± 0.024	0.680 ± 0.048	1.044 ± 0.080	3.36 ± 0.25	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
506	**13**	0.5137 ± 0.0074	0.767 ± 0.011	1.137 ± 0.025	3.467 ± 0.069	ICP-MS	Microwave (closed)	HNO_3, HCl; 220°C	Undried; 0.25g
509	**14**	0.421 ± 0.013	0.7297 ± 0.0049	1.061 ± 0.016	3.334 ± 0.079	ICP-MS/MS	Microwave (closed)	HNO_3, HCl; 175°C	Undried; 0.5g
511	**15**	0.4312 ± 0.0067	0.7225 ± 0.0078	1.217 ± 0.013	3.757 ± 0.011	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 165°C	Undried; 0.05g
596	**16**	0.4483 ± 0.0097	0.721 ± 0.014	1.057 ± 0.025	3.510 ± 0.042	ICP-MS	Graphite block	HNO_3, HCl, H_2O_2; 70°C	Undried; 0.3g
597	**17**	0.655 ± 0.027	1.168 ± 0.049 ↑	1.773 ± 0.061	5.53 ± 0.22 ↑	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
599	**18**	0.5219 ± 0.0071	1.1928 ± 0.0088 ↑	1.6545 ± 0.0036	3.949 ± 0.038	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, H_2O_2; 60°C	Undried; 0.05g
609	**19**	0.5652 ± 0.0051	0.970 ± 0.026	1.393 ± 0.033	4.302 ± 0.036	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
14700	**20**	0.5173 ± 0.0096	0.787 ± 0.013	1.4266 ± 0.0050	3.761 ± 0.013	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
14701	**21**	0.545 ± 0.019	0.826 ± 0.028	1.320 ± 0.050	4.05 ± 0.14	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 2: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for Hg

Hg (ng/g)	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
	156	<LOD	<LOD	<LOD	Not reported	ICP-MS	Microwave (closed)	HNO_3	Undried; 0.62g
	179	†12.6 ± 8.1	†7.1 ± 3.8	†6.8 ± 1.9	†33 ± 22	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, NaCl, $CaCl_2$; 80°C	Undried; 0.23-0.268g
	293	34.8 ± 1.5	16.0 ± 1.3	<LOQ	1015.1 ± 9.0	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 150°C	Dried; 0.2g
	312	12.0 ± 2.4	7.5 ± 1.3	7.4 ± 2.3	1230 ± 130	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	391	587 ± 29 ↑	537 ± 42 ↑	540.0 ± 8.2 ↑	600 ± 28	CVAAS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
	427	3.13 ± 0.12	1.967 ± 0.094	<3.3	5.0 ± 1.4	CVAFS	Hot plate/ block	HNO_3, H_2SO_4, BrCl; 91°C	Undried; 0.05-0.1g
	501	<LOD	<LOD	<LOD	<LOD	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried; 0.1g
	502	3.02 ± 0.16	1.759 ± 0.045	1.795 ± 0.030	2.3 ± 0.0	CV-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	506	<50	<50	<50	<50	ICP-MS	Microwave (closed)	HNO_3, HCl; 220°C	Undried; 0.25g
	511	15.1 ± 1.6	6.9 ± 2.0	2.1 ± 1.5	696.7 ± 2.9	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 165°C	Undried; 0.05g
	596	18.93 ± 0.41	10.12 ± 0.22	8.50 ± 0.35	2527 ± 12	ICP-MS	Graphite block	HNO_3, HCl, H_2O_2; 70°C	Undried; 0.3g
	597	5.38 ± 0.84	1.79 ± 0.61	1.79 ± 0.26	2.38 ± 0.23	DMA	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	609	7.3 ± 1.9	6.50 ± 0.79	14.2 ± 3.5	23.7 ± 7.4	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	69 ± 10 ↑	27.1 ± 5.6 ↑	21.0 ± 7.9	1280 ± 420	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	<38	‡50	<38	2150 ± 85	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).
DMA: Direct Mercury Analyzer. CV: Cold Vapor. AFS: Atomic Fluorescence Spectrometry.

