



FINAL REPORT OF THE RESEARCH MISCONDUCT INVESTIGATION AT
THE OHIO STATE UNIVERSITY

November 20, 2023 (RES-273, DIO-7639)

Respondent: Dr. Govindasamy Ilangovan, Associate Professor, College of Medicine,
Department of Internal Medicine, Division of Cardiovascular Medicine
ilangovan.1@osu.edu; govindasamy.ilangovan@osumc.edu

[REDACTED]

Research Integrity Officers: Julia Behnfeldt, Ph.D., Bridget Carruthers, Ph.D., Susan Garfinkel, Ph.D., Office of Research Compliance, Office of Research

Executive Summary

According to the Research Misconduct Policy (the “Policy”)¹ at The Ohio State University (OSU), an investigation was initiated on September 15, 2022, to determine whether each of the allegations against Dr. Ilangovan constitute research misconduct at the preponderance of the evidence standard and to recommend the appropriate corrective actions or sanctions. Dr. Ilangovan is currently an Associate Professor in the Department of Internal Medicine, College of Medicine. The investigation involved [REDACTED] allegations of falsified data in [REDACTED] publications, where Dr. Ilangovan was the senior and corresponding author.

[REDACTED]

[REDACTED] Venkatakrisnan CD, Tewari AK, Moldovan L, Cardounel AJ, Zweier JL, Kuppusamy P, Ilangovan G. Heat shock protects cardiac cells from doxorubicin – induced toxicity by activating p38 MAPK and phosphorylation of small heat shock protein 27. *Am J Physiol Heart Circ Physiol* 291:H2680-H2691, 2006. doi:10.1152/ajpheart.00395.2006.³ (hereafter, AJP 2006)

[REDACTED] C. D. Venkatakrisnan, Kathy Dunsmore, Hector Wong, Sashwathi Roy, Chandan K. Sen, Altaf Wani, Jay L. Zweier, and Govindasamy Ilangovan. HSP27 regulates p53 transcriptional activity in doxorubicin-treated fibroblasts and cardiac

¹ Ex. 015 Policy-FINAL-Research-Misconduct-20210301-3

[REDACTED]

³ Ex. 017 AJP 2006



H9c2 cells: p21 upregulation and G₂/M phase cell cycle arrest. *Am J Physiol Heart Circ Physiol* 294:H1736-H1744, 2008. doi:10.1152/ajpheart.91507.2007.⁴ (hereafter, AJP 2008)

⁵Related Publication: Samir Turakhia, C.D. Venkatakrishnan, Kathy Dunsmore, Hector Wong, Periannan Kuppusamy, Jay L. Zweier, and Govindasamy Ilangovan.

Doxorubicin-induced cardiotoxicity: direct correlation of cardiac fibroblast and H9c2 cell survival and aconitase activity with heat shock protein 27. *Am J Physiol Heart Circ Physiol* 293:H311-H3121, 2007. Doi:10.1152ajpheart.00328.2007.⁶ (hereafter, AJP 2007)

All [REDACTED] publications cite support from the National Heart, Lung, and Blood Institute and the National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health (NIH) grant R01HL078796-02. In addition, [REDACTED], and [REDACTED] cites grants R21 EB-004658, and BGIA 0365203B from the American Heart Association. Details regarding the allegations are provided in the Allegation Summary section of this report.

A committee of faculty members from the Research Integrity Standing Committee were charged with performing an investigation into allegations against Dr. Ilangovan per the Policy. Following a review of all data and evidence and conducting interviews, the committee found by a preponderance of the evidence that Dr. Ilangovan intentionally, knowingly, or recklessly falsified the data in Figure 4A of Allegation [REDACTED] and the data included in the corrigendum of Allegation [REDACTED] and that he intentionally and/or knowingly falsified the data in Figure 1B of Allegation [REDACTED], therefore making the determination that Dr. Ilangovan committed research misconduct. [REDACTED]

Based on the findings, the committee recommends to the College of Medicine that Dr. Ilangovan be required to complete the PI Program through Washington University in St. Louis within one-year and to have all data reviewed for all publications and grants prior to submission by a three person College of Medicine panel for a period of three years. Dr. Ilangovan should also be required to work with the other authors to retract all [REDACTED] papers.

Background

[REDACTED]

⁴ Ex. 018 AJP 2008

⁵ During the course of the investigation the committee identified data that was previously published in AJP 2007 that was duplicated elsewhere

⁶ Ex. 131 AJP 2007

[REDACTED]



[Redacted text block]

Per Procedures §I of the Policy a preliminary assessment was conducted, during which, [Redacted] additional allegations of research misconduct were reviewed. The additional allegations involved data falsification in Figure 4A in AJP 2006 and Figure 5A in AJP 2008. On February 18, 2022, Dr. Loren Wold, Associate Dean for Research Operations and Compliance, College of Medicine, issued a report of the preliminary assessment to Dr. Peter Mohler, Vice President of Research and Deciding Official, OSU, recommending that an inquiry be initiated for all [Redacted] [Redacted] allegations.⁹ Dr. Mohler concurred with the recommendation and an inquiry was initiated on February 25, 2022.

