

Supplementary information

1. Details on the sample pre-treatment for the separation of the micro, sub-micro and nano/ion fractions

The process developed for particle size fractionation consists of a 2 step-centrifugation. The first centrifugation was short and allowed to separate the fraction containing microparticles from the fraction containing sub-micro and nano-sized particles and potentially soluble metals (ions). The second centrifugation, longer than the first one, allowed separating sub-microparticles from nanoparticles and ions.

Step 1: isolation of the “micro” fraction – Samples were vortexed and sonicated using a Branson sonicator and Cup Horn (70%, 2 min at room temperature). 1 mL of sample was transferred into a 2 mL Protein LoBind tube (Eppendorf®). 0.5 mL of an extraction cushion consisting of a glycerol 75%v/v, NaOH 0.001 M 25%v/v solution was added to the samples. Because of their difference of density, the sample and the glycerol solution did not mixed. The tubes were centrifuged 10 min at 0°C, 1600g (4000 rpm) (Thermo Fisher Scientific Heraeus megafuge 16R). Tubes were then punctured at the level of the 0.25 mL mark with a needle (22G x 1^{1/2} Terumo®) mounted on a 2 mL syringe and the supernatant was aspirated and transferred into a new Protein LoBind tube, this part contained the sub-microparticles, nanoparticles and ions (≈ 1.25 mL). The pellet containing the microparticles was resuspended with 0.75 mL of NaOH 0.001 M and was transferred into a new Protein LoBind tube and stored at 4°C until analysis.

Step 2: separation of the “sub-micro” fraction from nano and ions – 0.5 mL of an extraction cushion (glycerol 75%v/v, NaOH 0.001 M 25%v/v) was added to the tube containing the sub-microparticles, nanoparticles and ions fractions obtained from step 1. Tubes were centrifuged during 3h30 at 0°C, 2500 g (5000 rpm). Tubes were then punctured at the 0.5 mL mark with a needle (22G x 1^{1/2} Terumo®) mounted on a 2 mL syringe and the supernatant was slowly aspirated and transferred into a new Protein LoBind tube, this part contained nanoparticles and

ions. The pellet containing the sub-microparticles was resuspended with 0.6 mL of NaOH 0.001 M and was transferred into a new Protein LoBind tube and stored at 4°C until analysis.

To assess the background noise a “blank” sample consisting of distilled water underwent the same protocol.

2. Comprehensive results of the mineralogical analyses

In Tables S1 to S12 are reported the mean concentrations observed for each element in the micron, submicron and nano/ion fractions for BW and BAL.

Table S1 - Mean AI concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	152 \pm 122	18 \pm 26	55 \pm 132	0	11 \pm 11	3 \pm 4
Other ILD:	86	109 \pm 191	8 \pm 17	28 \pm 101	38 \pm 129	5 \pm 9	2 \pm 3
Idiopathic nonspecific interstitial pneumonia	11	274 \pm 433	24 \pm 37	127 \pm 249	0	7 \pm 10	2 \pm 3
Idiopathic pulmonary fibrosis	9	23 \pm 68	0	2 \pm 3	51 \pm 101	0	2 \pm 3
Drug related ILD	15	103 \pm 134	8 \pm 17	24 \pm 79	80 \pm 118	5 \pm 8	2 \pm 3
Infectious ILD	12	150 \pm 144	12 \pm 16	27 \pm 81	0	11 \pm 11	2 \pm 3
Hypersensitivity pneumonitis	7	148 \pm 139	11 \pm 9	15 \pm 31	0	10 \pm 10	2 \pm 3
Auto-immune pneumonitis	5	0	0	3 \pm 3	196 \pm 437	0	0
Lymphangitis carcinomatosa /Neoplasia	4	137 \pm 137	11 \pm 11	54 \pm 80	58 \pm 100	10 \pm 10	5 \pm 3
Desquamative interstitial pneumonia	3	58 \pm 101	0	2 \pm 4	0	0	0
Pneumoconiosis	2	0	0	3 \pm 4	0	0	6 \pm 0
Pulmonary Pulmonary veno-occlusive disease	2	0	0	0	0	0	0
Silicosis	1	290	19	7	0	25	0
Microscopic polyangiitis	1	0	0	0	0	0	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	0	0	0	0	7
Left heart failure	1	0	0	0	0	0	0
Lipoid pneumonia	1	0	0	0	0	0	0
Bronchiolitis obliterans	1	0	0	0	0	0	0
Antisynthetase syndrome	2	235 \pm 68	11 \pm 16	3 \pm 4	0	10 \pm 14	0
Others	8	62 \pm 124	0	1 \pm 3	58 \pm 116	2 \pm 4	1 \pm 3

