

Supplementary Materials for

Bacterial colonization and succession in a newly opened hospital

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Published 24 May 2017, *Sci. Transl. Med.* **9**, eaah6500 (2017)
DOI: 10.1126/scitranslmed.aah6500

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Table S5. Summary of the 65 genome bins assembled from metagenome contigs.

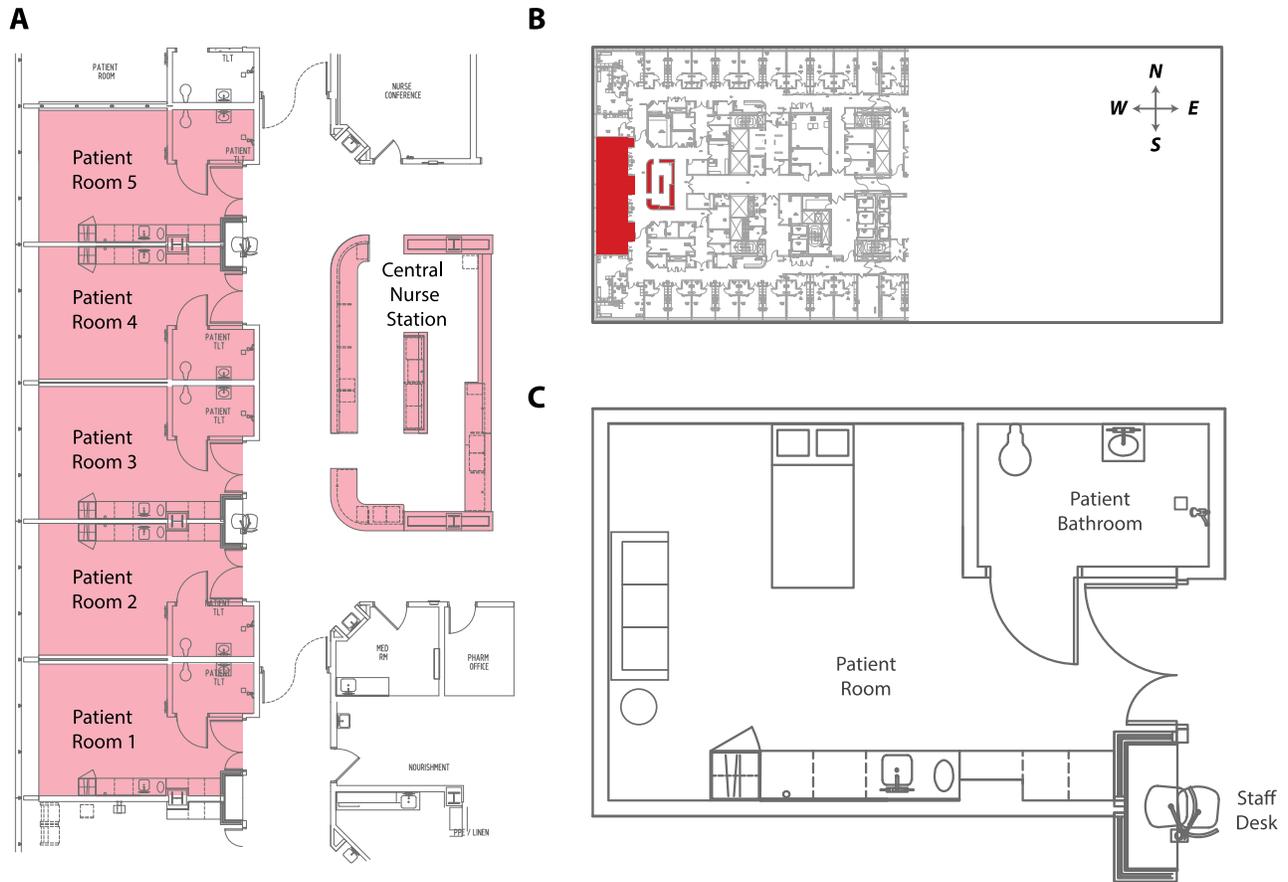


Fig. S1. Floor plan of sampling locations. Floor plan for the 9th and 10th floors of the Center for Care and Discovery, University of Chicago. The floor plan is identical for the 9th and 10th floor, where all sampling for the study occurred. **(A)** Location of the 5 rooms sampled on the floor in the study in relation to the central nurse station, which was also sampled. **(B)** Location of the sampled rooms and nurse station within the hospital building, with geographic orientation. **(C)** Floor plan of an individual patient room.

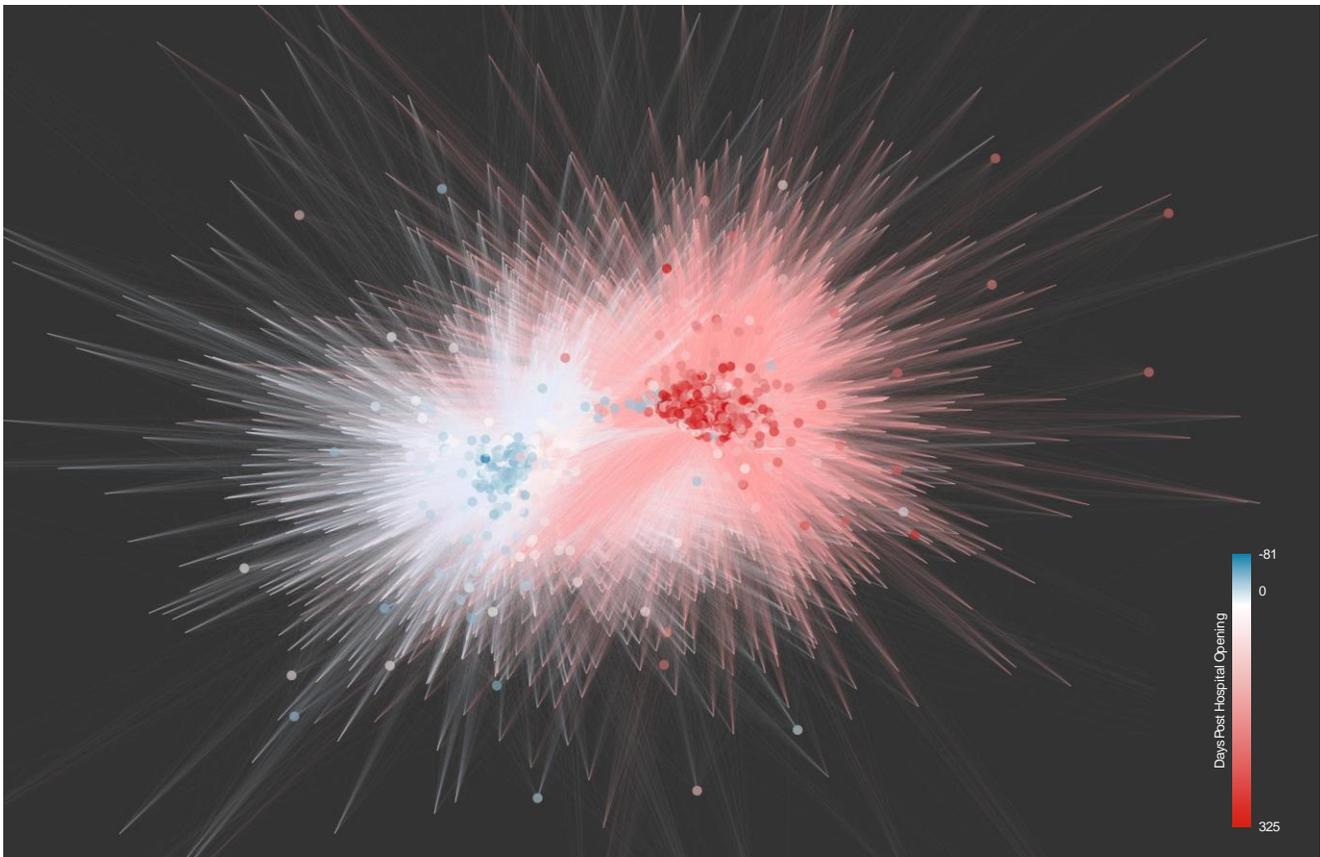


Fig. S2. Bipartite OTU network of floor samples. Sample nodes (circles) are connected to each OTU (invisible at edge terminus) detected in that sample by edges, and the network is ordinated using a spring-embedded algorithm that clusters highly connected nodes together. Sample nodes and edges are colored by the number of days post-hospital opening that the sample was taken.