Per Procedures §II of the Policy an inquiry was conducted by the RIOs in ORC. The purpose of the inquiry is to conduct preliminary information gathering and fact-finding to determine if the allegations have substance to warrant an investigation. On September 7, 2023, the RIOs in ORC finalized the inquiry report and recommended to Dr. Mohler that all [Redacted] allegations reviewed in the inquiry move forward to an investigation.¹⁰ Dr. Ilangovan did not appeal the decision and Dr. Mohler concurred with the recommendation that an investigation be initiated for all [Redacted] allegations of research misconduct on September 15, 2022.¹¹ A timeline of inquiry activities is included in TABLE 1.

TABLE 1: Timeline of Inquiry Activities

| DATE | ACTIVITY | ATTACHMENT |
|-------------------|--|-----------------------|
| February 25, 2022 | Respondent notification of inquiry | Ex. 020 ¹² |
| February 25, 2022 | Sequestration of western blots | Ex. 033 ¹³ |
| April 19, 2022 | 60 day extension granted | Ex. 037 ¹⁴ |
| May 4, 2022 | ORI granted extension to July 29, 2022 | Ex. 030 ¹⁵ |
| June 14, 2022 | Inquiry interview - Respondent | Ex. 027 ¹⁶ |
| June 27, 2022 | Inquiry interview transcript emailed to respondent for review | Ex. 038 ¹⁷ |
| June 28, 2022 | Respondent called RIO to request a 1 week extension to review the inquiry interview transcript | |

⁸ Ex. 001 20210913 Email Att Inquiry Cmte Report FINAL – Alleg11_Redacted

⁹ Ex. 016 20220218 Ilangovan PA

¹⁰ Ex. 068 20220907 Final Inquiry Report -Ilangovan

¹¹ Ex. 069 20220915 -Email DO to RIO_initiate investigation

¹² Ex. 020 20220225 Notification of Additional Allegations and Inquiry _ Ilangovan

¹³ Ex. 033 20220225 Data Sequestration Sheet_Ilangovan

¹⁴ Ex. 037 20220419 EMAIL ORI to RIO _extension request granted

¹⁵ Ex. 030 Inquiry Extension 05-04-2022

¹⁶ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan

¹⁷ Ex. 038 20220627 -EMAIL RIO to Ilangovan _Interview Transcript



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|-----------------|--|--------------------------|
| June 29, 2022 | RIO emailed respondent and granted extension to review inquiry interview transcript | Ex. 039 ¹⁸ |
| July 8, 2022 | Respondent emailed RIO regarding interview transcript and provided no errata | Ex. 034 ¹⁹ |
| July 12, 2022 | Respondent notified that scope for Allegation ■ was expanded | Ex. 036 ²⁰ |
| July 19, 2022 | Respondent replied to the expanded scope for Allegation ■ | Ex. 040 ²¹ |
| July 26, 2022 | Preliminary Inquiry Report sent to Respondent | Ex. 043 ²² |
| July 27, 2022 | ORI Granted Extension to September 27, 2022 | Ex. 042 ²³ |
| August 1, 2022 | Respondent requests extension for preliminary report response to August 30, 2022 | Ex. 045 ²⁴ |
| August 2, 2022 | RIO grants extension for preliminary report to August 16, 2022 | Ex. 046 ²⁵ |
| August 15, 2022 | Respondent called RIO and requested termination of the research misconduct proceedings without an admission | |
| August 16, 2022 | Respondent emailed RIO and requested termination of the research misconduct proceedings without an admission | Ex. 047 ²⁶ |
| August 16, 2022 | Respondent written response to preliminary inquiry report received | Ex. 044 ²⁷ |
| August 17, 2022 | Respondent request for termination of the research misconduct proceedings without an admission denied by RIO | Ex. 048 ²⁸ |
| August 22, 2022 | Zoom meeting between ORC and Respondent to discuss process for termination of the research misconduct proceedings without an admission | |
| August 24, 2022 | Respondent emails RIO and request termination of the research misconduct proceedings without an admission | Ex. 049 ²⁹ |
| August 26, 2022 | RIO informed Respondent that the document for termination without an admission was sent via | Ex. 050 ^{30,31} |

¹⁸ Ex. 039 20220629 -EMAIL RIO to Ilangovan -extension request granted for transcript review