Table S2 - Mean Be concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	0	0 \pm 1	0	0	0	10 \pm 35
Other ILD:	86	0	0 \pm 1	0 \pm 1	0	0	6 \pm 26
Idiopathic nonspecific interstitial pneumonia	11	0	0	0	0	0	0
Idiopathic pulmonary fibrosis	9	0	0 \pm 1	0	0	0	0
Drug related ILD	15	0	0	0 \pm 1	0	0 \pm 1	17 \pm 45
Infectious ILD	12	0	0 \pm 1	0 \pm 1	0	0	0
Hypersensitivity pneumonitis	7	0	1 \pm 2	0	0	0	32 \pm 54
Auto-immune pneumonitis	5	0	1 \pm 1	0	0	0	0
Lymphangitis carcinomatosa /Neoplasia	4	0	2 \pm 2	2 \pm 4	0	0	8 \pm 14
Desquamative interstitial pneumonia	3	0	0	0	0	0	0
Pneumoconiosis	2	0	0	0	0	0	0
Pulmonary veno-occlusive disease	2	0	0	0	0	0	0
Silicosis	1	0	0	0	0	0	0
Microscopic polyangiitis	1	0	0	0	0	0	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	0	0	0	0	0
Left heart failure	1	0	0	0	0	0	0
Lipoid pneumonia	1	0	0	0	0	0	0
Bronchiolitis obliterans	1	0	0	0	0	0	0
Antisynthetase syndrome	2	0	0	0	0	0	0
Others	8	0	0	0	0	0	0

Table S3 - Mean Co concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	0	1 \pm 1	1 \pm 2	0	0 \pm 1	0
Other ILD:	86	0 \pm 3	1 \pm 2	0 \pm 1	0	0 \pm 1	0
Idiopathic nonspecific interstitial pneumonia	11	0	1 \pm 2	0	0	0	0
Idiopathic pulmonary fibrosis	9	0	0 \pm 1	0	0	1 \pm 1	0
Drug related ILD	15	1 \pm 2	1 \pm 2	0 \pm 1	0	0 \pm 1	0 \pm 1
Infectious ILD	12	0	1 \pm 2	1 \pm 1	0	1 \pm 1	0
Hypersensitivity pneumonitis	7	0	1 \pm 3	0 \pm 1	0	0 \pm 1	0
Auto-immune pneumonitis	5	0	1 \pm 1	0	0	0	0
Lymphangitis carcinomatosa /Neoplasia	4	6 \pm 10	0 \pm 1	2 \pm 3	0	1 \pm 1	0
Desquamative interstitial pneumonia	3	0	0 \pm 1	0	0	0	0
Pneumoconiosis	2	0	0	0	0	1 \pm 1	0
Pulmonary veno-occlusive disease	2	0	0	0	0	0	0
Silicosis	1	0	0	0	0	0	0
Microscopic polyangiitis	1	0	0	0	0	0	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	0	0	0	0	0
Left heart failure	1	0	0	0	0	0	0
Lipoid pneumonia	1	0	1	0	0	0	0
Bronchiolitis obliterans	1	0	0	0	0	0	0
Antisynthetase syndrome	2	0	1 \pm 1	0	0	0	0
Others	8	0	0 \pm 1	0	0	0 \pm 1	0

