

# Virulence Potential of Biofilm-Producing *Staphylococcus pseudintermedius*, *Staphylococcus aureus* and *Staphylococcus coagulans* Causing Skin Infections in Companion Animals

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**Table S1.** Main characteristics of *S. coagulans* ( $n = 27$ ) isolates associated with canine skin infections included in the study [47].

Antimicrobial resistance profile and clonal lineages were determined previously.

Isolate	Biological sample	Resistance profile	PFGE type	Host	Year	Lab
BIOS-V1 <sup>(1)</sup>	skin swab	MSSC, non-MDR	F1	Dog	2015	Lab1
BIOS-V2	skin swab	MSSC, non-MDR	A1	Dog	2012	Lab1
BIOS-V3	skin swab	MSSC, non-MDR	F3	Dog	2014	Lab1
BIOS-V9	skin swab	MSSC, non-MDR	C	Dog	2018	Lab1
BIOS-V35	skin swab	MSSC, non-MDR	A8	Dog	2018	Lab1
BIOS-V41	perianal skin swab	MSSC, non-MDR	A6	Dog	2018	Lab1
BIOS-V42	skin swab	MSSC, non-MDR	H	Dog	2001	Lab1
BIOS-V43	skin swab	MSSC, non-MDR	I	Dog	2004	Lab1
BIOS-V44	skin swab	MSSC, non-MDR	G1	Dog	2005	Lab1
BIOS-V45	perianal fistula swab	MSSC, non-MDR	A1	Dog	2008	Lab1
BIOS-V46	skin swab	MSSC, non-MDR	B	Dog	1999	Lab1
BIOS-V47	skin swab	MSSC, non-MDR	A3	Dog	2003	Lab1
BIOS-V51	skin swab	MSSC, non-MDR	A3	Dog	2007	Lab1
BIOS-V91	axillar skin swab	MSSC, MDR	A3	Dog	2004	Lab1
BIOS-V93	skin swab	MSSC, non-MDR	G1	Dog	2007	Lab1
BIOS-V94	skin swab	MSSC, non-MDR	A3	Dog	2007	Lab1
BIOS-V95	skin swab	MSSC, non-MDR	A3	Dog	2013	Lab1
BIOS-V98	skin swab	MSSC, non-MDR	A7	Dog	2015	Lab1
BIOS-V107	skin swab	MSSC, non-MDR	A2	Dog	2015	Lab1
BIOS-V126 <sup>(1)</sup>	skin swab	MSSC, non-MDR	F2	Dog	2016	Lab1
BIOS-V191	skin swab	MRSC, non-MDR	D	Dog	2018	Lab2
BIOS-V205	skin swab	MSSC, MDR	A5	Dog	2018	Lab2
BIOS-V209	skin swab	MSSC, non-MDR	---	Dog	2018	Lab2
BIOS-V232	epidermal collarette	MSSC, non-MDR	G2	Dog	2018	Lab2
BIOS-V243	skin swab	MSSC, non-MDR	A3	Dog	2018	Lab2
BIOS-V265	skin swab	MSSC, non-MDR	A4	Dog	2018	Lab2
BIOS-V289	interdigital skin swab	MSSC, non-MDR	E	Dog	2018	Lab2

The numbers in brackets represent strains collected from the same animal. MSSC: methicillin-susceptible *Staphylococcus coagulans*; MRSC: methicillin-resistant *Staphylococcus coagulans*; MDR: multidrug resistant.

**Table S2. Main characteristics of *S. aureus* (*n* = 55) isolates associated with canine skin infections included in the study [45].**

Antimicrobial resistance profile and clonal lineages were determined previously.

