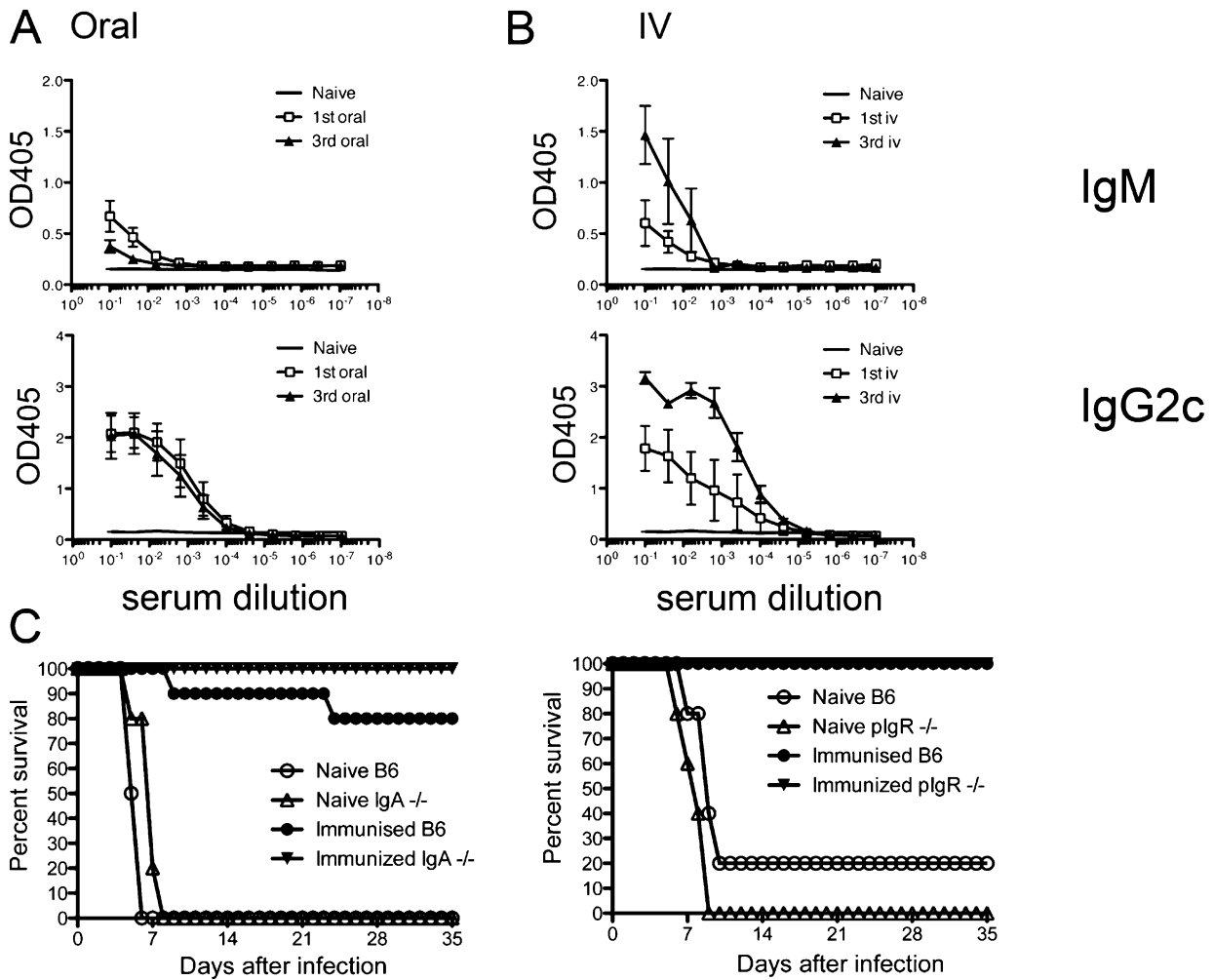


# Supporting Information

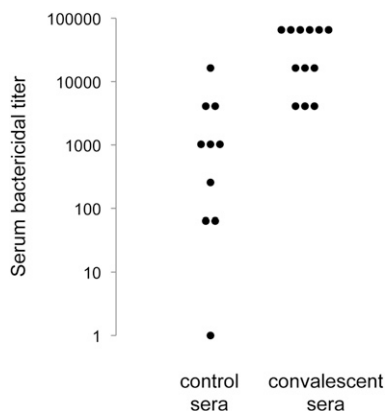
Lee et al. 10.1073/pnas.1111413109



**Fig. S1.** Vaccination with attenuated *Salmonella* induces a systemic antibody response. C57BL/6 mice were infected (A) orally with  $5 \times 10^9$  or (B) i.v. with  $5 \times 10^5$  BRD509. Some mice received a single immunization, and other mice were immunized three times with 1 mo between doses. Blood was obtained from the retro-orbital plexus 55 d after immunization, serum was prepared, and *Salmonella*-specific IgM (Upper) and IgG2c (Lower) were measured by ELISA. Line graphs show mean absorbance  $\pm$  SEM of four mice per group. (C) C57BL/6 mice and (Left) IgA-deficient (*IgA*<sup>-/-</sup>) or (Right) polymeric IgReceptor-deficient (*IgR*<sup>-/-</sup>) mice were immunized orally with  $5 \times 10^9$  BRD509, and 42 d later naive or immunized mice were infected orally with  $5 \times 10^7$  virulent *Salmonella* SL1344. Line graphs represent the percentage of survival of the infected mice and at least six to eight mice per group.







