# *PREFACE*

The National Institutes of Health (NIH) is the world's largest public funder of biomedical and behavioral research. In FY2023, NIH invested nearly 83% of its roughly $48 billion budget in extramural research, primarily through awarding almost 50,000 competitive grants at over 2,500 universities, medical schools, and other research institutions in every state and around the world (https://www.nih.gov/about-NIH/what-we-do/budget). The American public continues to be very generous in its support of the biomedical and behavioral research efforts of the NIH to turn scientific discoveries into improved ways to prevent, diagnose, and treat illness. In spite of that generosity, however, demand for NIH research dollars in recent years has largely outpaced their supply. As a result, investigators are experiencing great difficulty in meriting the funds needed to do the research.

The graph below (adapted from https://report.nih.gov/nihdatabook/report/20) illustrates that, in 2001, the success rate (line) for NIH Research (R) Project Grants (RPGs) was 32%. By 2013, that number had been cut nearly in half, falling to an all-time low of 17%. This decline was due, in large part, to an ever-expanding number of investigators who needed grant support at a time when base support for biomedical and behavioral research was decreasing. Between 2001 and 2013, the number of submitted applications for RPGs increased by 75% (tall bars) and the number of grants awarded decreased by 10% (short bars). Further, there were 25% fewer funds (normalized to 1986) available in constant dollars to support RPGs in 2013 compared to 2003 – just ten years earlier (https://nexus.od.nih.gov/all/2014/10/28/retention-of-first-time-r01-awardees/). Collectively, those trends contributed to what the authors of a 2014 policy paper in the *Proceedings of the National Academy of Sciences* (Rescuing US Biomedical Research from Its Systemic Flaws, [2014] 111, 5773-5777; https:// www.pnas.org/doi/epdf/10.1073/ pnas.1404402111) referred to as an era of "hypercompetition."
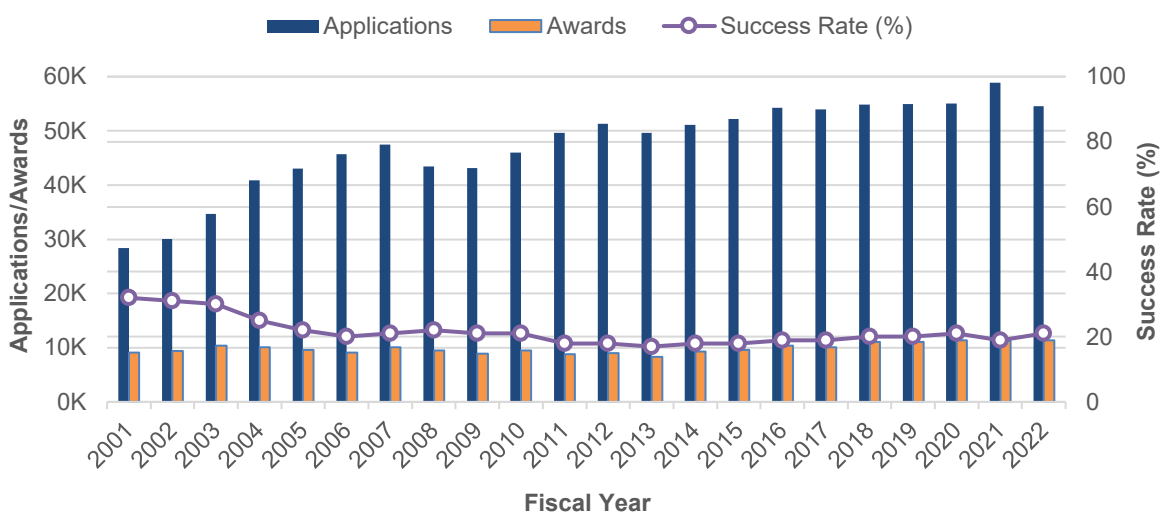
Since 2013, things have fortunately improved somewhat. Over the last decade, the average size of awards in current dollars has increased by 34.3%, and the average award size in constant dollars (normalized to 1998) between 2013 and 2020 increased by 7.6% (FY2021 and FY2022

