Expanded View Figures

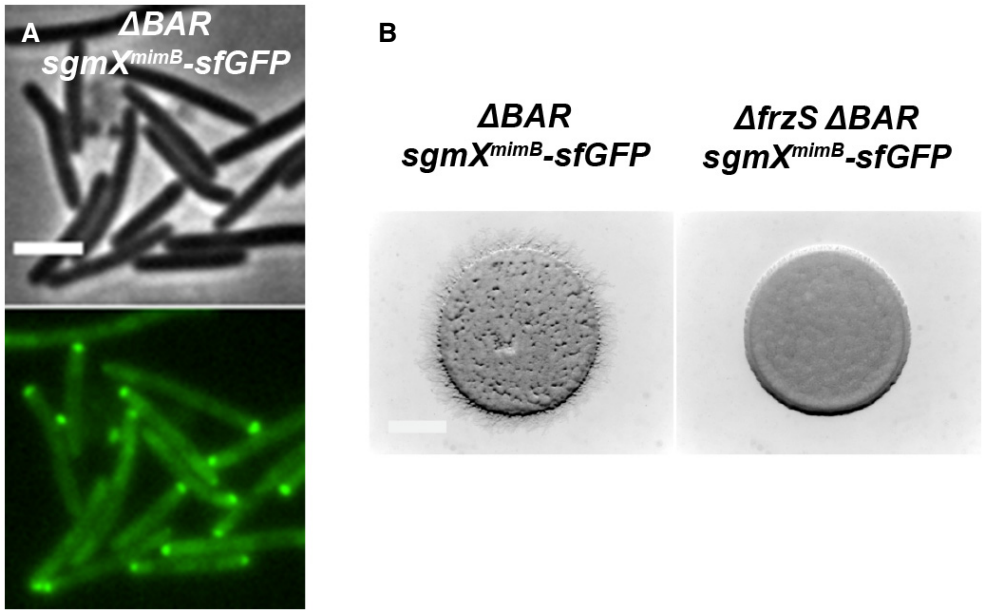

Figure EV1. FrzS is also important for SgmX polar localization and S-motility in a *mim* variant.

A Phase-contrast (top) and corresponding epifluorescence (bottom) images of the strain RM288 (*ΔBAR sgmX^{mimB}-sfGFP*) (Scale bar: 3 μm).
B Motility phenotypic assay of the strain RM288 (*ΔBAR sgmXmimB-sfGFP*, left) *and* RM302 (*ΔfrzS ΔBAR sgmX^{mimB}-sfGFP*, right) on a hard agar plate (Scale bar: 2 mm).

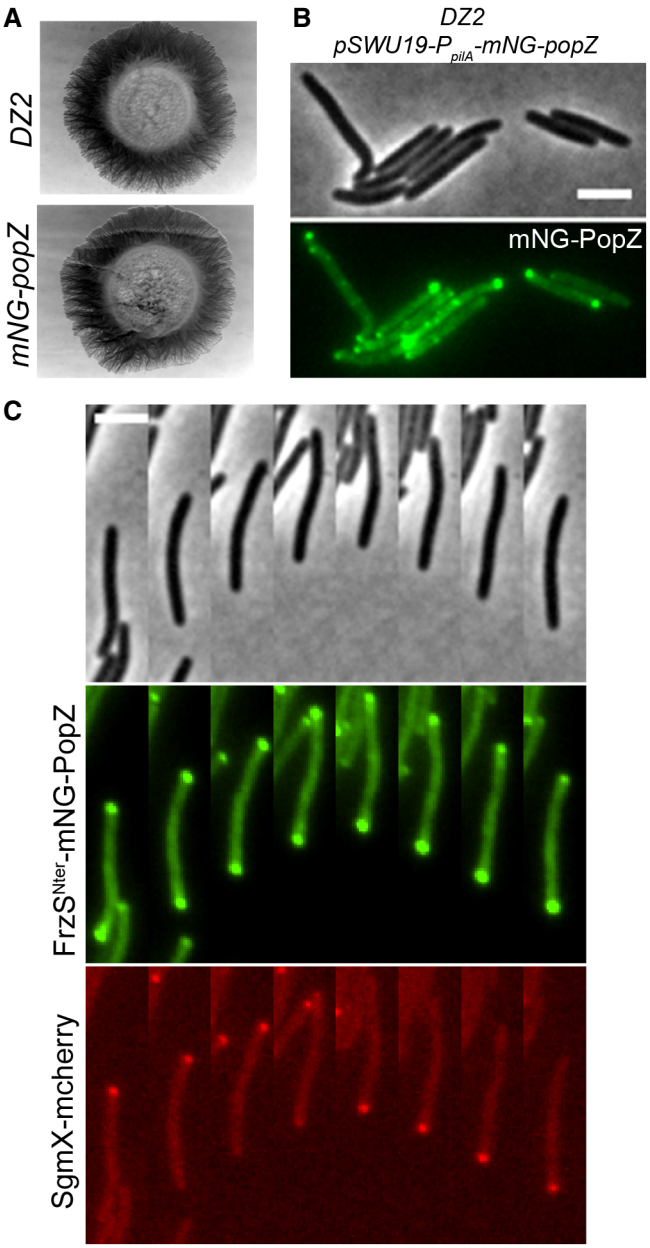

Figure EV2. PopZ protein localizes at *M. xanthus* cell poles.

