Preface

There comes a point in the career of a scientist when he or she should write a book about his or her subject of interest. Two of us always wondered when and how this was going to happen. Now we know: by pure accident. And, here is one word of advice: You are often warned not to get involved in the book business. Please consider those who are warning you as your best friends; they know what they are talking about. However, one day, we received an e-mail (actually much longer ago than we would have anticipated) asking whether we would be willing to write a book about the effects of gravity on single cells. One of us knew what that meant; he warned us, but we agreed anyway. Finally, all three of us completed the project, and we learned a lot in the process. So, thank you, Peter Barlow and Cambridge University Press for keeping your faith in us.

Those who teach about gravity effects on living systems, including single cells, quickly realize that this weak force seems to have escaped human attention. Although we all had strong fights with gravity, especially during the early phase of our lives, it seems that afterward, we have almost completely forgotten about it. However, for all living organisms in our world, it is the one parameter most steadily encountered. Gravity is so basic for all of us that it is almost hardwired into our interpretation of reality. Gravity is not only related to living organisms; convection and the weather are two other subjects that come to mind when thinking about gravity.

For more than 100 years, scientists have been fascinated to observe the effects of gravity on single, free-swimming cells. The reason is that these little cells have the same capability as humans to tell up from down, but they do it in a single cell. And, even though it may seem to be an eccentric subject to study, this swimming behavior bears a much closer relation to daily life than one might expect. First, it becomes more and more clear that, in terms of biochemistry, single cells detect gravity in much the same way as do higher, more organized, multicellular

organisms – and that is one of the things we want to show in this book. In addition, single cells are heavily involved in assembly and disassembly (either as consumer or as producer) of organic matter, and by this means are essential for food webs. Finally, photosynthetic cells are important oxygen sources and carbon dioxide sinks – topics coming more strongly to public attention in these times of global warming and climate change.

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