

Supplementary materials

Supplementary Table S1. Characteristics of physiological indicators with 5 monthly visits in this study (mean $\pm$ SD)

Variables	Total	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5
FVC (L)	3.2 $\pm$ 0.7	3.3 $\pm$ 0.7	3.2 $\pm$ 0.7	3.2 $\pm$ 0.7	3.1 $\pm$ 0.6	3.3 $\pm$ 0.8
FEV ₁ (L)	2.4 $\pm$ 0.6	2.5 $\pm$ 0.6	2.4 $\pm$ 0.6	2.4 $\pm$ 0.6	2.4 $\pm$ 0.5	2.5 $\pm$ 0.6
FEV ₁ /FVC (%)	76.0 $\pm$ 6.5	75.0 $\pm$ 6.3	76.5 $\pm$ 5.3	76.3 $\pm$ 5.8	76.1 $\pm$ 5.9	76.1 $\pm$ 8.2
PEF (L/s)	5.9 $\pm$ 1.8	6.1 $\pm$ 1.9	5.8 $\pm$ 1.7	5.9 $\pm$ 1.8	5.8 $\pm$ 1.8	6.0 $\pm$ 1.7
IL-1 β (pg/mL)	0.8 $\pm$ 1.9	0.5 $\pm$ 0.5	0.6 $\pm$ 0.8	1.2 $\pm$ 1.2	0.8 $\pm$ 0.8	0.8 $\pm$ 0.8
IL-2 (pg/mL)	2.2 $\pm$ 2.3	1.3 $\pm$ 1.4	1.7 $\pm$ 1.3	3.3 $\pm$ 3.3	2.1 $\pm$ 1.8	2.0 $\pm$ 2.2
IL-5 (pg/mL)	1.4 $\pm$ 1.6	1.3 $\pm$ 1.3	1.1 $\pm$ 0.8	1.8 $\pm$ 2.8	1.3 $\pm$ 0.8	1.2 $\pm$ 0.9
IL-6 (pg/mL)	1.5 $\pm$ 3.2	0.9 $\pm$ 2.0	0.6 $\pm$ 0.4	2.0 $\pm$ 3.4	1.3 $\pm$ 3.0	1.8 $\pm$ 4.1
IL-7 (pg/mL)	9.0 $\pm$ 3.8	5.9 $\pm$ 2.6	7.9 $\pm$ 2.5	11.8 $\pm$ 3.6	8.7 $\pm$ 3.5	9.5 $\pm$ 3.6
IL-8 (pg/mL)	5.7 $\pm$ 5.0	9.3 $\pm$ 9.3	5.1 $\pm$ 5.6	5.1 $\pm$ 1.6	4.7 $\pm$ 1.8	4.7 $\pm$ 2.4
IL-10 (pg/mL)	7.9 $\pm$ 40.9	3.1 $\pm$ 2.1	19.1 $\pm$ 82.0	8.0 $\pm$ 31.6	5.0 $\pm$ 14.3	10.1 $\pm$ 57.4
IL-12 (pg/mL)	1.8 $\pm$ 1.7	1.5 $\pm$ 1.4	1.6 $\pm$ 1.6	2.5 $\pm$ 2.1	1.7 $\pm$ 1.4	1.6 $\pm$ 1.5
IL-13 (pg/mL)	4.2 $\pm$ 3.5	1.8 $\pm$ 1.5	2.9 $\pm$ 2.1	6.7 $\pm$ 4.0	3.8 $\pm$ 2.9	4.4 $\pm$ 3.5
IL-17A (pg/mL)	4.1 $\pm$ 2.9	3.9 $\pm$ 2.7	3.7 $\pm$ 2.1	4.9 $\pm$ 3.5	3.4 $\pm$ 2.2	4.5 $\pm$ 3.2
IL-21 (pg/mL)	1.3 $\pm$ 2.1	1.1 $\pm$ 1.5	1.0 $\pm$ 0.9	1.8 $\pm$ 2.6	1.3 $\pm$ 2.1	1.3 $\pm$ 2.4
TNF- α (pg/mL)	3.8 $\pm$ 1.4	3.8 $\pm$ 1.4	3.4 $\pm$ 1.3	4.3 $\pm$ 1.6	4.1 $\pm$ 1.4	3.2 $\pm$ 1.1
IFN- γ (pg/mL)	5.8 $\pm$ 4.3	5.3 $\pm$ 3.8	5.4 $\pm$ 4.0	6.7 $\pm$ 4.8	4.6 $\pm$ 3.3	6.4 $\pm$ 4.9
TSH (mIU/L)	5.1 $\pm$ 4.3	4.3 $\pm$ 3.3	3.8 $\pm$ 2.4	5.9 $\pm$ 5.0	5.6 $\pm$ 4.7	5.2 $\pm$ 4.2
T ₃ (nmol/L)	1.5 $\pm$ 1.1	1.2 $\pm$ 0.3	1.9 $\pm$ 0.8	1.7 $\pm$ 1.8	1.3 $\pm$ 0.7	1.5 $\pm$ 1.0
T ₄ (nmol/L)	44.5 $\pm$ 13.1	43.4 $\pm$ 10.4	61.7 $\pm$ 13.4	43.9 $\pm$ 13.1	42.2 $\pm$ 11.7	41.7 $\pm$ 11.2

