



Association des Assistants en Biologie Clinique

A.S.B.L.

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Nos partenaires:

SIEMENS

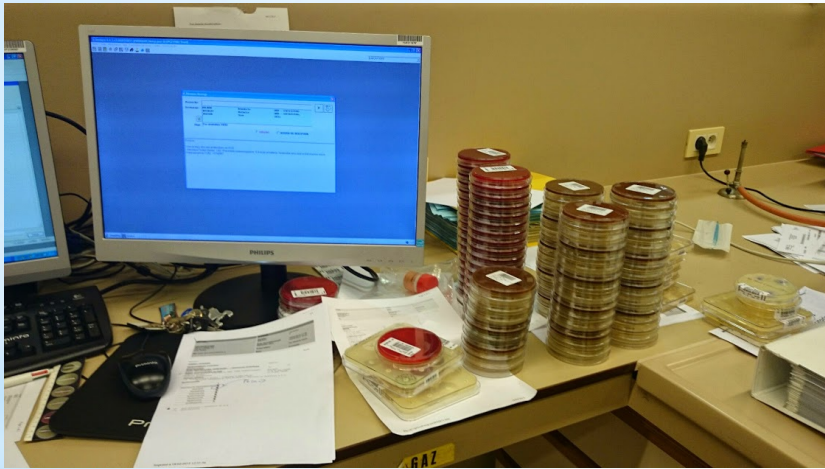




Pseudo-outbreak due to bacterial cross contamination associated with the use of a Walk Away Specimen Processor (WASP)

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- * In Mont-Godinne microbiology laboratory : daily use of the WASP for each bacteriological samples (liquid, airway, urine,)
- * For the liquids and biopsy specimens : use of BHI broths (enrichment medium) in addition to the traditional bacteriological media.



* A Broken Promise?



**A TOTAL
SOLUTION FOR
PRE-ANALYTICAL
MICROBIOLOGY
SPECIMEN
PROCESSING.**



**NEW MEDICAL INTERN
START SEPTEMBER THE 5TH**



RUN FOR YOUR LIFE!!!



* Important thing to remember

Date	Clinical Samples	Bacterium found in the BHI
22/08/2014	Right foot toe's liquid	<i>E. faecalis</i>
23/08/2014	Right lung biopsy	<i>E. faecalis</i>
24/08/2014	Pseudo-aneurysm	<i>E. faecalis</i>
24/08/2014	Femoral artery	<i>E. faecalis</i>
25/08/2014	Aortic valve	<i>E. faecalis</i>
25/08/2014	Joint fluid	<i>E. faecalis</i>
27/08/2014	Aortic valve	<i>E. faecalis</i>
08/09/2014	Peritoneal fluid	<i>E. faecium</i>

5 days period : 358
processed samples
(42 BHI)

**Contamination
Rate : 1,39%**





- **Mont-Godinne** : BHI Broth's contamination?
 - Incubation of BHI used in our routine on the WASP for 5 days at 35° C
 - → *negative*
 - Re-seeding of all of the contamination cases from the primary samples
 - Aerobic culture + Enrichment
 - → *negative.*
- **MLS** :
 - Seeding of 12 BHI from 12 physiologic water tube with a 10 µl-loop before and after cleaning that loop with a 2% Steranios solution. Incubation at 35° C
 - → *negative.*