Isolate	Biological sample	Resistance profile	Clonal lineage	<i>agr</i> type	Host	Year	Lab
BIOS-V4	skin swab	MRSA, MDR	398	I	Dog	2013	Lab1
BIOS-V5	skin swab	MRSA, non-MDR	22	I	Dog	2014	Lab1
BIOS-V6	skin swab	MRSA, non-MDR	22	I	Dog	2014	Lab1
BIOS-V19	skin swab	MRSA, non-MDR	22	I	Cat	2012	Lab1
BIOS-V20	skin swab	MRSA, non-MDR	22	I	Cat	2012	Lab1
BIOS-V21	skin swab	MSSA, non-MDR	97	I	Cat	2014	Lab1
BIOS-V22	skin swab	MRSA, non-MDR	22	I	Cat	2012	Lab1
BIOS-V30	skin swab	MRSA, MDR	22	I	Dog	2014	Lab1
BIOS-V31	skin swab	MSSA, non-MDR	188	I	Dog	2018	Lab1
BIOS-V60	skin swab	MSSA, non-MDR	816	II	Horse	2001	Lab1
BIOS-V61	skin swab	MSSA, non-MDR	5	II	Dog	2003	Lab1
BIOS-V62	skin swab	MSSA, non-MDR	15	II	Cat	2005	Lab1
BIOS-V63	paw swab	MRSA, non-MDR	22	I	Dog	2008	Lab1
BIOS-V70	skin swab	MRSA, non-MDR	5	II	Dog	2015	Lab1
BIOS-V74 <sup>(2)</sup>	pustule liquid	MSSA, non-MDR	5	II	Dog	2003	Lab1
BIOS-V75	skin swab	MSSA, non-MDR	72	I	Dog	2005	Lab1
BIOS-V76	skin swab	MRSA, non-MDR	22	I	Cat	2012	Lab1
BIOS-V85 <sup>(2)</sup>	pustule liquid	MSSA, non-MDR	5	II	Dog	2003	Lab1
BIOS-V118	skin swab	MRSA, non-MDR	6535	II	Dog	2007	Lab1
BIOS-V128	skin swab	MSSA, non-MDR	5	II	Cat	2018	Lab1
BIOS-V129	skin swab	MSSA, non-MDR	121	IV	Rabbit	2003	Lab1
BIOS-V147	skin swab	MSSA, non-MDR	398	I	Rabbit	2017	Lab2
BIOS-V150	skin swab	MRSA, non-MDR	22	I	Dog	2017	Lab2
BIOS-V151	skin swab	MSSA, MDR	398	I	Cat	2017	Lab2
BIOS-V153	skin swab	MRSA, MDR	105	II	Dog	2018	Lab2
BIOS-V154	skin swab	MRSA, non-MDR	22	I	Cat	2018	Lab2
BIOS-V155 <sup>(3)</sup>	skin swab	MRSA, non-MDR	22	I	Cat	2018	Lab2
BIOS-V156	skin swab	MSSA, non-MDR	6565	I	Dog	2018	Lab2
BIOS-V157	skin swab	MRSA-non-MDR	6566	I	Dog	2018	Lab2
BIOS-V158	skin swab	MSSA, non-MDR	7	I	Cat	2017	Lab2
BIOS-V159	skin swab	MRSA, non-MDR	22	I	Cat	2018	Lab2
BIOS-V160	skin swab	MRSA, non-MDR	5	II	Cat	2018	Lab2
BIOS-V161	skin swab	MRSA, non-MDR	22	I	Rabbit	2018	Lab2
BIOS-V168	skin swab	MSSA, non-MDR	72	I	Cat	2018	Lab2
BIOS-V172	skin swab	MSSA, non-MDR	5	II	Dog	2018	Lab2
BIOS-V178	skin swab	MSSA, MDR	398	I	Cat	2018	Lab2

The numbers in brackets represent strains collected from the same animal. MSSA: methicillin-susceptible *Staphylococcus aureus*; MRSA: methicillin-resistant *Staphylococcus aureus*; MDR: multidrug resistant.

Table S2. Continuation.