Note. FVC, forced vital capacity; FEV₁, forced expiratory volume in 1 s; FEV₁/FVC, the ratio of FEV₁ to FVC; PEF, peak expiratory flow; IL, interleukin; TNF, tumor necrosis factor; IFN, interferon; TSH, thyroid-stimulating hormone; T₃, triiodothyronine; T₄, thyroxine.

SupplementaryTable S2. Characteristics of organochlorines exposure among healthy older adults in this study

Organochlorines (ng/m ³)	Median	IQR	Ranges
1,3-Dichlorobenzene	2.36	7.16	0.08-9264.00
1,4-Dichlorobenzene	0.47	1.59	0.02-73.53
4-Chloroaniline	0.43	0.92	0.003-31.34
BCIE	1.57	1.95	0.05-726.62
HCBD	1.50	1.38	0.03-449.68

Note. BCIE, Bis (2-chloro-1-methylethyl) ether; HCBD, Hexachlorobutadiene.

Supplementary Table S3. Correlations among different organochlorines

Items	4-Chloroaniline	1,3-Dichlorobenzene	1,4-Dichlorobenzene	BCIE	HCDB
4-Chloroaniline	1.000				
1,3-Dichlorobenzene	-0.102	1.000			
1,4-Dichlorobenzene	0.249***	0.243***	1.000		
BCIE	0.196***	-0.076	0.164**	1.000	
HCBD	0.025	-0.134*	0.041	0.530* **	1.000

Note. BCIE, Bis (2-chloro-1-methylethyl) ether; HCBD, Hexachlorobutadiene. *, **, and *** represents $P < 0.05$, 0.01 and 0.001.

Supplementary Table S4. Overview of the associations between personal exposure to organochlorines and inflammatory factors