constant dollars were not available as of this writing). Also, the graph below reflects that the number of unique applicants (tall bars) competing for RPGs has largely stabilized since 2015 after a steady increase since 2003 (https://nexus.od.nih.gov/all/2022/05/03/how-many-research-ers-the-fy-2021-cumulative-investigator-rate/). This has contributed to an increase in both the number of funded investigators (short bars) and cumulative investigator rate (line)—the likelihood that unique investigators are funded over a 5-year window. Notwithstanding, competition for grant funds remains fierce. The main problem for most grant applicants remains hypercompetition, which may ebb and flow but is unlikely to end soon, in our opinion. Successful grant applicants will be those who have unwavering commitment to making the adjustments necessary to cope with today's (and tomorrow's) reality.
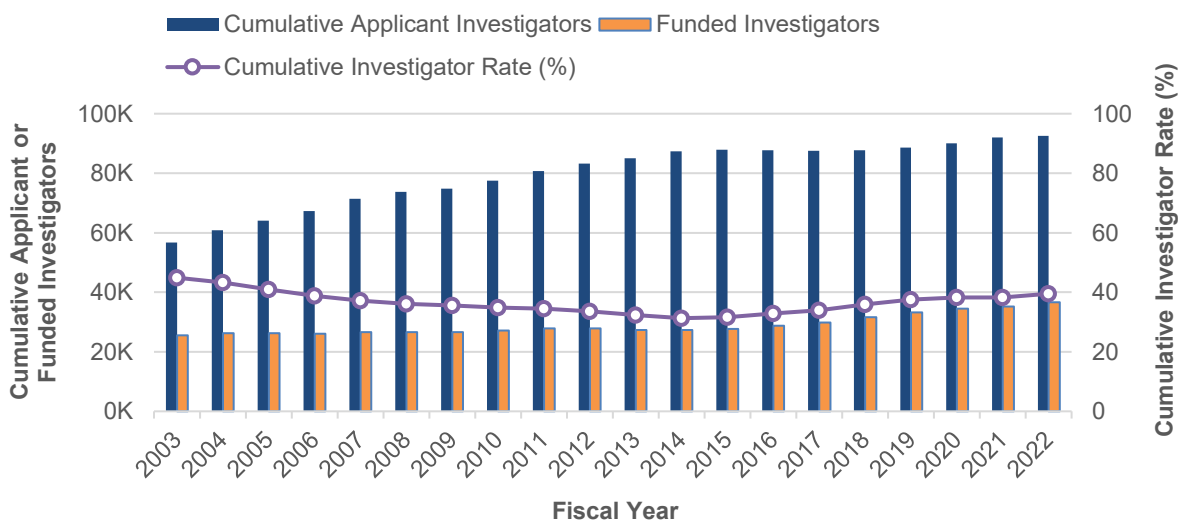
Those facts bring us to the premise of this *Workbook*, which is: To be successful in these hyper-competitive times, you must do far more than your peers to ensure that your grant proposal is competitive. You must take a strategic, "no-stone-left-unturned" approach that maximizes the efficiency of the proposal-writing process and thus your application's competitiveness. This *Workbook* will help you to take those critical "extra" steps that we consider keys to success. That position is based on our personal experience writing successful grant applications, collective experience of more than 20 years serving on NIH study sections, and 29 years' experience since GWSW was founded in helping literally thousands of other investigators write grant proposals. To us, it stands to reason that, if you do more to position your proposal for success than your competitors do, it will be your applications that prevail, and it will be theirs that fail.

In the theater, the last words of encouragement that an actor often hears before going on stage are, "Break a leg." We don't know what the equivalent is with respect to writing a grant application, but whatever it is, it would likely translate as, "Good luck." But, as you will see, luck doesn't play much of a role in the process of getting funded – unless, of course, it is the kind that Thomas Jefferson was referring to when he wisely remarked, "I'm a great believer in luck, and I find the harder I work the more of it I have." We agree with him, so let's get to work!

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