Supplementary Table 3: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by 10 or more laboratories (1/7)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
As (ng/g)	110	9.14 ± 0.13	9.96 ± 0.28	9.99 ± 0.41	17.18 ± 0.19	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	156	† 9.7 ± 1.2	† 13.33 ± 0.47	† 12.33 ± 0.47	† 21.3 ± 1.7	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	179	† 10.33 ± 0.84	† 10.4 ± 1.3	† 10.27 ± 0.79	† 18.00 ± 0.28	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, NaCl, $CaCl_2$; 80°C	Undried; 0.23-0.268g
	293	10.34 ± 0.33	12.90 ± 0.63	11.85 ± 0.54	18.615 ± 0.080	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 150°C	Dried; 0.2g
	312	13.2 ± 2.1	17.0 ± 6.2	14.8 ± 4.5	20.3 ± 6.8	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	391	530.0 ± 0.0 ↑	687 ± 12 ↑	640 ± 50 ↑	680 ± 62 ↑	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
	399	10.20 ± 0.24	11.23 ± 0.34	11.17 ± 0.50	18.71 ± 0.67	CC/DRC-ICP-MS	Microwave (open)	HNO_3, H_2O_2; 200°C	Undried; 0.5g
	427	11.27 ± 0.53	10.57 ± 0.62	9.57 ± 0.74	18.73 ± 0.79	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 190°C	Undried ; 0.25g
	501	18.8 ± 4.1	17.5 ± 2.6	19.2 ± 5.4	25.3 ± 1.7	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	‡ 7.73 ± 0.87	‡ 9.03 ± 0.82	‡ 7.54 ± 0.63	15.7 ± 1.0	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	25.7 ± 1.3	28.9 ± 2.2	20.4 ± 1.8	27.8 ± 2.2	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	506	<50	<50	<50	<50	ICP-MS	Microwave (closed)	HNO_3, HCl; 220°C	Undried; 0.25g
	509	708 ± 68 ↑	1050 ± 190 ↑	1090 ± 220 ↑	1420 ± 310 ↑	ICP-MS/MS	Microwave (closed)	HNO_3, HCl; 175°C	Undried; 0.5g
	511	11.07 ± 0.58	14.9 ± 1.5	15.47 ± 0.76	81 ± 89	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 165°C	Undried; 0.05g
	596	14.53 ± 0.53	17.10 ± 0.57	16.17 ± 0.69	28.5 ± 1.1	CC/DRC-ICP-MS	Graphite block	HNO_3, HCl, H_2O_2; 70°C	Undried; 0.3g
	597	28.53 ± 0.85	40.1 ± 1.1	31.13 ± 0.50	57.0 ± 1.3	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	609	11.6 ± 3.4	21.9 ± 8.3	15.8 ± 4.3	16.3 ± 4.8	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	11.97 ± 0.48	11.1 ± 1.0	11.3 ± 1.5	36.7 ± 2.0	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	<38	<38	<38	<38	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 3: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by 10 or more laboratories (2/7)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Ca (µg/g)	110	567 ± 17	570 ± 22	560 ± 29	627 ± 25	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	312	602 ± 51	568 ± 69	529 ± 63	584 ± 67	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	399	636 ± 11	600.9 ± 9.3	573 ± 21	645 ± 16	CC/DRC-ICP-MS	Microwave (open)	HNO_3, H_2O_2; 200°C	Undried; 0.5g
	427	610 ± 11	563.2 ± 6.1	526.2 ± 3.3	605.1 ± 6.3	ICP-MS/MS	Microwave (closed)	HNO_3, H_2O_2; 190°C	Undried ; 0.25g
	501	613 ± 56	591 ± 56	514.3 ± 6.3	617 ± 14	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	632.6 ± 6.1	563.0 ± 5.6	574.6 ± 6.4	597.7 ± 8.6	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	‡ 601	‡ 599	‡ 585	‡ 652	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	506	665.0 ± 2.5	642.5 ± 1.0	625.9 ± 4.1	696.4 ± 5.7	ICP-AES/OES	Microwave (closed)	HNO_3, HCl; 220°C	Undried; 0.25g
	509	595 ± 18	605 ± 15	584 ± 29	646 ± 27	ICP-MS/MS	Microwave (closed)	HNO_3, HCl; 175°C	Undried; 0.5g
	511	102.1 ± 3.7 ↓	95.6 ± 3.6 ↓	91.1 ± 1.3 ↓	100.6 ± 2.3 ↓	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 165°C	Undried; 0.05g
	596	640.7 ± 5.8	635 ± 10	587 ± 10	684.7 ± 6.3	ICP-AES/OES	Graphite block	HNO_3, HCl, H_2O_2; 70°C	Undried; 0.3g