Isolate	Biological sample	Resistance profile	Clonal lineage	agr type	Host	Year	Lab
BIOS-V183	skin swab	MRSA, non-MDR	22	I	Dog	2017	Lab2
BIOS-V184 <sup>(3)</sup>	skin swab	MRSA, non-MDR	22	I	Cat	2018	Lab2
BIOS-V185	skin swab	MRSA, non-MDR	22	I	Dog	2018	Lab2
BIOS-V186	skin swab	MRSA, MDR	22	I	Dog	2018	Lab2
BIOS-V187	skin swab	MRSA, non-MDR	22	I	Dog	2018	Lab2
BIOS-V200 <sup>(4)</sup>	skin swab	MRSA, non-MDR	22	I	Dog	2018	Lab2
BIOS-V201 <sup>(4)</sup>	skin swab	MRSA, non-MDR	22	I	Dog	2018	Lab2
BIOS-V202	skin swab	MRSA, non-MDR	22	I	Cat	2018	Lab2
BIOS-V203	skin swab	MSSA, non-MDR	398	I	Dog	2018	Lab2
BIOS-V204 <sup>(5)</sup>	skin swab	MRSA, non-MDR	22	I	Rabbit	2017	Lab2
BIOS-V245	skin swab	MSSA, non-MDR	1	III	Dog	2018	Lab2
BIOS-V250	skin swab	MSSA, non-MDR	1	III	Dog	2018	Lab2
BIOS-V255	skin swab	MRSA, MDR	105	II	Dog	2018	Lab2
BIOS-V257	skin swab	MSSA, non-MDR	15	II	Cat	2017	Lab2
BIOS-V258 <sup>(5)</sup>	skin swab	MRSA, non-MDR	22	I	Rabbit	2017	Lab2
BIOS-V279	skin swab	MSSA, non-MDR	72	I	Cat	2018	Lab2
BIOS-V295	skin swab	MSSA, non-MDR	72	I	U	2018	Lab2
BIOS-V296	skin swab	MRSA, non-MDR	22	I	Dog	2018	Lab2
BIOS-V300	skin swab	MRSA, MDR	22	I	Dog	2018	Lab2

The numbers in brackets represent strains collected from the same animal. MSSA: methicillin-susceptible *Staphylococcus aureus*; MRSA: methicillin-resistant *Staphylococcus aureus*; MDR: multidrug resistant; U= unknown source.

Table S3. Main characteristics of *S. pseudintermedius* ( $n = 155$ ) isolates associated with canine skin infections included in the study [46].

Isolate	Biological sample	agr type	Host	Year	Lab
BIOS-V7	skin swab	IV	Dog	2015	Lab1
BIOS-V10	skin swab	IV	Dog	2018	Lab1
BIOS-V11 <sup>(7)</sup>	skin swab	III	Dog	2018	Lab1
BIOS-V12 <sup>(9)</sup>	skin swab	III	Dog	2018	Lab1
BIOS-V13	paw swab	I	Dog	2018	Lab1
BIOS-V14	skin swab	III	Dog	2018	Lab1
BIOS-V15	skin swab	III	Dog	2018	Lab1
BIOS-V16	interdigital swab	II	Dog	2018	Lab1
BIOS-V18	skin swab	II	Dog	2018	Lab1
BIOS-V25	skin swab	IV	Dog	2016	Lab1
BIOS-V26	biopsy	IV	Dog	2017	Lab1
BIOS-V27	skin swab	IV	Dog	2018	Lab1

The numbers in brackets represent strains collected from the same animal. MSSP: methicillin-susceptible *Staphylococcus pseudintermedius*; MRSP: methicillin-resistant *Staphylococcus pseudintermedius*; MDR: multidrug resistant.

Table S3. Continuation.

