The FASEB Journal / Volume 30, Issue 8 / pp. 2673-2683

Research

Labor and skills gap analysis of the biomedical research workforce

Julie L. Mason, Elizabeth Johnston, Sam Berndt, Katie Segal, Ming Lei, Jonathan S. Wiest

First published: 13 April 2016

https://doi.org/10.1096/fj.201500067R

PDF

ABSTRACT

The United States has experienced an unsustainable increase of the biomedical research workforce over the past 3 decades. This expansion has led to a myriad of consequences, including an imbalance in the number of researchers and available tenure-track faculty positions, extended postdoctoral training periods, increasing age of investigators at first U.S. National Institutes of Health R01 grant, and exodus of talented individuals seeking careers beyond traditional academe. Without accurate data on the biomedical research labor market, challenges will remain in resolving these problems and in advising trainees of viable career options and the skills necessary to be productive in their careers. We analyzed workforce trends, integrating both traditional labor market information and real-time job data. We generated a profile of the current biomedical research workforce, performed labor gap analyses of occupations in the workforce at regional and national levels, and assessed skill transferability between core and complementary occupations. We conclude that although supply into the workforce and the number of job postings for occupations within that workforce have grown over the past decade, supply continues to outstrip demand. Moreover, we identify practical skill sets from real-time job postings to optimally equip trainees for an array of careers to effectively meet future workforce demand.—Mason, J. L., Johnston, E., Berndt, S., Segal, K., Lei, M., Wiest, J. S. Labor and skills gap analysis of the biomedical research workforce. FASEB J. 30, 2673-2683 (2016). www.fasebj.org

REFERENCES

3 National Institutes of Health. (2012) *Biomedical Research Workforce Working Group Report.* Working Group of the Advisory Committee to the Director, NIH, Bethesda, MD, USA. Available at: http://acd.od.nih.gov/Biomedical_research_wgreport.pdf

Google Scholar

4 National Science Foundation. (2013) Survey of Doctorate Recipients. Table 77. Available at: http://ncsesdata.nsf.gov/doctoratework/2013/ (Doctoral scientists and engineers employed as postdoctoral appointees, by selected demographic characteristics and broad field of doctorates)

Google Scholar

5 National Institutes of Health. (2014) *New and Early Stage Investigator Policies.* Office of Extramural Research, NIH, Washington DC. Accessed January 4, 2016, at: http://grants.nih.gov/grants/new_investigators/new_investigator_data_1980_to_2011.ppt/

Google Scholar

6 Alberts, B., Kirschner, M. W., Tilghman, S., and Varmus, H. (2014) Rescuing US biomedical research from its systemic flaws. *Proc. Natl. Acad. Sci. USA* **111**, 5773–5777

CAS | PubMed | Web of Science® | Google Scholar

7 Kimble, J., Bement, W. M., Chang, Q., Cox, B. L., Drinkwater, N. R., Gourse, R. L., Hoskins, A. A., Huttenlocher, A., Kreeger, P. K., Lambert, P. F., Mailick, M. R., Miyamoto, S., Moss, R. L., O'Connor-Giles, K. M., Roopra, A., Saha, K., and Seidel, H. S. (2015) Strategies from UW-Madison for rescuing biomedical research in the US. *eLife* **4**, e09305

Google Scholar

8 Daniels, R. J. (2015) A generation at risk: young investigators and the future of the biomedical workforce. *Proc. Natl. Acad. Sci. USA* **112**, 313–318

CAS | PubMed | Web of Science® | Google Scholar

10 National Science Foundation. (Undated) Early Career Doctorates Survey. Accessed January 4, 2016, at: http://www.nsf.gov/statistics/srvyecd/overview.htm/

Google Scholar

11 Gould, J. (2015) Career paths: tracking Ph.D.s. In Nature Jobs Blog. Accessed January 4, 2016, at: http://blogs.nature.com/naturejobs/2015/04/22/career-paths-tracking-phds/

Google Scholar

12 Callier, V., and Vanderford, N. L. (2015) Wanted: information. *Nature* **519**, 121–122

Google Scholar

13 Meyers, F. J., Mathur, A., Fuhrmann, C. N., O'Brien, T. C., Wefes, I., Labosky, P. A., Duncan, D. S., August, A., Feig, A., Gould, K. L., Friedlander, M. J., Schaffer, C. B., Van Wart, A., and Chalkley, R. (2016) The origin and implementation of the Broadening Experiences in Scientific Training programs: an NIH common fund initiative. *FASEB J.* **30**, 507–514