¹⁹ Ex. 034 20220708 -EMAIL Ilangovan to RIO _transcript review and document

²⁰ Ex. 036 20220712 Notification of Allegation ■ Expansion during Inquiry _ Ilangovan

²¹ Ex. 040 20220719-Email Ilangovan to RIO_response to expanded scope

²² Ex. 043 20220727 RIO to Ilangovan -CONFIDENTIAL Preliminary Inquiry Report

²³ Ex. 042 20220727 ORI to RIO -RE_ DIO 7639_ extension granted

²⁴ Ex. 045 20220802 EMAIL Ilangovan to RIO extension request for Preliminary Inquiry Report response

²⁵ Ex. 046 20220802 EMAIL RIO to Ilangovan extension granted for Preliminary Inquiry Report response

²⁶ Ex. 047 20220816 EMAIL Ilangovan to RIO RE_ CONFIDENTIAL Preliminary Report -request for AR without admission

²⁷ Ex. 044 20220816 Ilangovan Response to preliminary inquiry report

²⁸ Ex. 048 20220817 EMAIL RIO to Ilangovan -RE_ CONFIDENTIAL Preliminary Inquiry Report -request for AR without admission denied

²⁹ Ex. 049 20220824 EMAIL Ilangovan to RIO -request for termination without an admission

³⁰ Ex. 050 20220826 EMAIL RIO to Ilangovan -termination without admission document sent via docusign

³¹ Ex. 051 CONFIDENTIAL -Resolution document



| | | |
|--------------------|---|----------------------|
| | DocuSign and must be signed and returned by August 30, 2022 | |
| August 28, 2022 | Zoom meeting between RIO and Respondent to discuss the resolution document | |
| August 30, 2022 | Deadline for Respondent’s signed agreement to the resolution document passed without agreement | |
| September 7, 2022 | Final inquiry report sent to Respondent | Ex. 68 ³² |
| September 7, 2022 | Final inquiry report and written responses from respondent sent to the Deciding Official | Ex. 68 ³³ |
| September 15, 2022 | Deciding official concurs with the recommendation to move all █ allegations to an investigation | Ex. 69 ³⁴ |

Institutional Policies and Procedures: An investigation into the allegations of Research Misconduct was conducted according to the Policy.³⁵

Allegation Summary³⁶

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AJP 2006

Allegation █: Figure 4A in AJP 2006 was falsified by the reuse and relabeling of single bands in Bax and Bcl-2 Western blots as follows: (1) the 0.25µM and 5µM DOX treated Bax band in the control blot; (2) the 5µM and 10µM DOX treated Bcl-2 band in the control blot; and (3) the 5µM and 10µM DOX treated Bcl-2 band in the HS blot.

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AJP 2008

Allegation █: Figure 5A in AJP 2008 was falsified by (1) the reuse and relabeling of the p21 Western blot in H9c2 cells after 2hr treatment and in HSF-1^{+/+} wild type cells after 2hr treatment; and (2) the falsification of the 2021 corrigendum for Figure 5A by reuse and relabeling of the p21 Western blot in cardiac H9c2 cells 24h treatment (from Figure 4A in Lattest Figures.ppt) as HSF-1^{+/+} wild type cells after 2hr treatment.

³² Ex. 068 20220907 Final Inquiry Report -Ilangovan

³³ Ex. 068 20220907 Final Inquiry Report -Ilangovan

³⁴ Ex. 069 20220915-Email DO to RIO_initiate investigation

³⁵ Ex. 015 Policy-FINAL-Research-Misconduct-20210301-3

³⁶ The assigned allegation numbers are listed out of numerical sequence because Allegations █ and █ were added after the initiation of the investigation.

³⁷ During the course of the investigation, the investigation committee found additional concerns with AJP 2006 and unanimously voted to add Allegation █ below to the scope of the investigation.



Allegation ■: ³⁸ Figures 1A, 1B, and 1C of AJP 2008 were falsified and mislabeled by cropping and splicing Western blot bands from Figure 1A in AJP 2007, or bands from an unlabeled Western blot panel from 2006, [slide 6 of file “Figures1” emailed from Dr. Ilangoan to Dr. Venkatakrishnan on 6/7/2006] to represent the expression of a different protein and different cell types. Specifically:

Allegation ■A, in Figure 1A, AJP 2008:

- a. The **s-85 Hsp27** (phosphorylated Ser 85) Western blot for control and heat-shocked H9c2 cells were reused and relabeled from previously published data representing the **s-82 Hsp27** Western Blot for control and heat-shocked H9c2 cells in Figure 1A AJP 2007; and
- b. The GAPDH Western blot for control and heat-shocked **H9c2 cells** were reused and relabeled from previously published data representing a GAPDH Western blot from control and heat-shocked **HSF-1^{+/+} cells** in Figure 1A of AJP 2007.