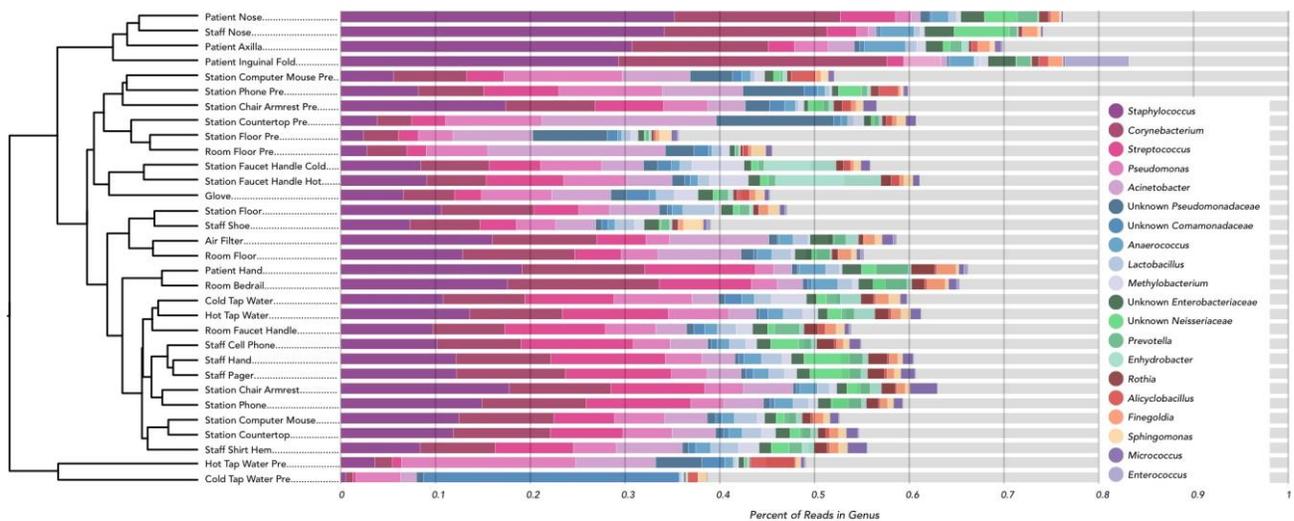


Fig. S3. Relative abundances of common genera by surface type. Relative abundances of 20 major taxonomic groups in the hospital dataset, split by sample type and hospital operational status (pre- or post-opening). Data was collapsed to genus level, and taxa were included if they fit one or both of the following criteria: an average relative abundance of at

least 1% across all sample types or a relative abundance of at least 5% in at least one individual sample type. The dendrogram at left is based on jackknifed UPGMA hierarchical clustering of OTU level communities, with 200,000 reads included in each jackknifed subset.

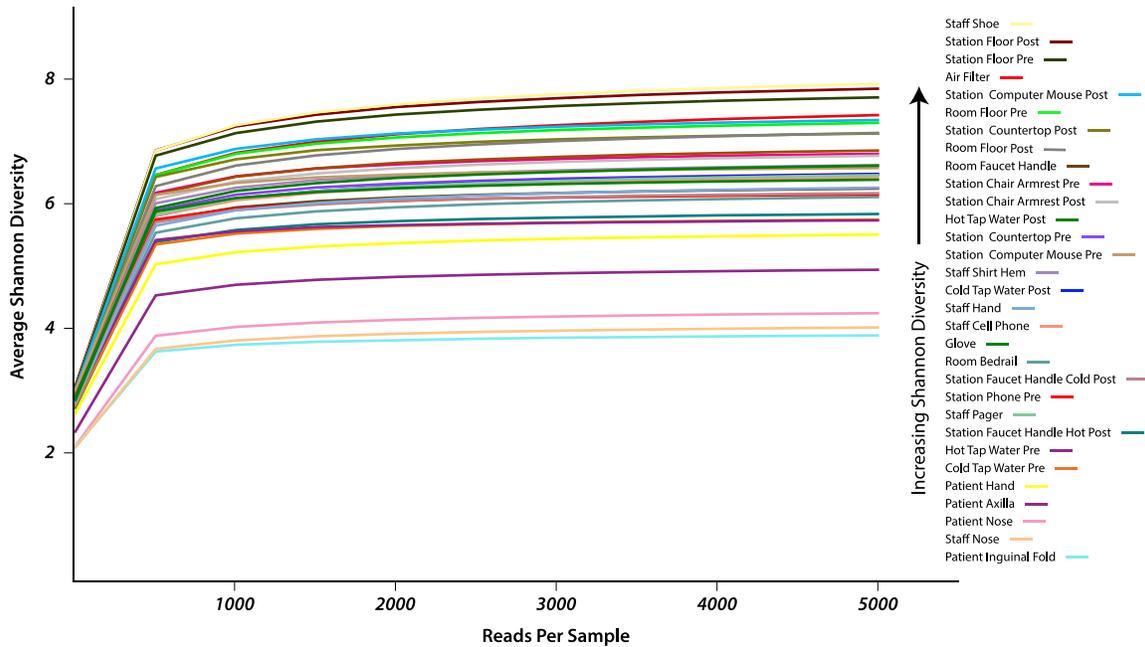


Fig. S4. Rarefaction curves demonstrate convergence of α -diversity calculations. Rarefaction depth is indicated on the x-axis and the average Shannon diversity of individual sample types for each rarefaction depth is indicated on the y-axis. For those sample types that were collected both before and after the opening of the hospital to the public, the words “pre” and “post” are used to indicate hospital operational status.

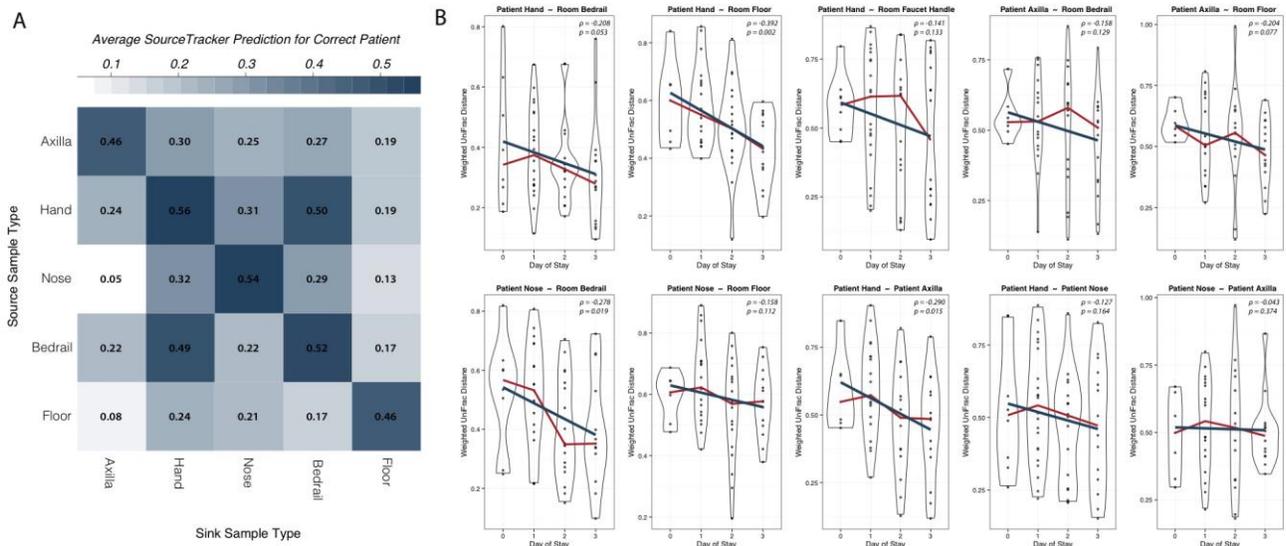


Fig. S5. Interaction between patient skin and room samples. (A) Heat map of the predictive accuracy of SourceTracker models that used samples taken from the first day of a patient’s stay (source sample) to predict which patient a day 2 sample was taken from (sink sample). **(B)** Microbial Similarity between Surface Types Increases with Day of Stay. Red lines connect the medians of the boxplots and the blue lines are the best-fit linear regressions. ρ is the Spearman rank

correlation and the p-value is calculated as the percent of 10,000 test-statistics drawn from random permutations of the dataset with more negative correlations that the one observed.