Inflammatory factors	Pollutants	High			Low		
		Percentage change (%, 95% CI)	P value	FDR	Percentage change (%, 95% CI)	P value	FDR
IFN- γ	4-Chloroaniline	-9.46 (-17.77, -0.32)	0.05	0.39	4.73 (-0.65, 10.40)	0.09	0.19
	1,3-Dichlorobenzene	-13.62 (-26.46, 1.47)	0.08	0.49	-5.35 (-12.69, 2.60)	0.18	0.32
	1,4-Dichlorobenzene	-9.57 (-26.84, 11.79)	0.36	0.86	-0.19 (-9.67, 10.29)	0.97	0.97
	BCIE	-5.82 (-19.35, 9.98)	0.45	0.86	0.24 (-5.45, 6.28)	0.94	0.96
	HCBD	3.10 (-9.74, 17.76)	0.66	0.87	3.41 (-1.15, 8.18)	0.15	0.28
IL-10	4-Chloroaniline	-5.68 (-17.13, 7.36)	0.38	0.86	7.44 (1.50, 13.73)	0.01	0.05
	1,3-Dichlorobenzene	-10.24 (-27.30, 10.83)	0.32	0.85	0.16 (-8.28, 9.37)	0.97	0.97
	1,4-Dichlorobenzene	0.04 (-24.42, 32.42)	1.00	1.00	8.46 (-2.63, 20.81)	0.14	0.28
	BCIE	-13.67 (-29.24, 5.33)	0.16	0.70	1.82 (-4.43, 8.49)	0.58	0.68
	HCBD	5.49 (-10.95, 24.96)	0.54	0.86	3.32 (-1.63, 8.51)	0.19	0.32
IL-12	4-Chloroaniline	3.06 (-5.49, 12.38)	0.50	0.86	9.95 (5.07, 15.06)	0.00	0.00
	1,3-Dichlorobenzene	-13.56 (-24.21, -1.42)	0.04	0.35	-9.32 (-15.49, -2.71)	0.01	0.03
	1,4-Dichlorobenzene	-1.04 (-17.68, 18.95)	0.91	0.98	-2.39 (-10.69, 6.68)	0.59	0.69
	BCIE	-1.99 (-14.10, 11.82)	0.77	0.93	4.99 (-0.28, 10.53)	0.07	0.17
	HCBD	2.40 (-8.49, 14.59)	0.68	0.88	4.31 (0.22, 8.57)	0.04	0.12
IL-13	4-Chloroaniline	-1.55 (-19.32, 20.13)	0.88	0.97	18.59 (6.98, 31.46)	0.00	0.01
	1,3-Dichlorobenzene	-42.69 (-55.36, -26.42)	0.00	0.01	-35.73 (-44.53, -25.53)	0.00	0.00
	1,4-Dichlorobenzene	-20.04 (-46.84, 20.28)	0.29	0.81	-6.29 (-23.16, 14.28)	0.52	0.66
	BCIE	10.34 (-18.15, 48.76)	0.52	0.86	27.53 (14.14, 42.49)	0.00	0.00
	HCBD	16.95 (-8.89, 50.12)	0.23	0.70	19.38 (9.41, 30.25)	0.00	0.00
IL-17A	4-Chloroaniline	-2.23 (-10.99, 7.39)	0.64	0.87	2.97 (-1.85, 8.04)	0.23	0.36
	1,3-Dichlorobenzene	-13.63 (-25.19, -0.28)	0.05	0.39	-3.27 (-10.12, 4.09)	0.37	0.52
	1,4-Dichlorobenzene	-2.43 (-19.89, 18.83)	0.81	0.94	-1.69 (-10.21, 7.64)	0.71	0.76
	BCIE	0.17 (-13.14, 15.53)	0.98	0.99	1.74 (-3.51, 7.28)	0.52	0.66
	HCBD	3.24 (-8.47, 16.44)	0.61	0.87	3.16 (-0.97, 7.47)	0.14	0.28
IL-1 β	4-Chloroaniline	-7.29 (-17.84, 4.62)	0.23	0.70	11.29 (5.05, 17.91)	0.00	0.00
	1,3-Dichlorobenzene	-19.54 (-32.38, -4.24)	0.02	0.26	-17.85 (-24.58, -10.52)	0.00	0.00
	1,4-Dichlorobenzene	-20.73 (-37.82, 1.05)	0.07	0.47	-7.75 (-17.45, 3.08)	0.16	0.29
	BCIE	-3.88 (-20.13, 15.68)	0.68	0.88	6.18 (-0.48, 13.28)	0.07	0.17
	HCBD	7.00 (-8.53, 25.17)	0.40	0.86	6.51 (1.31, 11.98)	0.01	0.05
IL-2	4-Chloroaniline	-0.25 (-11.61, 12.57)	0.97	0.99	17.34 (9.95, 25.22)	0.00	0.00
	1,3-Dichlorobenzene	-22.01 (-34.60, -7.00)	0.01	0.16	-22.12 (-29.41, -14.07)	0.00	0.00
	1,4-Dichlorobenzene	-15.28 (-33.55, 8.01)	0.19	0.70	-8.11 (-19.18, 4.47)	0.20	0.32
	BCIE	4.72 (-12.75, 25.69)	0.62	0.87	17.12 (9.02, 25.83)	0.00	0.00
	HCBD	13.10 (-2.68, 31.43)	0.12	0.60	12.37 (6.24, 18.86)	0.00	0.00
IL-21	4-Chloroaniline	-4.68 (-16.61, 8.96)	0.49	0.86	14.01 (6.60, 21.93)	0.00	0.00
	1,3-Dichlorobenzene	-20.96 (-35.49, -3.16)	0.03	0.33	-9.12 (-18.17, 0.93)	0.08	0.17
	1,4-Dichlorobenzene	-9.58 (-31.58, 19.49)	0.48	0.86	-2.68 (-14.60, 10.90)	0.68	0.75
	BCIE	-4.68 (-22.33, 16.97)	0.65	0.87	5.15 (-2.56, 13.47)	0.20	0.32
	HCBD	0.78 (-15.32, 19.93)	0.93	0.98	4.22 (-1.75, 10.56)	0.17	0.31
IL-5	4-Chloroaniline	4.54 (-7.36, 17.98)	0.48	0.86	9.09 (3.46, 15.03)	0.00	0.01

