Supplementary Table 1. Patient information[1].

												short term medications		long term medications							
subject	**age**	**gender**	**genotype I**	**genotype II**	**mean FEV_1 (%predicted) for the year**	**BMI**	**diabetes**	**number of CFPE over the period months studied**	**CFPE**	**CFPE occurrence (days) from study start, across full collection period**	**PO antibiotics**	**IV antibiotics**	**macrolide**	**colomycin neb**	**tobramycin neb**	**col/tob neb (alt months)**	**itraconazole**	**oral corticosteroids**	**inhaled corticosteroids**	**DNAse**	**hypertonic saline**
1	30	male	phe508del	unknown	54.9	29	no	3	1	95-130	doxy, azit, cipr	fluc, gent, tobr, mero	no	no	no	no	no	no	yes	yes	no
									2	151-161	cipr, fluc										
									3	237-256	cipr, doxy										
2	45	female	phe508del	unknown	40.2	18.5	yes	3 (+1[a])	1	1- 14		ceft, tobr	yes	yes	no	no	no	no	yes	no	no
									2	88-105		colo, tobr									
									El	191-198	doxy										
									3	254-268		colo, tobr									
3	47	male	phe508del	unknown	33.9	20.7	yes	0	0				yes	yes	no	no	no	no	yes	yes	no
4	30	female	phe508del	711+3A7G	38.2	25	no	3	1	175-189	co-am, fluc		yes	no	no	no	no	no	yes	yes	no
									2	235-249	doxy										
									3	349-362	doxy										
5	22	female	phe508del	phe508del	36.2	19	no	5	1	62-105		colo, ceft, mero, tobr, amik	yes	yes	no	no	yes	no	yes	yes	no
									2	126-135	doxy										
									3	153-167	doxy										
									4	215-239	cipr	mero, amik									
									5	322-345	doxy	mero, amik									
6	55	male	phe508del	G85E	52.2	24.5	no	2	1	210-220	cipr		yes	yes	no	no	no	no	yes	yes	no
									2	251-261		ceft, gent									

[1] "neb" – nebulised, "El" – elective antibiotics, [a] - for sinus infection, [b] - for skin infection, [c] - as maintenance therapy, [d] - for haemoptysis. "amik" – amikacin, "amox" – amoxicillin, "azit" – azithromycin, "ceft" – ceftazidime, "cipr" – ciprofloxacin, "clar"– clarithromycin, "co-am" – co-amoxiclav, "colo" – colomycin, "doxy" – doxycycline, "eryt" – erythromycin, "fluc" – flucloxacillin, "mero" – meropenem, "metr" – metronidazole, "pipe" – piperacillin, "tazo" – tazobactam

7	21	female	phe508del	phe508del	56.6	19	no	4	1	68-78		mero	yes	yes	no	no	no	no	yes	yes	no
									2	151-160	colo, mero									
									3	237-250		doxy								
									4	320-334		doxy								
8	40	male	phe508del	phe508del	50.6	19.4	yes	0 (+1[b])	El	274-280	fluc		yes	yes	no	no	no	yes	yes	no	no
9	22	male	phe508del	phe508del	16.5	17.9	yes	6 (+1[c])	1	85-93	amox	ceft	yes	yes	no	no	no	no	yes	yes	yes
									2	139-151		colo, ceft								
									3	198-212		mero, colo								
									4	256-279	co-am	mero, colo								
									5	336-357		mero, colo								
									El	396-410		mero, colo								
									6	440-442		mero, colo								
10	18	female	phe508del	phe508del	84	22.5	no	2 (+1[c])	El	106-124		ceft, gent	yes	no	no	yes	no	no	yes	yes	no
									1	247-263	cipr									
									2	334-344		ceft, gent								
11	24	female	phe508del	G542X	72.5	23.4	no	3	1	79-93	eryt		yes	yes	no	no	no	no	yes	yes	no
									2	177-194	clar									
									3	205-222		colo, pipe/tazo								
12	20	male	phe508del	phe508del	26.8	30.4	no	4	1	13-25		ceft, gent	yes	no	yes	no	no	no	no	no	no
									2	118-133	cipr									
									3	159-174	cipr, metr									
									4	192-203		ceft, gent								
13	20	male	phe508del	phe508del	54.4	21	no	4 (+1[b])	1	39-49		ceft, tobr	no	no	no	yes	yes	yes	yes	yes	no
									2	70-83		ceft, gent								
									3	103-119	co-am									
									4	173-184		ceft, gent								
									El	245-261		ceft, gent								
14	23	male	phe508del	phe508del	53.6	20.7	yes	3 (+1[d])	1	1- 27		mero, tobr	no	yes	no	no	no	no	yes	no	no
									2	123-133		meropene, tobr								
									3	237-254		ceft								
									El	299-309		meropene, tobr								