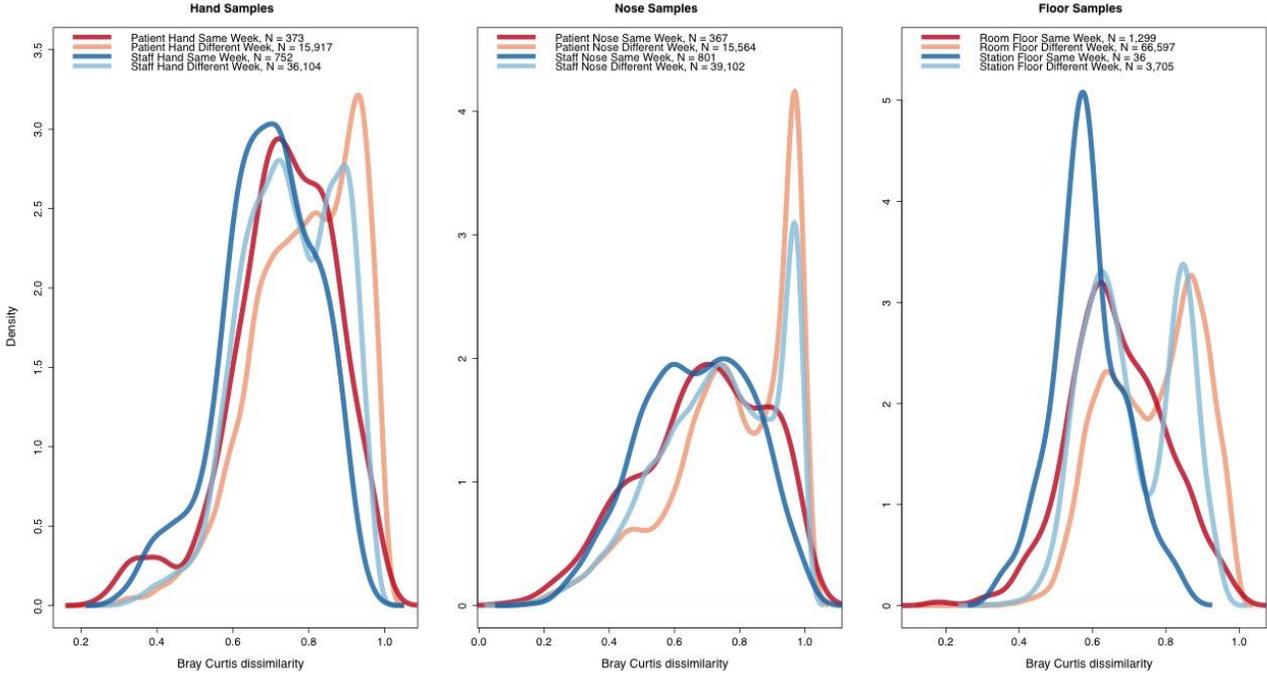


Fig. S6. Differences in community dissimilarity between intra- and interweek samples. Density plots of Bray-Curtis distances for hand, nose, and floor samples, segregated by environment and collection date proximity.

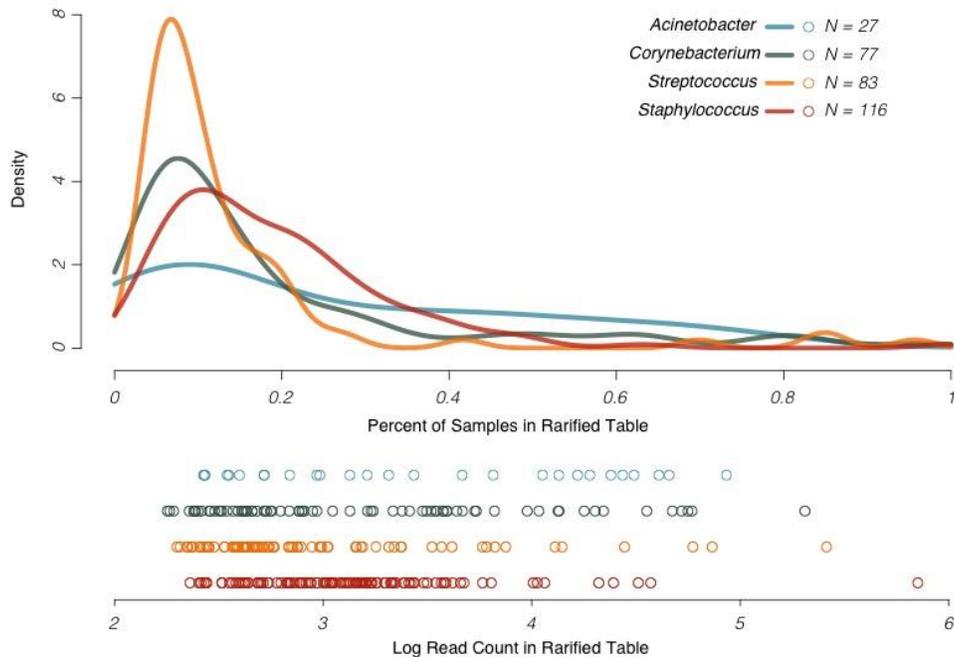


Fig. S7. Overview of oligotyping data. (A) Density plot of the number of samples individual oligotypes were detected in the rarified table, segregated by genus. (B) Plot of \log_{10} read counts in the rarified table for each individual oligotype, segregated by genus.

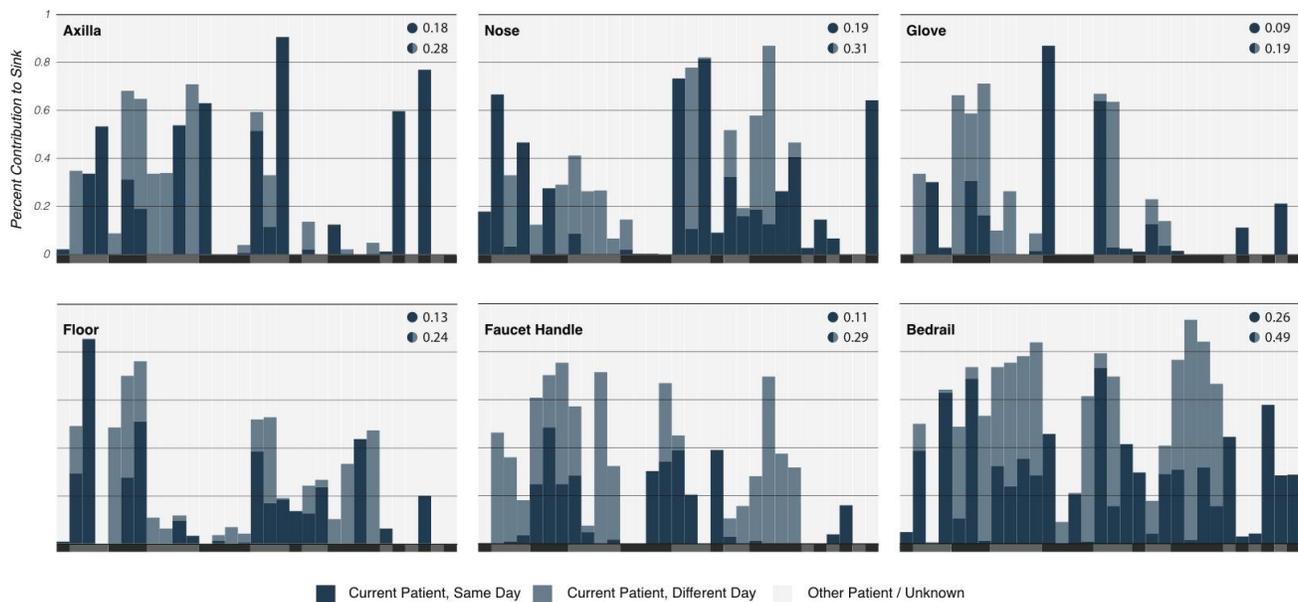


Fig. S8. Predictive accuracy of SourceTracker models using hand samples as source. Bar plots represent the mixing proportions estimated for individual samples, with dark blue representing the proportion for the same patient on the same day and light blue representing the summed proportions for the same patient on a different day. Samples are ordered by date and those taken from the same patient are linked by a common color block at the base of the plot. The values at the upper right of each plot represent the average proportion for the correct patient on the same day (top) and the average proportion for the correct patient regardless of day (bottom).

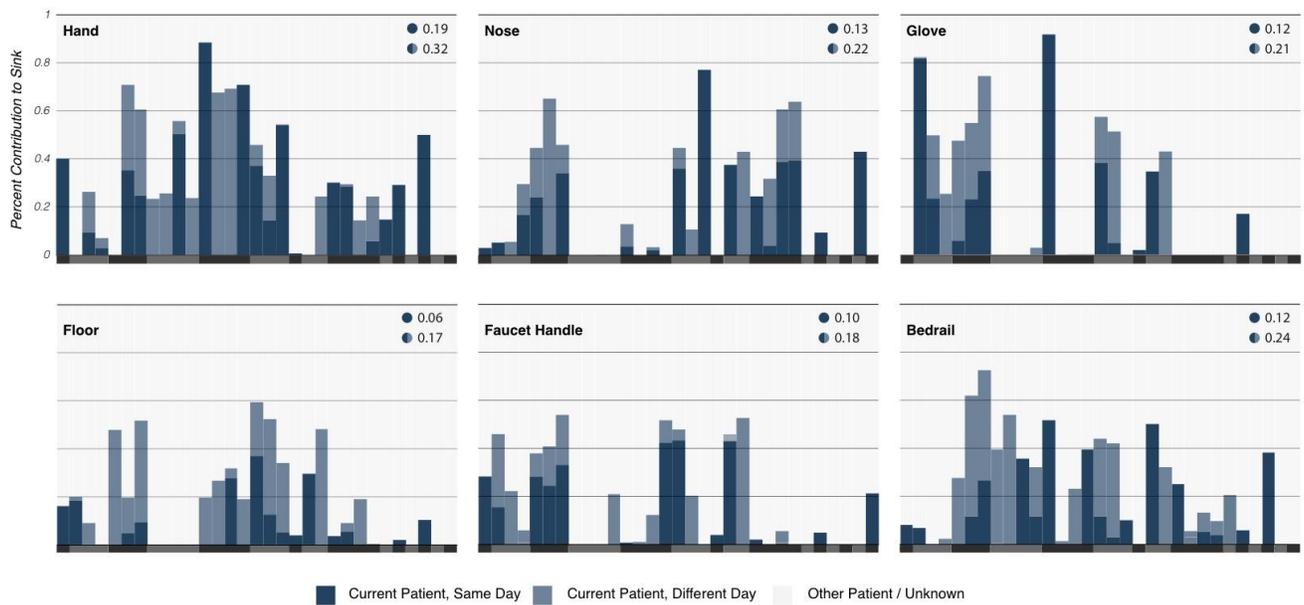


Fig. S9. Predictive accuracy of SourceTracker models using axilla samples as source. Format is the same as in Figure S7 with the exception of the change in source sample type.

