Supplementary information to: Lessons from researcher rehab (Comment in *Nature* 534, 173–175; 2016)

James M. DuBois, John T. Chibnall, Raymond Tait & Jillon Vander Wal

PI Program participants provided consent for the use of their assessment data; national sample participants consented to survey participation. Both studies were approved by the Washington University Human Research Protections Office. Participants provided permission for the use of all anonymous quotes appearing in the article.

Table 1. Reasons for Referral to the PI Program

Reasons for Referral (often more than one) with Typical Illustrations	
1. Oversight failure	49%
• Served as principal investigator and did not provide adequate oversight of staff, which might have avoided problems such as data fabrication in lab or poor consent documentation	
2. Human subjects – informed consent violations	31%
• Pattern of missing signatures on consent forms	
• Pattern of using outdated versions of consent forms	
3. Plagiarism	21%
• Cited all sources but did not put words into quotation marks (or equivalent)	
• Used work of co-investigator, which was comprised of previously published materials	
4. Human subjects – inappropriate recruitment	18%
• Recruiting subjects who did not meet inclusion criteria	
• Recruiting subjects when paperwork was not completed to renew a study or approval was not sought (e.g., for innovative medical intervention)	
5. Animal Care and Use	15%
• Conducting multiple studies using one approved research protocol	
• Failure to follow approved protocols, e.g., for anesthesia or euthanasia	
6. Data fabrication, falsification, or substandard research leading to false data being published	13%
• Deficient data management contributed to inaccurate data or inability to verify accuracy	
• Data or images enhanced without disclosure—but fundamental conclusions still valid	
7. Miscellaneous	<10%
• Violations of policies on conflicts of interest, allowable costs, select agents, or confidentiality	

Table 2. Scores of PI Participants vs. a Sample of NIH-funded Researchers

Test	PI Program Pre-Test Scores (N=24)	National Sample Test Scores (N=400)
Responsible conduct of research (RCR) Knowledge[1]	73.2/100	73.8/100
Good decision-making[2]	13.2/16	13.5/16
Compliance disengagement[3]	2.0/6	2.4/6
Ambiguity at work[4]	.20/1	.23/1

General Notes:

- No differences are statistically significant at $p<.05$. The RCR and decision-making measures do not correlate with socially desirable responding as measured by the Marlowe-Crowne test. Compliance disengagement scores are correlated with socially desirable responding; but correcting for this improves PI Program participants' scores vis-à-vis the national sample.
- On Compliance Disengagement and Ambiguity at Work lower scores are more desirable.

Specific Notes:

1. Measured using a 15-item multiple choice test of knowledge of responsible conduct of research. Antes, A. L. *et al.* Making Professional Decisions in Research: Measurement and Key Predictors. *Account Res* **23**, 288-308, (2016)
2. Measured using the Professional Decision-Making in Research (PDR) test. DuBois, J. M. *et al.* Professional Decision-Making in Research (PDR): The Validity of a New Measure. *Sci Eng Ethics* **22**, 391-416, (2016)
3. Measured using the How I Think about Research (HIT-Res) test. DuBois, J. M., Chibnall, J. T. & Gibbs, J. Compliance Disengagement in Research: Development and Validation of a New Measure. *Sci Eng Ethics*, July, 1-29 (2015).
4. Measured using the Role Hassles test. Zohar, D. Predicting burnout with a hassle-based measure of role demands. *Journal of Organizational Behavior* **18**, 101-115, (1997)

Table 3. Clifton StrengthsFinder® Test Results

Common (>50%)	Less Common (21 – 28%)	Rare (12-17%)	Nearly Absent (≤5%)	Absent (0%)
Achiever	Analytical	Deliberative	Connectedness	Adaptability
Learner	Responsibility	Strategic	Discipline	Command
	Input	Restorative	Inclusiveness	Developer
	Relator	Positivity	Empathy	Significance
	Ideation	Belief	Focus	
	Arranger	Futuristic	Harmony	
	Intellection	Context	Communication	
			Competition	
			Consistency/fairness	
			Woo	
			Self-assurance	
			Maximizer	

Note:

- Scores reflect the top 5 themes identified on the Clifton StrengthsFinder ® test. Themes are described in Asplund, J., Lopez, S. J., Hodges, T. & Harter, J. *The Clifton StrengthsFinder® 2.0 technical report: Development and validation*. (The Gallup Organization, 2009).

Table 4. What Caused Referrals to the PI Program?*

Contributing Factors Ranked by How Often Faculty Believed They Played a Role	
1. Paying too little attention to details or oversight (e.g., because overextended, not detail oriented, or distracted by personal problems)	72%
2. Unsure of rules (e.g., due to new area of research, increase in regulations since starting career, lack of mentoring, cultural differences, or receiving bad guidance)	56%
3. Did not prioritize compliance (e.g., failed to understand seriousness of violations, disengaged thought patterns, or cultural differences)	56%
4. Relationship problems, political tensions (e.g. history of aggressive communication or working with difficult personalities)	36%
5. Staff lacked adequate training or integrity (e.g., failure to provide adequate training, did not create culture of compliance in lab, or difficulty hiring competent individuals)	28%
6. Poor communication (e.g., failed to hold regular meetings with research team)	26%
7. Desire to compete or ambition (e.g., driven personality, desire for promotion, or competition for funding)	21%
8. Conflicting roles (e.g., being a physician and researcher, who accordingly interacts with individuals as both patient and research participant)	21%
9. Did not anticipate consequences, especially worst case scenario (no more basic causes were apparent)	13%
10. Lack of space or basic resources (due to inadequate institutional investment in researcher's program)	10%
11. Followed instructions of a mentor or superior (e.g., due to hierarchy of training programs and the absence of positive mentors to consult)	10%
* These statements are the opinions of the faculty who reflected upon the situations of the participants after facilitating the workshop and coaching calls.	