Supplemental table 1: Summary of the OPKA determined in polyclonal animal antisera and monoclonal mouse and human antibodies to *S. aureus* CP-TT (CP) or dPNAG-TT (dPNAG) antigens as either mono-specific samples or samples mixed together to evaluate interference.

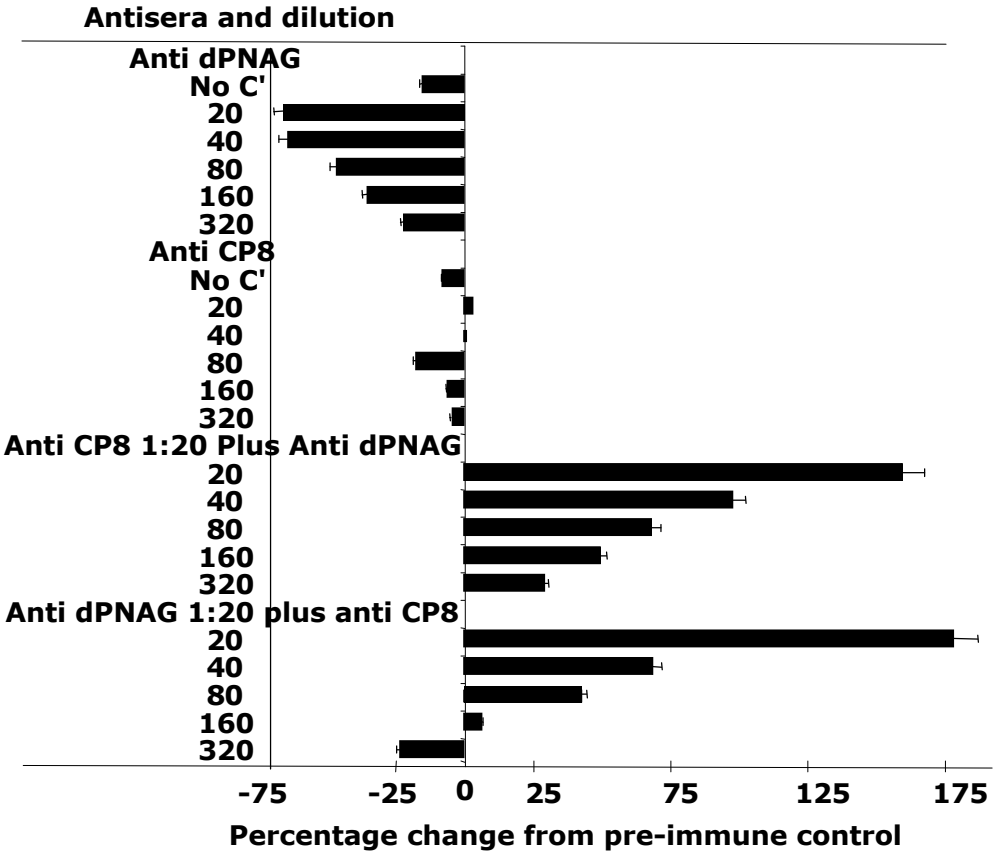
			anti-dPNAG	anti-CP8	anti-CP5	anti-dPNAG+ anti-CP8	anti-dPNAG+ anti-CP5	anti-CP8+ anti-CP5
Species and specificity of antisera tested	**Bacterial strain**	**CP type**	**Maximal OPKA**			**Residual OPKA**		
Rabbit antisera to CP or dPNAG antigens	***S. aureus* MN8**	**8**	**85%**	**75%**		**10%**		
	***S. aureus* PS80**	**8**	**80%**	**85%**	**15%**	**1%**	**18%**	**85 %**
	***S. aureus* Sanger252**	**8**	**65%**	**55%**		**1%**		
	***S. aureus* Reynolds**	**8**	**66%**	**58%**	**19%**	**15%**	**15%**	
	***S. aureus* Reynolds**	**5**	**55%**	**15%**	**65%**	**15%**	**21%**	
	***S. aureus* Newman**	**5**	**62%**	**5%**	**67%**	**25%**	**17%**	
	E. coli		**75%**	**6%**		**4%**		
Goat antiserum to dPNAG and rabbit antiserum to CP8	***S. aureus* PS80**	**8**	**65%**	**45%**		**10%**		
Mouse antisera to CP or dPNAG antigens	***S. aureus* PS80**	**8**	**55%**	**55%**	**15%**	**15%**	**23%**	**55 %**
Human MAb to dPNAG+ rabbit antiserum to CP8	***S. aureus* PS80**	**8**	**65%**	**85%**		**25%**		
Mouse MAb to CP8+ rabbit antiserum to dPNAG	***S. aureus* PS80**	**8**	**80%**	**62%**		**20%**		
Mouse MAb to dPNAG+ rabbit	***S. aureus* PS80**	**8**	**64%**	**85%**		**21%**		

