



# Response to intramammary challenge after experimental challenge with *S. epidermidis* and *S. aureus*

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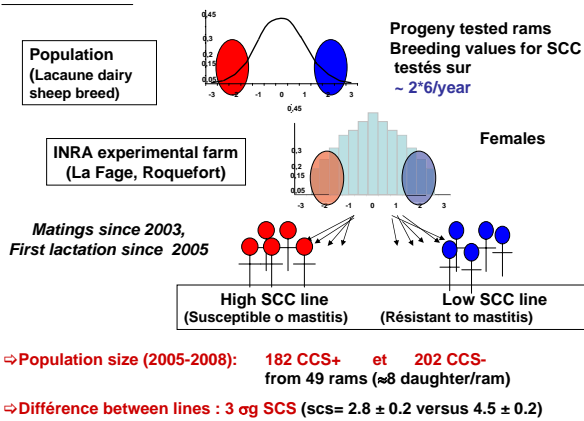
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## Objective

- Transcriptomic profiling of the inflammatory and immune responses during early stages of *Staphylococcus-induced* mastitis in dairy ewes
- Dendritic cells, neutrophils and mammary epithelial cells
- Target genes and mechanisms underlying resistance of the host to mastitis : compare resistant and susceptible animals
- Dairy sheep as an animal model : SCC-based divergent selection

## Animal model (Rupp et al., Journal of Dairy Science 2009)



## Natural infections in the High and Low SCC lines

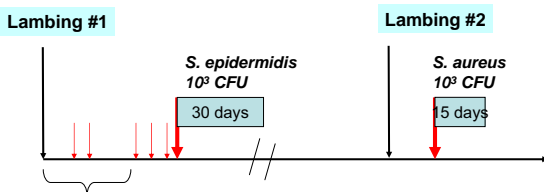
Trait	Lignée CCS+		Lignée CCS-	
	N	moyenne	N	moyenne
Clinical mastitis (384 lactations; 2005-2008)		<b>18 cases</b> (9.8%)	<b>5 cases</b> (2.4%)	
Mammary abscesses (% affected ewes)	05-08 283	<b>38%</b>		<b>7%</b>
Milk Bactériology (% positives in L1)	2005 586 2005	<b>45%</b>	536	<b>24%</b>

⇒ bactéries: Coagulase-Negative Staphylococci

⇒ Higher résistance of Low SCC ewes/ High SCC ewes (OR=3.1[1.9;5.2])

## Experimental protocol

- Selection of 2 groups of 6 ewes (6 CCS+, 6 CCS-)
- Animal healthy according to bacterial analyses and SCC
- Transfer to Veterinary School shortly after first lambing
- Two successive inoculations



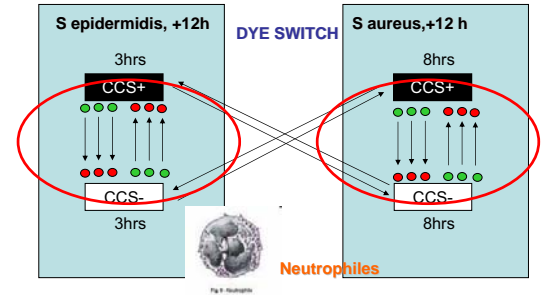
## Results

	CCS+	CCS-
Rectal temperature	++	+
Milk losses	++	+
Bacterial excretion	+++	+
Mammary abscesses	+++	+
SCC	++	++

## Transcriptomic profiling

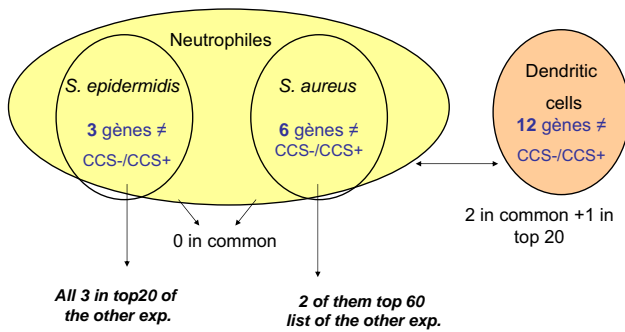
### Microarray experiment

- 8\*15K oligo microarray (Agilent)
- Hybridisation : Genopole Toulouse
- Data analyses : R , ANOVA, linear model gene by gene (line and color effects)



### Results

- Benjamini Hochberg correction



### Summary

- Two lines of sheep with enhanced and decreased resistance of intramammary infections (natural - experimental)
- Transcriptomic profiling in early stage of Infection with staph. in
  - > neutrophils (*S. epidermidis* + *S. aureus*)
  - > dendritic cells (*S. aureus*)
- Few genes differentially expressed between SCC+ and SCC-, some in common across experiments
- Meta analyses and Pathway analyses in progress
- NEXT STEP: mammary epithelial cells + confirmation by RT-PCR