Table S4 - Mean Cr concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	1 \pm 1	15 \pm 5	13 \pm 2	0 \pm 1	12 \pm 1	13 \pm 1
Other ILD:	86	0	13 \pm 2	13 \pm 3	0 \pm 1	12 \pm 1	12 \pm 2
Idiopathic nonspecific interstitial pneumonia	11	0	13 \pm 1	13 \pm 2	0	13 \pm 0	13 \pm 1
Idiopathic pulmonary fibrosis	9	0	13 \pm 3	11 \pm 4	0	12 \pm 1	13 \pm 0
Drug related ILD	15	0 \pm 1	13 \pm 1	13 \pm 1	0	12 \pm 2	12 \pm 1
Infectious ILD	12	0	13 \pm 3	13 \pm 3	0	12 \pm 1	13 \pm 1
Hypersensitivity pneumonitis	7	0	14 \pm 4	13 \pm 2	0	11 \pm 2	11 \pm 5
Auto-immune pneumonitis	5	0 \pm 1	13 \pm 1	13 \pm 1	0	12 \pm 1	12 \pm 1
Lymphangitis carcinomatosa /Neoplasia	4	0	15 \pm 2	17 \pm 6	0	12 \pm 0	13 \pm 1
Desquamative interstitial pneumonia	3	0	12 \pm 1	13 \pm 0	0	12 \pm 1	12 \pm 1
Pneumoconiosis	2	0	11 \pm 1	13 \pm 0	0	13 \pm 0	14 \pm 1
Pulmonary veno-occlusive disease	2	0	13 \pm 0	12 \pm 0	0	13 \pm 0	12 \pm 1
Silicosis	1	0	12	11	0	13	14
Microscopic polyangiitis	1	0	10	14	0	13	14
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	11	11	0	12	13
Left heart failure	1	0	10	12	0	12	13
Lipoid pneumonia	1	0	12	13	0	11	12
Bronchiolitis obliterans	1	0	13	12	5	13	13
Antisynthetase syndrome	2	0	13 \pm 1	12 \pm 1	0	13	13
Others	8	0	12 \pm 1	13 \pm 1	0	13 \pm 0	12 \pm 1

Table S5 - Mean Cu concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	7 \pm 14	83 \pm 151	9 \pm 14	2 \pm 8	3 \pm 7	0
Other ILD:	86	3 \pm 8	13 \pm 51	3 \pm 9	8 \pm 16	3 \pm 7	0 \pm 2
Idiopathic nonspecific interstitial pneumonia	11	4 \pm 12	9 \pm 12	7 \pm 13	12 \pm 17	4 \pm 9	0
Idiopathic pulmonary fibrosis	9	0	0	0	13 \pm 20	0	0
Drug related ILD	15	5 \pm 13	5 \pm 10	4 \pm 9	5 \pm 15	1 \pm 5	0
Infectious ILD	12	0	7 \pm 10	3 \pm 8	12 \pm 20	6 \pm 9	1 \pm 5
Hypersensitivity pneumonitis	7	7 \pm 12	61 \pm 147	6 \pm 12	7 \pm 11	2 \pm 7	0
Auto-immune pneumonitis	5	1 \pm 2	0	0	10 \pm 13	0	0
Lymphangitis carcinomatosa /Neoplasia	4	1 \pm 3	74 \pm 88	14 \pm 14	0	5 \pm 9	0
Desquamative interstitial pneumonia	3	0	0	0	0	0	0
Pneumoconiosis	2	0	0	0	0	0	0
Pulmonary veno-occlusive disease	2	0	0	0	13 \pm 19	0	0
Silicosis	1	0	19	0	0	17	0
Microscopic polyangiitis	1	0	0	0	28	0	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	0	0	0	0	0
Left heart failure	1	0	0	0	53	0	0
Lipoid pneumonia	1	0	0	0	0	0	0
Bronchiolitis obliterans	1	0	0	0	0	0	0
Antisynthetase syndrome	2	0	9 \pm 12	8 \pm 11	0	12 \pm 16	0
Others	8	7 \pm 15	0	0	0	0	0