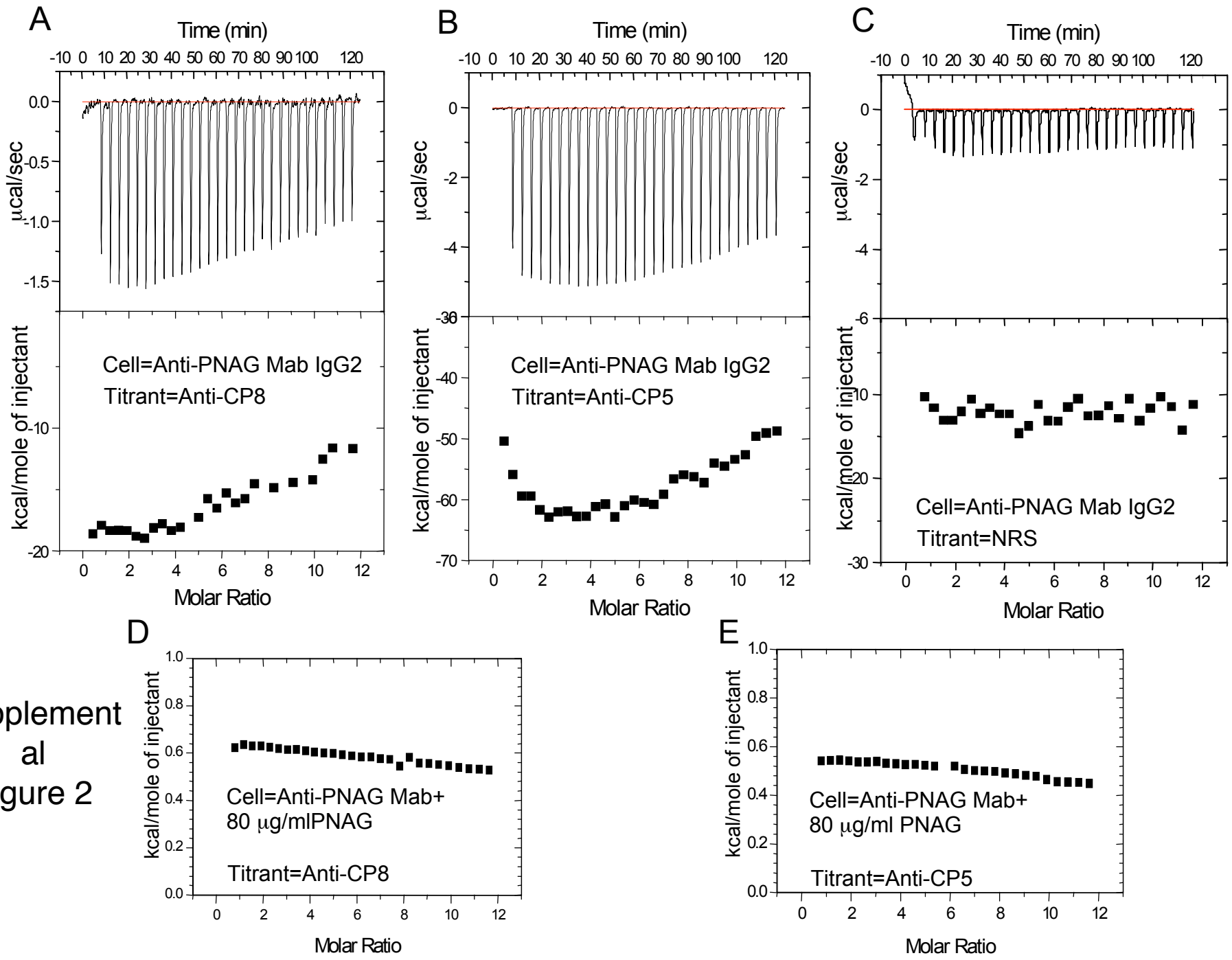
Supplemental table 2: Summary of the OPKA activity by serum sample as determined in 22 humans with *S. aureus* bacteremia