CAS | PubMed | Web of Science® | Google Scholar

14 State of California, Employment Development Department. (2013) *Biotechnology in California.* CAEDD, Sacramento, CA, USA. Available at: http://www.labormarketinfo.edd.ca.gov/Biotechnology_in_California.html

Google Scholar

15 Georgia Power Community and Economic Development. (2012) *Bioscience Industry in Georgia.* Georgia Power, Atlanta, GA, USA. Available at https://www.tradeandindustrydev.com/region/georgia/bioscience-industry-report-7596/

Google Scholar

16 National Cancer Institue. (2013) NCI Funded Research Portfolio. Accessed November 4, 2015, at: http://fundedresearch.cancer.gov/nciportfolio/

18 U.S. Office of Personnel Management. (2014) *Major Work Locations of the Executive Branch, Fiscal Year 2013.* OPM, Washington, DC. Available at: https://www.opm.gov/policy-data-oversight/data-analysis-documentation/federal-employment-reports/reports-publications/major-work-locations.pdf/

Google Scholar

19 Jones Lang LaSalle, Inc. (2014) Life Sciences Cluster Report. Accessed November 17, 2015, at: http://marketing.am.jll.com/acton/media/3030/jll-global-life-sciences-cluster-report/

Google Scholar

20 National Science Foundation. (2013) NSF-NIH Survey of Graduate Students and Postdoctorates in Science and Engineering. Table 47. Available at: http://ncsesdata.nsf.gov/gradpostdoc/2013/ (Postdoctoral appointees in science, engineering, and health in all institutions, by detailed field, citizenship, and doctoral degree type)

Google Scholar

21 Working Group on Diversity in the Biomedical Research Workforce. (2012) *Report of the Advisory Committee to the Director: Working Group on Diversity in the Biomedical Research Workforce*. NIH, Bethesda, MD, USA. Available at: http://acd.od.nih.gov/Diversity%20in%20the%20Biomedical%20Research%20Workforce%20Report.pdf

Google Scholar

22 Carnevale, A. P., and Jayasundera, T. D. R. (2014) *Understanding Online Job Ads Data.* Georgetown Center on Education and the Workforce, Washington, DC. Available at: https://cew.georgetown.edu/wp-content/uploads/2014/11/OCLM.Tech_.Web_.pdf

Google Scholar

23 Templin, R., and Hirsch, L. (2013) *Do Online Job Ads Predict Hiring?* New York City Labor Market Information Service, New York. Available at: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Centers/Center%20for%20Urban%20Research/LMIS/NYCLMIS-RESEARCH-BRIEF-Do-Online-Ads-Predict-Hiring.pdf

Google Scholar

p/FieldClassification.html/

Google Scholar

26 Rockey, S. (2012) Postdoctoral researchers: facts, trends, and gaps. In *Rock Talk*, National Institutes of Health, Bethesda, MD, USA. Accessed January 4, 2016, at: http://nexus.od.nih.gov/all/2012/06/29/postdoctoral-researchers-facts-trends-and-gaps/

Google Scholar

27 U.S. Department of Labor, Bureau of Labor Statistics. (2013) Employment Projections: 2012-2022 Summary (news release). USDL-13-2393. Available at: http://www.bls.gov/news.release/archives/ecopro_12192013.htm

Google Scholar

28 Educational Testing Service. (2015) *America's Skills Challenge: Millennials and the Future.* Educational Testing Service, Princeton, NJ, USA. Available at: http://www.ets.org/s/research/30079/asc-millennials-and-the-future.pdf

Google Scholar

29 National Academies of Sciences, Engineering, and Medicine. (2016) *Developing a National STEM Workforce Strategy: A Workshop Summary.* NASEM, Washington, DC. Available at: http://www.nap.edu/catalog/21900/developing-a-national-stem-workforce-strategy-a-workshop-summary/

Google Scholar

30 Allum J., and Okahana, H. (2015) *Graduate Enrollment and Degrees: 2004-2014.* Council of Graduate Schools, Washington, DC. Available at: http://www.cgsnet.org/ckfinder/userfiles/files/E_and_D_2014_report_final.pdf

Google Scholar

31 Garrison, H. H., Justement, L. B., and Gerbi, S. A. (2016) Biomedical science postdocs: an end to the era of expansion. *FASEB J.* **30**, 41–44

33 Federation of the American Societies for Experimental Biology. (2015) *Sustaining Discovery in Biological and Medical Sciences: A Framework for Discussion.* FASEB, Bethesda, MD, USA. Available at: https://www.faseb.org/Portals/2/PDFs/opa/2015/Sustaining%20Discovery%20Report%20Final.pdf

Google Scholar

Citing Literature

Download PDF

FASEB PUBLICATIONS

WILEY