Supplementary Table 2. Sample information.[2]

subject	sample	days since study start	clinical status	subject	sample	days since study start	clinical status
1	1	1*	stable	**08**	1	1*	stable
	2	24	stable		2	18	stable
	3	50	stable		3	46	stable
	4	80	3 days prior CFPE		4	76	stable
	5	120	8 days post CFPE		5	109	stable
	6	141	start of CFPE (prior to abx)		6	158	stable
	7	188	stable		7	176	stable
	8	220	5 days prior CFPE		8	211	stable
	9	260	15 days post CFPE		9	237	stable
	10	286	stable		10	270	exacerbating (day 6)
	11	323	stable		11	305	stable
	12	344	stable		12	349	stable
2	1	1	16 days post CFPE	**09**	1	1	stable
	2	19*	stable		2	10*	stable
	3	49	13 days prior CFPE		3	31	stable
	4	93	17 days post CFPE		4	57	stable
	5	119	stable		5	89	stable
	6	145	stable		6	176	12 days prior CFPE
	7	175	stable		7	218	15 days post CFPE
	8	191	stable		8	234	12 days prior CFPE
	9	227	exacerbating (day 3)		9	291	stable
	10	264	stable		10	305	stable
	11	285	stable		11	311	15 days prior CFPE
	12	324	stable		12	332	exacerbating (day 6)
3	1	1*	stable	**10**	1	1*	stable
	2	38	stable		2	29	stable
	3	70	stable		3	57	stable
	4	103	stable		4	83	13 days prior CFPE
	5	131	stable		5	134	19 days post CFPE
	6	161	stable		6	144	stable
	7	189	stable		7	181	stable
	8	220	stable		8	204	stable
	9	257	stable		9	221	16 days prior CFPE
	10	283	stable		10	270	16 days post CFPE
	11	306	stable		11	291	stable
	12	348	stable		12	321	3 days prior CFPE
4	1	1*	stable	**11**	1	1*	stable
	2	22	stable		2	31	stable
	3	52	stable		3	52	stable
	4	93	stable		4	83	exacerbating (day 10)
	5	168	exacerbating (day 2)		5	125	stable
	6	200	19 days post CFPE		6	150	stable
	7	213	13 days prior CFPE		7	162	9 days prior CFPE
	8	226	start of CFPE (prior to abx)		8	209	exacerbating (day 10)
	9	263	stable		9	239	stable
	10	308	20 days prior CFPE		10	269	stable
	11	320	9 days prior CFPE		11	304	stable
	12	331	stable		12	337	stable
5	1	1*	stable	**12**	1	1*	13 days prior CFPE
	2	22	stable		2	41	14 days post CFPE
	3	51	7 days prior CFPE		3	62	stable
	4	87	stable		4	98	stable

[2] * - sequenced for assignment of species identities to T-RF band lengths. Where samples were collected between two CFPE less than 42 days apart, the days to the nearest CFPE in time are shown. Samples taken at the start of CFPE were obtained before antibiotics (abx) were given.

