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## **Staphylococcus aureus induces DNA damage in host cell**

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François Vandenesch, et al.

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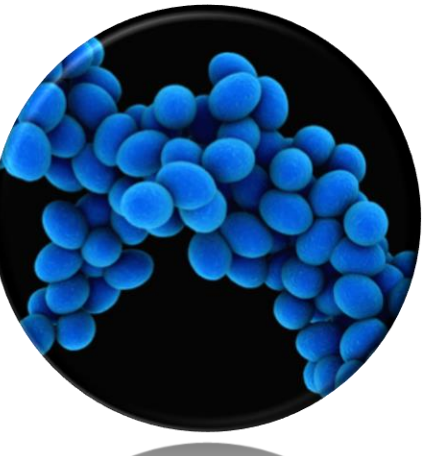
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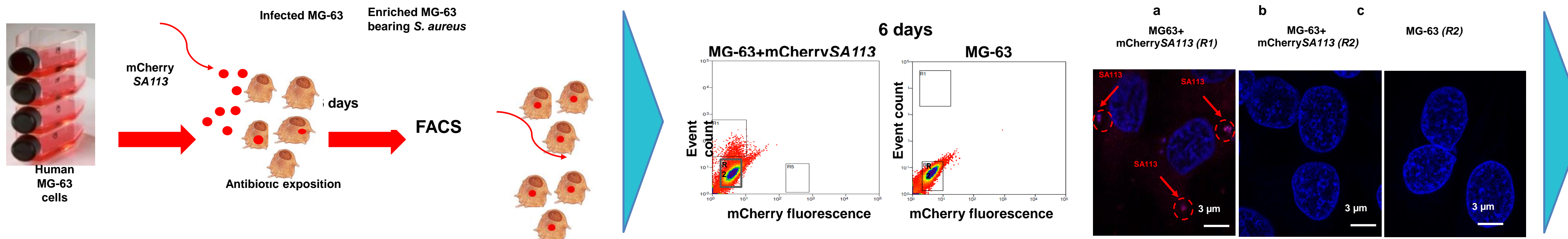


## CONTEXT

Eukaryotic cells are permanently exposed to environmental and endogenous factors that induce DNA damage, thus affecting genomic integrity. The host cells counteract the consequences of lesions by DNA damage response and checkpoint systems that repair DNA structure or trigger cell death when DNA is irredeemably damaged. *S. aureus*, a highly versatile gram-positive bacterium, can cause a multitude of human diseases ranging from mild superficial skin to life-threatening disseminated infections. *S. aureus* is one of the most prevalent pathogen that cause chronic ruminant mastitis. Chronic *S. aureus* infection is likely to be associated with the internalization of the pathogen by host cells, where bacteria are protected from host defenses. We aimed to investigate whether *S. aureus* can compromise host genomic integrity.