**Fig. S4.** Serum bactericidal titers against the invasive Malawian serovar Typhimurium strain D23580 in control and convalescent Malawian child sera following invasive *Salmonella* disease. *Salmonella* was added to serum from control or convalescent individuals, and complement-mediated bacterial killing was measured as described in *Materials and Methods*. Titer is the maximum dilution that can effect a 0.5 log<sub>10</sub> kill at 180 min in the serum bactericidal assay.

**Table S1.** *Salmonella* proteins recognized in three of four infected mouse strains

Antigen no.	Symbol	Product name	Predicted location	Comments
1850	ompA	Outer membrane protein A	Outer membrane	Target antigen in mice and humans (1–3)
4225	phoN	Nonspecific acid phosphatase precursor	Periplasmic	Target antigen in human typhoid (1)
2229	rlpA	Rare lipoprotein A	Unknown	
1594	pspB	Phage shock protein B	Cytoplasmic	
2128	tolB	Translocation protein B	Periplasmic	
0500	dedD	DedD protein	Unknown	
0336	yfgL	Outer membrane protein assembly complex subunit	Unknown	
1244	lppB	Major outer membrane lipoprotein	Unknown	
3426	pin	Putative regulatory protein	Unknown	
0097	djlA	DNA-J like membrane chaperone protein	Cytoplasmic membrane	
0754	wza	Putative polysaccharide export protein	Outer membrane	
2127	pal	Peptidoglycan-associated outer membrane lipoprotein	Outer membrane	
2239	pagP	Palmitoyl transferase for lipid A	Outer membrane	
3234	rpoN	Hypothetical protein	Unknown	
1245	lppA	Major outer membrane lipoprotein	Unknown	
1119	pagC	Outer membrane invasion protein	Outer membrane	Identified as a target antigen in human typhoid (1, 4)
4616	smp	Putative membrane protein	Unknown	
0029	nhaA	Putative exported protein	Unknown	
2294	ykgB	Hypothetical protein	Cytoplasmic	
1155	yeaD	Hypothetical protein	Unknown	
0013	dnaJ	Chaperone protein	Cytoplasmic	
4239	pilL	Hypothetical protein	Unknown	
4554	uxuR	Hypothetical protein	Unknown	
0906	fliH	Flagellar assembly protein H	Unknown	
1780	csgF	Curli assembly protein F	Unknown	Identified as a target antigen in human typhoid (4)
4155	aphA	Acid phosphatase/phosphotransferase	Unknown	
0918	fliC	Flagellin	Extracellular	Identified as a target antigen in mice and humans (5, 6)
2126	ybgF	Hypothetical protein	Unknown	
3874	viaD	Putative outer membrane lipoprotein	Outer membrane	

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**Table S2. Clinical features of Malawian children with Salmonella bacteremia**

Patient no	Age (mo)	Sex	Serovar	Source	MDR	Clinical presentation	HIV	Other diagnoses and comorbidities
1	2	F	Typhimurium	CSF		Fever, convulsions, vomiting	+	Meningitis
2	4	M	Typhimurium	Blood	√	Fever, cough and shortness of breath, diarrhea, and vomiting		Severe pneumonia, malnutrition
3	6	M	Typhimurium	Blood	√	Fever, cough		
4	10	F	Typhimurium	Blood	√	Fever, cough		
5	13	F	Typhimurium	Blood	√	Fever, shortness of breath, diarrhea, and vomiting		Severe malarial anemia
6	15	M	Typhimurium	Blood	√	Fever, diarrhea, and vomiting	+	
7	16	M	Typhimurium	Blood	√	Fever, cough, diarrhea, and vomiting	+	Malnutrition
8	20	F	Typhimurium	Blood	√	Fever, cough, vomiting		
9	43	M	Typhimurium	Blood	√	Fever	+	
10	72	F	Typhimurium	Blood	√	Fever		Moderate anemia
11	90	F	Typhi	Blood		Fever, cough		
12	151	M	Typhi	Blood		Fever, cough, and shortness of breath		Moderate anemia

M, male; F, female; MDR, multidrug resistant (resistant to cotrimoxazole, ampicillin, and chloramphenicol).

**Table S3. List of 14 antigens differentially reactive in human NTS patients vs. controls**

Human NTS antigens	C57BL/6	BALB/c	C3H/HeJ	B6x129	Gene	Product name (from NCBI)
4225	+	+	+	+	phoN	Nonspecific acid phosphatase precursor
1850	+	+	+	+	ompA	Outer membrane protein A
1449	+		+		hyaF	Putative exported protein
2070	+				ybhF	HlyD-family secretion protein
2126		+	+	+	ybgF	Hypothetical protein
4155		+	+	+	aphA	Acid phosphatase/phosphotransferase
2864		+	+		relA	Hypothetical protein
4189			+		nrfG	Formate-dependent nitrite reductase complex subunit
3119						Putative exported protein
2941						Conserved hypothetical protein
1459						Putative secreted hydrolase
1266					sseB	Pathogenicity island effector protein
0510					hisJ	Histidine-binding periplasmic protein
3708					hslT	Putative lipoprotein

NTS, non-Typhi *Salmonella*; NCBI, National Center for Biotechnology Information.

## Other Supporting Information Files

[Dataset S1 \(XLS\)](#)

[Dataset S2 \(XLS\)](#)