	5	113	12 days post CFPE
	6	138	7 days post CFPE
	7	176	13 days post CFPE
	8	204	7 days prior CFPE
	9	228	exacerbating (day 17)
	10	255	19 days post CFPE
	11	285	stable
	12	311	stable
6	1	1*	stable
	2	19	stable
	3	52	stable
	4	84	stable
	5	113	stable
	6	138	stable
	7	171	stable
	8	190	9 days prior CFPE
	9	229	19 days post CFPE
	10	264	13 days post CFPE
	11	311	stable
	12	351	stable
7	1	1	stable
	2	29*	stable
	3	48	stable
	4	80	stable
	5	111	stable
	6	143	exacerbating (day 3)
	7	171	stable
	8	192	stable
	9	213	13 days prior CFPE
	10	272	stable
	11	310	exacerbating (day 1)
	12	351	stable

	5	132	exacerbating (day 13)
	6	148	exacerbating (day 12)
	7	170	2 days post CFPE
	8	193	2 days prior CFPE
	9	225	20 days post CFPE
	10	245	stable
	11	358	stable
	12	371	stable
13	1	1*	stable
	2	24	16 days prior CFPE
	3	76	exacerbating (day 5)
	4	112	stable
	5	139	stable
	6	160	14 days prior CFPE
	7	199	13 days post CFPE
	8	223	stable
	9	234	12 days prior CFPE
	10	247	exacerbating (day 1)
	11	316	stable
	12	339	stable
14	1	1	exacerbating (day 1)
	2	50	stable
	3	62*	stable
	4	90	stable
	5	120	exacerbating (day 3)
	6	155	stable
	7	181	stable
	8	207	stable
	9	231	start of CFPE (prior to abx)
	10	267	stable
	11	316	13 days post CFPE
	12	351	stable

Supplementary Table 3. Microbiological culture data.

patient	sample	gram negative bacilli					gram positive cocci			mixed organisms		fungi and yeasts			
		coliform	*P. aeruginosa* non mucoid	*P. aeruginosa* mucoid	*Pseudomonas* sp.	*S. maltophilia*	*S. aureus* (MSSA[3])	*Staphylococcus* sp.	*Streptococcus* Group F	oral flora	unidentified	*Aspergillus fumigatus*	*Aspergillus flavus*	*Aspergillus* sp.	yeasts
1	1														
	2				1		1					1			
	3									1					
	4														
	5		1		2							1			
	6				1	1				1					
	7						1			1					
	8	1					1			1					
	9	1								1					
	10				1			1			1			1	
	11				1			1			1				
	12						1			1					
2	1		1	1											
	2		1							1		1			
	3				2										
	4														
	5														
	6														
	7				2										
	8		1	1	1					1				1	1
	9														
	10				2		1			1		1			
	11		1	1			1					1			
	12		1		2		1			1		1			
3	1			1	1					1					
	2			1	1					1					
	3			1	1					1					
	4			1	2										
	5				2					1					
	6														
	7														
	8				2										
	9														
	10				2					2					
	11				2					1					1
	12				3					1					
4	1									1					
	2						1			1					
	3														
	4				1										
	5														
	6				1										
	7				1		1			1					
	8									1					

[3] Methicillin sensitive *Staphylococcus aureus*

	9											
	10	2				1		1				
	11				2			1	1			
	12					1	1	2				
5	1		1	1				1				
	2				1			1				
	3			1	1			1				
	4	1			1							
	5				1				1			1
	6				4			1	1			1
	7				1							
	8			1	1							
	9											
	10			1	1			1	1			1
	11			1	1			1	1			
	12				2			1		1		
6	1				1				1			1
	2		1		1				1			1
	3				1			1	1			1
	4											
	5											
	6											
	7				3			1			1	1
	8		1	1	1				1			1
	9											
	10				1						1	1
	11		1		1			1	1			1
	12											
7	1				1			1				
	2			1								
	3		1		1			1				
	4											
	5											
	6		1		1			1	1			
	7				2							
	8		2		2			1				
	9		2					1				
	10				2			1				
	11				2			1				
	12											
8	1				1			1				
	2				2	1		1				
	3			1	1	1			1			1
	4		1	1				1	1			1
	5			1				1	1			
	6			1		1						
	7			1	2	1		1				1
	8											
	9			1	1	1		1				
	10			1	1			1				
	11				2	1		1				
	12				3	1		1				1
9	1				1			1				
	2				1							
	3			1	1							
	4			1	1							

