Posterior probability distributions created by parameter estimation k_1 - Rate constant of O_2 reduction k_3 - Rate constant of cbb_3 reduction l_1 - Rate constant of NO reduction 0.009 0.007 0.045 0.008 0.040 Prior Prior Prior 0.006 0.007 0.035 Posterior Posterior Posterior 0.005 Probability 0.006 0.030 Probability 0.0040.005 0.025 0.004 0.020 0.003 0.003 0.015 0.002 0.0020.0100.0010.0010.005 0.000 0.000 0.000 300 50 30 $\mu M^{-1}s^{-1}$ $\mu M^{-1}s^{-1}$ m_1 - Rate constant of NO_2^- reduction l_3 - Rate constant of NorB reduction *m*₃ - Rate constant of AniA reduction 0.012 0.008 Prior Prior Prior 0.010 0.8 0.007 Posterior Posterior Posterior Probability 0.006 0.004 Probability 70 9.0 9.0 0.0060.005 0.004 0.003 0.002 0.2 0.002 0.001 0.000 0.0 0.000 0.14 0.16 0.5 6.0 0.1 00 0.4 $\boldsymbol{\beta}$ - Rate constant of $\mu M^{-1}s^{-1}$ $\mu M^{-1}s^{-1}$ k_6 - Rate of cbb_3 recovery passive diffusion of O₂ - Rate constant of *cbb*₃ denaturing 0.20 0.014 0.012 Prior Prior Prior 0.012 0.010 0.15 Posterior **Posterior** Posterior 0.010 Probability 0.008 0.004 Probability 0.008 0.0060.004 0.05 0.002 0.002 0.00 0.000 0.000 20000 0.00012 0.00013 0.00015 10000 0.00014 0.00016 15000 5000 $\mu M^{-1}s^{-1}$ $\mu M^{-1}s^{-1}$ f - Rate constant of y - Loss of NO g - Rate of electrons in reduction of cytochromes 0.012 0.06 0.30 Prior Prior Prior 0.05 0.010 0.25 Posterior Posterior Posterior Probability 0.03 0.02 Probability Probability 0.008 0.20 0.006 0.15 0.004 0.10 0.01 0.002 0.05 0.00 0.000 0.004 0.003 0.2 0.5 1.5 0.005 0.006 0.007 0.008 0.009 0.010 0.017 0.3 0.5 10 20 00 0.7 9.6 0.4 00 $\mu M^{-1} s^{-1}$ μMs^{-1} X - Cytochrome concentration A - AniA concentration Q - Quinone concentration 0.0040 0.08 3.0 0.0035 Prior Prior 0.07 Prior 2.5 0.0030 0.06 Posterior Posterior Posterior Probability 1.5 1.0 0.05 0.00250.04 0.00200.03 0.00150.0010 0.02 0.5 0.0005 0.01 0.00 0.0000 L 0.0 10 Q_{4} 50 0.6 1.2 20 20 20 30 00 0.4 0.8 60 μM μΜ C - cbb_3 concentration B - NorB concentration 0.00120.007 Prior Prior 0.006 0.0010Posterior Posterior 0.005 0.0008 0.004 0.0006 0.003 0.0004 0.002 0.00020.0010.0000 0.000 20 15 0.5 15 10 2.0 00 25 20 μM

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