Why We Must Fund Medicinal Chemistry

The importance of modern medicine cannot be understated. Before modern medicine became widespread, dying of a simple infection was commonplace. Medicinal Chemistry, the field of designing and developing new drugs, is responsible for the creation of drugs such as penicillin, which combats infections. While this story of how modern medicine has changed society is commonplace (and rightfully so), many do not understand the importance of public research and development in this process. I'm willing to wager that a lot of Americans assume that the nebulous "Big Pharma" is responsible for all medicinal development. While to some extent, private pharmaceutical companies have advanced the field, public research is the backbone of all drug development.[1] However, the federal government has cut research subsidies expecting that private companies pick up the slack, as has been the case with Medicinal Chemistry.[2] If we don't restore these subsidies soon, the backbone of modern medicine will be permanently lost. For this reason, I believe that the scientific field of Medicinal Chemistry deserves more funding.

First, it's worth exploring why private pharmaceutical companies are unable to do a lot of the fundamental research that publicly funded science research labs do. Private companies have to make a profit, which means that the executives working for those companies have to be reasonably sure that research they choose to pursue will lead to a profitable drug. This means that any research pharmaceutical companies engage in has to be well developed before a

[1] Abbey Meller and Hauwa Ahmed, "How Big Pharma Reaps Profits While Hurting Everyday Americans," Center for American Progress, August 30, 2019, https://www.americanprogress.org/article/big-pharma-reaps-profits-hurting-everyday-americans/.

[2] Aatish Bhatia et al., "The U.S. Is Funding Fewer Grants in Every Area of Science and Medicine," The New York Times, December 2, 2025, https://www.nytimes.com/interactive/2025/12/02/upshot/trump-science-funding-cuts.html.

company will come in and expand on it. For example, if there is research indicating that a certain Amino acid chain can help relieve chronic pain, a pharmaceutical company might choose to develop a drug out of that research. However, that first step of researching Amino acids in the first place can never be done by private companies. Science involves researching the unknown for the benefit of society. Most research leads nowhere, and only a small fraction of research will ever lead to something greater, let alone a complete drug. In fact, National Institute of Health (NIH) research indicates that only 1 in 10,000 compounds selected as potential candidates for a drug ever become a marketable drug.[3] That success rate is way too low for private companies, which need to make a profit on the research they pursue. Essentially, the new and groundbreaking research that companies rely on comes from the public funding and support of Medicinal Chemistry.

The importance of public research underscores why continued support of Medicinal Chemistry is needed. While the loss of funding may only be temporary, its effects are not. Research is a multiyear process that involves continually doing experiments.[4] Simply pausing research is not an option without completely restarting, so short funding gaps can cost years of lost research. Additionally, it takes years to train science researchers. Undergraduate, graduate school, and post-grad can take a decade before someone is ready to do research. Because of these long schooling times, science relies on professors who have dedicated their life to the field that guarantee constant research. However, recent cuts to science mean that many researchers are considering leaving the US in pursuit of higher paying jobs unaffected by an unstable political environment. This loss would be devastating, as new researchers would not be available for a

[3] Duxin Sun et al., “Why 90% of Clinical Drug Development Fails and How to Improve It?,” Acta Pharmaceutica Sinica B 12, no. 7 (February 2022), https://pmc.ncbi.nlm.nih.gov/articles/PMC9293739/.
[4] Duxin Sun et al

very long time, and hours of research would be lost.[5] While this research could happen in other countries, it will still take years to re-establish the long existing research networks that exist in America. It is our pejorative to make sure that this loss of research doesn't occur. We can do this by increasing the amount of funding going towards the field of Medicinal Chemistry.

[5] Stephanie Sy, "Top Researchers Consider Leaving U.S. Amid Funding Cuts: 'the Science World Is Ending,'" PBS News, October 29, 2025, https://www.pbs.org/newshour/show/top-researchers-consider-leaving-u-s-amid-funding-cuts-the-science-world-is-ending.

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