	5		1			1		
	6			2	1	1		
	7							
	8							
	9		1			1		
	10		1	1		1		
	11							
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	4					1		1
	5			1				
	6		1			1		1
	7							
	8							
	9			3		1		1
	10		1			1		1
	11							
	12					1		1
11	1		1	1			1	1
	2							
	3			2		1		1
	4							
	5			2		1		1
	6			1		1		1
	7							
	8			2				1
	9			2		1		1
	10			1		1		
	11							
	12		1	1		1		1
12	1			2		1		
	2							
	3							
	4			2		1		
	5		1	1		1		
	6							
	7							
	8		1	2		1		
	9		1	2				
	10		1	1		1		
	11			2		1		
	12		1	3		1		
13	1	1	1	1				
	2		1	1			1	
	3	1	1	1		1		
	4			2				
	5	1	1	1				
	6							
	7	1		1				
	8		1	2		1	1	
	9	1	1	1		1	1	
	10	1	2			1		
	11		1	1		1	1	
	12		1	1		1	1	

14	1			1	1	
	2			1	1	
	3			2	1	
	4		1	2		
	5			2	1	
	6			2	1	
	7		1	2	1	
	8			2	1	
	9			2	1	
	10			2	1	
	11	2			1	1
	12			1	1	

Supplementary Table 4. Overall change in community composition.

subject	overall (mean %) change of the bacterial community over year[4]	standard deviation (%)
1	52.9	15.0
2	4.3	3.3
3	18.1	16.5
4	70.0	16.4
5	18.7	11.2
6	24.8	13.4
7	31.7	19.7
8	25.0	24.7
9	39.5	22.2
10	38.9	18.4
11	45.7	26.4
12	27.4	21.9
13	35.8	19.6
14	64.3	18.2