	609	708.4 ± 9.3	654 ± 13	617 ± 19	703 ± 11	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14701	658 ± 18	620 ± 23	582 ± 16	654 ± 25	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 3: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by 10 or more laboratories (3/7)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Cd (ng/g)	110	8.46 ± 0.25	7.10 ± 0.27	7.62 ± 0.28	9.33 ± 0.94	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	156	† 7.33 ± 0.47	† 7.0 ± 0.0	† 6.67 ± 0.47	† 8.33 ± 0.47	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	179	† 4.7 ± 0.0	† 5.57 ± 0.46	† 11.8 ± 8.1	† 8.23 ± 0.65	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, NaCl, $CaCl_2$; 80°C	Undried; 0.23-0.268g
	293	9.89 ± 0.68	8.155 ± 0.043	7.61 ± 0.31	9.07 ± 0.33	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 150°C	Dried; 0.2g
	312	7.8 ± 2.3	8.05 ± 0.83	7.3 ± 1.1	10.2 ± 1.2	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	391	13.3 ± 4.7	10.0 ± 0.0	13.3 ± 4.7	20.0 ± 0.0 ↑	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
	399	8.80 ± 0.57	6.367 ± 0.094	6.70 ± 0.29	8.20 ± 0.14	CC/DRC-ICP-MS	Microwave (open)	HNO_3, H_2O_2; 200°C	Undried; 0.5g
	427	11.10 ± 0.86	8.67 ± 0.90	8.00 ± 0.14	10.50 ± 0.16	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 190°C	Undried ; 0.25g
	501	7.34 ± 0.59	7.8 ± 1.9	7.8 ± 2.2	10.1 ± 1.2	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	6.28 ± 0.73	5.77 ± 0.90	5.43 ± 0.84	7.5 ± 1.4	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	6.30 ± 0.77	6.76 ± 0.86	6.38 ± 0.67	7.66 ± 0.87	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	506	<50	<50	<50	<50	ICP-MS	Microwave (closed)	HNO_3, HCl; 220°C	Undried; 0.25g
	509	19.1 ± 2.3 ↑	10.28 ± 0.87	10.6 ± 1.7	11.1 ± 2.0	ICP-MS/MS	Microwave (closed)	HNO_3, HCl; 175°C	Undried; 0.5g
	511	12.8 ± 1.4	6.23 ± 0.52	6.40 ± 0.28	7.83 ± 0.87	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 165°C	Undried; 0.05g
	596	5.20 ± 0.11	6.713 ± 0.094	6.213 ± 0.033	8.257 ± 0.021	ICP-MS	Graphite block	HNO_3, HCl, H_2O_2; 70°C	Undried; 0.3g
	597	7.33 ± 0.24	10.13 ± 0.17	9.93 ± 0.25	13.50 ± 0.42 ↑	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	609	9.05 ± 0.72	5.72 ± 0.10	5.04 ± 0.17	6.72 ± 0.34	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	‡ 11.110 ± 0.010	<10	<10	<10	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	9.79 ± 0.24	7.52 ± 0.35	7.13 ± 0.18	9.31 ± 0.47	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 3: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by 10 or more laboratories (4/7)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Co (ng/g)	156	763.3 ± 4.1	506.7 ± 3.3	426.3 ± 1.7	1149.3 ± 6.9	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	391	787 ± 34	640 ± 36	473 ± 25	1510 ± 100	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
	421	864.1 ± 7.6	593.7 ± 4.8	415.1 ± 3.6	1160 ± 20	CC/DRC-ICP-MS	Hot plate/ block	HNO_3; 145°C	Moisture-correction; 0.25g
	501	758 ± 45	573 ± 15	388 ± 17	1173 ± 27	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	977.3 ± 6.6 ↑	825.9 ± 5.6	536.0 ± 3.6	1233 ± 15	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	747 ± 18	579 ± 25	393 ± 19	1136 ± 67	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	511	719.0 ± 4.4	353.4 ± 5.1	301.6 ± 6.5	1361.9 ± 8.2	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 165°C	Undried; 0.05g
	609	807.7 ± 2.9	556.1 ± 8.4	431 ± 17	1179.1 ± 9.2	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	804.10 ± 0.50	494.33 ± 0.74	395.2 ± 2.5	1089.9 ± 6.5	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	791 ± 40	606 ± 30	460 ± 21	1423 ± 76	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 3: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by 10 or more laboratories (5/7)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Cu (µg/g)	110	4.58 ± 0.11	4.67 ± 0.13	3.88 ± 0.11	4.736 ± 0.041	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	179	4.892 ± 0.035	4.977 ± 0.084	4.16 ± 0.13	5.20 ± 0.12	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, NaCl, $CaCl_2$; 80°C	Undried; 0.23-0.268g
	312	4.546 ± 0.017	4.931 ± 0.071	4.21 ± 0.14	4.88 ± 0.11	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	391	5.05 ± 0.30	5.760 ± 0.085	4.59 ± 0.27	7.51 ± 0.64	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
