The U.S. Biomedical and Life Sciences Field and Research Misconduct: Insights from an Analysis of Closed U.S. Office of Research Integrity (ORI) Case Files

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Disclaimers

- The views and opinions expressed in this presentation are solely those of the authors and do not represent the official position of HHS, ORI, or its employees.

- The information in this presentation does not constitute official HHS policy statements or guidance.
Note
A part of the data in this presentation were presented at the Fourth World Conference on Research Integrity and the Promoting the Responsible Conduct of Research for College and University Leaders Meeting.

References:

Tamot, Raju. “Drivers of Misconduct and Biased Proceedings: The Power of Institutional Leaders to Ensure Integrity.” Promoting the Responsible Conduct of Research for College and University Leaders Conference, Office of Research Integrity and Loyola Marymount University, Los Angeles, CA, April 14, 2016.

* Presenter
1980s

~ Scientist John Long’s testimony before a Congressional subcommittee in the 1980s

“An honest investigator should be able to deal effectively with the traditional ‘publish or perish’ pressures... The loss of my ability to be an objective scientist...cannot...be linked to defects in the system under which I worked.”

(Quoted in Berg, A. O.:1990)
The U.S. Biomedical/Life Sciences Field
For the Gold!

http://www.zimbio.com/photos/Lionel+Messi/Argentina+v+Bosnia+Herzegovina+Group+F+2014/_HfYRT42wYn
Doctorates Awarded in Science and Engineering

~25K (1994)
→
~38K (2014)

http://www.economist.com/print edición/covers/2015-03-26/ap-e-eu-la-me-na-uk-0
Sources: Special Report NSF 16-300. 2015
Stay Rate of Temporary Visa Holders with Definite Commitments (Life Sciences)

\[ \sim 58\% \text{ (1994)} \rightarrow \sim 79\% \text{ (2014)} \]

Sources: Special Report NSF 16-300. 2015, NRC: 1998
Life Sciences Graduates taking Postdoctoral Positions immediately after Graduation

Sources: Special Report NSF 16-300. 2015, NRC: 1998
Number of Papers (from 1997 and 2012)
Submitted to *Nature* ~43%
Published *Worldwide* ~86%

Retraction Notices

Average time to obtain first R01 after securing
Faculty Position, (e.g., Medical)
~ 7.5 years

What has Decreased?

Full-Time Tenured and Tenure-Track Faculty in US Institutions ~ **45%** (1975) ~ **24%** (2011)

http://www.chronicle.com/article/The-Lost-of-the-Tenure-Track/129075

Success Rates for NIH Research Project Grant Applications

~ 44% (1975) ~ 18% (2014) ~ 19% (2016)

Submitted Papers Published (e.g., *Nature*)

10.7% (1997) ~ 7.8% (2013)

Sources: Table #207, NIH, Office of Extramural Research, 2015;
http://www.nature.com/nature/authors/get_published/index.html (5/19/2017)
“I think the amount of pressure put on people at this place to move their careers along is unheard of anywhere else. I don’t know that could be changed, I think [it’s] the nature of people who came here; it’s the nature of the place, etc.”
“...runs in our family. My father and grandfather are also working as postdocs.”
The U.S. Biomedical/Life Sciences Field:

“A tournament economic structure” Freeman et al. (2001)

“...unsustainable hypercompetitive system... in a state of perpetual disequilibrium...” Alberts et al. (2014)

No financial guarantee associated with tenure Bunton and Mallon (2007)

“A generation at risk: young investigators...” Daniels (2015)
58 closed case files with admissions of research misconduct by Respondents (1996-2013)

Analyzed narratives of the Respondents, Mentors, RIOs, Institutional Committees, and ORI
“Causes” of Research Misconduct

- Poor Mentorship
- Inadequate Training
- Pressures of the Field
- Individual Circumstances
- Individual Psychology

Research Misconduct
“Causes” of Research Misconduct

Pressures of the Field

Research Misconduct
A graduate student Respondent:

“These transgressions in my part were due to two reasons: First, I felt it was necessary to get a paper in a high profile journal in order to get a faculty position. Second, I put a lot of pressure on myself, which caused me to do things that I would not normally do.”
A Postdoctoral Fellow:

“... *the publication was the most significant of my career*, not to mention the impact that the results would have on *future therapies* for the treatment of prostate cancer, *I altered the data in the Western blots to appease the reviewer* ....”
A Postdoctoral Fellow:

“After two post-doctoral students were fired, one in less than a year after I started in the lab, I became fearful for my job and my future.”

Committee:

“The Respondent had been applying for a green card and felt pressured to make a good paper and get good publications.”
A Postdoctoral Fellow:

“My situation was so bad owing to Dr. X.”

The Chief Legal Counsel:

“The Respondent admitted to substituting the wrong photos in the figures and that he felt great pressure to publish the article in Nature in order to distance himself from the Dr. X scandal.”
A Postdoctoral Fellow:

“... there was a hypothesis that went into this set of studies with and this was also supposed to be sort of my area of expertise where my career was going to blossom...and when the data ... really, lots of time the data quality was an issue and when it looked like the data wasn’t going to bear this out, I think I pushed the data towards the hypotheses.”
Conclusions

• There are disturbing trends in the training of new scientists and their hiring and funding, and publication mechanisms.

• Investigators who commit misconduct are under an unprecedented level of pressure to produce results, publish, secure funding and find permanent positions.

• Investigators pursuing their goals externalize their aspirations into action so as to increase their chances of success in the scientific field.
Reforming the U.S. biomedical/life sciences field?

National Level:

• A sustained national conversation about the increasingly “hyper-competitive” conditions under which investigators work

• Evaluation of the costs and benefits of new research funding models
Institutional Level:

- Emphasize on the financial/career threatening and psychological pressures investigators are increasingly under: recognize the symptoms and seek help

- Develop employee assistance programs
Thank you!

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Courtesy: flickr.com/dfreu/9031718232