

Supplementary Materials: Genotypes of *Staphylococcus aureus* Clinical Isolates Are Associated with Phenol-Soluble Modulin (PSM) Production

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Table S1. Genotypic characteristics and δ -toxin production of MSSA clinical isolates.

MSSA strains	<i>spa</i> type	δ -toxin production
24689	t002	+
26136	t005	+
24865	t008	+
26782	t019	+
27126	t021	+
25139	t084	+
25496	t084	+
26486	t084	+
26559	t085	+
26641	t085	+
24692	t126	+
24899	t126	+
24900	t126	+
25157	t126	+
27043	t126	+
27254	t126	+
25280	t127	-
26768	t177	-
25180	t179	-
26704	t179	+
26052	t189	+
26253	t189	+
26255	t189	+
26331	t189	+
26369	t189	-
26537	t189	+
27339	t189	+
26340	t304	+
24855	t324	-
24901	t324	+
25992	t338	+
26653	t338	+
25637	t346	+
26287	t363	+
26642	t386	+
25499	t416	+
26931	t521	+
27078	t571	+

24915	t1333	+
26170	t1361	+
26153	t1767	+
25350	t1858	+
25351	t1858	+
26281	t1950	-
24722	t4727	-
25930	t4956	+
25106	t10234	+
26612	t10686	+
25619	t12605	+
25025	undefined	+

+, present; -, absent.

Table S2. Genotypic characteristics and δ -toxin production of MRSA clinical isolates.

MRSA strains	<i>spa</i> type	SCC <i>mec</i> type	δ -toxin production
24663	t002	II	-
26180	t002	II	+
26744	t002	II	+
24651	t008	IV	+
25250	t008	IV	+
25773	t008	IV	+
26154	t008	IV	+
26928	t008	IV	+
27310	t008	IV	+
25870	t034	V	+
26792	t062	II	+
25754	t111	II	+
26558	t111	II	-
27106	t111	II	-
27179	t111	II	-
24718	t148	IVA	+
27186	t148	IVA	+
25849	t189	IV	+
26194	t189	IV	+
26644	t189	IV	+
26930	t189	IV	+
24962	t242	IV	+
26725	t264	II	-
24958	t304	IV	+
26538	t304	IV	+
25029	t324	IVA	+
26393	t324	IVA	+
26421	t324	IVA	+
27331	t324	IVA	+
25027	t664	IVA	-
25944	t664	IVA	+
26031	t664	IVA	+

26507	t893	II	+
25274	t1081	V	+
24952	t1154	II	-
25620	t1560	II	+
24733	t1784	IV	+
25135	t1784	IV	+
26216	t1784	IV	+
26987-2	t1784	IV	+
27288	t1784	IV	+
25437	t2460	II	-
25606	t2460	II	-
25625	t2460	II	-
25681	t2460	II	-
25753	t2460	II	-
26088	t2460	II	-
26209	t2460	II	-
26256	t2460	II	-
26271	t2460	II	-
26793	t2460	II	-
24830	t3092	V	+
25580	t4359	IVA	-
25899	t9353	II	-
26101	t9353	II	+
26139	t9353	II	+

+, present; -, absent.

Table S3. Variation in PSM production between MSSA and MRSA strains.

PSM subtype	Average PSM production (μ M)		<i>P</i> value
	MSSA (<i>n</i> = 50)	MRSA (<i>n</i> = 56)	
PSMα1	1.229	0.882	0.036
PSM α 2	0.929	0.635	0.030
PSM α 3	1.693	1.116	0.061
PSM α 4	1.462	1.056	0.055
PSM β 1	1.925	1.434	0.048
PSM β 2	1.018	0.820	0.141
δ -toxin	6.811	5.391	0.058

Averaged PSM production by MSSA and MRSA strains. Kruskal–Wallis test was used to calculate the difference in production. There was no significant difference in PSM α 3, PSM α 4, PSM β 2, and δ -toxin production between MSSA and MRSA strains, but MSSA strains produce higher amounts of PSM α 1, PSM α 2, and PSM β 1 than MRSA, *P* > 0.05.

Table S4. Variation in PSM production between SCCmec type strains of MRSA.

PSM subtype	Average PSM production (μM)			
	SCCmec II (n = 25)	SCCmec IV (n = 18)	SCCmec IVA (n = 10)	SCCmec V (n = 3)
PSMα1	0.120	1.097	2.272	1.304
PSMα2	0.068	0.902	1.459	1.014
PSMα3	0.058	1.883	2.100	2.043
PSMα4	0.073	1.572	2.308	1.984
PSMβ1	0.395	1.758	3.220	2.189
PSMβ2	0.488	0.731	1.730	1.090
δ-toxin	0.785	7.891	11.390	8.790

Averaged PSM production by SCCmec type strains of MRSA. The SCCmec type IV, IVA, and V strains had significantly higher PSMα1-α4, PSMβ1-β2, and δ-toxin production than SCCmec type II strains.

Table S5. Variation in PSM production between similar *spa* type strains of MSSA and MRSA.