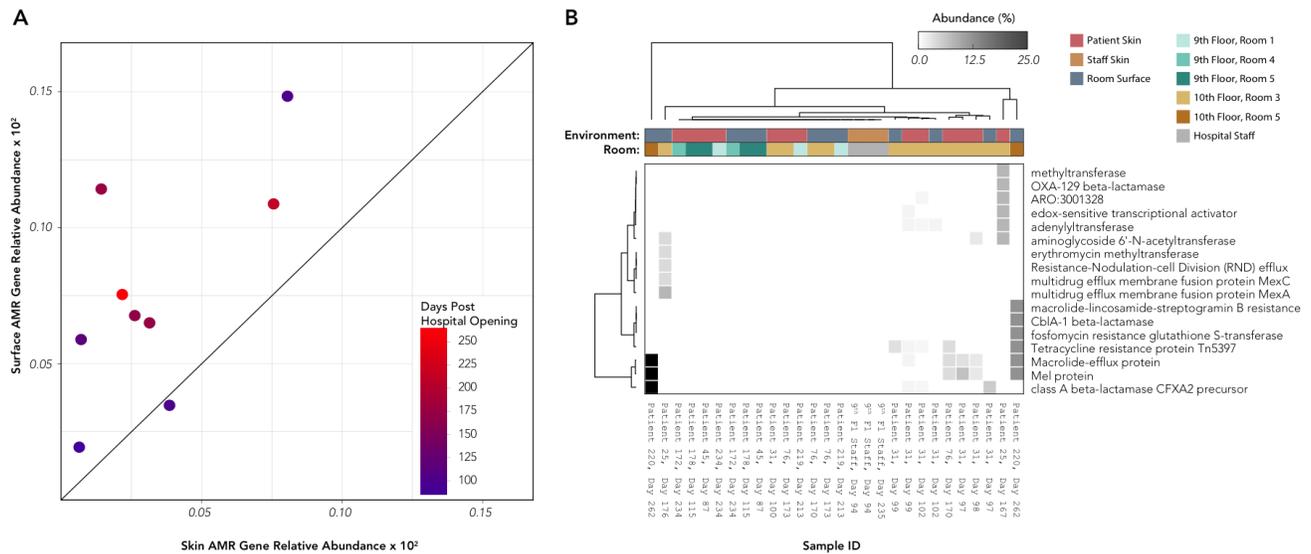


Fig. S10. Patterns of antimicrobial resistance gene abundance. (A) Scatterplot of the relative abundances of antibiotic resistance genes in patient and room samples. Each point represents a room and day. (B) Abundance heat map of individual antibiotic resistance genes that were found to be differentially abundant across sample types based on a Bonferroni-corrected ANOVA.

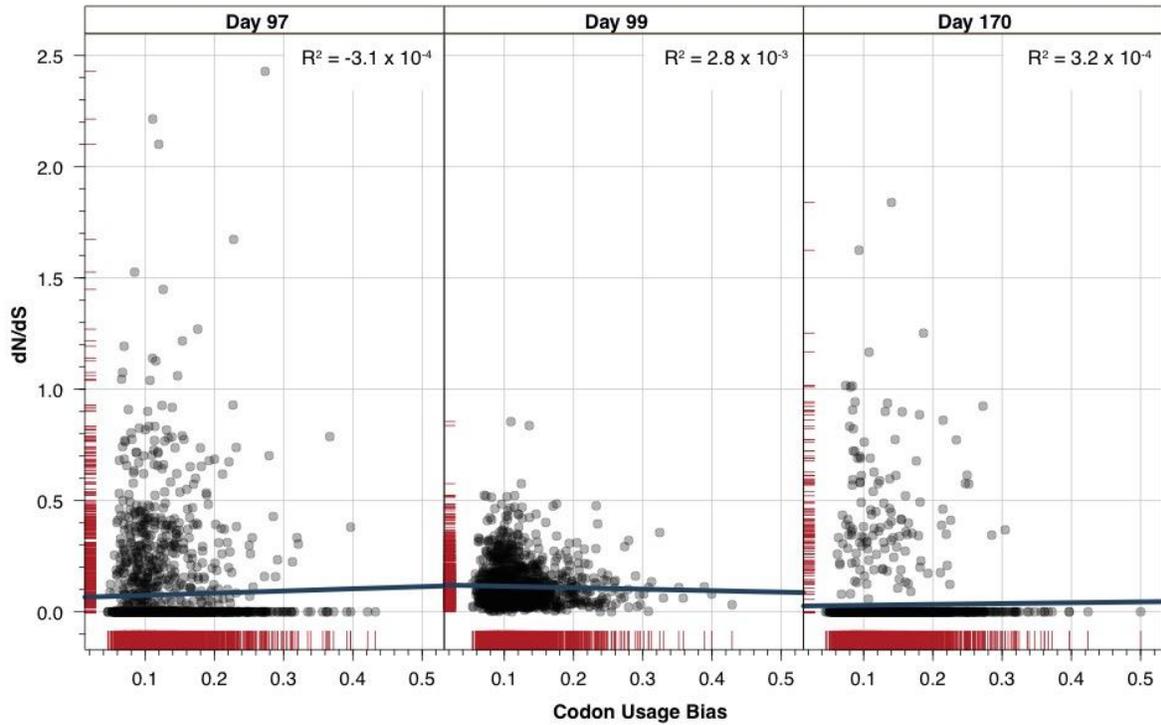
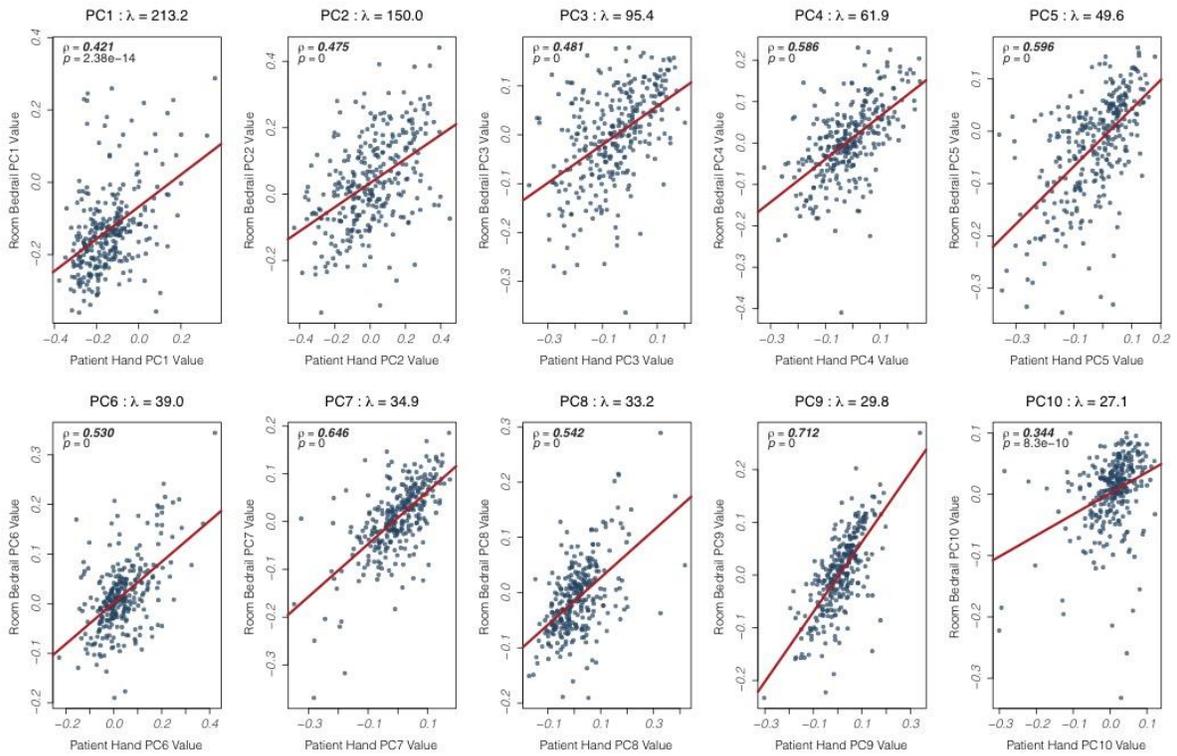


Fig. S11. Coupling between selection and codon usage bias shows differential impact of in situ functional constraints on the same strain of *P. acnes*. Reverse blast hit (RBH) based orthologous genes were used to perform the pair-wise dN/dS analysis and codon usage bias. Codon deviation coefficient was computed using methods explained in methods reference 38.



$$\rho = \sum_{i=1}^N \rho_i \frac{\lambda_j}{\sum_{j=1}^N \lambda_j} = 0.421 \left(\frac{213.2}{734.1} \right) + \dots + 0.344 \left(\frac{27.1}{734.1} \right) = 0.496$$

Fig. S12. Example PC space correlation calculation. Correlation along each of the first 10 eigenvectors of the distance matrix for patient hand and room bedrail samples taken from the same room on the same day.