## EXPERIMENT DESIGN

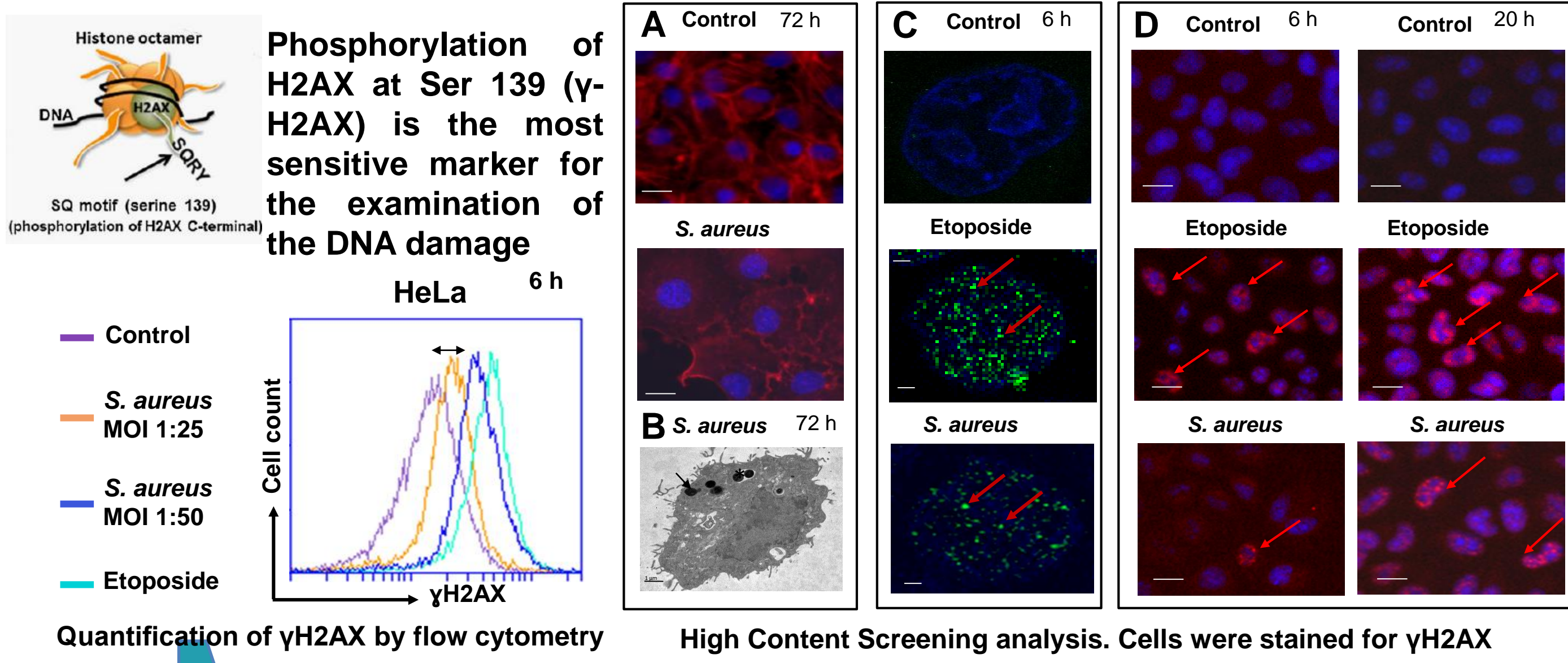
### DEVELOPMENT OF AN INFECTION MODEL TO ISOLATE SOLELY CELLS CONTAINING INTERNALIZED *S. aureus*