Table S6 - Mean Fe concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	48 \pm 52	26 \pm 19	177 \pm 196	18 \pm 34	4 \pm 6	5 \pm 7
Other ILD:	86	32 \pm 109	21 \pm 69	62 \pm 211	42 \pm 80	14 \pm 23	22 \pm 82
Idiopathic nonspecific interstitial pneumonia	11	8 \pm 24	13 \pm 5	29 \pm 18	36 \pm 56	14 \pm 20	10 \pm 11
Idiopathic pulmonary fibrosis	9	20 \pm 41	8 \pm 6	18 \pm 12	22 \pm 44	11 \pm 17	5 \pm 6
Drug related ILD	15	68 \pm 230	12 \pm 9	23 \pm 18	18 \pm 37	9 \pm 6	10 \pm 7
Infectious ILD	12	30 \pm 43	12 \pm 7	30 \pm 25	28 \pm 39	10 \pm 8	14 \pm 21
Hypersensitivity pneumonitis	7	11 \pm 29	7 \pm 7	9 \pm 10	24 \pm 41	5 \pm 8	4 \pm 7
Auto-immune pneumonitis	5	14 \pm 31	5 \pm 7	3 \pm 7	77 \pm 125	7 \pm 10	5 \pm 7
Lymphangitis carcinomatosa /Neoplasia	4	15 \pm 25	15 \pm 4	54 \pm 23	19 \pm 34	12 \pm 7	7 \pm 7
Desquamative interstitial pneumonia	3	0	4 \pm 7	7 \pm 6	0	10 \pm 1	13 \pm 2
Pneumoconiosis	2	0	7 \pm 9	15 \pm 22	33 \pm 47	11 \pm 16	13 \pm 18
Pulmonary veno-occlusive disease	2	70 \pm 99	27 \pm 22	6 \pm 8	266 \pm 248	46 \pm 44	15 \pm 0
Silicosis	1	158	615	1745	73	15	16
Microscopic polyangiitis	1	69	53	383	105	56	489
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	275	89	360	377	131	562
Left heart failure	1	70	70	50	122	115	17
Lipoid pneumonia	1	0	0	0	0	0	0
Bronchiolitis obliterans	1	0	0	0	200	0	0
Antisynthetase syndrome	2	0	18 \pm 25	114 \pm 162	38 \pm 54	9 \pm 13	0
Others	8	0	17 \pm 22	147 \pm 259	18 \pm 36	6 \pm 7	6 \pm 7

Table S7 - Mean Ni concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	3 \pm 8	9 \pm 18	0	0	0	0
Other ILD:	86	3 \pm 7	1 \pm 6	0	0	0	0
Idiopathic nonspecific interstitial pneumonia	11	2 \pm 7	0	0	0	0	0
Idiopathic pulmonary fibrosis	9	2 \pm 6	0	0	0	0	0
Drug related ILD	15	3 \pm 8	0	0	0	0	0
Infectious ILD	12	2 \pm 6	0	0	0	0	0
Hypersensitivity pneumonitis	7	3 \pm 8	6 \pm 16	0	0	0	0
Auto-immune pneumonitis	5	0 \pm 1	0	0	0	0	0
Lymphangitis carcinomatosa /Neoplasia	4	1 \pm 1	9 \pm 15	0	0	0	0
Desquamative interstitial pneumonia	3	9 \pm 15	0	0	0	0	0
Pneumoconiosis	2	0	0	0	0	0	0
Pulmonary veno-occlusive disease	2	0	0	0	0	0	0
Silicosis	1	0	0	0	0	0	0
Microscopic polyangiitis	1	0	0	0	0	0	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	17	0	0	0	0	0
Left heart failure	1	0	0	0	0	0	0
Lipoid pneumonia	1	0	0	0	0	0	0
Bronchiolitis obliterans	1	22	0	0	0	0	0
Antisynthetase syndrome	2	0	0	0	0	0	0
Others	8	0	0	0	0	0	0

Table S8 - Mean Si concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	279 \pm 226	564 \pm 443	0	247 \pm 280	501 \pm 399	0
Other ILD:	86	205 \pm 257	292 \pm 385	10 \pm 92	92 \pm 199	246 \pm 342	0
Idiopathic nonspecific interstitial pneumonia	11	168 \pm 165	457 \pm 489	0	143 \pm 250	347 \pm 411	0
Idiopathic pulmonary fibrosis	9	101 \pm 151	90 \pm 111	0	0	59 \pm 88	0
Drug related ILD	15	240 \pm 381	211 \pm 361	54 \pm 210	39 \pm 151	153 \pm 304	0
Infectious ILD	12	227 \pm 191	487 \pm 464	0	186 \pm 259	426 \pm 413	0
Hypersensitivity pneumonitis	7	261 \pm 244	499 \pm 439	0	155 \pm 265	382 \pm 408	0
Auto-immune pneumonitis	5	337 \pm 312	127 \pm 116	0	46 \pm 103	141 \pm 130	0
Lymphangitis carcinomatosa /Neoplasia	4	427 \pm 379	478 \pm 478	0	246 \pm 247	435 \pm 439	0
Desquamative interstitial pneumonia	3	181 \pm 158	144 \pm 125	0	0	138 \pm 119	0
Pneumoconiosis	2	180 \pm 254	126 \pm 178	0	0	110 \pm 156	0
Pulmonary veno-occlusive disease	2	0	0	0	0	0	0
Silicosis	1	387	953	0	516	953	0
Microscopic polyangiitis	1	298	231	0	0	205	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	166	0	0	153	0
Left heart failure	1	0	153	0	0	160	0
Lipoid pneumonia	1	317	199	0	0	209	0
Bronchiolitis obliterans	1	0	0	0	0	0	0
Antisynthetase syndrome	2	177 \pm 250	493 \pm 697	0	228 \pm 322	465 \pm 657	0
Others	8	52 \pm 104	51 \pm 102	0	0	67 \pm 133	0

