Lipid effects on the gating behaviour and reconstitution of MscL and MscS

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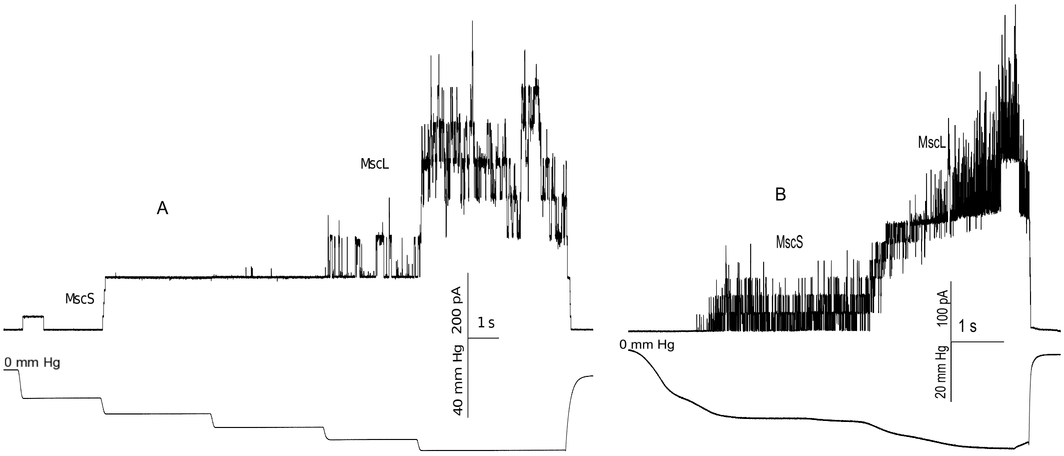
The *m*echanosensitive *c*hannels of *l*arge (MscL) and *s*mall (MscS) conductance act as osmosensors in bacterial cells against hypo-osmotic shock (Martinac, 2007). MscL has been extensively studied by reconstitution into liposomes (Häse *et al.*, 1995; Moe & Blount, 2005), however MscS has proved more difficult to reconstitute, requiring high protein-lipid ratios (Sukharev, 2002; Vásquez *et al.*, 2007). We recently published an improved reconstitution method for both MscL and MscS in soy azolectin (Battle *et al.*, 2009), a mixture that contains lipids, sugars and sterols. We have expanded these results and show here the effect of both individual and mixtures of lipids on the reconstitution and channel gating behaviour of co-reconstituted MscL and MscS. Introduction of the highly charged lipid cardiolipin causes rapid gating of MscS (Figure, A) in comparison to soy azolectin (Figure, B), indicating that lipid charge may play a significant role on channel gating dynamics.



***MscS/MscL co-reconstitution*. *A*: in soy azolectin. *B*: in mixture of phosphatidyl ethanolamine/ phosphatidyl choline/cardiolipin at a wt/wt ratio of 7:2:1, both recordings at a pipette voltage of +30 mV.**

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