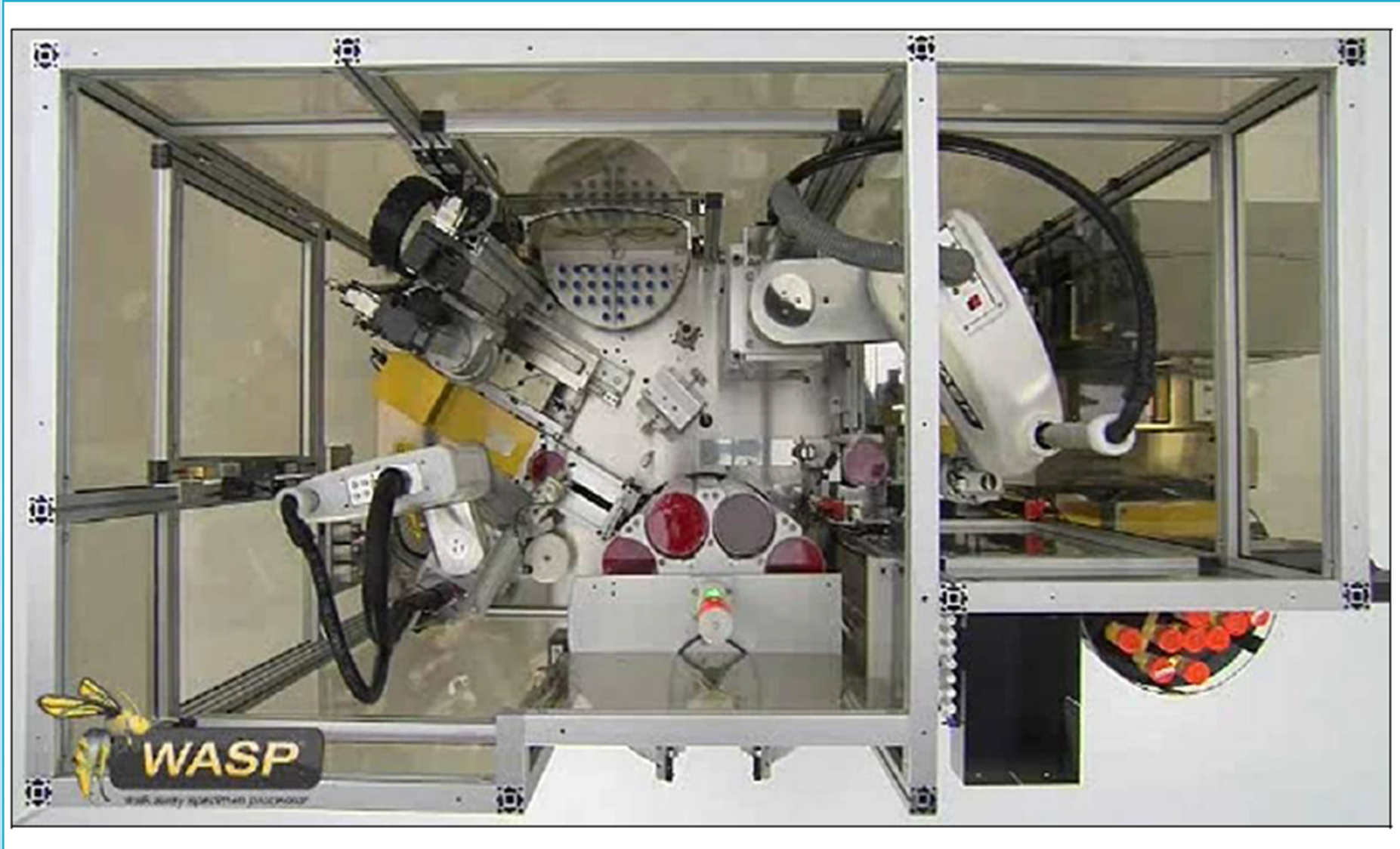


* From September 11th until September 22th :
disinfection with 2% Steranios during 1 hour every morning before our routine daily task.

1 BHI at the end of every WASP rack used for liquid and biopsy specimens

→ all of them were negative.

* Contamination inside the WASP chamber?



EVERYTHING
IS UNDER
CONTROL

Thursday, March 16, 2017

Not really ...

* From december the 16
th to december the
26th : a second
outbreak ...

OUTBREAK

FILE #2



* From december the 16th until the 26th

Date	Clinical samples	Bacterium found in the BHI
16/12/2014	Right mastoid fluid	<i>S. aureus</i> & <i>S. epidermidis</i>
17/12/2014	Peritoneal fluid	<i>E. Coli</i>
17/12/2014	Peritoneal fluid	<i>S. Aureus</i>
18/12/2014	Bile	<i>E. Coli</i>
22/12/2014	Left breast liquid	<i>S. Aureus</i>
22/12/2014	Unknown Liquid object (U.L.O)	<i>S. Aureus</i> <i>Ent. Faecalis</i>
22/12/2014	Articular liquid	<i>S. Aureus</i>
26/12/2014	Drain	<i>S. Aureus</i>
28/12/2014	Cyst liquid biopsy	<i>S. Aureus</i> <i>E. Coli</i>



12 days period : 778 processed samples (156 BHI)

Contamination Rate : 1,10%



- **MLS** :

- Check the WASP incinerator's temperature : OK.
- 20 BHI incubated for a 24 hours period at 35°
 - Reading at 24 hours : all negative.
 - Seeding on a Tryptic Soy Agar (TSA) : negative.