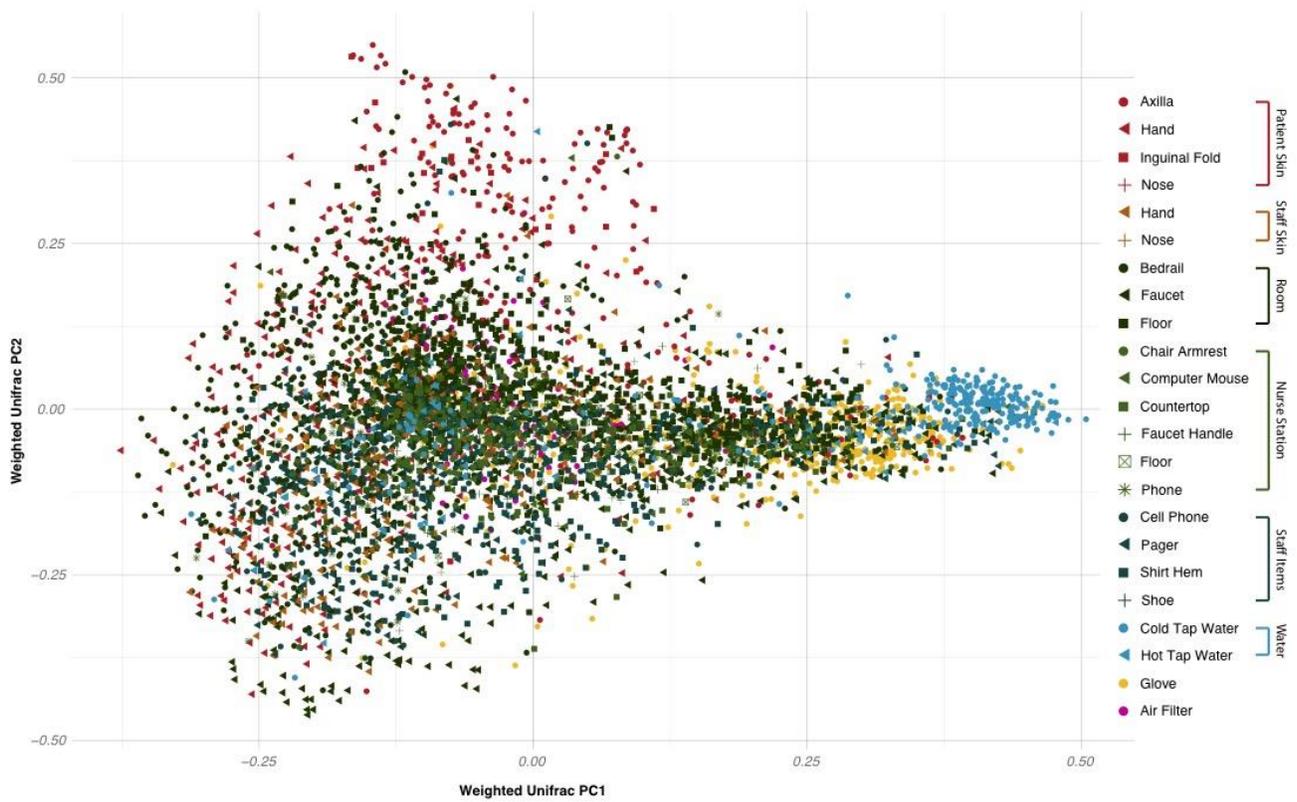


Fig. S13. PCoA of all samples. Ordination is based on weighted UniFrac distance and sample points are distinguished by sample type and environment.

Table S1. Summary of the 6523 samples included in the study, grouped by surface type.

Surface Type	Surface	Post Opening	Pre Opening	Surface Total	Surface Type Total
Patient Skin	Hand	328	NA	328	956
	Nose	323	NA	323	
	Axilla	277	NA	277	
	Inguinal Fold	28	NA	28	
Patient Room	Bedrail	650	NA	650	2742
	Floor	647	194	841	
	Faucet Handle	635	NA	635	
	Glove	616	NA	616	
Hospital Staff	Hand	272	NA	272	1574
	Nose	283	NA	283	
	Cell Phone	257	NA	257	
	Pager	266	NA	266	
	Shirt Hem	270	NA	270	
	Shoe	226	NA	226	
Nurse Station	Chair Armrest	80	29	109	591
	Computer Mouse	74	28	102	
	Countertop	77	30	107	
	Faucet Handle Cold	32	NA	32	
	Faucet Handle Hot	30	NA	30	
	Floor	76	30	106	
	Phone	75	30	105	
Air & Water	Cold Tap Water	43	220	263	452
	Hot Tap Water	46	24	70	
	Air Filter	119	NA	119	
Blank	Blank	179	29	208	208
		5909	614	6523	

Table S2. Summary of clinical metadata for 49 patients sampled on multiple days. (A) Overview of patient metadata. All values are number of patients in that category unless otherwise indicated. **(B) Correlation between 6 binary clinical factors (yes = 1, no = 0).**

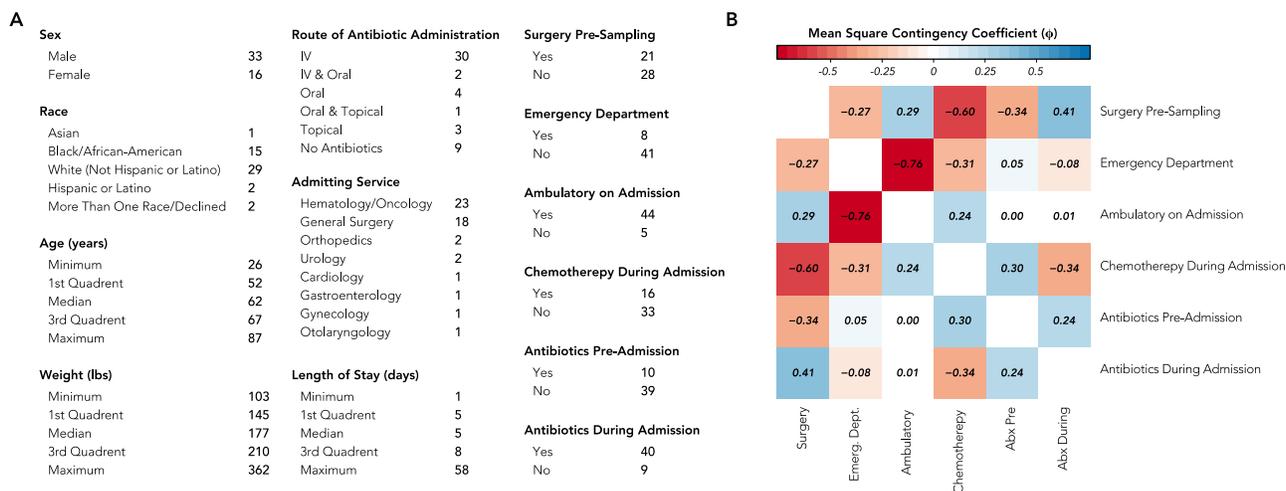


Table S3. Predictive accuracy of random forest supervised learning models predicting seven binary clinical factors. To improve computational speed, only OTUs containing at least 0.01% of all reads within the individual sample type and which were found in at least 3 samples of that type were included in the model input. All models were run with 1,000 trees and 10-fold cross validation.

