FigureS3.tif

**Figure S4. Detection of specific BvgS variants in membrane extracts of *B. pertussis* by immunoblotting.** S and A represent strains with deletions of *bvgS* and *bvgA*, respectively. In the right panel in A, the BvgSE113C+E177C band was most likely too faint and fuzzy for detection under non-reducing conditions, but the left panel confirms that the protein was produced and membrane-localized as expected. The amounts of BvgS are generally lower in avirulent strains because the *bvgAS* operon is positively auto-regulated. The asterisk in the right panel denotes that the oxidized BvgST355C+D442C variant migrates slightly faster than the wild type control. Note that *in vivo* S-S bond formation was confirmed by the observation that the recombinant strain producing the BvgST355C+D442C variant does not respond to nicotinate modulation, unless the S-S bond is reduced (see Fig. S5). The other non-functional BvgS variants are presented in B, showing that they are all produced and localized in the membrane.