	421	4.415 ± 0.059	4.682 ± 0.075	3.675 ± 0.083	4.47 ± 0.13	CC/DRC-ICP-MS	Hot plate/ block	HNO_3; 145°C	Moisture-correction; 0.25g
	501	4.67 ± 0.16	4.86 ± 0.18	4.046 ± 0.061	5.10 ± 0.12	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	5.680 ± 0.017	5.458 ± 0.013	4.7596 ± 0.0091	5.433 ± 0.021	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	5.12 ± 0.12	5.04 ± 0.23	4.11 ± 0.22	4.99 ± 0.34	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	597	5.92 ± 0.30	6.93 ± 0.28	5.46 ± 0.25	7.16 ± 0.27	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	609	4.539 ± 0.079	4.81 ± 0.17	3.732 ± 0.069	4.629 ± 0.046	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	4.846 ± 0.090	4.99 ± 0.10	4.142 ± 0.078	5.56 ± 0.14	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	5.54 ± 0.17	5.69 ± 0.16	4.71 ± 0.15	5.63 ± 0.16	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 3: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by 10 or more laboratories (6/7)

Mn (µg/g)

Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
110	0.5809 ± 0.0055	0.760 ± 0.013	0.753 ± 0.016	1.1075 ± 0.0077	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
156	0.656 ± 0.012	0.953 ± 0.024	0.817 ± 0.013	1.342 ± 0.031	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	undried; 0.62g
179	0.568 ± 0.014	† 1.0037 ± 0.0047	0.7308 ± 0.0095	† 1.268 ± 0.012	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, H_2O_2; 80°C	Undried; 0.015-0.037g
312	0.5674 ± 0.0038	0.781 ± 0.022	1.03 ± 0.16	1.112 ± 0.023	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
391	1.96 ± 0.22 ↑	1.80 ± 0.22 ↑	2.717 ± 0.063 ↑	9.81 ± 0.62 ↑	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
421	0.6739 ± 0.0085	0.9276 ± 0.0083	0.8227 ± 0.0061	1.208 ± 0.029	CC/DRC-ICP-MS	Hot plate/ block	HNO_3; 145°C	Moisture-correction; 0.25g
501	0.681 ± 0.012	0.804 ± 0.025	0.738 ± 0.042	1.237 ± 0.066	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
502	0.825 ± 0.019	0.998 ± 0.027	1.152 ± 0.026 ↑	1.436 ± 0.023	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
504	0.6025 ± 0.0091	0.833 ± 0.022	0.792 ± 0.031	1.165 ± 0.062	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
597	0.54 ± 0.28	1.78 ± 0.91 ↑	0.71 ± 0.37	1.17 ± 0.60	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
609	0.6305 ± 0.0094	0.9108 ± 0.0083	0.837 ± 0.024	1.415 ± 0.014	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
14700	0.7045 ± 0.0038	0.827 ± 0.014	0.764 ± 0.010	2.415 ± 0.023 ↑	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
14701	0.675 ± 0.022	0.928 ± 0.035	0.772 ± 0.020	1.237 ± 0.029	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 3: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by 10 or more laboratories (7/7)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Se (ng/g)	110	316 ± 28	320 ± 26	232 ± 11	299 ± 29	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	156	† 329 ± 25	† 327 ± 13	† 226.0 ± 8.8	† 295 ± 10	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	179	† 299 ± 10	† 280 ± 13	† 215 ± 18	† 282.0 ± 7.7	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, NaCl, $CaCl_2$; 80°C	Undried; 0.23-0.268g
	293	338 ± 13	332.2 ± 9.0	239.0 ± 6.7	308 ± 10	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 150°C	Dried; 0.2g
	312	329 ± 56	398 ± 83	219 ± 24	360 ± 27	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	399	294.4 ± 5.3	293.1 ± 2.0	207.5 ± 7.7	275 ± 11	CC/DRC-ICP-MS	Microwave (open)	HNO_3, H_2O_2; 200°C	Undried; 0.5g
	421	258.6 ± 4.6	257.9 ± 6.1	188.6 ± 5.1	242 ± 16	CC/DRC-ICP-MS	Hot plate/ block	HNO_3; 145°C	Moisture-correction; 0.25g
	427	341.1 ± 6.1	336.9 ± 6.2	232.4 ± 4.9	317.0 ± 5.4	ICP-MS/MS	Microwave (closed)	HNO_3, H_2O_2; 190°C	Undried ; 0.25g
	501	348 ± 36	334 ± 27	191 ± 59	302.9 ± 2.6	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	91.2 ± 3.0	100.7 ± 1.7	† 60.2 ± 4.3	98 ± 10	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	378 ± 32	393 ± 36	291 ± 30	390 ± 57	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	506	335 ± 18	455.7 ± 6.3	423.7 ± 9.0	435.3 ± 7.8	ICP-MS	Microwave (closed)	HNO_3, HCl; 220°C	Undried; 0.25g