Allegation ■B, in Figure 1B, AJP 2008:

- a. The **total and s-15 HSP25** Western blots for control and heat-shocked HSF-1^{+/+} cells were reused from lanes 5-6 and 3-4 respectively, of a 2006 **unlabeled blot** in the research record;
- b. The **s-86 Hsp25** (phosphorylated Ser 86) Western blot for control and heat-shocked HSF-1^{+/+} cells were reused and relabeled from previously published data representing **total Hsp27** Western blots for control and heat-shocked HSF-1^{+/+} cells in Figure 1A of AJP 2007; and
- c. The GAPDH Western blot data for control and heat-shocked **HSF-1^{+/+} cells** were reused and relabeled from previously published data representing GAPDH Western blot for heat-shocked **H9c2 cells and control HSF-1^{+/+} cells** in Figure 1A of AJP 2007.

Allegation ■C, in Figure 1C, AJP 2008:

- a. The **total Hsp25** Western blot for control and heat-shocked HSF-1^{-/-} cells were reused and relabeled from previously published data representing **total Hsp27** Western blot for control and heat-shocked HSF-1^{-/-} cells in Figure 1A AJP 2007;
- b. The **s-15 and s-86 Hsp25** Western blots for control and heat-shocked **HSF-1^{-/-} cells** were reused and relabeled from previously published data representing **S-15 and S-82 Hsp27** Western blots for control and heat-shocked **HSF-1^{+/+} cells** in Figure 1A AJP 2007; and
- c. The GAPDH Western blot from control and heat-shocked **HSF-1^{-/-} cells** were reused and relabeled from previously published data representing GAPDH Western blot for control and heat shocked **H9c2 cells** in Figure 1A AJP 2007.

Subsequent Use Summary

AJP 2006 and AJP 2008 are outside of the six-year time limit as specified in the Policy,³⁹ therefore a subsequent use analysis was conducted per Six-Year Time Limitation & the Subsequent Use Exception Standard Operating Procedures.⁴⁰ The conclusions or results

³⁸ During the course of the investigation, the investigation committee found additional concerns with AJP 2008 and unanimously voted to add Allegation ■ to the scope of the investigation.

³⁹ Ex. 015 Policy-FINAL-Research-Misconduct-20210301-3

⁴⁰ Ex. 019 Subsequent-Use-Exception-FINAL



derived from the questioned data in AJP 2006 and AJP 2008 were cited in grant proposal 1 R01 HL161067-01 submitted by Dr. Ilangovan to the NIH on February 5, 2021. Subsequent use was identified for both AJP 2006 and AJP 2008 and therefore, allegations for both publications were reviewed under the Policy.

In an email dated June 16, 2022, Dr. Ilangovan objected to the inclusion of AJP 2006 and AJP 2008 in the research misconduct proceedings because they were “cited in general as group references along with other papers to explain the field as background information or experimental detail”.⁴¹

Notification to the Respondent

On September 15, 2022, Dr. Ilangovan was notified via EMAIL that an investigation had been initiated for all [REDACTED] allegations reviewed during the inquiry.⁴²

Sequestration

On November 10, 2021, the Wexner Medical Center Information Technology (WMC IT) copied “Lab Share” network files belonging to Dr. Ilangovan and on November 22, 2021, copied “[REDACTED]” network files that Dr. Ilangovan has access to.

On January 11, 2022, immediately following notification of the original Allegation [REDACTED], ORC and WMC IT accompanied Dr. Ilangovan to Tzagournis Medical Research Facility, Room 130, and sequestered a Dell Desktop computer that was assigned to Dr. Ilangovan (s/n 12563754662).⁴³ A forensic image was copied by WMC IT and provided to ORC. Dr. Ilangovan indicated that he no longer had related physical research data and that everything was either on his hard drive or shared network drives.

On January 12, 2022, a litigation hold was placed on Dr. Ilangovan’s university and medical center email accounts.

On February 25, 2022, immediately following the notification of Dr. Ilangovan of Allegations [REDACTED] and [REDACTED] and that Allegations [REDACTED] were moving forward to inquiry, ORC accompanied Dr. Ilangovan to Tzagournis Medical Research Facility, Room 130, where Dr. Ilangovan stored a large box of physical data. A western blot binder and loose western blots that represented the timeframe of when the experiments for Allegations [REDACTED] and [REDACTED] would have been conducted were sequestered.⁴⁴

Committee of Investigation Composition

Christin Burd, Ph.D., Associate Professor, Molecular Genetics, College of Arts and Sciences, and Cancer Biology and Genetics, College of Medicine (Committee Chair), Ruth M. Barrientos, Ph.D., Associate Professor, Psychiatry and Behavioral Health, College of Medicine, Brandon Biesiadecki, Ph.D., Professor and Vice Chair, Physiology and Cell Biology, College of Medicine.