CROSS-CONTAMINATION TESTS

* ATCC E. coli 25922 and ATCC Staphylococcus aureus 25923

	A	B	C	D
1	ATCC EC	BHI STERILE	BHI STERILE	ATCC STAA
2	ATCC EC	ATCC STAA	BHI STERILE	BHI STERILE
3	BHI STERILE	ATCC EC	ATCC STAA	BHI STERILE



*CROSS-CONTAMINATION TEST is validated if :

- ✓ TSA from E.coli ATCC are positive with E. coli
- ✓ TSA from S. aureus ATCC are positive with S. aureus
- ✓ TSA from sterile water are negative
- ✓ BHI from ATCC are positive
- ✓ BHI from sterile water are negative.
- ✓ Seeding on TSA of BHI ATCC E. coli are positive with E. coli
- ✓ Seeding on TSA of BHI ATCC S. aureus are positive with S. aureus
- ✓ Seeding on TSA of BHI sterile water are negative.

ALL OF THE 8 CRITERIA NEED TO BE MET.

EVERYTHING
IS UNDER
CONTROL

Thursday, March 16, 2017



Not really ...

		TSA after 24 hours	BHI after 24 hours	Seeding of BHI 24 h	
				TSA	BHI
A1	ATCC EC	E.C.	Turbid	E.C.	Turbid
A2	ATCC EC	E.C.	Turbid	E.C.	Turbid
A3	STERILE BHI	Negative	Turbid	E.C.	Turbid
B1	STERILE BHI	Negative	Turbid	E.C.	Turbid
B2	ATCC S.A.	S.A.	Turbid	S.A. + E.C.	Turbid
B3	ATCC E.C.	E.C.	Turbid	E.C.	Turbid
C1	STERILE BHI	Negative	Turbid	E.C.	Turbid
C2	STERILE BHI	Negative	Turbid	E.C.	Turbid
C3	ATCC S.A.	S.A.	Turbid	S.A.	Turbid
D1	ATCC S.A.	S.A.	Turbid	S.A.	Turbid
D2	STERILE BHI	Negative	Turbid	S.A.	Turbid
D3	STERILE BHI	Negative	Negative	Neg	Turbid

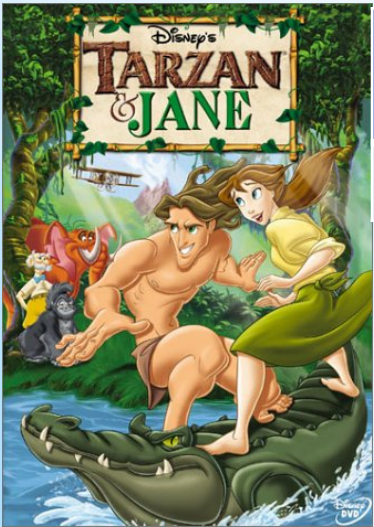
* MLS Intervention

* Change of incinerator position (1 to 2) (2015/12/29)

Position	Strain	TSA	BHI	Seeding of BHI
C1	WATER	Negative	Turbid	E.C.
A2	WATER	Negative	Turbid	E.C.
A3	WATER	Negative	Turbid	S.A.
B4	WATER	Negatif	Turbid	E.C.



