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Findings of Research Misconduct

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AGENCY:

Office of the Secretary, HHS.

ACTION:

Notice.

Notice is hereby given that on June 22, 2017, the Department of Health and Human Services (HHS) took final action in the following case:

Frank Sauer, Ph.D., University of California, Riverside: Based on evidence and findings of an investigation conducted by the University of California, Riverside (UCR), the Office of Research Integrity's (ORI's) review of UCR's Research Misconduct Investigation Report, the Report of Investigation by the National Science Foundation (NSF) Office of Inspector General, additional evidence obtained by ORI during its oversight review of UCR's investigation, and independent analyses conducted as part of ORI's oversight review, ORI found that Dr. Frank Sauer, former Associate Professor of Biochemistry, UCR, committed research misconduct in research supported by the following National Institute of General Medical Sciences (NIGMS), National Institutes of Health (NIH) grants:

- R01 GM073776
- R01 GM066204

Images that were falsified and/or fabricated were presented in the following publications and grant applications.

- Gou, D., Rubalcava, M., Sauer, S., Mora-Bermúdez, F., Erdjument-Bromage, H., Tempst, P., Kremmer, E., & Sauer, F. “SETDB1 is involved in postembryonic DNA methylation and gene silencing in *Drosophila*.” *PLoS One* 5(5):e10581, 2010 (hereafter referred to as “*PLoS One* 2010”).
- Sanchez-Elsner, T., Gou, D., Kremmer, E., & Sauer, F. “Noncoding RNAs of trithorax response elements recruit *Drosophila* Ash1 to Ultrabithorax.” *Science* 311(5764):1118-1123, 2006 (hereafter referred to as “*Science* 2006”).
- Maile, T., Kwoczyński, S., Katzenberger, R.J., Wassarman, D.A., & Sauer, F. “TAF1 activates transcription by phosphorylation of serine 33 in histone H2B.” *Science* 304(5673):1010- 1014, 2004 (hereafter referred to as “*Science* 2004”).
- National Institute on Drug Abuse (NIDA), NIH, grant application R21 DA025703-01.
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), NIH, grant application R21 DK082631-01.
- NIDDK, NIH, grant application R01 DK082675-01.
- NIGMS, NIH, grant application R01 GM073776-06A1.
- NIGMS, NIH, grant application R01 GM085229-01.
- NIGMS, NIH, grant application R01 GM085303-01.
- NIGMS, NIH, grant application R01 GM085303-01A1.

ORI found by a preponderance of the evidence that the Respondent engaged in research misconduct by intentionally, knowingly, or recklessly falsifying and/or fabricating images in seven (7) submitted NIH grant application and three (3) published papers by manipulating, reusing, and falsely labeling images. Specifically, the Respondent falsified and/or fabricated images representing controls or experimental results for *in vitro* interactions between RNA and proteins, co-immunoprecipitation (“co-IP”) assays, histone methyltransferase (“HMT”) or kinase assays and related stained SDS-PAGE gels, and reverse transcription-polymerase chain reactions (“RT-PCR”) in the following grant applications and publications.

1. The image in Figure S4, *Science* 2006, representing the *in vitro* interactions between RNA and specific proteins, was used in similar assays to represent results with other sets of protein-RNA interactions in Figure 9, R21

DA025703-01, Figure 9, R21 DK082631-01, and Figure 9, R01 DK082675-01, and again in R01 GM085229-01, Figure 11C.

2. The image in Figure 1A, R01 GM085303-01, representing a co-IP assay from the *Drosophila* cell line S2, was manipulated and used in Figure 1B of the same grant application to represent a different co-IP assay from *Drosophila* embryonic extracts.

3. The image in Figure 8A, R01 GM085303-01A1, representing an SDS-PAGE gel for an *in vitro* HMT assay, was used previously in Figure 1d in a manuscript submitted to *Nature* in 2005 to represent an SDS-PAGE gel from an unrelated experiment for an ubiquitination assay.

4. The image in Figure 1E, R01 GM085303-01 and Figure 1D, R01 GM085303-01A1, representing stained SDS-PAGE for an HMT assay, was used in Figure 1b, *Nature* 419(6909):857-862, 2002, to represent an HMT assay with different experimental conditions, and also was used in Figure 1B, *Science* 2004, to represent stained PAGE for an *in vitro* kinase assay.

5. The image in Figure 1C, R01 GM085303-01 and Figure 1B, R01 GM085303-01A1, representing an HMT assay, was manipulated and used to represent an HMT assay with different experimental conditions in Figure 1E, R01 GM085303-01 and Figure 1D, R01 GM085303-01A1, and also was used to represent another unrelated HMT assay in Figure 2 (right panel) in R01 GM085303-01.

6. The image in Figure 2 (right panel) in R01 GM085303-01 representing an HMT assay was used in Figure 1B, *PLoS One* 2010 to represent an HMT assay with different experimental conditions.

7. The image in Figure 6B, R21 DA025703-01, Figure 11B, R01 GM085229-01, Figure 6B, R01 DK082675-01, and Figure 6B, R21 DK082631-01, all representing RT-PCR experiments for transcribed ncRNAs, was used in Figure 13, R21 DK082631-01 and Figure 13, R21 DA025703-01 to represent RT-PCR experiments for transcription for different ncRNAs.

8. The image in Figure 10C (right half) in R01 GM073776-06A1, representing transcription of endodermal genes from embryo bodies, was manipulated and used in Figure 10C (left half) in the same grant application to represent the transcription of mesodermal and ectodermal genes.

Science 311(5764):1118-1123, 2006 was retracted in: *Science* 344(6187):981, 2014. *Science* 304(5673):1010-1014, 2004 was retracted in: *Science* 344(6187):981, 2014. *Nature* 419(6909):857-862, 2002 was retracted in *Nature* 521(7550):110, 2015.

ORI issued a charge letter enumerating the above findings of research misconduct and proposing HHS administrative actions. Dr. Sauer subsequently requested a hearing before an Administrative Law Judge (ALJ) of the Departmental Appeals Board to dispute these findings. The parties filed cross-motions for summary judgment. On May 22, 2017, the ALJ recommended to the Assistant Secretary for Health that summary judgment be granted in favor of ORI. On June 22, 2017, the ALJ's recommended decision became the final agency decision. Thus, the research misconduct findings set forth above became effective, and the following administrative actions have been implemented, beginning on June 22, 2017:

- (1) Dr. Sauer is prohibited from serving in any advisory capacity to PHS including, but not limited to, service on any PHS advisory committee, board, and/or peer review committee, or as a consultant, through July 27, 2020, the end date of his government-wide debarment, which was imposed by NSF; and
- (2) ORI will send a notice to *PLoS* requesting retraction or correction of *PLoS One* 5(5):e10581, 2010 (PMID: 20498723) in accordance with 42 CFR 93.411(b).

FOR FURTHER INFORMATION CONTACT:

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Kathryn M. Partin,
Director, Office of Research Integrity.