Predicted Factor	Sample Subset	N (Y/N)	Estimated Error ± SD	Baseline Error	Ratio
Antibiotics Pre-Admission	Hands	29/109	0.15833 +/- 0.06400	0.21014	1.33
	Axillae	20/95	0.13939 +/- 0.04548	0.17391	1.25
	Noses	24/114	0.14359 +/- 0.04201	0.17391	1.21
	Bedrails	24/108	0.15147 +/- 0.03367	0.18182	1.20
Antibiotics During Admission	Hands	115/23	0.12908 +/- 0.05443	0.16667	1.29
	Axillae	93/22	0.18100 +/- 0.03841	0.19130	1.06
	Noses	113/25	0.15114 +/- 0.03459	0.18116	1.20
	Bedrails	109/23	0.15073 +/- 0.04634	0.17424	1.16
Antibiotics At Sampling	Hands	40/98	0.21099 +/- 0.07431	0.28986	1.37
	Axillae	33/82	0.24376 +/- 0.07675	0.28696	1.18
	Noses	38/100	0.21758 +/- 0.06026	0.27536	1.27
	Bedrails	35/97	0.25156 +/- 0.05760	0.26515	1.05
Chemotherapy During Admission	Hands	44/94	0.18769 +/- 0.09069	0.31884	1.70
	Axillae	40/75	0.24242 +/- 0.11978	0.34783	1.43
	Noses	42/96	0.21535 +/- 0.09343	0.30435	1.41
	Bedrails	40/92	0.20440 +/- 0.07961	0.30303	1.48
Ambulatory on Admission	Hands	124/14	0.09684 +/- 0.06751	0.11594	1.20
	Axillae	112/3	0.03095 +/- 0.05240	0.03478	1.12
	Noses	125/13	0.11093 +/- 0.06128	0.10870	0.98
	Bedrails	120/12	0.08266 +/- 0.01803	0.09848	1.19
Samples Taken Post-Surgery	Hands	59/79	0.18690 +/- 0.16188	0.42754	2.29
	Axillae	53/62	0.35367 +/- 0.19519	0.46087	1.30
	Noses	62/76	0.18897 +/- 0.07085	0.44928	2.38
	Bedrails	57/75	0.24002 +/- 0.13267	0.43182	1.80
Emergency Department	Hands	22/116	0.10696 +/- 0.05764	0.15942	1.49
	Axillae	12/103	0.09365 +/- 0.04239	0.10435	1.11
	Noses	21/117	0.11560 +/- 0.04811	0.15217	1.32
	Bedrails	20/112	0.11374 +/- 0.05409	0.15152	1.33

Table S4. Effect of binary clinical factors on the similarity between sample types taken from the same room on the same day. Each comparison is a two-sided, non-parametric t-test of the weighted UniFrac distances between samples of the types indicated in the second and third columns, with distances divided by the clinical factor indicated in the first column. Note that because of the non-parametric assessment of significance, p-values are not-necessarily symmetric when the sample types are flipped, even though the permutations are drawn from the same set of distances. Significant values ($p < 0.05$) are highlighted in blue, and p-values significant after a Bonferroni correction for multiple comparisons are highlighted in red.

Significant with Bonferroni correction
 Significant without Bonferroni correction

Factor	Surface 1	Surface 2	N Total	N Yes	N No	WUniFrac Mean Yes	WUniFrac Mean No	T-Test p
Abx_During	Patient Axilla	Patient Axilla	NA	NA	NA	NA	NA	NA
Abx_During	Patient Axilla	Patient Hand	109	88	21	0.539	0.616	0.0676
Abx_During	Patient Axilla	Patient Nose	109	87	22	0.495	0.573	0.0606
Abx_During	Patient Axilla	Room Bedrail	106	86	20	0.506	0.532	0.4878
Abx_During	Patient Axilla	Room Faucet Handle	110	89	21	0.580	0.604	0.6154
Abx_During	Patient Axilla	Room Floor	105	86	19	0.537	0.559	0.5434
Abx_During	Patient Hand	Patient Axilla	109	88	21	0.539	0.616	0.0692
Abx_During	Patient Hand	Patient Hand	NA	NA	NA	NA	NA	NA
Abx_During	Patient Hand	Patient Nose	131	108	23	0.477	0.523	0.3264
Abx_During	Patient Hand	Room Bedrail	126	105	21	0.367	0.370	0.9328
Abx_During	Patient Hand	Room Faucet Handle	126	104	22	0.509	0.532	0.682
Abx_During	Patient Hand	Room Floor	126	106	20	0.504	0.564	0.0898
Abx_During	Patient Nose	Patient Axilla	109	87	22	0.495	0.573	0.0572
Abx_During	Patient Nose	Patient Hand	131	108	23	0.477	0.523	0.3386
Abx_During	Patient Nose	Patient Nose	NA	NA	NA	NA	NA	NA
Abx_During	Patient Nose	Room Bedrail	124	101	23	0.469	0.508	0.351
Abx_During	Patient Nose	Room Faucet Handle	125	101	24	0.606	0.617	0.8434
Abx_During	Patient Nose	Room Floor	125	103	22	0.566	0.637	0.024
Abx_During	Room Bedrail	Patient Axilla	106	86	20	0.506	0.532	0.4978
Abx_During	Room Bedrail	Patient Hand	126	105	21	0.367	0.370	0.927
Abx_During	Room Bedrail	Patient Nose	124	101	23	0.469	0.508	0.36
Abx_During	Room Bedrail	Room Bedrail	NA	NA	NA	NA	NA	NA
Abx_During	Room Bedrail	Room Faucet Handle	121	99	22	0.500	0.472	0.5474
Abx_During	Room Bedrail	Room Floor	121	101	20	0.459	0.480	0.4944
Abx_During	Room Faucet Handle	Patient Axilla	110	89	21	0.580	0.604	0.6192
Abx_During	Room Faucet Handle	Patient Hand	126	104	22	0.509	0.532	0.644
Abx_During	Room Faucet Handle	Patient Nose	125	101	24	0.606	0.617	0.8496
Abx_During	Room Faucet Handle	Room Bedrail	121	99	22	0.500	0.472	0.5614
Abx_During	Room Faucet Handle	Room Faucet Handle	NA	NA	NA	NA	NA	NA
Abx_During	Room Faucet Handle	Room Floor	122	99	23	0.526	0.631	0.0116
Abx_During	Room Floor	Patient Axilla	105	86	19	0.537	0.559	0.559
Abx_During	Room Floor	Patient Hand	126	106	20	0.504	0.564	0.0986
Abx_During	Room Floor	Patient Nose	125	103	22	0.566	0.637	0.0244
Abx_During	Room Floor	Room Bedrail	121	101	20	0.459	0.480	0.499
Abx_During	Room Floor	Room Faucet Handle	122	99	23	0.526	0.631	0.0122
Abx_During	Room Floor	Room Floor	NA	NA	NA	NA	NA	NA
Abx_Pre	Patient Axilla	Patient Axilla	NA	NA	NA	NA	NA	NA
Abx_Pre	Patient Axilla	Patient Hand	109	20	89	0.529	0.559	0.559
Abx_Pre	Patient Axilla	Patient Nose	109	18	91	0.527	0.507	0.771
Abx_Pre	Patient Axilla	Room Bedrail	106	19	87	0.547	0.503	0.3094
Abx_Pre	Patient Axilla	Room Faucet Handle	110	19	91	0.592	0.583	0.918
Abx_Pre	Patient Axilla	Room Floor	105	20	85	0.531	0.543	0.8258
Abx_Pre	Patient Hand	Patient Axilla	109	20	89	0.529	0.559	0.5634
Abx_Pre	Patient Hand	Patient Hand	NA	NA	NA	NA	NA	NA
Abx_Pre	Patient Hand	Patient Nose	131	24	107	0.518	0.478	0.3774
Abx_Pre	Patient Hand	Room Bedrail	126	24	102	0.348	0.372	0.5342
Abx_Pre	Patient Hand	Room Faucet Handle	126	23	103	0.521	0.511	0.8568
Abx_Pre	Patient Hand	Room Floor	126	29	97	0.479	0.524	0.1664
Abx_Pre	Patient Nose	Patient Axilla	109	18	91	0.527	0.507	0.7528
Abx_Pre	Patient Nose	Patient Hand	131	24	107	0.518	0.478	0.3694
Abx_Pre	Patient Nose	Patient Nose	NA	NA	NA	NA	NA	NA
Abx_Pre	Patient Nose	Room Bedrail	124	20	104	0.494	0.473	0.701
Abx_Pre	Patient Nose	Room Faucet Handle	125	20	105	0.581	0.613	0.4258
Abx_Pre	Patient Nose	Room Floor	125	24	101	0.550	0.585	0.2618
Abx_Pre	Room Bedrail	Patient Axilla	106	19	87	0.547	0.503	0.3096
Abx_Pre	Room Bedrail	Patient Hand	126	24	102	0.348	0.372	0.5486