	Number of samples from each patient with the indicated activity:							
Patient number	Number of samples from one single patient	No opsonic activity	Inconclusive-killing without complement	Only opsonic killing activity when anti-CP and anti-PNAG mixed together	Anti-PNAG activity only	Anti-CP activity only	Both anti-CP and anti-PNAG activity and no interference when combined together	Both anti-CP and anti-PNAG activity with interference when combined together
1	17	2	0	0	2	0	8	5
2	13	1	1	2	2	2	1	4
3	11	6	0	0	2	1	0	2
4	8	1	6	0	0	0	0	1
5	7	0	0	0	0	0	6	1
6	7	3	0	0	1	2	0	1
7	6	4	0	0	1	0	0	1
8	5	2	0	1	0	2	0	0
9	4	4	0	0	0	0	0	0
10	2	0	0	0	0	1	0	1
11	2	0	0	0	0	0	0	2
12	2	0	0	0	0	0	1	1
13	2	1	0	0	0	0	0	1
14	2	0	0	0	1	0	0	1
15	2	2	0	0	0	0	0	0
16	2	0	0	0	0	2	0	0
17	1	0	0	0	0	0	0	1
18	1	0	0	0	0	0	0	1
19	1	1	0	0	0	0	0	0
20	1	1	0	0	0	0	0	0
21	1	0	0	0	0	1	0	0
22	1	0	0	1	0	0	0	0
N=	98	28	7	4	9	11	16	23

Supplemental Figure 1:

Intracellular survival of *S. aureus* after opsonization. After the 90 min incubation of an OPKA as described in figure 2 antisera to dPNAG-TT or CP8-TT were used to opsonize *S. aureus* PS80 (CP8) as either mono-specific samples or when mixed together, with one antiserum held constant and the second one diluted as indicated. After sampling the supernate for bacterial viability, gentamicin was added in MEM-1% BSA to the PMN suspension to achieve a final concentration of 300 μg/ml. PMNs were incubated at 22^{o}C for 20 min, then washed three times with MEM-1% BSA, resuspended in 60 μl of PBS-tween to lyse the PMN and release intracellular *S. aureus* which was then diluted and plated for bacterial enumeration. Results are depicted as change from intracellular cfu determined in control using normal rabbit serum and complement (mean 482 ± 24 cfu). Negative percentages indicated fewer cfu than normal rabbit serum control, positive percentages indicate more cfu than control. Bars represent means, error bars the SEM.