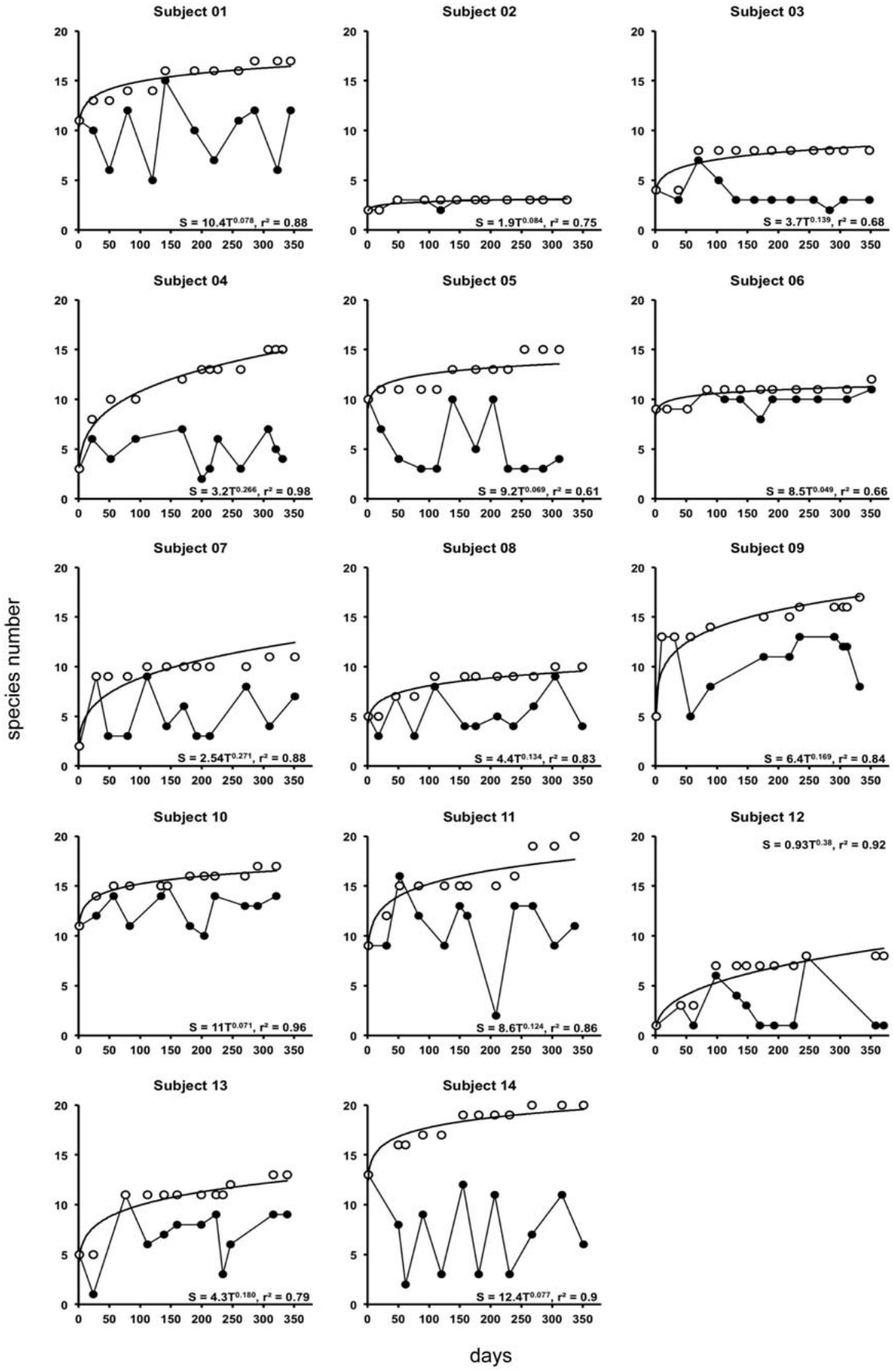
[4] mean inverse of the Bray-Curtis similarity index

Supplementary Table 5. Summary of bacterial community characteristics.[5]