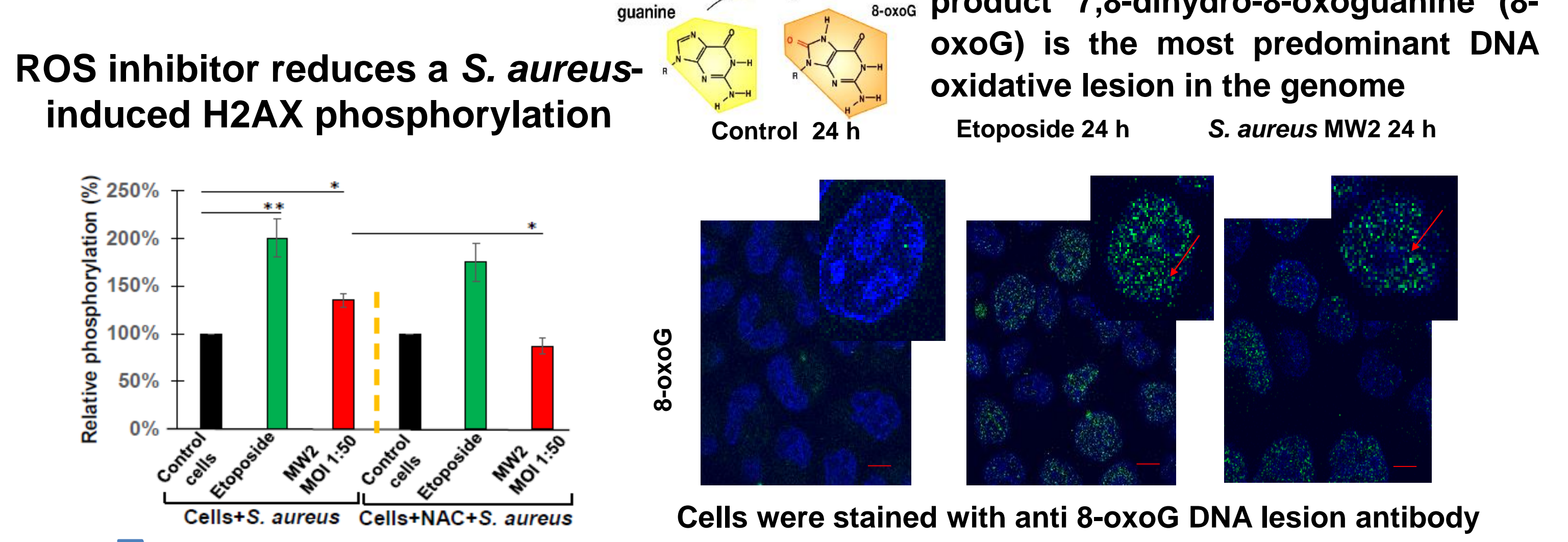
## RESULTS

### 1. *S. aureus* INDUCES DNA DAMAGE IN HOST CELLS

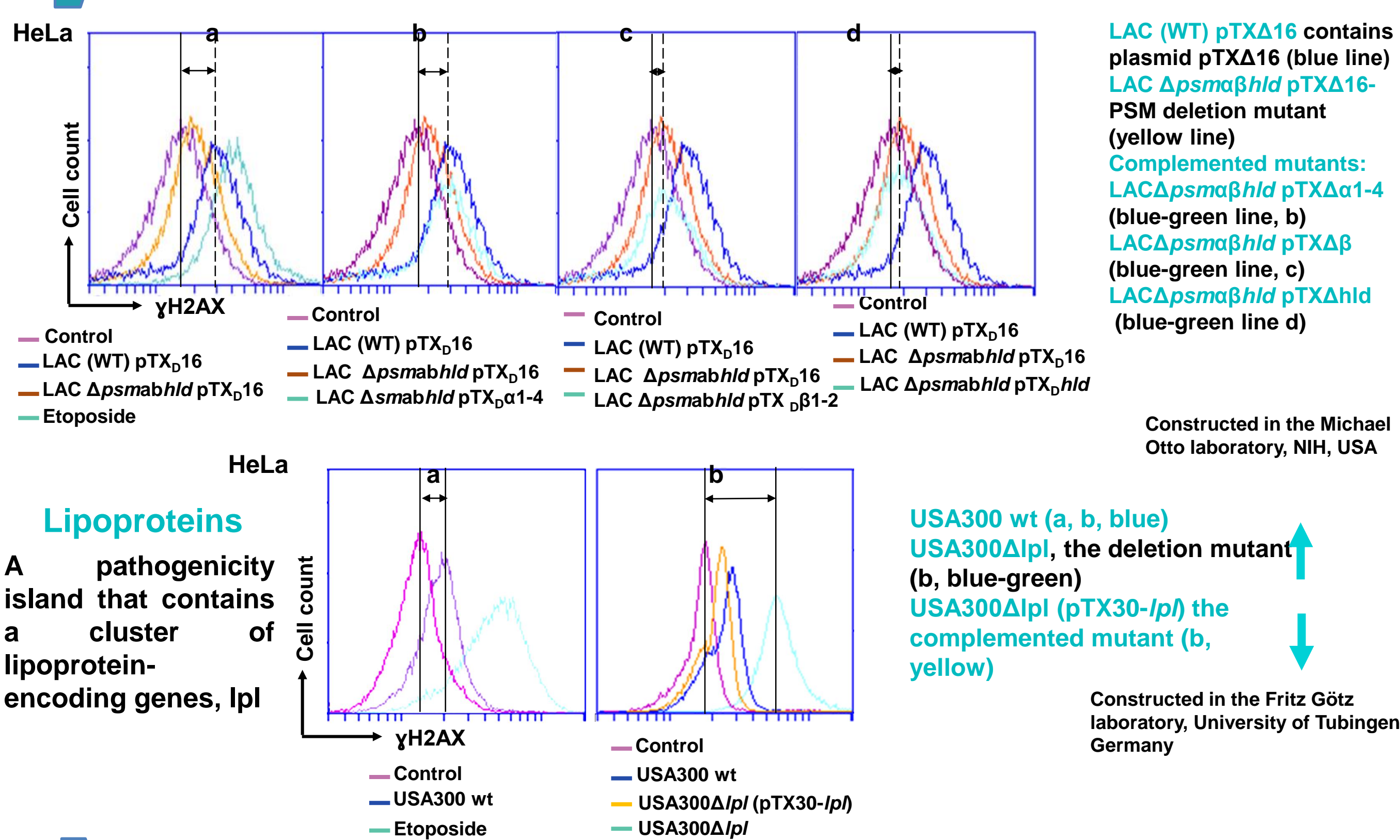
#### *S. aureus* increases $\gamma$ H2AX phosphorylation