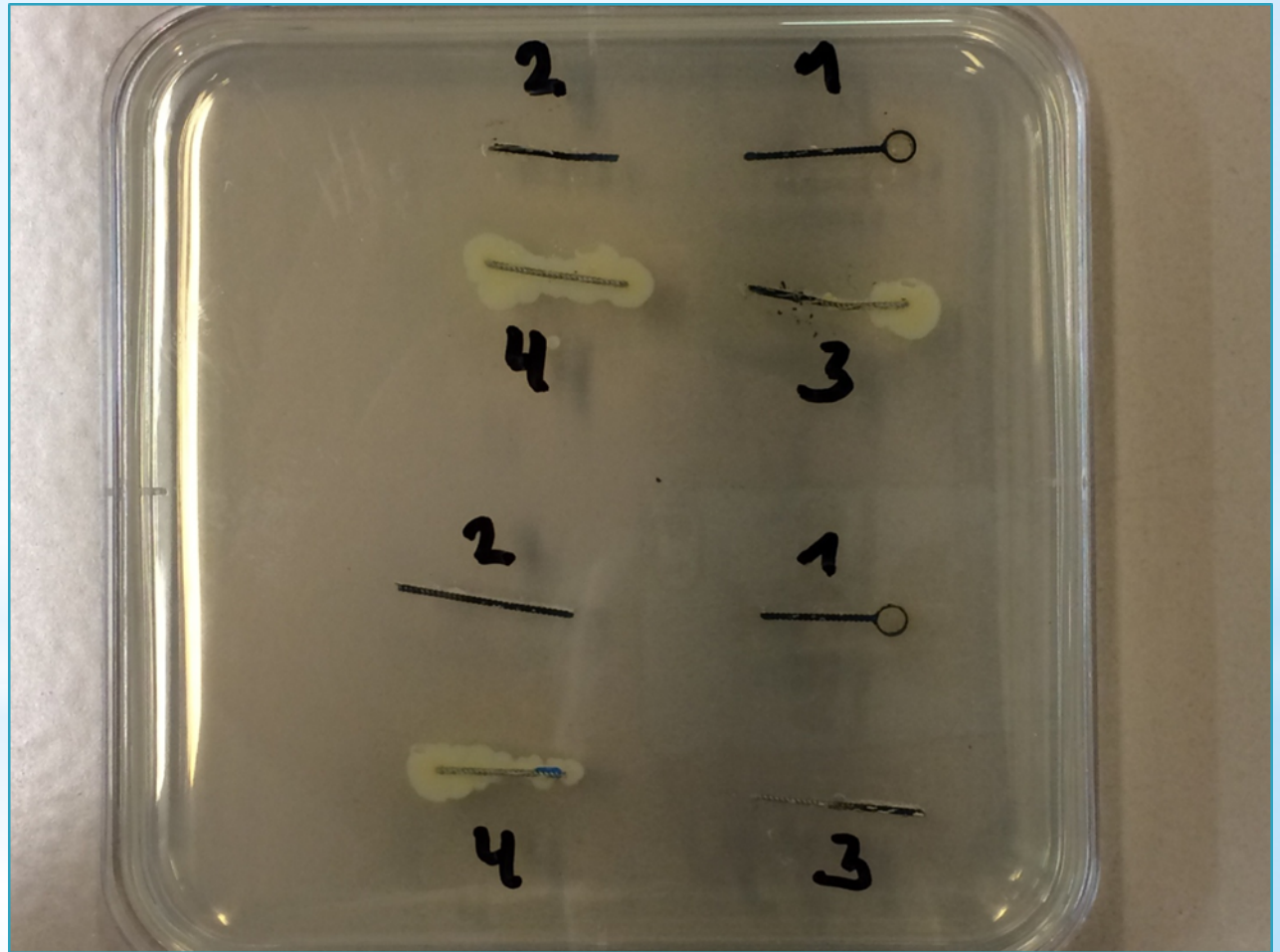
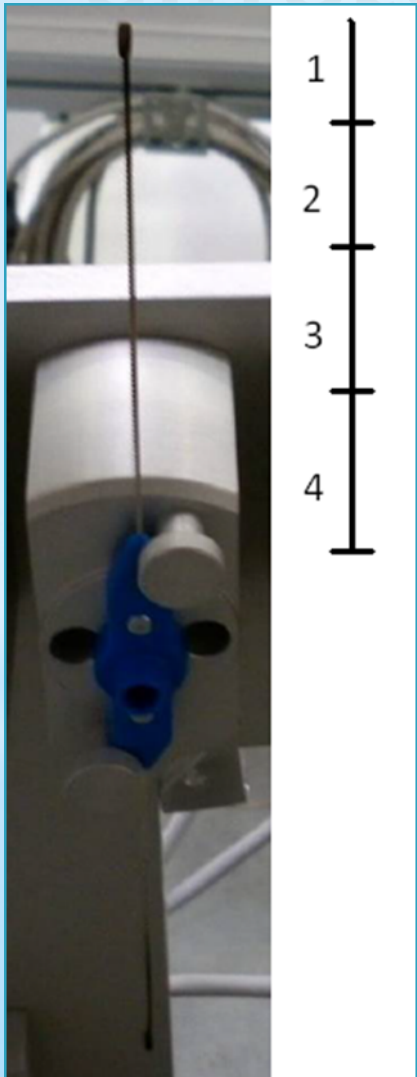
* Change of robotic arm JANE's position into the BHI broths



Position	Strain	TSA	BHI	Seeding of BHI
B4	WATER	Negative	Turbid	E.C.



