It is encouraging to see that NIH is concerned about the growing costs of scientific publication. Journals have increasingly moved to an open access model, which has the great advantage of allowing anyone to read manuscripts without paying a subscription fee and improves access to scientific research for the general public. However, the APCs that the journals charge the authors to enable this access are often far in excess of the costs involved, contributing to the ~30% profit margin of for-profit publishers. Scientists can't shop around—there are usually only one or two journals that are the best fit for a given paper—and so the publishers essentially have a monopoly on many fields. APCs have consistently increased over the years as there is little incentive for publishers to lower them. For some of the most visible, high-impact journals, APCs are now above $10,000—enough money to pay for a substantial portion of a graduate student's salary or run an additional set of experiments. Pressure from NIH to lower the costs may help to counter this unbounded growth.

Not all journals embrace high APCs. Large APCs are mostly adopted by for-profit publishers, and many fields have non-profit or society-managed journals available with APCs of $2000 or below. In 2023, the editorial board of the flagship journal NeuroImage, published by Elsevier, resigned in protest of the constantly-rising APC to start a nonprofit alternative, Imaging Neuroscience, with a much lower APC. Similar transitions have occurred in other fields, evidence of the scientific community's desire for less expensive alternatives. Nevertheless, society-owned journals and nonprofit publishers cannot be the entire solution to the problem. Society journals typically cater to a particular research niche and lack the breadth of readership of more generalist journals, and existing nonprofit publishers simply lack the infrastructure to host a substantial migration of journals from for-profit publishers. New solutions are needed. Thoughts on the options proposed by NIH are:

1) *Disallow all publication costs*. This option would strangle the dissemination of scientific research. Institutions and private funders do not have the resources to replace the funding currently provided by NIH. There are a number of preprint servers available (arXiv, biorXiv, etc.) where researchers routinely share the results of their work prior to journal publication, but while free, these outlets lack the most important feature provided by journals—peer review. Consistent, rigorous peer review is essential to ensure the quality of scientific results. Papers at reputable journals undergo multiple rounds of review by several reviewers and editors, with each round of review addressing weaknesses and improving the quality of the work. Comments, voluntary reviews, and generic 'likes' of preprints cannot give the same level of consistent critique. Any solution to the problem of publication expenses must retain peer review. The kind of detailed, deep knowledge of a field needed to provide a good review cannot be outsourced to tools such as AI.
2) *Set a limit on costs per publication*. This option might have the desirable effect of convincing authors to migrate to nonprofit or society journals, and may encourage some for-profit journals with relatively low APCs to stay below the threshold. However, as long as the impact of the journal where publication occurs is heavily weighed in NIH's assessment of research productivity and universities' promotion and tenure decisions, high-impact journals will still be able to command a premium. Institutions, private funders, or individual researchers will have to make up the difference. It should also be noted that the mean APC varies substantially across fields, and setting the cap at $2000 might have disproportionate effects.
3) *Set a limit on costs per publication that is higher when reviewers are compensated*. Paying reviewers sounds like a good idea, but in practice, it can have undesirable side effects. Unless the payments are substantial, which would increase costs, they will remain a token acknowledgement of the effort that reviewers invest while increasing the complexity of journal administration. Very junior researchers or researchers in countries with lower incomes may be

disproportionately attracted to the review process, which could lead to a lower quality of review and/or bias introduced by having a handful of reviewers providing most of the reviews for an entire field. Researchers may even provide superficial reviews for pay in areas where they are not truly experts. In the current unpaid system, reviewers rarely agree to review a paper unless it is close enough to their expertise that they are interested in reading it anyway. It is difficult to recruit reviewers, but perhaps the answer is to consider this aspect of service to the community as part of the research process. Reviewing papers contributes to researchers' scientific growth and promotes deep consideration of work that is not their own, providing new perspectives. As an example of how this could be encouraged, perhaps a researcher could include the number of relevant manuscripts reviewed as part of a progress report. AI is already increasing the number of (often bad) papers submitted, and the burden on reviewers and editors is only going to grow.

4) *Set a limit on total amount of award spent on publication costs*. This option allows the PI to choose how to divide publications between high impact, high APC journals and less expensive options. The flexibility is helpful and allows for differences in publication priorities across different fields. However, it does not produce any downward pressure on APCs in general. This approach also produces a de facto limit on the number of papers published—for the proposed $20,000 cap and average APC of $2000, that would be 10 papers or 2 papers per year for a five year grant. Many labs publish more than this, and the dissemination of results should not be discouraged. A limit on the number of papers may encourage researchers to write large manuscripts covering several years' worth of work at the expense of the detailed, foundational papers that are typically published in more specialized journals and provide other researchers with the means to reproduce the work.
5) *Limit the per publication cost and total amount of award spent on publication*. This option maintains much of the flexibility of #4 but would also place some downward pressure on APCs, which might help to reduce costs.

The diversion of funding from research projects to for-profit publishing companies is frustrating for researchers and funders alike. NIH should continue to work in collaboration with the scientific community to identify better solutions.

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