Table S9 - Mean Ti concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	0	1 \pm 2	8 \pm 19	0	0	0 \pm 1
Other ILD:	86	3 \pm 27	1 \pm 2	4 \pm 11	0 \pm 2	0 \pm 1	1 \pm 1
Idiopathic nonspecific interstitial pneumonia	11	26 \pm 79	2 \pm 4	13 \pm 25	0	0	1 \pm 1
Idiopathic pulmonary fibrosis	9	0	1 \pm 1	1 \pm 2	0	1 \pm 2	1 \pm 1
Drug related ILD	15	0	1 \pm 2	5 \pm 13	0	0	1 \pm 1
Infectious ILD	12	0 \pm 1	1 \pm 2	3 \pm 8	0	0	0
Hypersensitivity pneumonitis	7	0	1 \pm 1	2 \pm 5	0	0	0
Auto-immune pneumonitis	5	0	1 \pm 2	1 \pm 2	0	0	0 \pm 1
Lymphangitis carcinomatosa /Neoplasia	4	0 \pm 1	1 \pm 2	6 \pm 7	0	0	1 \pm 1
Desquamative interstitial pneumonia	3	0	0	1 \pm 1	0	0	1 \pm 1
Pneumoconiosis	2	0	0	0	9 \pm 13	0	1 \pm 1
Pulmonary veno-occlusive disease	2	0	0	1 \pm 2	0	0	1 \pm 2
Silicosis	1	0	0	0	0	0	0
Microscopic polyangiitis	1	0	0	2	0	0	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	0	0	0	0	0
Left heart failure	1	0	0	0	0	0	0
Lipoid pneumonia	1	0	0	0	0	0	0
Bronchiolitis obliterans	1	0	0	0	0	0	0
Antisynthetase syndrome	2	0	0	1 \pm 1	0	0	0
Others	8	0	1 \pm 2	1 \pm 2	0	1 \pm 1	1 \pm 1

Table S10 - Mean W concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	2 \pm 6	34 \pm 83	0	1 \pm 4	0	4 \pm 14
Other ILD:	86	3 \pm 11	5 \pm 25	0	6 \pm 8	0	23 \pm 117
Idiopathic nonspecific interstitial pneumonia	11	0	3 \pm 8	0	5 \pm 7	0	6 \pm 19
Idiopathic pulmonary fibrosis	9	3 \pm 10	0	0	4 \pm 8	0	2 \pm 7
Drug related ILD	15	6 \pm 17	16 \pm 55	0	8 \pm 10	0	77 \pm 226
Infectious ILD	12	5 \pm 14	0	0	4 \pm 7	0	52 \pm 171
Hypersensitivity pneumonitis	7	0	7 \pm 18	0	3 \pm 7	0	0
Auto-immune pneumonitis	5	0	8 \pm 19	0	6 \pm 8	0	0
Lymphangitis carcinomatosa /Neoplasia	4	4 \pm 7	9 \pm 15	0	0	0	0
Desquamative interstitial pneumonia	3	0	0	0	4 \pm 8	0	0
Pneumoconiosis	2	0	0	0	9 \pm 12	0	0
Pulmonary veno-occlusive disease	2	0	0	0	18 \pm 3	0	0
Silicosis	1	0	0	0	0	0	0
Microscopic polyangiitis	1	0	0	0	0	0	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	0	0	0	0	0
Left heart failure	1	0	0	0	15	0	0
Lipoid pneumonia	1	0	0	0	0	0	0
Bronchiolitis obliterans	1	0	0	0	16	0	0
Antisynthetase syndrome	2	0	0	0	9 \pm 13	0	0
Others	8	11 \pm 23	0	0	14 \pm 12	0	0