	509	462 ± 49	441 ± 32	344 ± 23	434 ± 49	ICP-MS/MS	Microwave (closed)	HNO_3, HCl; 175°C	Undried; 0.5g
	511	86.5 ± 5.5	86 ± 10	59.0 ± 7.6	121 ± 14	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 165°C	Undried; 0.05g
	596	629 ± 16	662 ± 20	446.3 ± 8.7	601.0 ± 6.7	CC/DRC-ICP-MS	Graphite block	HNO_3, HCl, H_2O_2; 70°C	Undried; 0.3g
	597	968 ± 44 ↑	1030 ± 39 ↑	720 ± 13 ↑	1007 ± 38 ↑	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	14700	390.1 ± 9.2	366 ± 18	267 ± 20	342 ± 24	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	371 ± 33	374 ± 25	264 ± 17	339 ± 18	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 4: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by between 4 and 9 laboratories (1/3)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Al (µg/g)	**391**	30.9 ± 1.8	34.1 ± 1.1	37.7 ± 1.1	32.7 ± 1.0	ETAAS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
	502	19.16 ± 0.28	21.20 ± 0.30	18.35 ± 0.37	20.14 ± 0.51	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	14.13 ± 0.44	35.0 ± 2.4	27.7 ± 2.3	13.8 ± 1.6	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	14700	14.73 ± 0.70	26.71 ± 0.92	23.26 ± 0.46	23.20 ± 0.86	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	25.27 ± 0.61	44.5 ± 4.3	17.80 ± 0.28	19.13 ± 0.78	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Ba (ng/g)	**110**	232.4 ± 5.5	272.7 ± 8.8	349.0 ± 5.9	535.9 ± 7.8	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	156	384 ± 16	663.0 ± 4.5 ↑	335 ± 13	579 ± 18	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	504	243.10 ± 0.67	267.7 ± 2.4	255.8 ± 2.4	475.8 ± 5.6	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	597	266.6 ± 5.1	320.1 ± 5.1	354.7 ± 6.0	716 ± 13	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	609	338 ± 17	351.9 ± 6.3	337 ± 22	769.6 ± 9.8	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	250.2 ± 4.6	286.7 ± 8.7	339.1 ± 9.2	1086 ± 40	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	283 ± 23	335 ± 21	413 ± 19	535 ± 24	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Cr (ng/g)	**156**	591 ± 10	730 ± 18	533.3 ± 8.8	2165 ± 29	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	312	493 ± 56	333 ± 24	378.6 ± 8.9	406.3 ± 3.0	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	391	12410 ± 510 ↑	8670 ± 270 ↑	8880 ± 360 ↑	111000 ± 6500 ↑	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
	501	340 ± 56	625 ± 42	270 ± 10	1140 ± 62	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	750 ± 15	538 ± 14	691 ± 12	803 ± 13	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	255.9 ± 2.1	105.5 ± 3.9	149.8 ± 1.5	248.31 ± 0.42	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	609	942.0 ± 9.6	1194 ± 27	696 ± 20	1273 ± 18	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	1070 ± 31	658 ± 18	720 ± 14	1378 ± 52	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	845 ± 43	564 ± 31	604 ± 46	973 ± 69	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Fe (µg/g)	**421**	33.12 ± 0.50	35.18 ± 0.49	34.38 ± 0.30	63.31 ± 0.55	CC/DRC-ICP-MS	Hot plate/ block	HNO_3; 145°C	Moisture-correction; 0.25g
	501	27.74 ± 0.92	30.6 ± 1.1	31.10 ± 0.15	64.3 ± 1.8	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	41.66 ± 0.64	37.24 ± 0.63	44.86 ± 0.71 ↑	76.2 ± 1.6	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	33.54 ± 0.51	34.38 ± 0.64	35.53 ± 0.14	68.29 ± 0.81	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	609	34.90 ± 0.45	35.31 ± 0.34	36.25 ± 0.81	76.77 ± 0.72	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14701	31.8 ± 5.0	30.0 ± 4.1	34.3 ± 6.3	55.2 ± 8.2	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 4: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by between 4 and 9 laboratories (2/3)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