Isolate	Biological sample	<i>agr</i> type	Host	Year	Lab
BIOS-V28	skin swab	III	Dog	2018	Lab1
BIOS-V29	interdigital swab	I	Dog	2018	Lab1
BIOS-V32	skin swab	I	Dog	2018	Lab1
BIOS-V34 <sup>(7)</sup>	skin swab	III	Dog	2018	Lab1
BIOS-V36	skin biopsy	III	Dog	2017	Lab1
BIOS-V37 <sup>(10)</sup>	skin swab	IV	Dog	2018	Lab1
BIOS-V38	skin swab	III	Dog	2018	Lab1
BIOS-V39	skin biopsy	III	Dog	2016	Lab1
BIOS-V40	skin swab	III	Dog	2016	Lab1
BIOS-V48	secretion	III	Dog	2014	Lab1
BIOS-V49	skin swab	II	Dog	2015	Lab1
BIOS-V50 <sup>(11)</sup>	pustule	II	Dog	2015	Lab1
BIOS-V52 <sup>(10)</sup>	skin biopsy	III	Dog	2017	Lab1
BIOS-V53 <sup>(6)</sup>	skin swab	III	Dog	2015	Lab1
BIOS-V54	skin swab	III	Dog	2018	Lab1
BIOS-V55	skin swab	IV	Dog	2014	Lab1
BIOS-V56	skin swab	I	Dog	2014	Lab1
BIOS-V57	skin swab	IV	Dog	2015	Lab1
BIOS-V58 <sup>(12)</sup>	skin swab	III	Dog	2014	Lab1
BIOS-V59	skin swab	I	Dog	2017	Lab1
BIOS-V64	interdigital swab	III	Dog	2018	Lab1
BIOS-V65	skin swab	IV	Dog	2018	Lab1
BIOS-V66	lip crease swab	III	Dog	2015	Lab1
BIOS-V67	skin swab	IV	Dog	2018	Lab1
BIOS-V68	armpit skin swab	IV	Dog	2015	Lab1
BIOS-V71	pustule swab	IV	Dog	2015	Lab1
BIOS-V72	skin swab	I	Dog	2018	Lab1
BIOS-V73	skin swab	IV	Dog	2017	Lab1
BIOS-V77	swab	IV	Dog	2015	Lab1
BIOS-V78	scrotal swab	III	Dog	2015	Lab1
BIOS-V79	skin swab	I	Dog	2015	Lab1
BIOS-V82 <sup>(11)</sup>	epidermal scab swab	III	Dog	2015	Lab1
BIOS-V83	abdominal area pustule swab	III	Dog	2015	Lab1
BIOS-V84	pustule swab	IV	Dog	2015	Lab1
BIOS-V87	swab	III	Dog	2014	Lab1
BIOS-V88 <sup>(12)</sup>	scab swab	IV	Dog	2015	Lab1
BIOS-V89 <sup>(13)</sup>	skin granuloma	IV	Dog	2015	Lab1
BIOS-V90	skin swab	III	Dog	2015	Lab1

The numbers in brackets represent strains collected from the same animal. MSSP: methicillin-susceptible *Staphylococcus pseudintermedius*; MRSP: methicillin-resistant *Staphylococcus pseudintermedius*; MDR: multidrug resistant.

Table S3. Continuation.

Isolate	Biological sample	<i>agr</i> type	Host	Year	Lab
BIOS-V92	skin swab	II	Dog	2005	Lab1
BIOS-V96 <sup>(8)</sup>	swab	IV	Dog	2015	Lab1
BIOS-V97	suture swab	III	Dog	2015	Lab1
BIOS-V99 <sup>(13)</sup>	chronic wound swab	III	Dog	2015	Lab1
BIOS-V101	skin swab	II	Dog	2017	Lab1
BIOS-V102	skin swab	I	Dog	2015	Lab1
BIOS-V103	interdigital swab	II	Dog	2015	Lab1
BIOS-V104	fistula swab	III	Dog	2014	Lab1
BIOS-V105 <sup>(6)</sup>	skin swab	II	Dog	2017	Lab1
BIOS-V106	deep biopsy	III	Dog	2017	Lab1
BIOS-V108	skin granuloma	III	Dog	2015	Lab1
BIOS-V110	skin swab	I	Dog	2015	Lab1
BIOS-V113	abdominal area pustule	III	Dog	2018	Lab1
BIOS-V114	dermatitis fistula in hind limb	I	Dog	2015	Lab1
BIOS-V116 <sup>(8)</sup>	skin pustules	IV	Dog	2015	Lab1
BIOS-V117	skin swab	II	Dog	2018	Lab1
BIOS-V119	skin swab	III	Dog	2018	Lab1
BIOS-V120	skin swab	III	Dog	2017	Lab1
BIOS-V121	skin swab	II	Dog	2018	Lab1
BIOS-V122	paw swab	IV	Dog	2018	Lab1
BIOS-V123	skin exudate	IV	Dog	2015	Lab1
BIOS-V124	perilabial swab	III	Dog	2015	Lab1
BIOS-V125	skin biopsy	III	Dog	2015	Lab1
BIOS-V127 <sup>(8)</sup>	skin swab	IV	Dog	2016	Lab1
BIOS-V130	Paracostal abscess	I	Rabbit	2003	Lab1
BIOS-V131	finger swab	III	Dog	2014	Lab1
BIOS-V132	chronic wound swab	I	Dog	2015	Lab1
BIOS-V133	skin swab	III	Dog	2014	Lab1
BIOS-V134	interdigital swab	II	Dog	2014	Lab1
BIOS-V135	pustule swab	IV	Dog	2015	Lab1
BIOS-V136	perilabial swab	III	Dog	2015	Lab1
BIOS-V137	skin swab	II	Dog	2014	Lab1
BIOS-V138	paw swab	II	Dog	2018	Lab1
BIOS-V140	skin swab	III	Dog	2015	Lab1
BIOS-V141	skin swab	II	Dog	2015	Lab1
BIOS-V142	skin swab after disinfection	III	Dog	2014	Lab1
BIOS-V143 <sup>(9)</sup>	Hind limb lesion swab	III	Dog	2014	Lab1