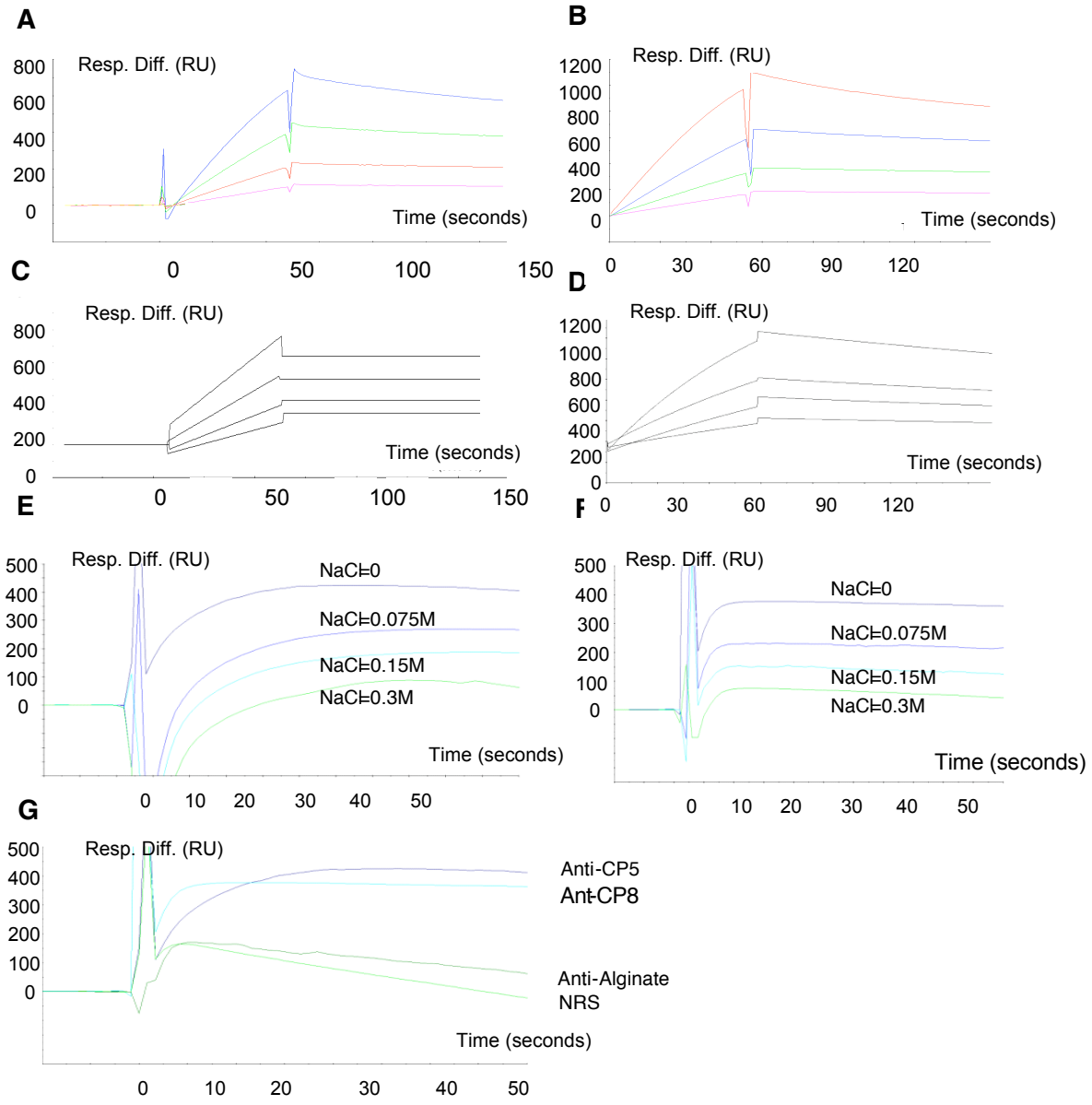




Supplemental figure 2

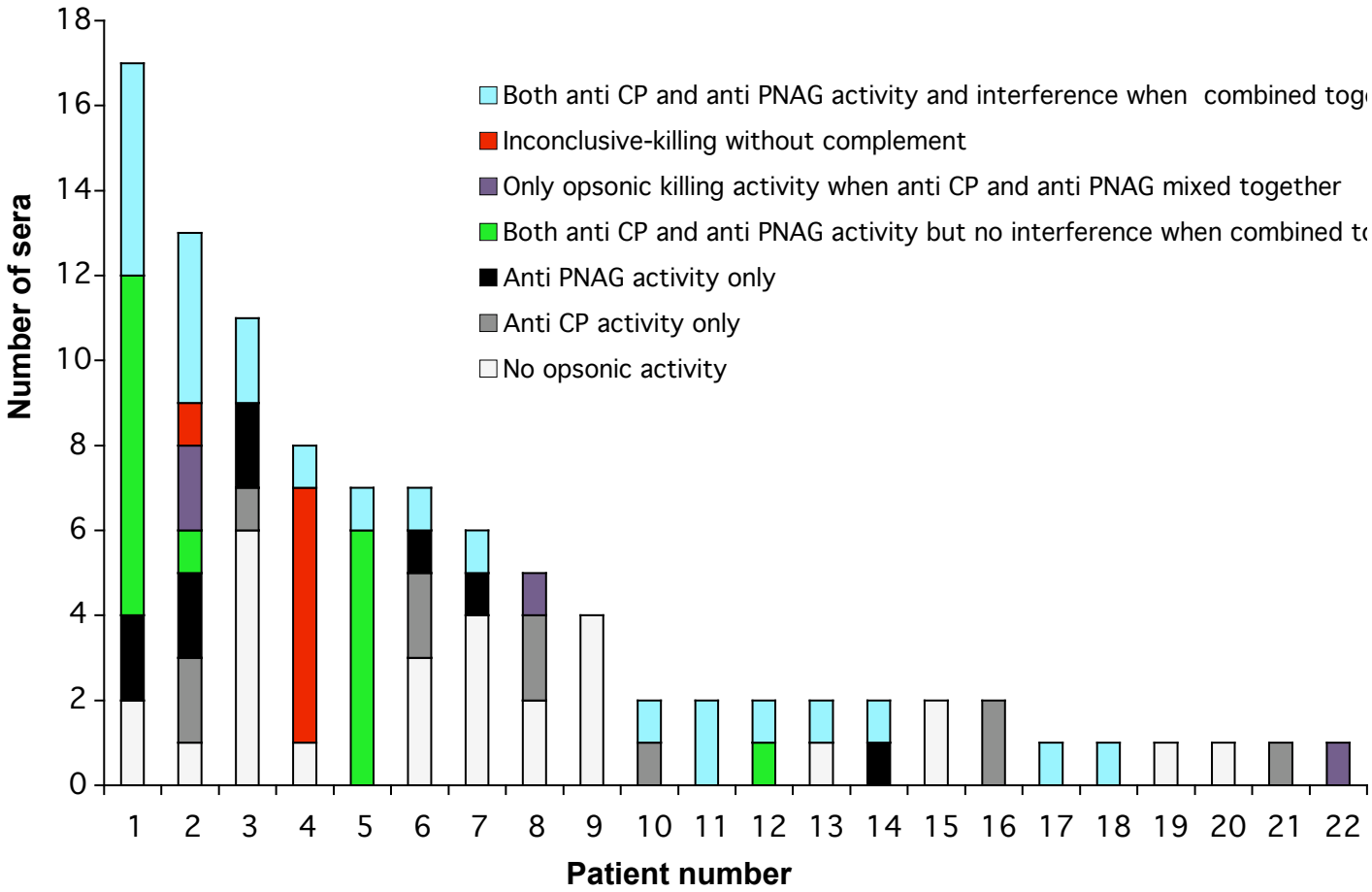
Supplemental figure 2. Effect on IgG isotype and presence of PNAG on the binding of MAb F598 to antibody to CP5 or CP8. **A and B**: Binding curves obtained when solutions containing 250 μg of rabbit IgG raised to CP8 or CP5 (Titrant) were injected into the cell containing 5 μM of an IgG2 MAb to PNAG with the same V region as the IgG1 MAb to PNAG. (**C**) No binding was observed NRS was injected into the cell. **D and E**: No binding was observed when solutions containing 250 μg of rabbit IgG raised to CP8 or CP5 (Titrant) were injected into the cell containing 5 μM of IgG1 Mab to PNAG and 80 μg/ml of purified PNAG.

Supplemental Figure 3



Supplemental Fig. 3. Analysis by surface plasmon resonance of the binding of rabbit antibody to PNAG and staphylococcal CP antigens. a-b: Sensograms showing the complex binding obtained when antibody to PNAG was coupled to a CM-5 sensor chip and 4 different concentrations (1000nM, 500nM, 250nM and 125nM) of IgG to CP8 (a) or CP5 (b) were added. c and d: Attempts to measure the KA and the KD using the curve-fitting Bioevaluation software was not possible as the different binding curves were parallel, and none of the binding models were applicable here, with the chi-square >10 for all attempted curve-fitting models. e-f, Effect of increasing concentrations of NaCl on binding to immobilized rabbit IgG to PNAG of rabbit IgG to CP5 (e) or CP8 (f). g, Comparative binding to immobilized rabbit IgG to PNAG of rabbit IgG to CP5, CP8, *P. aeruginosa* alginate or NRS. e,f,g the concentration of the analytes=500nM.

Supplemental Figure 4



Supplemental Figure 4: Summary of the OPKA in 98 sera from 22 French subjects with *S. aureus* bacteremia. Samples classified as in legend, inconclusive killing represents samples showing reductions in bacterial CFUs in the absence of complement.