Abx_Pre	Room Bedrail	Patient Nose	124	20	104	0.494	0.473	0.6896
Abx_Pre	Room Bedrail	Room Bedrail	NA	NA	NA	NA	NA	NA
Abx_Pre	Room Bedrail	Room Faucet Handle	121	21	100	0.528	0.489	0.3922
Abx_Pre	Room Bedrail	Room Floor	121	24	97	0.457	0.464	0.8414
Abx_Pre	Room Faucet Handle	Patient Axilla	110	19	91	0.592	0.583	0.884
Abx_Pre	Room Faucet Handle	Patient Hand	126	23	103	0.521	0.511	0.8452
Abx_Pre	Room Faucet Handle	Patient Nose	125	20	105	0.581	0.613	0.4266
Abx_Pre	Room Faucet Handle	Room Bedrail	121	21	100	0.528	0.489	0.377
Abx_Pre	Room Faucet Handle	Room Faucet Handle	NA	NA	NA	NA	NA	NA
Abx_Pre	Room Faucet Handle	Room Floor	122	23	99	0.528	0.550	0.6648
Abx_Pre	Room Floor	Patient Axilla	105	20	85	0.531	0.543	0.8018
Abx_Pre	Room Floor	Patient Hand	126	29	97	0.479	0.524	0.1724
Abx_Pre	Room Floor	Patient Nose	125	24	101	0.550	0.585	0.2578
Abx_Pre	Room Floor	Room Bedrail	121	24	97	0.457	0.464	0.8196
Abx_Pre	Room Floor	Room Faucet Handle	122	23	99	0.528	0.550	0.662
Abx_Pre	Room Floor	Room Floor	NA	NA	NA	NA	NA	NA
Ambulatory	Patient Axilla	Patient Axilla	NA	NA	NA	NA	NA	NA
Ambulatory	Patient Axilla	Patient Hand	109	106	3	0.548	0.756	0.027
Ambulatory	Patient Axilla	Patient Nose	109	106	3	0.506	0.673	0.0074
Ambulatory	Patient Axilla	Room Bedrail	106	103	3	0.508	0.612	0.1088
Ambulatory	Patient Axilla	Room Faucet Handle	110	107	3	0.589	0.453	0.049
Ambulatory	Patient Axilla	Room Floor	105	103	2	0.540	0.577	0.7396
Ambulatory	Patient Hand	Patient Axilla	109	106	3	0.548	0.756	0.0328
Ambulatory	Patient Hand	Patient Hand	NA	NA	NA	NA	NA	NA
Ambulatory	Patient Hand	Patient Nose	131	117	13	0.474	0.562	0.1042
Ambulatory	Patient Hand	Room Bedrail	126	114	12	0.358	0.459	0.0472
Ambulatory	Patient Hand	Room Faucet Handle	126	116	10	0.500	0.658	0.0116
Ambulatory	Patient Hand	Room Floor	126	113	12	0.509	0.548	0.3188
Ambulatory	Patient Nose	Patient Axilla	109	106	3	0.506	0.673	0.0076
Ambulatory	Patient Nose	Patient Hand	131	117	13	0.474	0.562	0.1032
Ambulatory	Patient Nose	Patient Nose	NA	NA	NA	NA	NA	NA
Ambulatory	Patient Nose	Room Bedrail	124	112	12	0.461	0.626	2.00E-04
Ambulatory	Patient Nose	Room Faucet Handle	125	115	10	0.603	0.670	0.122
Ambulatory	Patient Nose	Room Floor	125	113	11	0.572	0.634	0.053
Ambulatory	Room Bedrail	Patient Axilla	106	103	3	0.508	0.612	0.1148
Ambulatory	Room Bedrail	Patient Hand	126	114	12	0.358	0.459	0.0386
Ambulatory	Room Bedrail	Patient Nose	124	112	12	0.461	0.626	0
Ambulatory	Room Bedrail	Room Bedrail	NA	NA	NA	NA	NA	NA
Ambulatory	Room Bedrail	Room Faucet Handle	121	111	10	0.483	0.638	6.00E-04
Ambulatory	Room Bedrail	Room Floor	121	111	10	0.458	0.511	0.1562
Ambulatory	Room Faucet Handle	Patient Axilla	110	107	3	0.589	0.453	0.051
Ambulatory	Room Faucet Handle	Patient Hand	126	116	10	0.500	0.658	0.0102
Ambulatory	Room Faucet Handle	Patient Nose	125	115	10	0.603	0.670	0.1264
Ambulatory	Room Faucet Handle	Room Bedrail	121	111	10	0.483	0.638	0.0024
Ambulatory	Room Faucet Handle	Room Faucet Handle	NA	NA	NA	NA	NA	NA
Ambulatory	Room Faucet Handle	Room Floor	122	114	8	0.549	0.501	0.3286
Ambulatory	Room Floor	Patient Axilla	105	103	2	0.540	0.577	0.7548
Ambulatory	Room Floor	Patient Hand	126	113	12	0.509	0.548	0.3224
Ambulatory	Room Floor	Patient Nose	125	113	11	0.572	0.634	0.056
Ambulatory	Room Floor	Room Bedrail	121	111	10	0.458	0.511	0.1616
Ambulatory	Room Floor	Room Faucet Handle	122	114	8	0.549	0.501	0.3186
Ambulatory	Room Floor	Room Floor	NA	NA	NA	NA	NA	NA
Chemo	Patient Axilla	Patient Axilla	NA	NA	NA	NA	NA	NA
Chemo	Patient Axilla	Patient Hand	109	39	70	0.548	0.557	0.8498
Chemo	Patient Axilla	Patient Nose	109	39	70	0.541	0.493	0.2764
Chemo	Patient Axilla	Room Bedrail	106	37	69	0.527	0.502	0.5072
Chemo	Patient Axilla	Room Faucet Handle	110	38	72	0.563	0.596	0.5116
Chemo	Patient Axilla	Room Floor	105	38	67	0.536	0.544	0.8438
Chemo	Patient Hand	Patient Axilla	109	39	70	0.548	0.557	0.8368
Chemo	Patient Hand	Patient Hand	NA	NA	NA	NA	NA	NA

Chemo	Patient Hand	Patient Nose	131	41	90	0.489	0.483	0.8754
Chemo	Patient Hand	Room Bedrail	126	39	87	0.354	0.374	0.5896
Chemo	Patient Hand	Room Faucet Handle	126	40	86	0.471	0.533	0.1132
Chemo	Patient Hand	Room Floor	126	42	84	0.511	0.515	0.894
Chemo	Patient Nose	Patient Axilla	109	39	70	0.541	0.493	0.2622
Chemo	Patient Nose	Patient Hand	131	41	90	0.489	0.483	0.8592
Chemo	Patient Nose	Patient Nose	NA	NA	NA	NA	NA	NA
Chemo	Patient Nose	Room Bedrail	124	37	87	0.478	0.476	0.9708
Chemo	Patient Nose	Room Faucet Handle	125	39	86	0.558	0.631	0.058
Chemo	Patient Nose	Room Floor	125	40	85	0.587	0.575	0.6868
Chemo	Room Bedrail	Patient Axilla	106	37	69	0.527	0.502	0.5114
Chemo	Room Bedrail	Patient Hand	126	39	87	0.354	0.374	0.5746
Chemo	Room Bedrail	Patient Nose	124	37	87	0.478	0.476	0.9828
Chemo	Room Bedrail	Room Bedrail	NA	NA	NA	NA	NA	NA
Chemo	Room Bedrail	Room Faucet Handle	121	37	84	0.456	0.513	0.1098
Chemo	Room Bedrail	Room Floor	121	38	83	0.452	0.468	0.5576
Chemo	Room Faucet Handle	Patient Axilla	110	38	72	0.563	0.596	0.5122
Chemo	Room Faucet Handle	Patient Hand	126	40	86	0.471	0.533	0.1212
Chemo	Room Faucet Handle	Patient Nose	125	39	86	0.558	0.631	0.058
Chemo	Room Faucet Handle	Room Bedrail	121	37	84	0.456	0.513	0.1116
Chemo	Room Faucet Handle	Room Faucet Handle	NA	NA	NA	NA	NA	NA
Chemo	Room Faucet Handle	Room Floor	122	40	82	0.534	0.552	0.622
Chemo	Room Floor	Patient Axilla	105	38	67	0.536	0.544	0.8412
Chemo	Room Floor	Patient Hand	126	42	84	0.511	0.515	0.9212
Chemo	Room Floor	Patient Nose	125	40	85	0.587	0.575	0.6692
Chemo	Room Floor	Room Bedrail	121	38	83	0.452	0.468	0.5812
Chemo	Room Floor	Room Faucet Handle	122	40	82	0.534	0.552	0.632
Chemo	Room Floor	Room Floor	NA	NA	NA	NA	NA	NA
OR	Patient Axilla	Patient Axilla	NA	NA	NA	NA	NA	NA
OR	Patient Axilla	Patient Hand	109	48	61	0.552	0.555	0.941
OR	Patient Axilla	Patient Nose	109	50	59	0.491	0.527	0.3496
OR	Patient Axilla	Room Bedrail	106	47	59	0.484	0.532	0.1628
OR	Patient Axilla	Room Faucet Handle	110	52	58	0.599	0.572	0.548
OR	Patient Axilla	Room Floor	105	48	57	0.542	0.540	0.9638
OR	Patient Hand	Patient Axilla	109	48	61	0.552	0.555	0.9564
OR	Patient Hand	Patient Hand	NA	NA	NA	NA	NA	NA
OR	Patient Hand	Patient Nose	131	58	73	0.453	0.511	0.084
OR	Patient Hand	Room Bedrail	126	54	72	0.357	0.376	0.5308
OR	Patient Hand	Room Faucet Handle	126	57	69	0.511	0.515	0.9094
OR	Patient Hand	Room Floor	126	53	73	0.514	0.513	0.9352
OR	Patient Nose	Patient Axilla	109	50	59	0.491	0.527	0.3574
OR	Patient Nose	Patient Hand	131	58	73	0.453	0.511	0.0892
OR	Patient Nose	Patient Nose	NA	NA	NA	NA	NA	NA
OR	Patient Nose	Room Bedrail	124	54	70	0.433	0.511	0.027
OR	Patient Nose	Room Faucet Handle	125	58	67	0.612	0.605	0.8108
OR	Patient Nose	Room Floor	125	55	70	0.552	0.599	0.0834
OR	Room Bedrail	Patient Axilla	106	47	59	0.484	0.532	0.1756
OR	Room Bedrail	Patient Hand	126	54	72	0.357	0.376	0.552
OR	Room Bedrail	Patient Nose	124	54	70	0.433	0.511	0.0256
OR	Room Bedrail	Room Bedrail	NA	NA	NA	NA	NA	NA
OR	Room Bedrail	Room Faucet Handle	121	54	67	0.478	0.509	0.387
OR	Room Bedrail	Room Floor	121	52	69	0.464	0.462	0.9308
OR	Room Faucet Handle	Patient Axilla	110	52	58	0.599	0.572	0.5336
OR	Room Faucet Handle	Patient Hand	126	57	69	0.511	0.515	0.9146
OR	Room Faucet Handle	Patient Nose	125	58	67	0.612	0.605	0.8374
OR	Room Faucet Handle	Room Bedrail	121	54	67	0.478	0.509	0.3812
OR	Room Faucet Handle	Room Faucet Handle	NA	NA	NA	NA	NA	NA
OR	Room Faucet Handle	Room Floor	122	55	67	0.543	0.548	0.8992
OR	Room Floor	Patient Axilla	105	48	57	0.542	0.540	0.9198
OR	Room Floor	Patient Hand	126	53	73	0.514	0.513	0.9538