K (µg/g)	**502**	336 ± 19	283 ± 17	233 ± 13	268 ± 15	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	‡ 265 ± 0	‡ 245 ± 0	‡ 197 ± 0	‡ 234 ± 0	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	609	325.7 ± 5.3	279.3 ± 6.1	220.1 ± 4.6	275.4 ± 9.4	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14701	271.3 ± 9.4	241 ± 13	185.0 ± 9.8	229 ± 13	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Mg (µg/g)	**502**	79.3 ± 5.4	91.5 ± 6.7	80.2 ± 5.2	76.8 ± 5.0	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	‡ 67	‡ 87	‡ 78	‡ 75	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	597	82.2 ± 3.1	115.3 ± 4.2	94.4 ± 2.6	103.1 ± 3.8	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	14701	67.47 ± 0.31	80.6 ± 1.4	68.40 ± 0.51	70.37 ± 0.88	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Mo (ng/g)	**110**	216.1 ± 3.0	84.2 ± 2.3	58.4 ± 2.7	109.0 ± 1.3	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	156	224.0 ± 2.2	97.7 ± 7.3	66.7 ± 1.2	165.3 ± 3.4	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	501	219.6 ± 9.8	85.2 ± 2.2	56.6 ± 6.5	176 ± 14	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	237 ± 19	91.9 ± 9.5	694 ± 55 ↑	124.9 ± 9.9	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	99 ± 95 ↓	40 ± 39 ↓	26 ± 27	48 ± 50	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	14700	241.8 ± 1.2	102.3 ± 5.7	73.47 ± 0.31	201.07 ± 0.74	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	249.0 ± 3.7	93.73 ± 0.86	67.43 ± 0.33	131.3 ± 2.9	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Ni (ng/g)	**156**	418.7 ± 3.3	386.3 ± 1.7	214 ± 11	1256.7 ± 4.8	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	502	523.4 ± 2.8	306.5 ± 3.7	275.0 ± 3.5	513.0 ± 2.7	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	511	349.6 ± 8.4	87.167 ± 0.094 ↓	173 ± 11	177.8 ± 6.0	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 165°C	Undried; 0.05g
	609	412 ± 15	390 ± 15	220.5 ± 3.7	603.1 ± 6.9	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	483.6 ± 5.6	357.5 ± 4.7	184.8 ± 7.3	868 ± 16	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	462 ± 27	405 ± 22	209 ± 14	514 ± 30	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 4: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by between 4 and 9 laboratories (3/3)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Sb (ng/g)	**110**	16.51 ± 0.76	9.56 ± 0.14	8.63 ± 0.42	13.60 ± 0.18	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	156	† 18.33 ± 0.47	† 9.67 ± 0.47	† 10.7 ± 1.2	† 14.0 ± 2.2	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
	504	7.4 ± 5.9 ↓	4.9 ± 5.1	3.3 ± 3.4	5.6 ± 5.8	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	597	21.92 ± 0.53	15.36 ± 0.27	13.81 ± 0.22	24.02 ± 0.16	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	14700	18.9 ± 1.1	9.80 ± 0.49	19.63 ± 0.74	23.67 ± 0.73	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	17.83 ± 0.90	9.88 ± 0.60	9.06 ± 0.85	16.67 ± 0.69	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Sr (ng/g)	**110**	358.1 ± 7.9	355 ± 10	353 ± 10	393.5 ± 5.4	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	502	337 ± 28	339 ± 36	341 ± 27	346 ± 29	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	‡ 310	‡ 327	‡ 456	‡ 295	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	609	382.4 ± 9.5	396.3 ± 6.4	385.8 ± 4.6	437 ± 13	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
V (ng/g)	**312**	18.0 ± 2.9	18.9 ± 3.2	24.7 ± 4.3	49.6 ± 2.0	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	391	550 ± 330 ↑	580 ± 240 ↑	690 ± 260 ↑	1240 ± 230 ↑	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, HCl; 200°C	Undried; 0.15g
	501	134 ± 32 ↑	124 ± 22 ↑	132 ± 16 ↑	433 ± 27 ↑	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	28.68 ± 0.49	23.61 ± 0.98	32.69 ± 0.59	57.72 ± 0.75	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	23.6 ± 5.1	22.2 ± 6.5	21.0 ± 4.7	43.6 ± 9.3	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	609	48.5 ± 4.2	31.3 ± 3.3	31.8 ± 1.6	66.1 ± 2.0	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
