

Of Mice and Math: four models, four collaborations

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The title is meant to suggest that mathematics can be a link between experimental science and practical medicine, although in reality only a few mice will actually appear in this talk. I hope to tell you a story of discovery through interdisciplinary collaboration. In particular, I will tell you about four collaborations between mathematicians and scientists in which I have taken part. How can we make the ideal time-release tablet? How much blood-thinner should we prescribe? What are the best shoes to wear to improve your balance? When do we need to perform a Caesarian? These problems illustrate different modeling modalities and different mathematical techniques used to reach different goals, but all of them bridge the gap from bench to bedside, and beyond.