⁴¹ Ex. 024 20220616 -EMAIL Ilangovan to RIO _ interview follow up question

⁴² Ex. 053 20220915 -EMAIL RIO to R_initiate investigation

⁴³ Ex. 031 20220111 Data Sequestration Sheet_Ilangovan

⁴⁴ Ex. 033 20220225 Data Sequestration Sheet_Ilangovan



Human Resources (HR) representative: Colleen Rupp, Lead Employee Relations Consultant, Wexner Medical Center Human Resources (non-voting consultant).

Charge to the Committee

On October 25, 2022, the investigation committee, consisting of the RISC members above, was formally given their charge.⁴⁵ Prior to the charge, each member verbally reconfirmed that they did not have a conflict of interest with the respondents. The committee was charged to: (1) examine all evidence and collect any additional evidence it deems appropriate; (2) determine if the allegation constitutes research misconduct (i.e., meets all of the criteria required for a finding of research misconduct), and if so, if the respondent was responsible for the research misconduct; and (3) recommend sanctions if it is determined that a respondent committed research misconduct.

Interviews

Dr. [REDACTED] did not respond to the request for an interview nor to the request for responses to written questions.^{46,47,48,49}

The investigation committee conducted an investigation interview with Dr. [REDACTED] on February 20, 2023.⁵⁰

The investigation committee conducted an investigation interview with Dr. Ilangovan on February 24, 2023.⁵¹

The investigation committee conducted an investigation interview with a witness [REDACTED] on March 29, 2023.

TABLE 1: Timeline of Investigation Activities

| DATE | ACTIVITY | ATTACHMENT |
|--------------------|---|-----------------------|
| September 15, 2022 | Ilangovan notification of investigation | Ex. 053 ⁵² |
| September 27, 2022 | NIH Notification Memo | Ex. 055 ⁵³ |
| September 27, 2022 | ORI Notification Memo | Ex. 056 ⁵⁴ |
| September 29, 2022 | Ilangovan notification of investigation committee members | Ex. 054 ⁵⁵ |

⁴⁵ Ex. 057c Investigation Committee Charge_Redacted

⁴⁶ Ex. 064 20230124 -EMAIL RIO to [REDACTED] _Investigation Interview

⁴⁷ Ex. 065 20230127 -EMAIL RIO to [REDACTED] _RE_ Investigation Interview

⁴⁸ Ex. 066 20230221 -EMAIL RIO to [REDACTED] _RE_ Investigation Interview

⁴⁹ Ex. 067 RISC Interview Slides_ [REDACTED]

⁵⁰ Ex. 058 Confidential Interview of [REDACTED]

⁵¹ Ex. 059 Confidential Interview of Dr. Govindasamy Ilangovan

⁵² Ex. 053 20220915-Email RIO to R_initiate investigation

⁵³ Ex. 055 20220927 NIH Notification Memo DIO 7639

⁵⁴ Ex. 056 20220927 ORI Notification of Investigation DIO 7639

⁵⁵ Ex. 054 20220929 Notification of Investigation Committee Members



| | | |
|--------------------|--|---|
| October 25, 2022 | Investigation Committee Charged | Ex. 057c ⁵⁶ |
| November 15, 2022 | Investigation Committee Meeting | |
| December 12, 2022 | Investigation Committee Meeting | |
| January 3, 2023 | Ilangovan notified of new allegation | Ex. 063 ⁵⁷ |
| January 10, 2023 | Investigation Committee Meeting | |
| January 24, 2023 | Investigation Committee Meeting | |
| February 7, 2023 | Investigation Committee Meeting | |
| February 17, 2023 | Investigation Committee Meeting | |
| February 20, 2023 | Investigation Committee Interview [REDACTED] | Ex. 058 ⁵⁸ |
| February 21, 2023 | Investigation Committee Meeting | |
| February 23, 2023 | ORI grants extension for receipt of Investigation Report | Ex. 060 ⁵⁹ |
| February 24, 2023 | Investigation Committee Interview -Ilangovan | Ex. 059 ⁶⁰ |
| March 8, 2023 | Investigation Committee Meeting | |
| March 29, 2023 | Investigation Committee Interview [REDACTED] | Ex. 075 ⁶¹ |
| April 25, 2023 | Investigation Committee Meeting, voting meeting | |
| May 11, 2023 | Investigation Committee Meeting, voting meeting | |
| May 22, 2023 | ORI grants extension for receipt of Investigation Report | Ex. 074c ⁶² |
| July 12, 2023 | Received written response from Dr. [REDACTED] | Ex. 109c ⁶³ , Ex. 110 ⁶⁴ , Ex. 111c ⁶⁵ |
| July 20, 2023 | Respondent notification of additional allegations | Ex. 126 ⁶⁶ |
| July 27, 2023 | Investigation Committee Meeting | |
| July 27, 2023 | Received written response from Dr. [REDACTED] | Ex. 115 ⁶⁷ |
| August 09, 2023 | Received written response from Dr. Ilangovan | Ex. 128 ⁶⁸ , Ex. 129 ⁶⁹ |
| August 15, 2023 | Investigation Committee Meeting | |
| August 22, 2023 | ORI grants extension for receipt of Investigation Report | Ex. 120c ⁷⁰ |
| September 7, 2023 | Investigation Committee Meeting, voting meeting | |
| September 27, 2023 | Ilangovan provided Preliminary Investigation Reports | |
| October 11, 2023 | Ilangovan granted 2-week extension | Ex. 137 ⁷¹ |