* A clue that could make the difference ...



* 5 valid cross-contamination tests after the change of incinerator



* CROSS-CONTAMINATION TESTS

- * Integration of Cross-Contamination tests into our internal quality control.
- * 1/Week:
 - * Monday : Seeding of 1 TSA and 1 BHI
 - * Tuesday : Seeding of the BHI on TSA and first reading of the TSA
 - * Wednesday : Reading of the TSA seeded from the BHI's.



COPAN & MLS integrated those tests into their maintenance

* Further investigations

* Retrospective work :

- * Consequences for the patients in term of mis-treatment?

- * Phenotyping of the strains implied in the bacterial cross-contamination

- * Logbook of the WASP :

- * Sample case and sample processed two samples before (WASP -2)

- * Sample case and BHI done for samples two samples before

- * On the 23 investigated cases

- Only 4 full concordances (species and antibiograms)

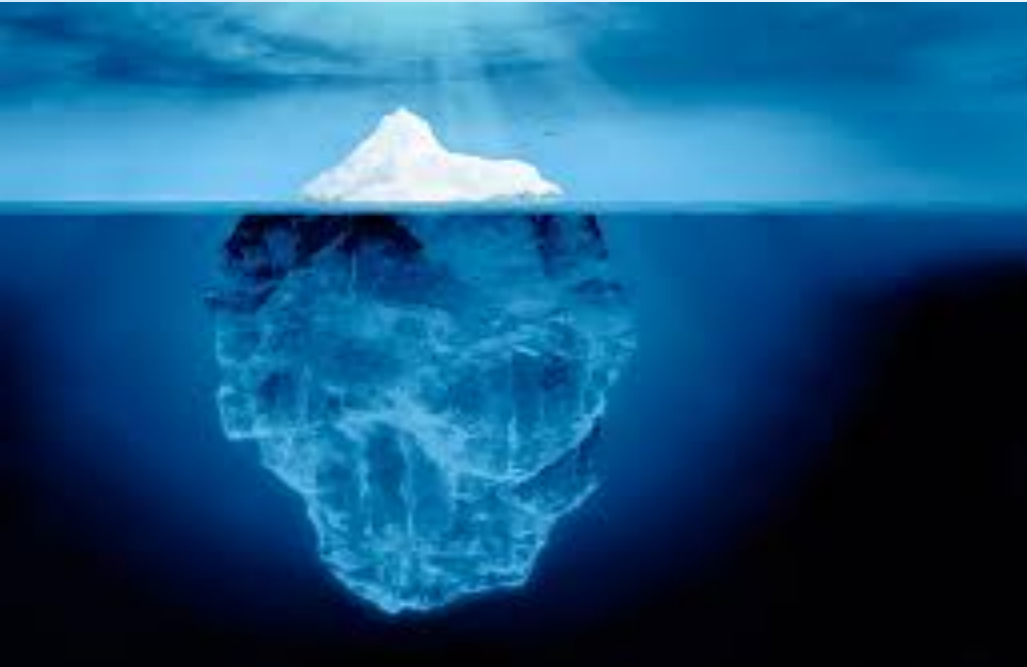
- 13 correspondences (bacterial species)

