**Supplementary file 1. Mean values and confidence intervals for probabilities and mean first passage times calculated from the Bayesian MSM, the confidence intervals are calculated at a confidence level of 95%.**

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| **VSD I WT** | mean / µs | lower limit | upper limit |
| mfpt(Resting 3-Activated) | 260 | 130 | 350 |
| mfpt(Activated-Resting 3) | 558 | 300 | 710 |
| mfpt(Resting 2-Resting 3) | 560 | 320 | 760 |
| mfpt(Resting 3-Resting 2) | 2126 | 1800 | 2600 |
| mfpt(Resting 1-Resting 2) | 611 | 380 | 850 |
| mfpt(Resting 2-Resting 1) | 2354 | 2000 | 2650 |

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| **VSD IVe** | mean / µs | lower limit | upper limit |
| mfpt(Resting 3-Activated) | 0.9 | 0.5 | 1.5 |
| mfpt(Activated-Resting 3) | 1.3 | 0.7 | 3.6 |
| mfpt(Resting 2-Resting 3) | 0.5 | 0.3 | 1.3 |
| mfpt(Resting 3-Resting 2) | 1.1 | 0.8 | 2.6 |
| mfpt(Resting 1-Resting 2) | 0.8 | 0.4 | 2.0 |
| mfpt(Resting 2-Resting 1) | 1.2 | 0.9 | 1.7 |

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| **VSD IVa** | mean / µs | lower limit | upper limit |
| mfpt(Resting 3-Activated) | 3.0 | 2.0 | 4.7 |
| mfpt(Activated-Resting 3) | 6.0 | 4.5 | 8.0 |
| mfpt(Resting 2-Resting 3) | 0.6 | 0.3 | 1.2 |
| mfpt(Resting 3-Resting 2) | 1.0 | 0.7 | 1.9 |
| mfpt(Resting 1-Resting 2) | 3.0 | 2.1 | 4.1 |
| mfpt(Resting 2-Resting 1) | 6.0 | 4.0 | 7.5 |

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| **VSD I E87A/E90A** | mean / µs | lower limit | upper limit |
| mfpt(Resting 3-Activated) | 8.0 | 6.0 | 11.0 |
| mfpt(Activated-Resting 3) | 13.0 | 10.5 | 17.0 |
| mfpt(Resting 1/2-Resting 3) | 18.0 | 15.5 | 20.0 |
| mfpt(Resting 3-Resting 1/2) | 14.0 | 12.5 | 16.0 |

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| **VSD I E87A** | mean / µs | lower limit | upper limit |
| mfpt(Resting 3-Activated) | 142 | 90 | 200 |
| mfpt(Activated-Resting 3) | 221 | 180 | 310 |
| mfpt(Resting 2-Resting 3) | 484 | 375 | 680 |
| mfpt(Resting 3-Resting 2) | 271 | 195 | 360 |
| mfpt(Resting 1-Resting 2) | 157 | 100 | 220 |
| mfpt(Resting 2-Resting 1) | 430 | 280 | 570 |

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| **VSD I E90A** | mean / µs | lower limit | upper limit |
| mfpt(Resting 3-Activated) | 5.0 | 3.0 | 7.5 |
| mfpt(Activated-Resting 3) | 8.0 | 5.5 | 10.0 |
| mfpt(Resting 1/2-Resting 3) | 14.0 | 11.8 | 17.0 |
| mfpt(Resting 3-Resting 1/2) | 10.0 | 8.7 | 12.4 |