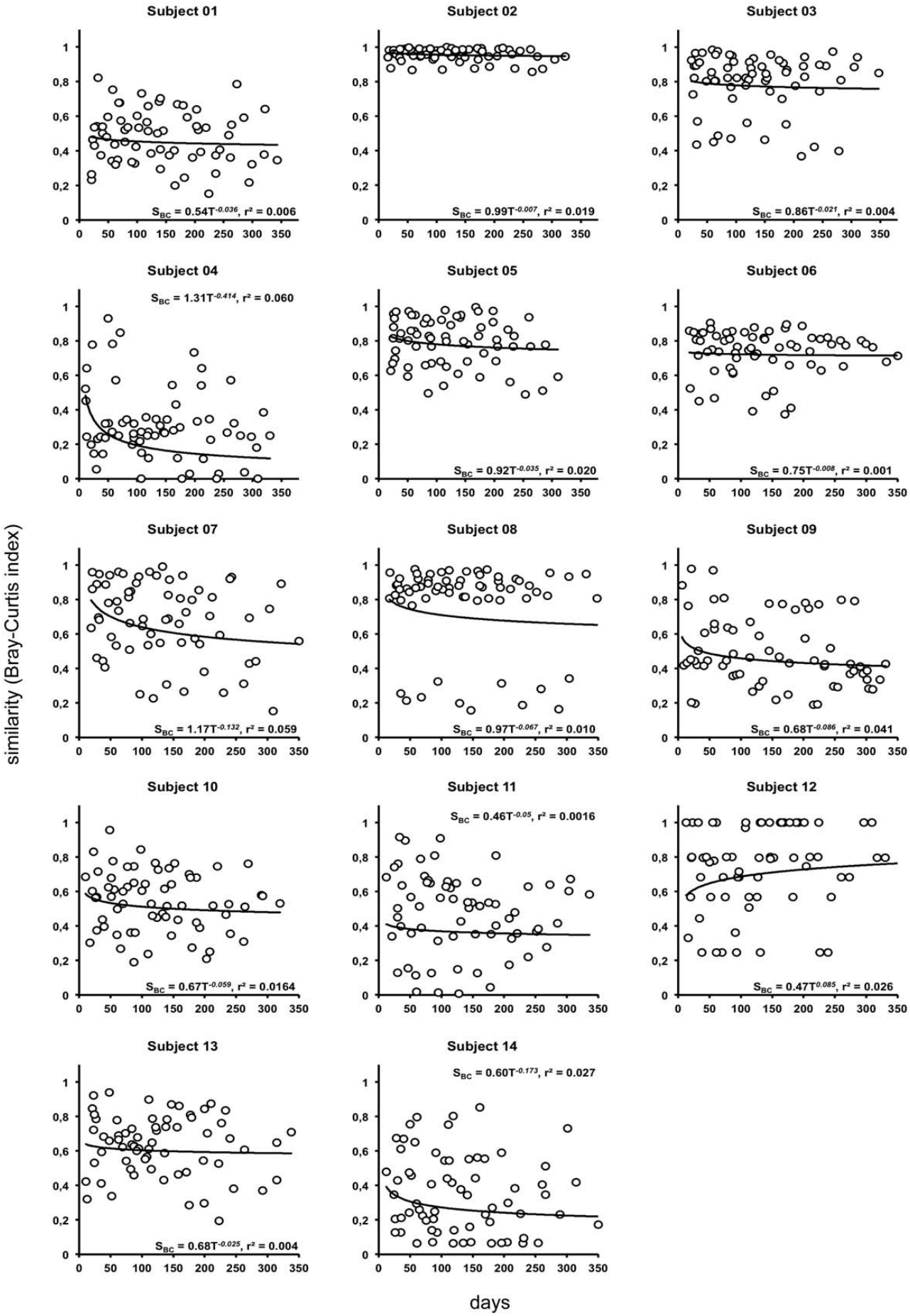
Subject	mean FEV_1 (L)	mean species number	mean *P. aeruginosa* T-RF band %	TTR scaling component (w)	significance of TTR scaling component (*P*)	DDR scaling component	significance of DDR scaling component (*P*)
1	2.13	9.8	4.65	0.078	0.0001	-0.036	0.533
2	0.95	2.8	93.59	0.084	0.0001	-0.007	0.275
3	1.08	3.5	77.22	0.139	0.001	-0.021	0.624
4	1.15	4.7	12.31	0.266	0.0001	-0.414	0.040
5	1.15	5.4	78.63	0.069	0.003	-0.035	0.254
6	1.71	9.8	17.49	0.049	0.001	-0.008	0.810
7	1.82	5.1	64.66	0.271	0.0001	-0.132	0.040
8	1.68	5.2	64.27	0.134	0.0001	-0.067	0.422
9	0.62	10.3	26.48	0.169	0.0001	-0.086	0.102
10	2.81	12.7	21.96	0.071	0.0001	-0.059	0.306
11	2.14	10.7	25.62	0.124	0.0001	-0.05	0.750
12	1.06	2.6	84.11	0.38	0.0001	-0.846	0.197
13	1.87	6.8	51.83	0.18	0.0001	-0.025	0.607
14	2.40	7.3	34.63	0.077	0.001	-0.173	0.186

[5] Shading denotes patients with a mean FEV_1 above the median (1.68 L) that shared at least 4 out of 5 of the following community characteristics: a mean species number > 7, a mean relative abundance of *P. aeruginosa* of < 35%, TTR and SDR values of < 0.1 with no statistical significance.