The numbers in brackets represent strains collected from the same animal. MSSP: methicillin-susceptible *Staphylococcus pseudintermedius*; MRSP: methicillin-resistant *Staphylococcus pseudintermedius*; MDR: multidrug resistant.

Table S3. Continuation.

Isolate	Biological sample	agr type	Host	Year	Lab
BIOS-V144 <sup>(9)</sup>	pustule swab	III	Dog	2014	Lab1
BIOS-V145	ventral pustule	IV	Dog	2018	Lab1
BIOS-V146	skin swab	III	Dog	2015	Lab1
BIOS-V162	nodular lesion swab	IV	Dog	2018	Lab2
BIOS-V164	surgical wound swab	IV	Dog	2018	Lab2
BIOS-V167	submandibular abscess swab	II	Dog	2018	Lab2
BIOS-V170	arm abscess swab	IV	Dog	2018	Lab2
BIOS-V175	skin swab	IV	Dog	2018	Lab2
BIOS-V176	skin swab	II	Dog	2018	Lab2
BIOS-V179	skin swab	III	Dog	2018	Lab2
BIOS-V182	subcutaneous swab	IV	Dog	2018	Lab2
BIOS-V188	hind limb abscess swab	III	Dog	2018	Lab2
BIOS-V189	pyoderma swab	IV	Dog	2018	Lab2
BIOS-V190	papule in armpit	I	Dog	2018	Lab2
BIOS-V194	skin swab	III	Dog	2018	Lab2
BIOS-V195	skin swab	III	Dog	2018	Lab2
BIOS-V196	skin swab	III	Dog	2018	Lab2
BIOS-V207	thigh wound swab	III	Cat	2018	Lab2
BIOS-V211	skin swab	IV	Dog	2018	Lab2
BIOS-V212	interdigital swab	IV	Dog	2018	Lab2
BIOS-V213	amputation thigh material swab	III	Dog	2018	Lab2
BIOS-V214	skin swab	II	Dog	2018	Lab2
BIOS-V217	skin swab	IV	Dog	2018	Lab2
BIOS-V218	skin swab	III	Dog	2018	Lab2
BIOS-V219	skin swab	IV	Dog	2018	Lab2
BIOS-V221	skin swab	I	Dog	2018	Lab2
BIOS-V223	surgical site swab	III	Dog	2018	Lab2
BIOS-V224	face mass swab	II	Dog	2018	Lab2
BIOS-V225	interdigital swab	III	Dog	2018	Lab2
BIOS-V226	pelvic limb swab	II	Dog	2018	Lab2
BIOS-V227	pustule swab	III	Dog	2018	Lab2
BIOS-V228	skin swab	II	Dog	2018	Lab2
BIOS-V230	pelvic limb biopsy	IV	Dog	2018	Lab2
BIOS-V231	skin swab	IV	Dog	2018	Lab2
BIOS-V233	papule swab	IV	Dog	2018	Lab2
BIOS-V234	skin swab	III	Dog	2018	Lab2
BIOS-V235	skin pustule swab	III	Dog	2018	Lab2
BIOS-V236	skin swab	III	Dog	2018	Lab2

The numbers in brackets represent strains collected from the same animal. MSSP: methicillin-susceptible *Staphylococcus pseudintermedius*; MRSP: methicillin-resistant *Staphylococcus pseudintermedius*; MDR: multidrug resistant.