	14700	36.7 ± 1.2	23.50 ± 0.94	34.3 ± 1.5	59.2 ± 1.3	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	36.6 ± 2.4	26.1 ± 2.0	34.0 ± 4.1	75 ± 11	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Zn (µg/g)	**110**	100.5 ± 1.6	118.8 ± 2.7	120.8 ± 1.6	130.1 ± 1.5	ICP-MS/MS	Microwave (open)	HNO_3; 83°C	Oven-dried; 0.3g
	179	98.3 ± 2.0	116.8 ± 2.0	116.2 ± 2.4	137 ± 15	CC/DRC-ICP-MS	Hot plate/ block	HNO_3, NaCl, $CaCl_2$; 80°C	Undried; 0.23-0.268g
	312	100.40 ± 0.65	127.5 ± 3.4	129.2 ± 5.8	133.4 ± 4.1	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
	501	91.9 ± 5.2	114.6 ± 1.4	112.3 ± 1.8	124.2 ± 4.5	CC/DRC-ICP-MS	Microwave (open)	HNO_3, HCl; 105°C	Undried ; 0.1g
	502	79.39 ± 0.28	99.297 ± 0.080	94.92 ± 0.36	107.31 ± 0.55	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
	504	76.4 ± 7.1	89.5 ± 8.8	87.6 ± 9.3	96 ± 11	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
	597	130.3 ± 6.0	172.3 ± 6.9	167.1 ± 5.1	192.7 ± 8.0	ICP-MS/MS	Room-temp.	HNO_3, H_2O_2	Moisture-correction; 0.2g
	14700	106.3 ± 4.0	125.9 ± 5.3	129.3 ± 6.0	139.6 ± 6.5	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
	14701	112.9 ± 1.5	138.5 ± 3.7	134.6 ± 3.5	141.6 ± 4.9	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

↑/↓ Statistical high/low outlier. † Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.
Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 5: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by <4 laboratories (1/2)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Ag (ng/g)	504	77.4 ± 8.0	19.8 ± 3.8	7.0 ± 1.7	4.1 ± 1.6	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
Ag (ng/g)	14700	16.6 ± 4.3	‡ 17.3 ± 1.9	‡ 17.1 ± 2.0	‡ 16.0 ± 2.1	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
Ag (ng/g)	14701	‡ 23.1	<20	<20	<20	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
B (µg/g)	504	1.050 ± 0.084	0.595 ± 0.072	0.455 ± 0.072	0.520 ± 0.099	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
Be (ng/g)	14700	<30	<30	<30	<30	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
Be (ng/g)	14701	<170	<170	<170	<170	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Bi (ng/g)	156	† 1.67 ± 0.47	† 2.67 ± 0.47	† 4.67 ± 0.47	† 6.67 ± 0.47	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
Bi (ng/g)	312	1.09 ± 0.27	2.40 ± 0.60	3.95 ± 0.85	6.54 ± 0.93	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
Bi (ng/g)	14700	<10	<10	<10	<10	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
Bi (ng/g)	14701	<15	<15	<15	<15	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Ce (ng/g)	609	8.47 ± 0.30	13.38 ± 0.31	16.6 ± 1.0	28.65 ± 0.29	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
Cs (ng/g)	14701	<0.9	‡ 1.18 ± 0.18	‡ 1.180 ± 0.050	2.00 ± 0.39	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Ga (ng/g)	504	43 ± 21	45 ± 12	32.4 ± 6.5	29.3 ± 7.5	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
Gd (µg/g)	179	<0.1	<0.1	<0.1	<0.1	ICP-MS	Hot plate/ block	HNO_3, H_2O_2; 80°C	Undried; 0.015-0.037g
La (ng/g)	609	3.91 ± 0.16	6.517 ± 0.056	7.79 ± 0.28	13.020 ± 0.092	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
Li (ng/g)	14700	22.9 ± 7.2	14.40 ± 0.45	14.17 ± 0.49	20.80 ± 0.80	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
Na (µg/g)	502	473 ± 24	470 ± 26	481 ± 24	504 ± 26	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
Na (µg/g)	504	‡ 366	‡ 398	‡ 407	‡ 438	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
Na (µg/g)	14701	387 ± 11	403 ± 14	386 ± 10	436 ± 10	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Nb (ng/g)	504	80 ± 54	9.0 ± 5.5	4.0 ± 1.8	5.4 ± 2.2	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
Pt (ng/g)	14700	<1	<1	<1	<1	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g

† Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.

Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).

Supplementary Table 5: Participant laboratory data (mean ± SD for triplicate analysis) and methods details for elements reported by <4 laboratories (2/2)

	Lab Code	18-01	18-02	18-03	18-04	Instrumental Method	Digestion Method	Digestion Reagents; Max. Temp.	Drying; Sample Mass
Rb (ng/g)	502	260 ± 23	362 ± 41	288 ± 26	315 ± 27	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
Rb (ng/g)	14701	279 ± 21	385 ± 24	304 ± 17	365 ± 24	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
S (µg/g)	312	19600 ± 1700	19700 ± 2700	20200 ± 2700	18500 ± 2400	ICP-MS	Microwave (open)	HNO_3; 95°C	Undried; 0.05g
S (µg/g)	609	18740 ± 470	19570 ± 350	19850 ± 620	20530 ± 180	HR-ICP-MS	Microwave (closed)	HNO_3, HCl, HF; 225°C	Undried; 0.1g
Si (µg/g)	504	‡ 108	‡ 120	‡ 143	‡ 115	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
Sn (ng/g)	156	† 36.7 ± 1.7	† 21.3 ± 1.2	† 48.7 ± 2.1	† 31.3 ± 2.5	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
Sn (ng/g)	504	35 ± 16	11.3 ± 5.2	10.7 ± 8.2	9.0 ± 6.7	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
Sn (ng/g)	14701	29.5 ± 4.4	17.67 ± 0.19	39.9 ± 3.0	29.33 ± 0.95	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Te (ng/g)	14700	<2	<2	<2	<2	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
Te (ng/g)	14701	<1.9	<1.9	<1.9	<1.9	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Th (ng/g)	14700	<100	<100	<100	<100	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
Th (ng/g)	14701	5.3 ± 1.1	5.0 ± 1.2	5.7 ± 1.3	5.4 ± 1.3	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
Ti (µg/g)	504	2.4 ± 2.5	0.86 ± 0.89	0.89 ± 0.92	0.61 ± 0.63	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
Tl (ng/g)	156	† 1.0 ± 0.0	† 1.0 ± 0.0	† 1.0 ± 0.0	† 3.3 ± 2.1	ICP-MS/MS	Hot plate/ block	HNO_3, HCl, HF, H_2O_2; 105°C	Undried; 0.62g
Tl (ng/g)	14700	1.400 ± 0.082	1.000 ± 0.082	0.767 ± 0.047	0.967 ± 0.047	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
Tl (ng/g)	14701	1.257 ± 0.087	1.055 ± 0.063	0.861 ± 0.063	3.7 ± 4.0	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
U (ng/g)	502	0.289 ± 0.018	0.2710 ± 0.0045	0.4023 ± 0.0024	0.458 ± 0.011	CC/DRC-ICP-MS	Digestion "bomb"	HNO_3, HCl; 160°C	Undried; 0.05g
U (ng/g)	14700	‡ 2.050 ± 0.050	‡ 1.950 ± 0.050	‡ 1.850 ± 0.050	‡ 1.950 ± 0.050	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.06g
U (ng/g)	14701	<0.8	<0.8	<0.8	<0.8	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g
W (ng/g)	504	70 ± 65	45 ± 43	34 ± 33	15000 ± 15000	CC/DRC-ICP-MS	Microwave (closed)	HNO_3, H_2O_2; 175°C	Freeze-dried; 0.13g
W (ng/g)	14701	183 ± 11	593 ± 17	106.3 ± 1.9	50200 ± 4300	ICP-MS	Digestion "bomb"	HNO_3; 110°C	Undried; 0.2g

† Value(s) reported were below the laboratory's reporting limit. ‡ Fewer than 3 numerical values were reported.

Lab 147 reported results using one method designed and validated for human hair analysis (14700), and another for human tissues analysis (14701).