

A broad-spectrum pneumococcal vaccine induces mucosal immunity and protects against lethal *Streptococcus pneumoniae* challenge



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Rationale and Vaccine Candidate (LAAC)

Lacking of induction of Th1 responses, the CD4+ T-cell-deficient mice was unable to clear nasopharyngeal colonization.

Infect. Immun. 68, 1557-1562 (2000), *Infect. Immun.* 70, 5019-5025 (2002), *Nature Reviews Microbiology* 6, 288-301 (2008)

Rationale

Inducing Th1 responses and mucosal immunity

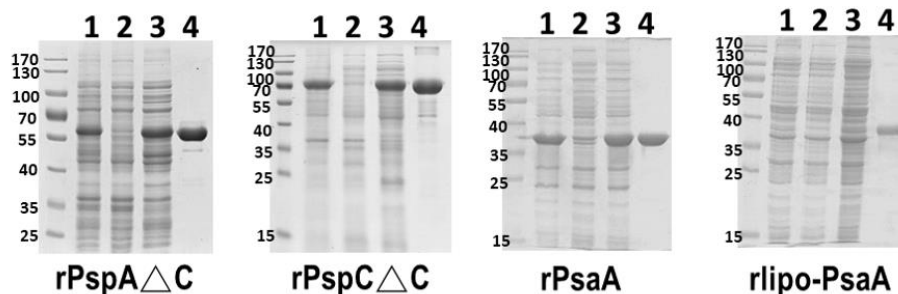
Approach

Intranasal immunization of **lipidated antigen** and selected antigens to induce Th1 responses and mucosal immunity.

Vaccine candidate:

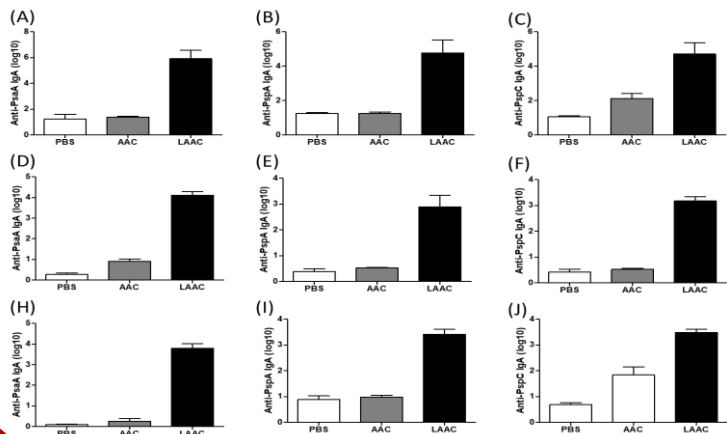
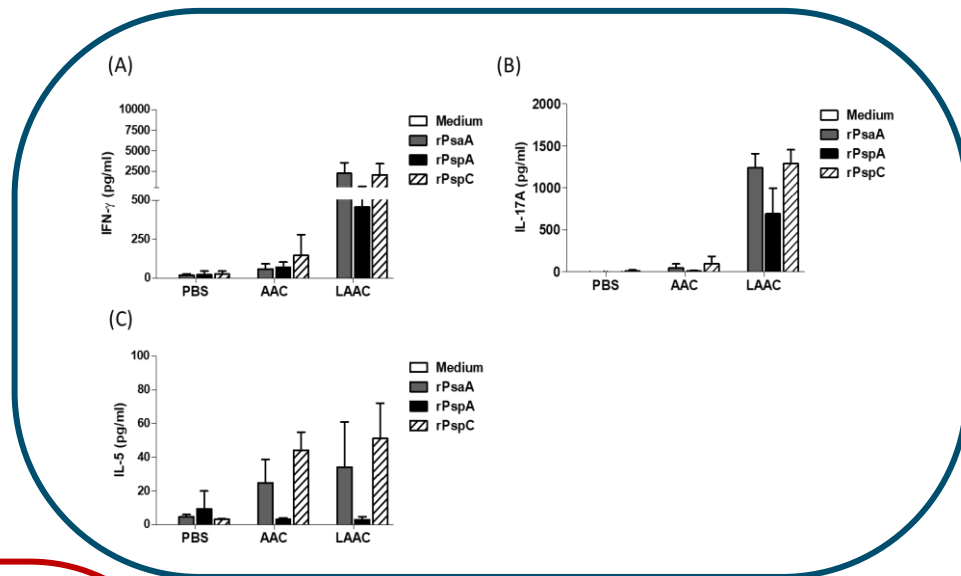
LAAC : rlipo-PsaA/ rPsp Δ A/ rPsp Δ C

AAC : rPsaA/ rPsp Δ A/ rPsp Δ C (-Ve control)



Immunization of LAAC induced higher levels of Th1/Th17 T cell responses and enhanced systemic mucosal IgA