A Motility phenotypic assay of strains DZ2 and DZ2 expressing mNG-popZ (RM500, DZ2 *attMx8:: P_{pilA}-mNG-popZ*) *on the soft agar plate.*

B Phase-contrast (top) and corresponding epifluorescence (bottom) images of the strain RM500 (DZ2 *attMx8:: P_{pilA}-mNG-popZ*) expressing *mNG-popZ* (Scale bar: 3 μm).

C Times series representing the phase-contrast (Phase) and epifluorescence (mNG-PopZ and SgmX-mcherry) images of the dynamic localization of SgmX-mcherry in *M. xanthus* cells of the strain RM502 (*ΔfrzS sgmX-mcherry attMx8:: P_{pilA}:frzS^{Nter}-mNG-popZ*) during a cellular reversal (Scale bar: 3 μm). See also Movie EV1.

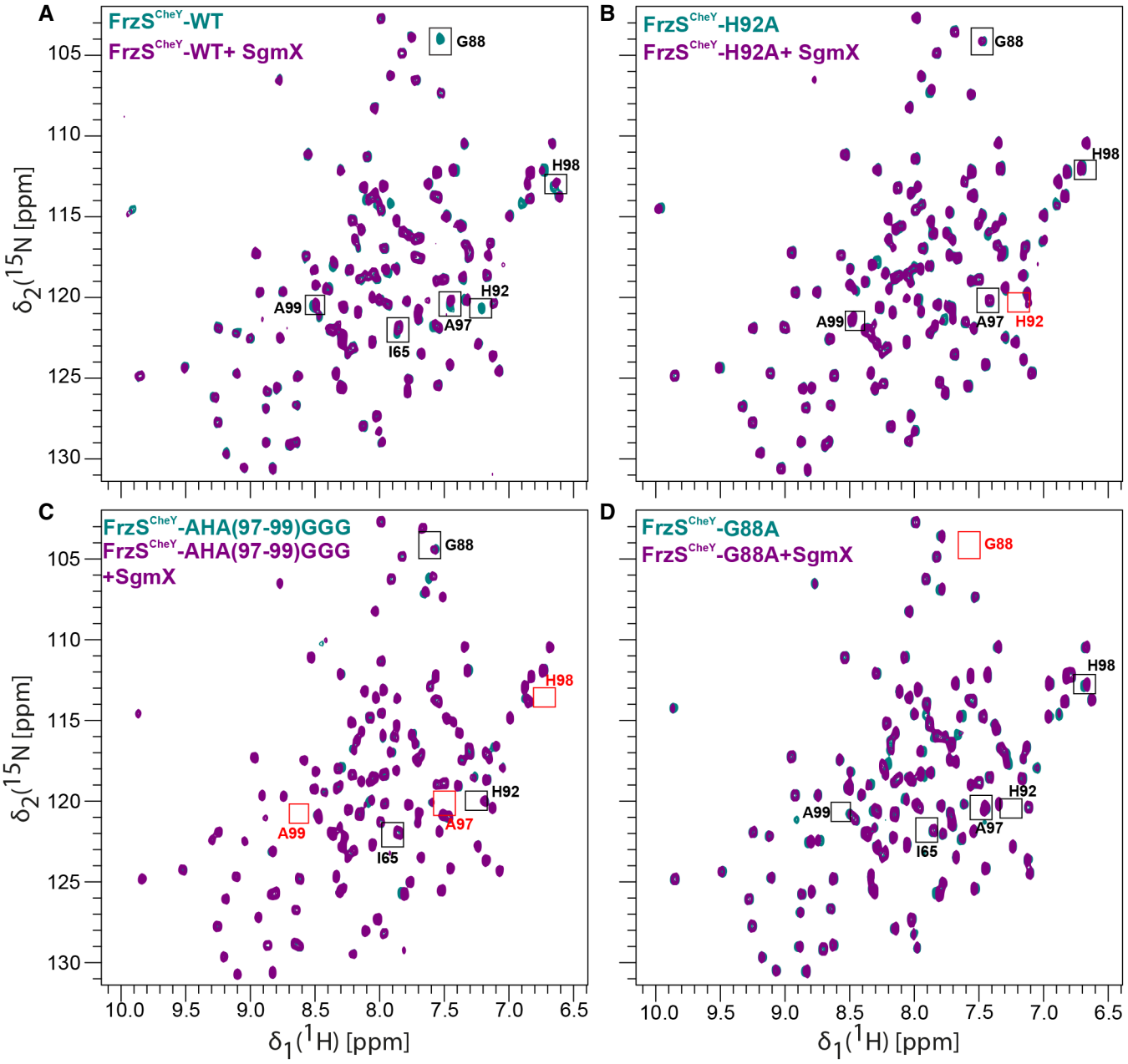

Figure EV3. NMR spectroscopy of FrzS^{CheY} upon SgmX interaction.

A–D Superposition of 2D ^{1}H, ^{15} N HSQC spectrum of 0.10 mM ^{15} N-labelled FrzS^{CheY} (A) or FrzS^{CheY}-H92A (B), FrzS^{CheY}-AHA(97–99)GGG (C) and FrzS^{CheY}-G88A (D) point mutants in the absence (teal) and in the presence of SgmX (purple) recorded at 298 K in 50 mM Tris pH 7.2 with 150 mM NaCl and 5 mM $MgCl_2$ in 95%/5% D2O. Resonances of targeted residues in these experiments are framed. Red empty frames correspond to the resonance position of the mutated residue. Note that panels A from this figure and Fig 4 originate from the same dataset.