Modeling the interactions between stimulation and physiologically induced APs in a mammalian nerve fiber: dependence on frequency and fiber diameter

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Supplementary information

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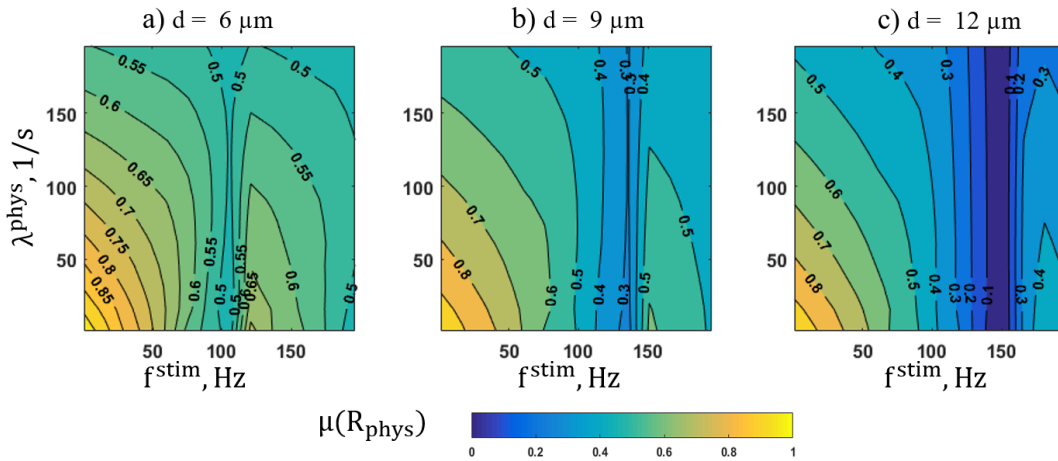Baltimore, MD 21287, USA
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Fig. S1 Conduction map of physiological APs maps of mechanistic model for 6,9 and 12 μm diameters. Contour map of conduction reliability values for a range $(1\,\text{s}^{-1}$ to $200\,\text{s}^{-1})$ of physiological frequency (Y-axis) and $(1\,\text{Hz}$ to $200\,\text{Hz})$ stimulus frequency (X-axis). Color gradient represents the mean of reliability values (0-1) with yellow (1) being the highest relay and purple (0) being the lowest.

Fig. S2 Conduction map of stimulus APs of mechanistic model for 6,9 and 12 μm diameters. Contour map of reliability values for a range $(1\,\text{s}^{-1}$ to $200\,\text{s}^{-1})$ of physiological frequency (Y-axis) and $(1\,\text{Hz}$ to $200\,\text{Hz})$ stimulus frequency (X-axis). Color gradient represents the mean of reliability values (0-1) with yellow (1) being the highest relay and purple (0) being the lowest.
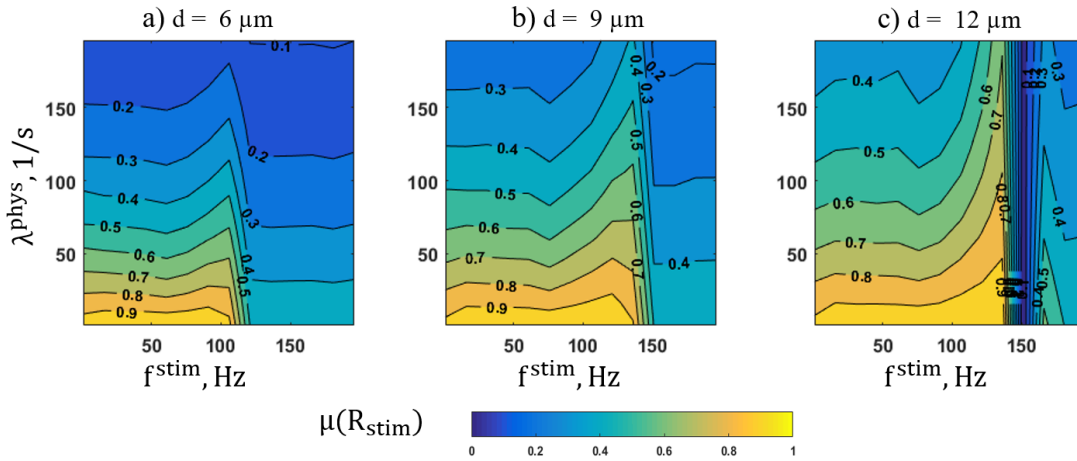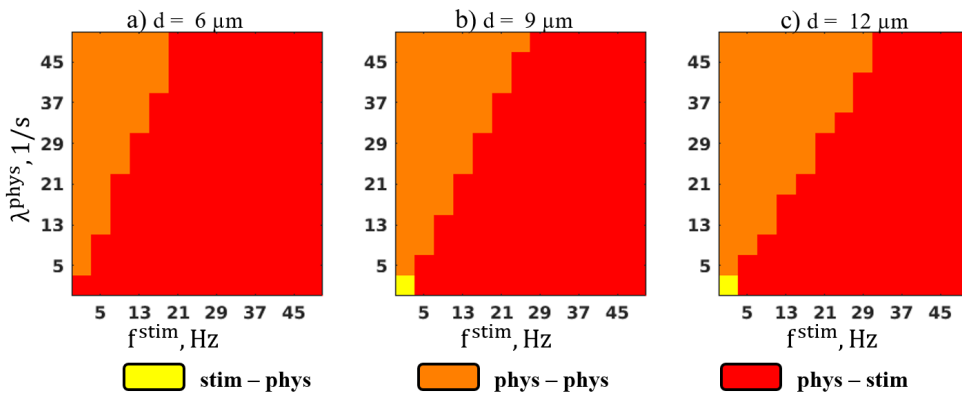