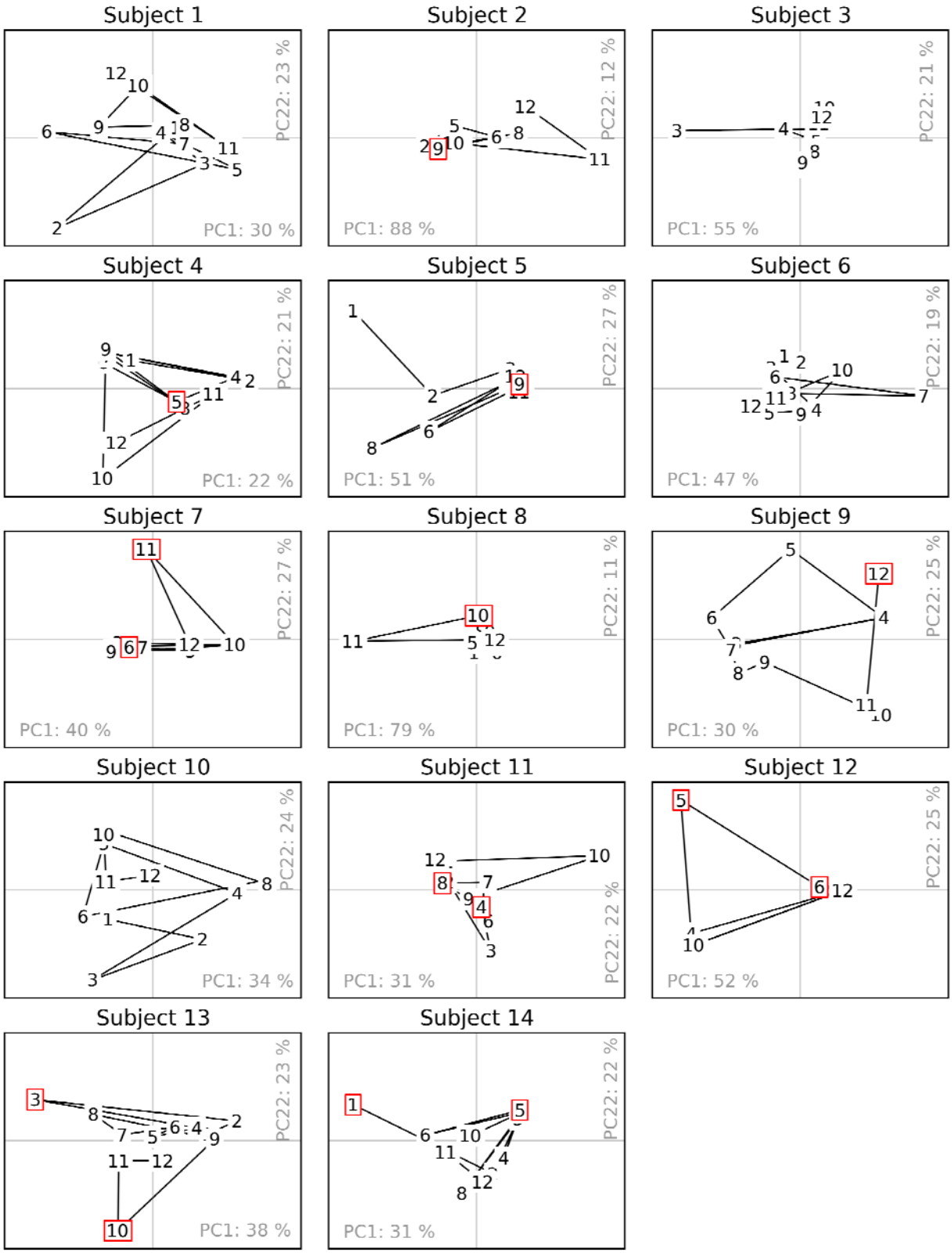
Supplementary Figure 1



Supplementary Figure 2



Supplementary Figure 3



Supplementary Figure 4

Supplementary Figure 5