- 7 by BHI

- 6 by WASP - 2

numéro WASP	élévèment clinique	Germe	Antibiogramme	te et heure passa	WASP - 2	Type de prélèmen	Culture	par BHI	Germe BHI	Antibiogramme
	1068951301	Sta. Aureus	AB à faire	17/12/2014 12:36	6100572001	Liquide gastrique	négatif.	1068932601	Sta Aureus C01 Microbia (crauz+ conta non valide)	pas d'AB réalisé
1075274101	1069123201	E. coli		19-12-14 10H57	1069099201	Frottis	MSSA	non concordant		
1075257901	1068668801 souche 10	E. coli								
1075256501	10686688 souche 11	E. coli				Morceaux osées (pas passés au WASP)				
1075254301	10686688 souche 12	E. coli								
1075270201	61005717	E. coli		17-12-14 13h47	1068932601	Test eau stérile	Sta	non concordant		
1075249501	10694884 souche 1	E. coli	Poly S	23-12-14 17h53	1069468001	Oreille	<i>Pseudomonas aeruginosa</i>	6100618801	E. coli (comparé AB avec conta bidon)	peni, R. catarrh, R. agalactiae, R. solis S.
1075251001	10696688 souche 7	E. coli	poly S	23-12-14 17h28	6100618801	liquide	E. coli + ana	1068668801	E. Coli (dossier eau sterile souche 4)	poly S concordant
1075264501	10686688 souche 4	E. coli	poly S	21-12-14 15h32	1069268001	Expectoration	Flore salivaire	1068668801	Test cross conta passage négatif	
1075252601	10696688 souche 8	Sta. Aureus	R pénit S le reste	23-12-2014 17h28	6100618801	Liquide péricardique	E. Coli	1068668801	Sta. Aureus Passage 15:52	R peni S le reste
1075246401	10686688 souche 6	Sta. Aureus	R peni S le reste	23-12-14 15h48	1069457201	KT	negatif	10693277701	E. coli Cross conta 23/12 à 11h25	
1075243601	10686688 souche 14	Sta. Aureus	poly S	23-12-14 17h49	1069468201	Frottis	Sta. Aureus, Strepto constellatus			peni R reste S --> non concordant
1075240901	10686688 souche 15	Sta. aureus		26-12-14 17h02	1069642501	LBA	Négatif	1069625801	PL Suppuration post-trachéotomie : négatif	
1075259301	10693391	Sta. aureus		22-12-14 15h46	1069338901	Génital biopsie	Prev. Intermedia	1068932601	Cross conta : + à Sta Aureus	
1075260701	10693487	Sta. Aureus		22-12-14 16h27	1069347401	Nez	Sta. Aureus			
1075261801	10686688 souche 3	Sta. Aureus	R pénit S le reste	22-12-14 15h39	1068932601	Test eau stérile	Sta. Aureus			pas d'AB réalisé
1075263301	10686688 souche 2	Sta. Aureus		22-12-14 15h19	6100608101	MRSA	Négatif (! Si MSSa???)	1069327701	cross conta 22/12 12h57	
1075265601	10686688 souche 5	Sta. Aureus		21-12-2014 15h32	1069268001	Expectoration	Flore salivaire	1068668801	passage 21/12/2014 négatif	
1075266601	10686688 souche 9	Sta. Aureus	R pénit S le reste	23-12-14 15h52	1068668801	BHI (souche 6)	Sta Aureus			R pénit, S le reste
1075267601	10693531	Sta. Aureus		22-12-14 17h56	1069353601	LBA	Neg	1069348701	Sta Aureus liquide 22/12	
1075268501	10686688 souche 1	Sta. Aureus								
1075247701	10694884 souche 2	Sta. Aureus	R peni S le reste	23-12-2015 17h36	1069468201	Frottis malléole	Staphylococcus aureus			Péni R, reste S.
1075271201	10689513	Sta. Aureus	poly S	17-12-14 13h50	1068932601	Test eau stérile	Pos Sta aureus			pas d'AB réalisé
1075272201	10689501	Sta. Aureus		17-12-14 15h16	1068953901	Liquide phlyctène	Pyo + MDMO + Proteus			
1075273201	10689789	Sta. Aureus		17-12-14 16h42	1068971801	Liquide péritonéal	Faecium			
1075235901	10696614	Sta. Aureus		26-12-14 18h52	6100636001	Expecto	Mor. Catarrh	1069654501	négatif	

* Perspectives



= Amount of seeded samples

If you are using a WASP, please send an e-mail to adress

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* CONCLUSIONS

- * Despite its potential plating accuracy provided by the WASP, cross-contamination studies were needed.
- * A change of incinerator : has to be added in its technical maintenance.