⁵⁶ Ex. 057c Investigation Committee Charge_Redacted

⁵⁷ Ex. 063 20230103 Notification of new allegations

⁵⁸ Ex. 058 Confidential Interview of [REDACTED]

⁵⁹ Ex. 060c 20230223 -EMAIL ORI to RIO RE_ CONFIDENTIAL -DIO 7639 Extension Request_Redacted

⁶⁰ Ex. 059 Confidential Interview of Dr. Govindasamy Ilangovan

⁶¹ Ex. 075 3-29-23 Interview of [REDACTED] full size

⁶² Ex. 074c 20230522 -Email ORI to RIO -RE_ CONFIDENTIAL_ DIO 7639 Extension Request_Redacted

⁶³ Ex. 109c Summary_ 7-12-2023_Redacted

⁶⁴ Ex. 110 Response to RISC interview slides_7-12-2023

⁶⁵ Ex. 111c Response to the Investigation committee_7-12-2023_Redacted

⁶⁶ Ex. 126 20230720 Ilangovan notification of additional allegations

⁶⁷ Ex. 115 Phone call only i did

⁶⁸ Ex. 128 20230809 -EMAIL Ilangovan to RIO -Re_ CONFIDENTIAL -Notification of additional allegations

⁶⁹ Ex. 129 Responseto [REDACTED]

⁷⁰ Ex. 120c 20230822 -Email ORI to RIO RE_ CONFIDENTIAL DIO 7639 Extension Request_Redacted

⁷¹ Ex. 137 20231011 -EMAIL RIO to Ilangovan RE_ Extension Request Approved



| | | |
|-------------------|--|---|
| October 26, 2023 | Received written response to preliminary investigation report from Dr. Ilangovan | Ex. 138 ⁷² , Ex. 139 ⁷³ , Ex. 140 ⁷⁴ , Ex. 141 ⁷⁵ , Ex. 142 ⁷⁶ |
| November 09, 2023 | Investigation Committee Meeting, voting meeting | |

Investigation Analysis

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

⁷² Ex. 138 R01HL078796-01A2

⁷³ Ex. 139 R21EB004658-01

⁷⁴ Ex. 140 RecommendationAppeal

⁷⁵ Ex. 141 Specific aims of the referenced grants

⁷⁶ Ex. 142 20231026 Screenshot email Ilangovan to RIO

[Redacted]



[REDACTED]

| | | | |
|------------|------------|------------|------------|
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
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AJP 2006

Allegation ■: Figure 4A in AJP 2006 was falsified by the reuse and relabeling of single bands in Bax and Bcl-2 Western blots as follows: (1) the 0.25 μ M and 5 μ M DOX treated Bax band in the control blot; (2) the 5 μ M and 10 μ M DOX treated Bcl-2 band in the control blot; and (3) the 5 μ M and 10 μ M DOX treated Bcl-2 band in the HS blot.

Finding of Fact:

1. Concerns with AJP 2006, Figure 4A were originally posted to PubPeer in May 2020.¹¹⁷
2. Forensic analysis of Figure 4A conducted by ORC shows band duplication and pasting images of bands to cover original band images.
 - a. Forensic analysis conducted by ORC using the overlay action in Photoshop shows that the Bax bands for 0.25 μ M and 5 μ M DOX treated control cells appear to be the same (red boxes slide #17) and that the Bcl-2 bands for 5 μ M and 10 μ M DOX treated control cells appear to be the same (purple boxes slide #17). The forensic analysis of the Bcl-2 bands for 5 μ M and 10 μ M DOX treated HS cells (green boxes slide #17) was not conclusive.¹¹⁸
 - b. ORC identified the same western blot panels used in AJP 2006, Figure 4A in a PowerPoint file in the sequestered research record located in the following path: Ilan01 > Dr.IlangovanHard drive data > Talks. The image was found on slide #45 from a ppt file called "BWH Talk". According to the associated metadata, Dr. Ilangovan created this file on September 26, 2002, and it was last saved on April 15, 2008 by "OSU".¹¹⁹ Additional analysis by ORC using the "ungrouping" function in PowerPoint demonstrated that a band was cut and