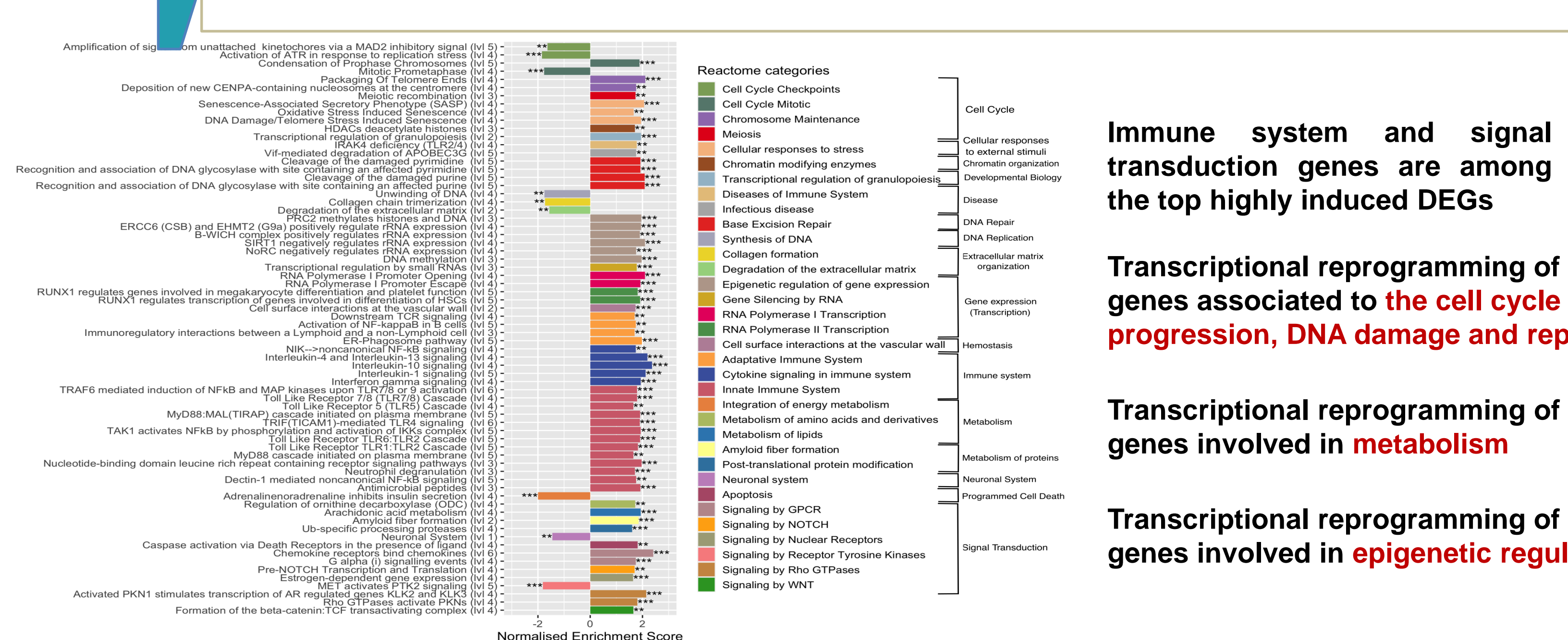
### 2. *S. aureus* INDUCES 8-OXOG DNA LESIONS IN THE HOST CELLS