Table S11 - Mean Zn concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	10 \pm 6	66 \pm 127	19 \pm 16	11 \pm 2	5 \pm 8	4 \pm 5
Other ILD:	86	7 \pm 10	11 \pm 50	10 \pm 10	11 \pm 4	2 \pm 5	1 \pm 3
Idiopathic nonspecific interstitial pneumonia	11	7 \pm 7	8 \pm 14	16 \pm 14	11 \pm 3	4 \pm 8	2 \pm 4
Idiopathic pulmonary fibrosis	9	8 \pm 18	0	8 \pm 6	10 \pm 5	0	0
Drug related ILD	15	8 \pm 13	3 \pm 9	8 \pm 6	9 \pm 5	2 \pm 6	2 \pm 3
Infectious ILD	12	6 \pm 6	5 \pm 9	12 \pm 9	13 \pm 4	2 \pm 6	1 \pm 3
Hypersensitivity pneumonitis	7	9 \pm 4	47 \pm 115	11 \pm 13	11 \pm 3	2 \pm 6	1 \pm 4
Auto-immune pneumonitis	5	4 \pm 7	0	6 \pm 4	17 \pm 9	0	0
Lymphangitis carcinomatosa /Neoplasia	4	12 \pm 8	80 \pm 139	21 \pm 14	9 \pm 1	5 \pm 6	2 \pm 4
Desquamative interstitial pneumonia	3	6 \pm 5	0	3 \pm 6	10 \pm 1	0	0
Pneumoconiosis	2	8 \pm 11	0	3 \pm 4	12 \pm 3	0	0
Pulmonary veno-occlusive disease	2	0	0	0	12 \pm 1	0	0
Silicosis	1	13	15	33	11	0	0
Microscopic polyangiitis	1	9	0	13	17	0	8
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	0	8	12	0	0
Left heart failure	1	0	0	0	11	0	0
Lipoid pneumonia	1	0	0	0	11	0	0
Bronchiolitis obliterans	1	0	0	7	11	0	0
Antisynthetase syndrome	2	6 \pm 9	3 \pm 4	11 \pm 3	10	0	0
Others	8	8 \pm 15	0	10 \pm 7	9 \pm 6	0	0

Table S12 - Mean Zr concentration \pm standard deviation (ppb).

Disease	Number of patients	BW			BAL		
		Micro particles	Submicron particles	Nanoparticles/Ion	Micro particles	Submicron particles	Nanoparticles/Ion
Sarcoidosis	14	0 \pm 1	4 \pm 8	0	0	0	0
Other ILD:	86	1 \pm 7	2 \pm 5	2 \pm 12	0	1 \pm 4	2 \pm 12
Idiopathic nonspecific interstitial pneumonia	11	0	4 \pm 8	0	0	0	0
Idiopathic pulmonary fibrosis	9	0	1 \pm 1	1 \pm 2	0	2 \pm 5	0
Drug related ILD	15	0	2 \pm 4	3 \pm 9	0	1 \pm 1	8 \pm 27
Infectious ILD	12	5 \pm 18	2 \pm 6	1 \pm 3	0	0 \pm 1	1 \pm 3
Hypersensitivity pneumonitis	7	0	3 \pm 7	15 \pm 39	0	0	0
Auto-immune pneumonitis	5	2 \pm 2	2 \pm 5	1 \pm 3	0	1 \pm 1	0
Lymphangitis carcinomatosa /Neoplasia	4	0	10 \pm 11	0	0	10 \pm 15	0
Desquamative interstitial pneumonia	3	0	0	0	0	0	0
Pneumoconiosis	2	3 \pm 4	0	0	0	0	0
Pulmonary veno-occlusive disease	2	0	0	0	0	0	0
Silicosis	1	0	0	0	0	0	0
Microscopic polyangiitis	1	0	0	0	0	0	0
Granulomatosis with polyangiitis (Wegener's granulomatosis)	1	0	0	0	0	0	0
Left heart failure	1	0	0	0	0	0	0
Lipoid pneumonia	1	0	0	0	0	0	0
Bronchiolitis obliterans	1	0	0	0	0	0	0
Antisynthetase syndrome	2	0	0	0	0	0	0
Others	8	0	1 \pm 1	0	0	1 \pm 1	0