	1,3-Dichlorobenzene	-14.43 (-28.49, 2.39)	0.10	0.54	-2.02 (-9.80, 6.45)	0.63	0.72
	1,4-Dichlorobenzene	12.11 (-12.84, 44.21)	0.38	0.86	9.97 (-0.62, 21.70)	0.07	0.17
	BCIE	4.23 (-13.16, 25.10)	0.66	0.87	3.19 (-2.79, 9.54)	0.30	0.44
	HCBD	21.95 (6.07, 40.21)	0.01	0.16	1.41 (-3.19, 6.23)	0.55	0.68
	4-Chloroaniline	-0.80 (-20.47, 23.73)	0.94	0.98	14.24 (1.91, 28.06)	0.02	0.07
IL-6	1,3-Dichlorobenzene	-4.73 (-31.65, 32.80)	0.78	0.93	-29.24 (-40.26, -16.18)	0.00	0.00
	1,4-Dichlorobenzene	-8.30 (-41.82, 44.52)	0.71	0.90	-15.87 (-32.20, 4.40)	0.12	0.25
	BCIE	-12.60 (-37.24, 21.73)	0.43	0.86	8.05 (-4.81, 22.65)	0.23	0.36
	HCBD	-9.43 (-31.61, 19.93)	0.49	0.86	7.58 (-2.49, 18.70)	0.15	0.28
	4-Chloroaniline	-0.43 (-10.08, 10.25)	0.93	0.98	8.39 (3.47, 13.56)	0.00	0.00
IL-7	1,3-Dichlorobenzene	-18.84 (-28.57, -7.80)	0.00	0.07	-19.46 (-24.59, -13.97)	0.00	0.00
	1,4-Dichlorobenzene	-7.03 (-23.78, 13.40)	0.48	0.86	-9.17 (-16.88, -0.74)	0.03	0.10
	BCIE	-2.48 (-16.13, 13.39)	0.75	0.92	8.44 (3.02, 14.16)	0.00	0.01
	HCBD	2.29 (-9.82, 16.03)	0.73	0.91	7.92 (3.71, 12.29)	0.00	0.00
	4-Chloroaniline	6.18 (-5.98, 19.91)	0.34	0.86	3.05 (-2.47, 8.88)	0.29	0.42
IL-8	1,3-Dichlorobenzene	19.53 (2.03, 40.02)	0.03	0.33	12.18 (3.43, 21.66)	0.01	0.03
	1,4-Dichlorobenzene	7.73 (-14.74, 36.11)	0.54	0.86	2.05 (-7.91, 13.09)	0.70	0.75
	BCIE	-8.07 (-23.04, 9.80)	0.36	0.86	-7.34 (-12.70, -1.65)	0.01	0.05
	HCBD	-21.07 (-31.00, -9.72)	0.00	0.05	-7.82 (-11.94, -3.51)	0.00	0.00
	4-Chloroaniline	5.28 (-2.13, 13.24)	0.18	0.70	4.10 (0.98, 7.33)	0.01	0.04
TNF- α	1,3-Dichlorobenzene	0.99 (-10.19, 13.57)	0.87	0.97	-0.29 (-4.89, 4.54)	0.90	0.93
	1,4-Dichlorobenzene	1.12 (-13.62, 18.39)	0.89	0.97	2.75 (-3.05, 8.91)	0.36	0.51
	BCIE	8.19 (-3.04, 20.71)	0.17	0.70	2.46 (-0.97, 6.01)	0.16	0.30
	HCBD	4.53 (-5.03, 15.05)	0.37	0.86	0.99 (-1.65, 3.70)	0.47	0.62

Note. BCIE, Bis (2-chloro-1-methylethyl) ether; HCBD, Hexachlorobutadiene; IL, interleukin; TNF, tumor necrosis factor; IFN, interferon.

Supplementary Table S5. Mediation effects of inflammatory factors in the relationship between BCIE and FVC in low thyroid hormone group

Lung Function	Organochlorine	Inflammatory factors	Indirect Effect (95% CI)	P value	Direct Effect (95% CI)	P value	Total Effect	P value	Proportion mediated (% , 95% CI)	P value
FVC	BCIE	IL-2	-0.003 (-0.006, 0.000)	0.040	-0.015 (-0.024, -0.006)	<0.001	-0.017 (-0.027, -0.008)	0.000	15.633 (0.910, 44.641)	0.040
FVC	BCIE	IL-7	-0.001 (-0.004, 0.001)	0.320	-0.016 (-0.026, -0.008)	<0.001	-0.017 (-0.027, -0.009)	0.000	5.604 (-4.915, 24.694)	0.320
FVC	BCIE	IL-8	-0.001 (-0.003, 0.001)	0.280	-0.016 (-0.026, -0.007)	<0.001	-0.017 (-0.027, -0.009)	0.000	5.001 (-3.426, 22.503)	0.280
FVC	BCIE	IL-13	-0.003 (-0.006, 0.000)	0.048	-0.015 (-0.024, -0.006)	<0.001	-0.017 (-0.027, -0.008)	0.000	13.938% (0.521, 41.074)	0.048

Note. BCIE, Bis (2-chloro-1-methylethyl) ether; FVC, forced vital capacity; IL, interleukin.