Table S3. Continuation.

Isolate	Biological sample	agr type	Host	Year	Lab
BIOS-V237	torso swab	III	Dog	2018	Lab2
BIOS-V238	skin swab	IV	Dog	2018	Lab2
BIOS-V239	limb swab	IV	Dog	2018	Lab2
BIOS-V240	fracture wound swab	III	Cat	2018	Lab2
BIOS-V241	granuloma swab	III	Dog	2018	Lab2
BIOS-V242	biopsy swab	II	Dog	2018	Lab2
BIOS-V244	skin swab	III	Dog	2018	Lab2
BIOS-V247	callus swab	II	Dog	2018	Lab2
BIOS-V249	skin swab	III	Dog	2018	Lab2
BIOS-V251	exudate swab	II	Dog	2018	Lab2
BIOS-V259	skin swab	IV	Dog	2018	Lab2
BIOS-V260	foreskin swab	IV	Dog	2018	Lab2
BIOS-V262	dermal punch	II	Dog	2018	Lab2
BIOS-V263	papule	IV	Dog	2018	Lab2
BIOS-V264	interdigital swab	III	Dog	2018	Lab2
BIOS-V268	skin exudate swab	II	Dog	2018	Lab2
BIOS-V270	skin wound swab	III	Dog	2018	Lab2
BIOS-V273	wound swab	II	Dog	2018	Lab2
BIOS-V276	thigh swab	III	Dog	2018	Lab2
BIOS-V280	surgical material	III	Dog	2018	Lab2
BIOS-V281	skin swab	III	Dog	2018	Lab2
BIOS-V285	skin swab	III	Dog	2018	Lab2
BIOS-V286	pustule swab	III	Dog	2018	Lab2
BIOS-V287	skin swab	III	Dog	2018	Lab2
BIOS-V290	chin swab	III	Dog	2018	Lab2
BIOS-V292	suture swab	II	Cat	2018	Lab2
BIOS-V297	skin swab	III	Dog	2018	Lab2
BIOS-V298	skin swab	I	Dog	2018	Lab2
BIOS-V299	interdigital furunculosis swab	III	Dog	2018	Lab2
BIOS-V302	skin swab	III	Dog	2018	Lab2

The numbers in brackets represent strains collected from the same animal. MSSP: methicillin-susceptible *Staphylococcus pseudintermedius*; MRSP: methicillin-resistant *Staphylococcus pseudintermedius*; MDR: multidrug resistant.

Table S4. Primers used in this study.

Gene	Primers	Sequence (5′-3′)	Amplicon size (pb)	Reference
<i>Staphylococcus pseudintermedius</i>				
lukF	lukF_SP_Fw	CCTGTCTATGCCGCTAATCAA	572	[90]
	lukF_SP_Rv	AGGTCATGGAAGCTATCTCGA		
icaADB	icaADB_SP_Fw	GCAACATGGTCAAGTCCAGA	358	This work
	icaADB_SP_Rv	CGACACACCCTATGGCTATG		
agrD	agrD_SP_Fw	GGGGTATTATTACAATCATTC	300	[88]
	agrD_SP_Rv	CTGATGCGAAAATAAAGGATTG		
<i>Staphylococcus aureus</i>				
lukS- PV/lukF- PV	lukSF_Fw	CATTAGGTAAAATGTCTGG	431	This work
	lukSF_Rv	GCATCAACTGTATTGGAT		
icaADB	icaADB_SA_Fw	AGTTCTTGTCGCATTTCCAA	359	This work
	icaADB_SA_Rv	CACGATTCTCTTCCTCTCTGC		
agr	pan_agr_SA_Fw	ATGCACATGGTGCACATGC	439	[89]
	agr_I_SA_Rv	GTCACAAGTACTATAAGCTGCGAT		
	agr_II_SA_Rv	TATTACTAATTGAAAAGTGCCATAGC	572	
	agr_III_SA_Rv	GTAATGTAATAGCTTGTATAATAATAC CCAG	321	
	agr_IV_SA_Rv	CGATAATGCCGTAATACCCG	657	

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