¹¹⁷ Ex. 070 Investigation Analysis, slide 16

¹¹⁸ Ex. 070 Investigation Analysis, slide 17

¹¹⁹ Ex. 070 Investigation Analysis, slide 18



pasted over the Bax expression for 5 μ M DOX treatment (lane 3) in the control blot to give the desired result. The band cut and pasted over Bax 5 μ M DOX was the same as the band for Bax expression after treatment with 0.25 μ M DOX in the control blot.¹²⁰ Similarly, ORC found that the two bands inserted over the bands for Bcl2 expression after treatment with 0.25 μ M and 5 μ M DOX in the control blot panel are the same as the bands for Bcl2 expression after treatment with 5 μ M and 10 μ M DOX in the control blot.¹²¹

3. ORC identified a replicate of the experiment shown in AJP 2006, Figure 4A, in the sequestered research record and in emails.¹²² Forensic analysis of the files associated with the replicate experiment also shows band duplication and pasting images of bands to cover original band images.
 - a. The same figure from the replicate experiment was identified in previous versions of the manuscript submitted to and rejected by other journals (JBC¹²³ and PNAS¹²⁴), in other draft figure files (Figure1new.ppt)¹²⁵, in a conference poster (SFRBM(Venkat) Conference.ppt)¹²⁶, and in presentation slides for a talk (Lorrillard2005.ppt)¹²⁷.
 - b. Raw data from the replicate experiment, in the form of TIF file images, were also identified in the sequestered research record.^{128,129}
 - c. Figure1new.ppt is a working draft of figures for the manuscripts submitted to PNAS and JBC.¹³⁰ Slide 12 of Figure1new.ppt matched the raw data files “Bax (2min, Dox only)” (purple and yellow boxes)¹³¹ and “Bcl-2 (2min, Dox only)” (cyan and black boxes)¹³².
 - i. ORC compared the blots on slide 12 of “Figure1new.ppt” with Figure 5 in the PNAS and JBC^{133,134} submissions and found: (1) 4 lanes from both the Bax and Bcl2 blots were duplicated from slide 12 of “Figure1new.ppt” and relabeled to represent different experimental conditions in Figure 5 of the PNAS and JBC submissions^{135,136}; (2) and as with the data in Figure 4A from AJP 2006, bands in the Bcl2 blots

¹²⁰ Ex. 070 Investigation Analysis, slide 19

¹²¹ Ex. 070 Investigation Analysis, slide 19

¹²² Ex. 070 Investigation Analysis, slides 20-23

¹²³ Ex. 091 ManuscriptJBC 20051104 email attachment

¹²⁴ Ex. 090 Figure1new.pdf

¹²⁵ Ex. 088 Figure1new.ppt

¹²⁶ Ex. 097 SFRBM() Conference

¹²⁷ Ex. 108 Lorrillard2005.ppt

¹²⁸ Ex. 106 Bax (2min, Dox only)

¹²⁹ Ex. 107 Bcl-2 (2min, Dox only)