OR	Room Floor	Patient Nose	125	55	70	0.552	0.599	0.08
OR	Room Floor	Room Bedrail	121	52	69	0.464	0.462	0.9162
OR	Room Floor	Room Faucet Handle	122	55	67	0.543	0.548	0.8914
OR	Room Floor	Room Floor	NA	NA	NA	NA	NA	NA

Table S5. Summary of the 65 genome bins assembled from metagenome contigs.

Taxonomy	Room	Day	Type	Patient ID	Origin	Genome Name
c_Bacilli	10th Floor, Room 3	170	Skin	76	Skin	Genome60_pro_new
f_Aerococcaceae	10th Floor, Room 3	99	Skin	31	Skin	Genome28_pro_new
f_Aerococcaceae	10th Floor, Room 3	99	Skin	31	Skin	Genome15_pro_new
f_Aerococcaceae	10th Floor, Room 3	99	Surface	31	Surface	Genome30_pro_new
f_Aerococcaceae	10th Floor, Room 3	99	Surface	31	Surface	Genome41_pro_new
f_Erysipelotrichaceae	10th Floor, Room 3	102	Skin	31	Skin	Genome55_pro_new
f_Synergistaceae	10th Floor, Room 3	99	Surface	31	Surface	Genome37_pro_new
f_Synergistaceae	10th Floor, Room 3	97	Skin	31	Skin	Genome10_pro_new
f_Synergistaceae	10th Floor, Room 3	99	Skin	31	Skin	Genome21_pro_new
f_Synergistaceae	10th Floor, Room 3	99	Skin	31	Skin	Genome24_pro_new
f_Synergistaceae	10th Floor, Room 3	99	Surface	31	Surface	Genome35_pro_new
f_Synergistaceae	10th Floor, Room 3	102	Skin	31	Skin	Genome44_pro_new
f_Synergistaceae	10th Floor, Room 3	102	Skin	31	Skin	Genome45_pro_new
f_Synergistaceae	10th Floor, Room 3	102	Skin	31	Skin	Genome50_pro_new
f_Synergistaceae	10th Floor, Room 3	102	Skin	31	Skin	Genome56_pro_new
g_Anaerococcus	10th Floor, Room 3	99	Skin	31	Skin	Genome17_pro_new
g_Anaerococcus	10th Floor, Room 3	99	Skin	31	Skin	Genome23_pro_new
g_Anaerococcus	10th Floor, Room 3	99	Skin	31	Skin	Genome27_pro_new
g_Anaerococcus	10th Floor, Room 3	99	Surface	31	Surface	Genome33_pro_new
g_Anaerococcus	10th Floor, Room 3	99	Surface	31	Surface	Genome42_pro_new
g_Anaerococcus	10th Floor, Room 3	170	Surface	76	Surface	Genome61_pro_new
g_Capnocytophaga	10th Floor, Room 3	102	Skin	31	Skin	Genome47_pro_new
g_Corynebacterium	9th Floor, Room 5	115	Skin	178	Skin	Genome1_pro_new
g_Corynebacterium	10th Floor, Room 3	176	Skin	25	Skin	Genome2_pro_new
g_Corynebacterium	10th Floor, Room 3	176	Skin	25	Skin	Genome3_pro_new
g_Corynebacterium	10th Floor, Room 3	176	Skin	25	Surface	Genome5_pro_new
g_Corynebacterium	10th Floor, Room 3	97	Skin	31	Skin	Genome7_pro_new
g_Corynebacterium	10th Floor, Room 3	99	Skin	31	Skin	Genome20_pro_new
g_Corynebacterium	10th Floor, Room 3	99	Surface	31	Surface	Genome32_pro_new
g_Corynebacterium	10th Floor, Room 3	102	Skin	31	Skin	Genome53_pro_new
g_Corynebacterium	10th Floor, Room 3	170	Surface	76	Surface	Genome64_pro_new
g_Corynebacterium.s_aurimucosum	10th Floor, Room 3	99	Surface	31	Surface	Genome38_pro_new
g_Corynebacterium.s_aurimucosum	10th Floor, Room 3	170	Surface	76	Surface	Genome63_pro_new
g_Peptoniphilus	10th Floor, Room 3	99	Skin	31	Skin	Genome25_pro_new
g_Peptoniphilus	10th Floor, Room 3	99	Surface	31	Surface	Genome34_pro_new
g_Porphyrromonas	10th Floor, Room 3	102	Skin	31	Skin	Genome52_pro_new
g_Prevotella	10th Floor, Room 3	97	Skin	31	Skin	Genome12_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	176	Skin	25	Surface	Genome4_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	97	Skin	31	Skin	Genome8_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	97	Surface	31	Surface	Genome13_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	99	Skin	31	Skin	Genome14_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	99	Skin	31	Skin	Genome18_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	99	Surface	31	Surface	Genome29_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	99	Surface	31	Surface	Genome39_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	102	Skin	31	Skin	Genome43_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	102	Skin	31	Skin	Genome46_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	102	Surface	31	Surface	Genome57_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	170	Surface	76	Surface	Genome59_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	170	Surface	76	Surface	Genome65_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	173	Skin	76	Skin	Genome66_pro_new
g_Propionibacterium.s_acnes	10th Floor, Room 3	173	Surface	76	Surface	Genome68_pro_new
g_Staphylococcus.s_epidermidis	10th Floor, Room 3	99	Skin	31	Skin	Genome19_pro_new
g_Staphylococcus.s_epidermidis	10th Floor, Room 3	99	Surface	31	Surface	Genome36_pro_new
g_Staphylococcus.s_epidermidis	10th Floor, Room 3	102	Skin	31	Skin	Genome48_pro_new
g_Staphylococcus.s_epidermidis	10th Floor, Room 3	170	Surface	76	Surface	Genome58_pro_new
g_Staphylococcus.s_epidermidis	10th Floor, Room 3	173	Skin	76	Skin	Genome67_pro_new
g_Streptococcus.s_mitis	10th Floor, Room 3	97	Skin	31	Skin	Genome9_pro_new
g_Streptococcus.s_sanguinis	10th Floor, Room 3	102	Skin	31	Skin	Genome51_pro_new
g_Xanthomonas.s_campestris	10th Floor, Room 3	99	Skin	31	Skin	Genome26_pro_new
o_Actinomycetales	10th Floor, Room 3	99	Skin	31	Skin	Genome16_pro_new
o_Actinomycetales	10th Floor, Room 3	99	Skin	31	Skin	Genome22_pro_new
o_Actinomycetales	10th Floor, Room 3	99	Surface	31	Surface	Genome31_pro_new
o_Actinomycetales	10th Floor, Room 3	99	Surface	31	Surface	Genome40_pro_new
o_Actinomycetales	10th Floor, Room 3	170	Surface	76	Surface	Genome62_pro_new
o_Clostridiales	10th Floor, Room 3	102	Skin	31	Skin	Genome54_pro_new