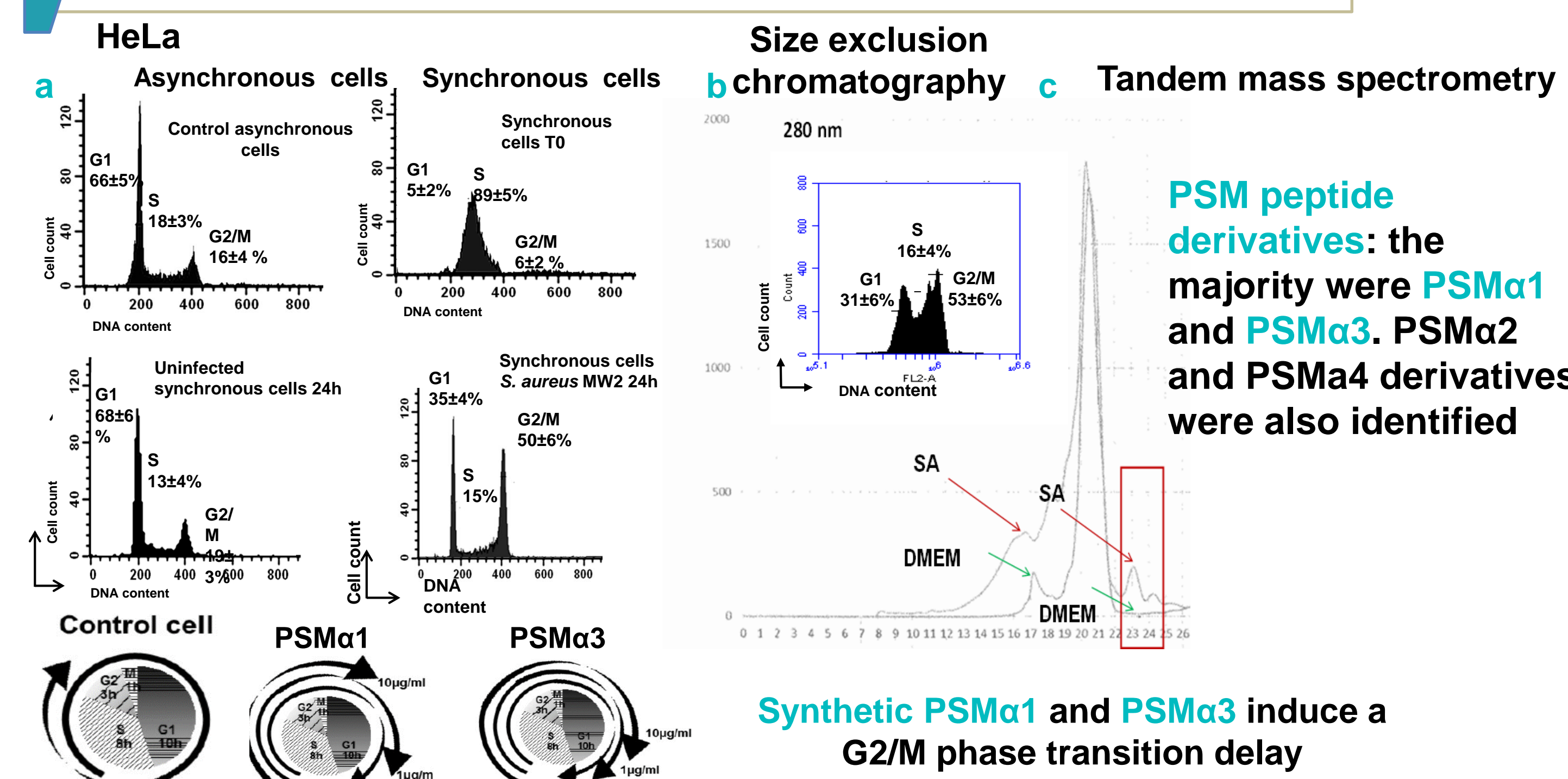
### 3. *S. aureus* PHENOL-SOLUBLES MODULINES PSM $\alpha$ 1-4 INDUCE, WHILE LPLs DAMPEN HOST DNA DAMAGE



### 5. GENE-SET ENRICHMENT ANALYSIS USING REACTOME DATABASE



### 4. *S. aureus* INDUCED A G2/M PHASE TRANSITION DELAY



## CONCLUSION

Model of the immune, signal transduction, metabolic and epigenetic dysregulated signatures induced by long-term *S. aureus* infection