<i>spa</i> type and PSMs	Average PSM production (μM)		<i>P</i> value
<i>spa</i> type t002 (n = 4)	MSSA (n = 1)	MRSA (n = 3)	
PSMα1	0.210	0.242	0.655
PSMα2	0.352	0.026	0.180
PSMα3	0.429	0.043	0.180
PSMα4	0.246	0.097	0.180
PSMβ1	0.340	0.083	0.180
PSMβ2	0.345	0.282	0.655
δ-toxin	9.211	0.331	0.180
<i>spa</i> type t008 (n = 7)	MSSA (n = 1)	MRSA (n = 6)	
PSMα1	2.923	0.985	0.134
PSMα2	1.958	0.974	0.134
PSMα3	3.616	2.147	0.134
PSMα4	3.434	1.985	0.134
PSMβ1	2.440	1.374	0.134
PSMβ2	1.012	0.546	0.134
δ-toxin	11.470	10.343	0.134
<i>spa</i> type t189 (n = 11)	MSSA (n = 7)	MRSA (n = 4)	
PSMα1	2.505	2.315	0.850
PSMα2	1.824	1.478	0.345
PSMα3	3.725	3.149	0.571
PSMα4	2.642	2.193	0.186
PSMβ1	2.849	2.368	0.450
PSMβ2	1.017	1.108	1.000
δ-toxin	5.427	6.328	0.850
<i>spa</i> type t304 (n = 3)	MSSA (n = 1)	MRSA (n = 2)	
PSMα1	1.469	1.024	1.000
PSMα2	1.408	0.924	0.221
PSMα3	3.700	1.854	0.221
PSMα4	3.542	1.644	0.221
PSMβ1	2.771	2.174	1.000
PSMβ2	0.361	0.753	0.221
δ-toxin	13.430	9.328	0.221
<i>spa</i> type t324 (n = 6)	MSSA (n = 2)	MRSA (n = 4)	
PSMα1	0.031	2.849	0.064
PSMα2	0.015	1.752	0.064

PSM α 3	0.014	1.773	0.064
PSM α 4	0.005	2.413	0.064
PSM β 1	0.188	4.506	0.064
PSM β 2	0.904	2.228	0.165
δ -toxin	0.544	14.400	0.064

Averaged PSM production by similar *spa* type strains of MSSA and MRSA. The separate Kruskal–Wallis test was used to calculate the difference in production. There was no significant difference in PSM α 1– α 4, PSM β 1– β 2, and δ -toxin production between similar *spa* type strains of MSSA and MRSA, $P > 0.05$.

Table S6. PSM production by different *spa* type strains of *S. aureus* clinical isolates.

<i>spa</i> types	PSM α 1	PSM α 2	PSM α 3	PSM α 4	PSM β 1	PSM β 2	δ -toxin
MSSA							
t084 ($n = 3$)	1.065	0.707	1.547	1.139	2.950	1.542	3.658
t085 ($n = 2$)	1.476	1.159	2.635	1.473	5.540	3.363	2.077
t126 ($n = 6$)	0.932	0.779	1.207	1.381	1.338	0.675	11.489
t179 ($n = 2$)	0.159	0.210	0.172	0.184	0.402	0.979	7.515
t338 ($n = 2$)	0.584	0.598	0.188	0.607	1.125	1.192	9.383
t1858 ($n = 2$)	1.513	1.127	2.214	1.697	2.424	1.254	12.048
MRSA							
t111 ($n = 4$)	0.015	0.008	0.007	0.000	0.184	0.638	0.073
t2460 ($n = 10$)	0.033	0.014	0.013	0.013	0.290	0.474	0.000
t9353 ($n = 3$)	0.199	0.127	0.122	0.128	0.622	0.256	0.873
t1784 ($n = 5$)	0.403	0.364	0.653	0.583	1.541	0.701	5.305
t148 ($n = 2$)	3.240	1.868	3.028	3.101	4.138	1.998	13.108
t664 ($n = 3$)	1.615	1.283	2.617	2.408	1.811	1.227	10.028

Averaged PSM production by different *spa* type strains.

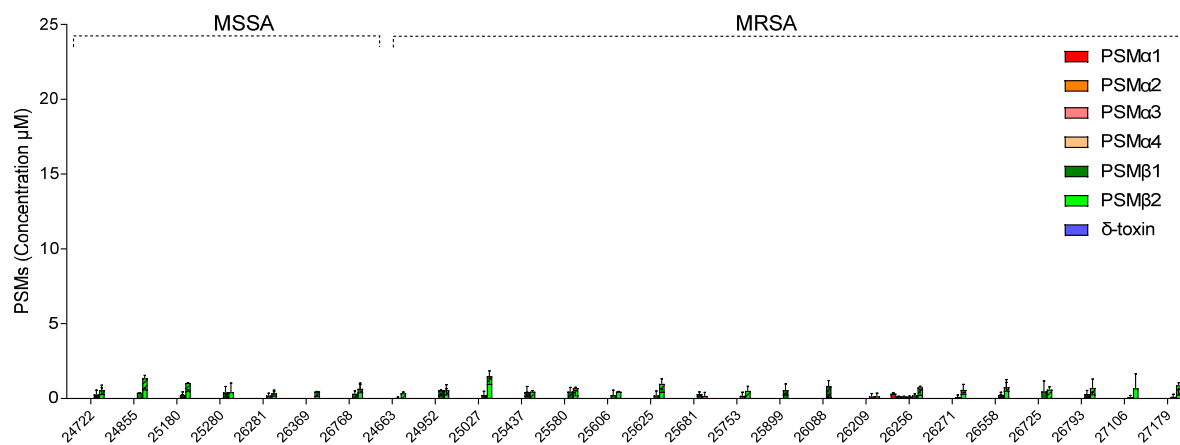


Figure S1. δ -toxin deficient MSSA ($n = 7$) and MRSA ($n = 19$) strains. PSM production was measured by LC-MS and shown as the sum of formyl- and deformylated forms. All the δ -toxin deficient strains also showed no production of PSM α 1– α 4, with strain 26256 as exception. Most of the δ -toxin deficient strains produced low quantity of PSM β 1– β 2.