Fig. S3 Dominance of interactions in a conduction map. Yellow represents stimulus – physiological loss of excitability, orange represents physiological – physiological loss of excitability and red represents physiological – stimulus loss of excitability. Dominance represents the interaction type with maximum interaction count.
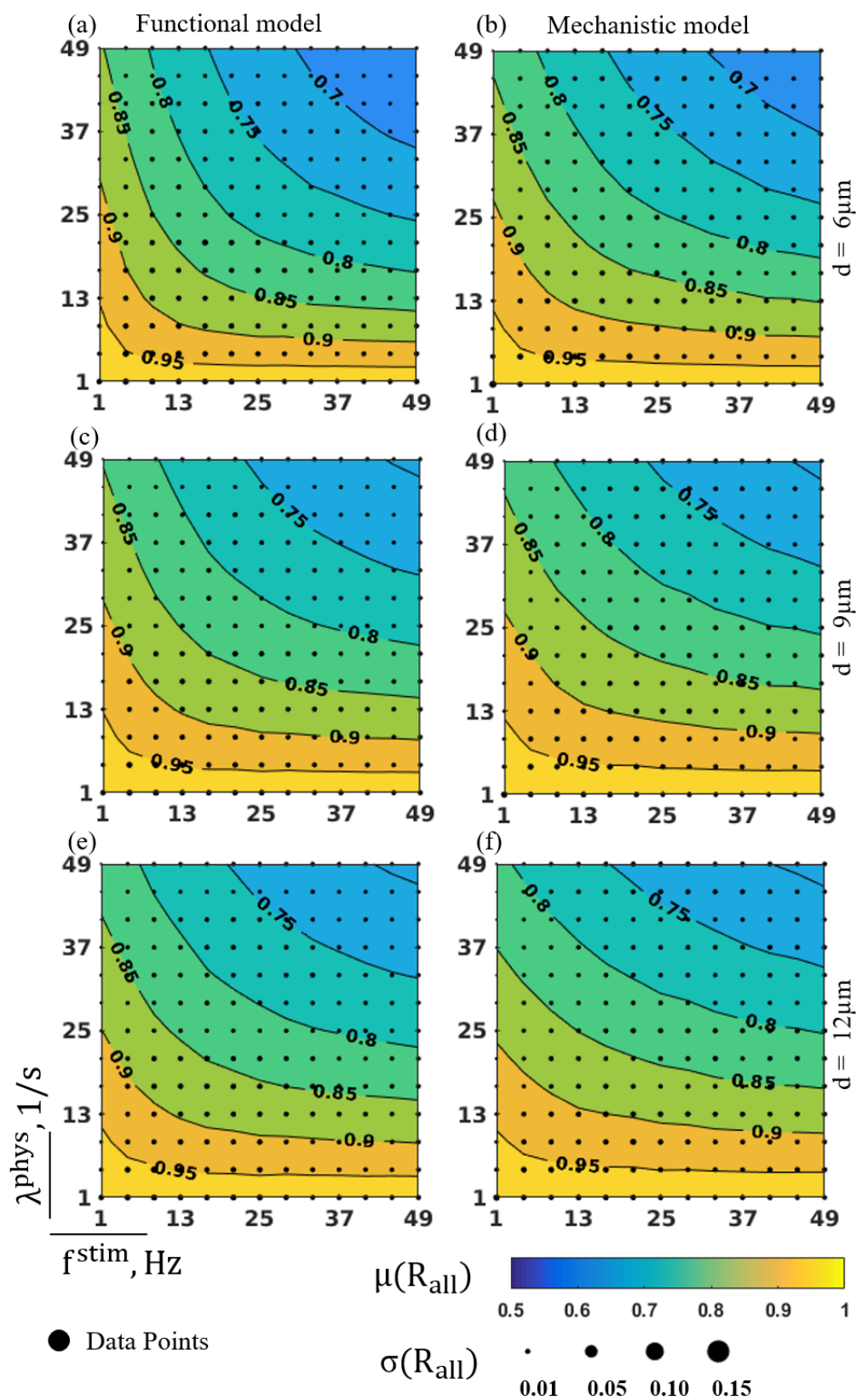
Fig. S4 Conduction maps of all action potentials for functional and mechanistic models. Contour map of reliability values for a range $(1\,\mathrm{s}^{-1}$ to $200\,\mathrm{s}^{-1})$ of physiological frequency (Y-axis) and $(1\,\mathrm{Hz}$ to $200\,\mathrm{Hz})$ stimulus frequency (X-axis). Black dots represent the data points. Color gradient represents the mean of reliability values $(\mu(R_{all}) = [0.5–1])$. Size of the dot represents the standard deviation $(\sigma(R_{all}))$ of reliability values..

Table S1 Three group, one-way ANOVA statistics for interaction count in 6 μm, 9 μm and 12 μm diameter fibers

	Interaction	collision		phys - phys		phys - stim		stim - phys	
	Measure	p	$F(2,147)$	p	$F(2,147)$	p	$F(2,147)$	p	$F(2,147)$
	1	0.62	0.48	0.14	1.98	3e-4	8.58	0.908	0.098
	2	2.86e-08	19.59	8.34e-32	121.074	1.98e-22	71.56	1.77e-3	6.61
Region	3	5.58e-22	69.54	7.78e-13	33.90	3.77e-45	222.08	5.61e-05	10.46
	4	1.92e-05	11.70	0.08	2.46	2.19e-31	118.54	0.03	3.52
	5	4.72e-45	221.18	1.34e-17	51.18	1.40e-32	125.87	4.93e-14	38.01