Immunization of LAAC induced higher levels of Th1/Th17 T cell responses



Vaginal washes

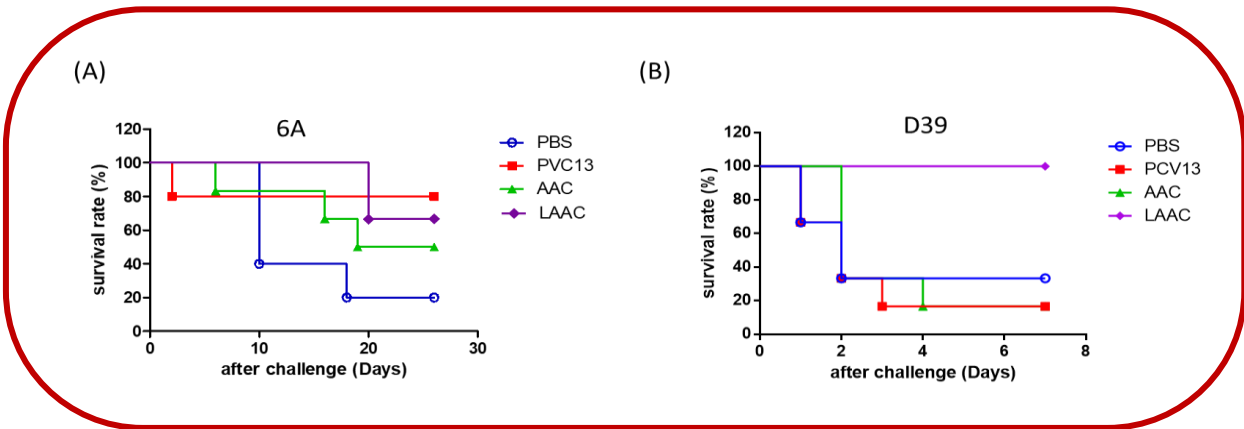
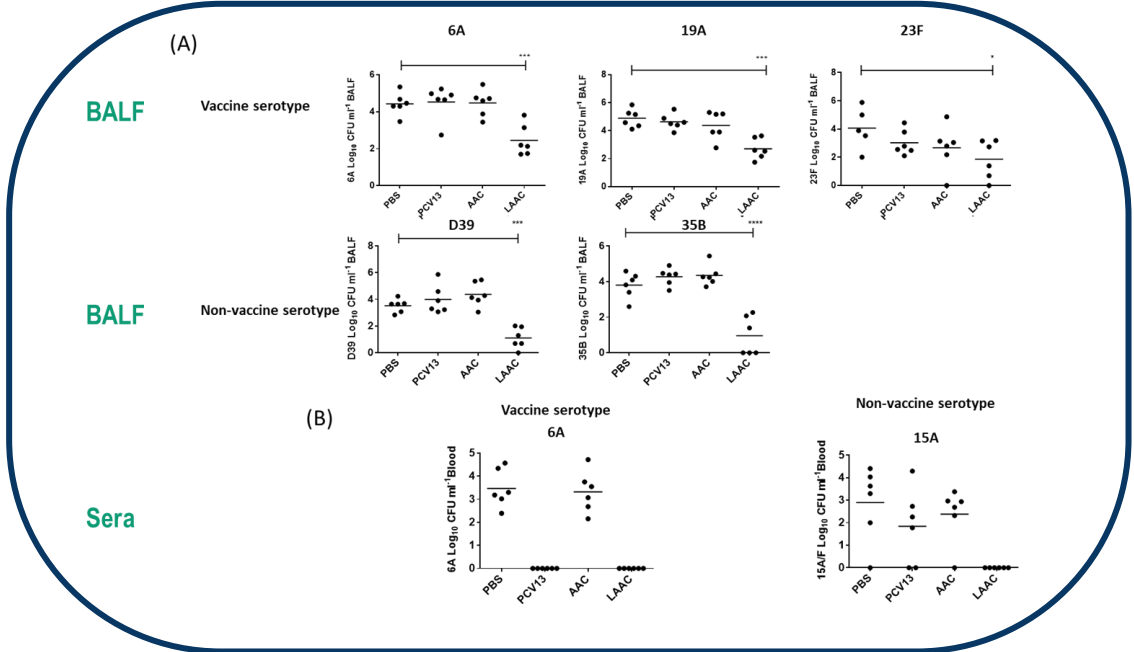
Feces

Sera

Immunization of LAAC enhanced systemic mucosal IgA

Protective effects of LAAC immunization in bacterial challenge model

Immunization of LAAC efficiently reduced the bacterial load



Survival studies

Patents and Paper

◆ Current status of filed patents

NRC#	NHRI#	Country	Filing #/date	Status	Issue #*/date
2015-100-03	1060101TW	TW	105140949 (2016/12/9)	Granted	TWI745323 (2021/11/11)
2015-100-05	1060102JP	Japan	2018-530743 (2016/12/9)	Granted	JP6947727 (2021/10/13)
2015-100-06	1060102CN	China	201680078929.3 (2016/12/9)	Pending	
2015-100-07	1060102EP	Europe	16871875.7 (2016/12/9)	Pending	
2015-100-09	1060102CA	Canada	3088042 (2016/12/9)	Pending	
2015-100-04	1060102(2)US	CIP of 16/061,1 05	US 15/619,075 (2017/6/9)	Granted	US10406221 (2019/9/10)
2015-100-11	1060102(2)TW	TW	107119885 (2018/6/8)	Pending	
2015-100-12	1060102(2)CA	Canada	2018-530743 (2016/12/9)	Pending	
2015-100-13	1060102(2)EP	Europe	18813089.2 (2018/6/11)	Pending	

◆ Paper

Emerg Microbes Infect. 2023 Dec;12(2):2272656.