Prior probability distributions used for parameter estimation k_1 - Rate constant of O_2 reduction k₃ - Rate constant of cbb₃ reduction l₁ - Rate constant of NO reduction 0.00400.0040 0.0035 0.005 0.0035 0.0030 Probability 0.003 0.003 0.00300.0025 0.00250.0020 0.00200.0015 0.0015 0.002 0.0010 0.00100.001 0.0005 0.0005 0.0000 0.000 0.0000 300 $\mu {\rm M}^{-1} {\rm s}^{-1}$ $\mu M^{-1} s^{-1}$ $\mu {\rm M}^{-1} {\rm s}^{-1}$ l₃ - Rate constant of NorB reduction m_1 - Rate constant of NO_2^- reduction m₃ - Rate constant of AniA reduction **Uninformed Prior Uninformed Prior** 0.004 Probability 0.003 0.002 Probability Probability 0.001 0.000 0.12 0.04 0.06 0.08 0.00 0.00 0.02 0.10 0.14 0.16 $\mu M^{-1} s^{-1}$ β - Rate constant of $\mu M^{-1} s^{-1}$ passive diffusion of O₂ k₅ - Rate constant of cbb₃ denaturing k₆ - Rate of cbb₃ recovery 0.0060.0045 0.016 0.0040 0.014 0.005 0.0035 0.012 0.0040.0030 Probability Probability 0.010 0.0025 0.008 0.003 0.0020 0.006 0.002 0.0015 0.004 0.0010 0.001 0.0020.0005 0.000 0.000 0.0000 20000 0.00014 0.00015 0.00012 0.00016 15000 0.00013 5000 10000 ა s⁻¹ $\mu M^{-1} s^{-1}$ $\mu\mathrm{M}^{-1}\mathrm{s}^{-1}$ f - Rate constant of γ - Loss of NO g - Rate of electrons in reduction of cytochromes 0.0045 0.0045 0.30 0.0040 0.0040 0.25 0.00350.0035 Aropapility 0.20 0.15 0.10 0.0030 0.00250.0025 0.0020 0.0015 0.0015 0.0010 0.00100.05 0.0005 0.0005 0.0000 0.00 0.003 0.004 0.5 0.9 1.2 1.3 14 0.005 0.006 0.007 0.008 0.009 0.010 0.011 0.8 $\mu M^{-1} s^{-1}$ $\mu \rm Ms^{-1}$ A - AniA concentration Q - Quinone concentration X - Cytochrome concentration 0.0040 0.0025 **Uninformed Prior** 0.0035 0.0020 0.0030 Probability 0.0025 0.0015 0.0020 0.0010 0.0015 0.0010 0.0005 0.0005 0.0000 0.0000.0 0.00 10 12 ૭ 30 14 Ŵ 50 6 60 μ M μ M μ M C - cbb₃ concentration B - NorB concentration 0.0014 0.007 0.0012 0.006 0.0010 0.0050.0008 0.0040.0006 0.003 0.0004 0.002 0.0002 0.001 0.0000 0.000 0.05 0.30 0.10 0.10 0.15 0.05 0.15 0.00 0.20 0.00 0.20 0.25

 μ M

 μ M