Preface

It has been only 12 years since the original publication of *Guide to Research Techniques in Neuroscience*, and only 7 years since the second edition. Yet the field of neuroscience has already reinvented itself yet again. Just over a decade ago, there seemed to be a gulf between electrophysiologists and geneticists, systems neuroscientists and molecular biologists, research in vivo and research in vitro. The rapid pace of discovery, innovation, and ingenuity has allowed for a rapid expansion of experimental tools, and these tools have also allowed separate subfields to come together to provide a holistic investigation of the nervous system. It is now possible for a single study to identify a novel population of neurons, determine their gene expression profiles, record their activity patterns, correlate their activity with behavior, map their structure, perturb their function, and analyze circuit level properties in an intact nervous system. There are so many new tools to learn about and become familiar with.

The original coauthors, Matt Carter and Jennifer Shieh, somehow wrote the first edition of this book in-between experiments as graduate students. Since that time, Matt completed a postdoc, started a faculty position at Williams College, and now has tenure in the Biology Department and Program in Neuroscience where he uses this book in his Physiology and Neuroscience courses. Jennifer Shieh started a successful career in scientific policy, working at the National Institutes of Health, White House Office of Science and Technology Policy, and U.S. Small Business Administration. Moving on from day-to-day bench science, Jennifer decided to end her stewardship of this book that she helped create to allow a new generation of neuroscientists to offer their own contributions. Who better to serve as new coauthors for a third edition than a new crop of neuroscience graduate students, each working with a variety of cutting-edge techniques on a daily basis? And who better to recruit than Matt's first few honors thesis students at Williams, who are now finishing doctoral dissertations of their own?

Therefore, this third edition welcomes three new coauthors: Rachel Essner, completing her Ph.D. in the Harvard Program in Neuroscience; Nitsan Goldstein, completing her Ph.D. in the University of Pennsylvania Neuroscience Program; and Manasi Iyer, completing her Ph.D. in the Stanford Neurosciences Program. Each brings a wealth of knowledge for a diverse array of neuroscience techniques, as well as a fantastic ability to communicate complex information to others. As always, working in-between experiments, we all spent hours

modernizing this book for the 2020s. Because we all have a connection with Williams College, we have dutifully made the book's cover a shade of Williams purple. We thank our Williams colleagues and friends, as well as those at Harvard, UPenn, and of course, Stanford, where this book originally began, for their support and encouragement.

Please feel free to reach out to any of us for requests, suggestions, or feedback. So many improvements from the first and second editions are due to your thoughtful comments and ideas. We cannot wait to experience the innovation and advancement of new neuroscience techniques over the next several years.

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