¹³⁰ Ex. 088 Figure1new.ppt

¹³¹ Ex. 070 Investigation Analysis, slide 29

¹³² Ex. 070 Investigation Analysis, slide 31

¹³³ Ex. 090 Figure1new.pdf

¹³⁴ Ex. 091 ManuscriptJBC 20051104 email attachment

¹³⁵ Ex. 070 Investigation Analysis, slide 25

¹³⁶ Ex. 070 Investigation Analysis, slides 29, 31



- were cut and pasted over the original image panel with images of bands representing other experimental conditions.¹³⁷
- ii. The raw data files of the western blots used for Figure 5 in the JBC and PNAS submissions were labeled as Bax (2min, Dox only) and Bcl-2 (2min, Dox only).¹³⁸ The figure legends and the figure labels for Figure 5 in the JBC and PNAS submissions indicate that the western blots were heat shocked and treated with Dox.¹³⁹ ORC identified raw data files in the sequestered research record that were labeled as Bax (HS+Dox) and Bcl-2 (HS+Dox), but they were not used.¹⁴⁰
 - d. The meta data indicates that “Figure1new.ppt” was created by Dr. Ilangovan on 3/29/2005 and last saved by Dr. Ilangovan on 11/2/2005^{141,142}. This file was also sent as an attachment to an email sent from Dr. Ilangovan to Dr. [REDACTED] on 11/04/2005¹⁴³. This file contained unmanipulated (slide 12) and manipulated (slide 13) versions of the Dr. [REDACTED] data on back to back slides.¹⁴⁴
 4. In reference to Figure 4A, the results section of the publication states “Addition of DOX induced Bax, which increased with increasing DOX concentration, suggesting that Bax is involved in DOX-induced apoptosis signaling”.¹⁴⁵ In all cases where images were identified with bands covering the original image bands, the manipulated images showed either an increase or similar expression levels with increasing concentrations of DOX, where the original images showed a decrease in expression from 0.25 μ M to 5 μ M DOX or no significant increase at 10 μ M DOX.
 5. In an email to Dr. Ilangovan dated 11/11/2005, Dr. [REDACTED] states that he is attaching the corrected version of the poster and that he has “scrutinized the proof”.¹⁴⁶ The poster attached to this email contained manipulated images.¹⁴⁷
 6. Dr. Ilangovan was notified of the problems with Figure 4A, AJP 2006 on June 24, 2020, by a letter from Dr. Christina Bennett, Publications Director, Policy, American Physiological Society.¹⁴⁸
 7. Dr. Ilangovan responded to Dr. Bennett on November 4, 2020, and stated the following: (1) Dr. [REDACTED] was primarily responsible for the data; (2) Dr. Ilangovan was not able to reach Dr. [REDACTED]; the original films could not be located; (3) “we have not been able to find any data even in digital format”; (4) the image is representative of multiple runs; (5) “I clearly remember seeing and reviewing the

¹³⁷ Ex. 070 Investigation Analysis, slide 31

¹³⁸ Ex. 070 Investigation Analysis, slides 29, 31

¹³⁹ Ex. 070 Investigation Analysis, slides 29, 31

¹⁴⁰ Ex. 070 Investigation Analysis, slides 26-28, 30

¹⁴¹ Ex. 088 Figure1new.ppt

¹⁴² Ex. 070 Investigation Analysis, slide 20

¹⁴³ Ex. 089 Ilango to Venkat 20051104

¹⁴⁴ Ex. 088 Figure1new.ppt, slides 12, 13

¹⁴⁵ Ex. 017 AJP 2006

¹⁴⁶ Ex. 094 Venkat to Ilango 20051111

¹⁴⁷ Ex. 70 Investigation Analysis, slide 21

¹⁴⁸ Ex. 025 Ilangovan first letter



original blots from the first author”; and (6) “I believe the overall conclusions of the paper are valid”.¹⁴⁹

8. In a letter dated November 13, 2020, Dr. Christina Bennett told Dr. Ilangovan that “because the concerns do not affect the overall conclusions of the paper, corrections are not recommended at this time”.¹⁵⁰

Respondent’s Responses:

1. During his investigation interview, Dr. Ilangovan stated that he was not involved in compiling and formatting images for publication. He said that his staff, including first author Dr. [REDACTED], was primarily responsible for these duties.
 - a. “Since I am not expert, I was not at least at that time, I was not expert in that, so everybody used to maintain a folder and what all they do, they archive, they scan it, you know, compiled a figure, a particular figure, and present it at the group meeting.”¹⁵¹
 - b. “Initially in the group meetings they used to bring the film and show this is what -- in the pouch as is, this is what we obtained. So we discuss further, do you want to repeat it or do you want to combine the different, you know, conditions together, together, and we decide, we make a decision there. Then he -- You know, once it gets formalized or finalized, they scan it and produce the digital figure.”¹⁵²
 - c. When asked about his role in manuscript preparation, Dr. Ilangovan said that “it’s primarily the primary author is responsible for composing the figures. Nothing will be -- you know, I will not maintain the films, I will not be maintaining anything with me, so the person will be maintaining everything together.”¹⁵³
2. During his investigation interview, Dr. Ilangovan was asked if he had any records of his submission to AJP and he responded “I don’t remember. I don’t know whatever we have -- or, I don’t have anything.”¹⁵⁴
3. Dr. Ilangovan trusted that the figures provided to him by Dr. [REDACTED] were unmanipulated, even when the conclusions of the research changed significantly between manuscript submissions and in response to a reviewer comment.¹⁵⁵
4. During the investigation interview, Dr. Ilangovan was asked about how films and images of research data were managed and he stated that he trusted what Dr. [REDACTED] said and what he was doing. He went on to say that “Those were very primitive days and the Adobe Photoshop was not well versed in 2004, or 2003 or 2004. So it’s kind of a learning process for him too. So, you know, then the final stage we used to make, I mean, he used to make the figure as a digital form”.¹⁵⁶

¹⁴⁹ Ex. 041 ResponsetoAJPComments

¹⁵⁰ Ex. 032 20201113 Letter from APS to Ilangovan

¹⁵¹ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 21, lines 14-19

¹⁵² Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 22, lines 24-25; page 23, lines 1-7

¹⁵³ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 39, lines 7-25; page 40, lines 1-3

¹⁵⁴ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 96, lines 4-9

¹⁵⁵ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, pages 98-107

¹⁵⁶ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 23, lines 23-25; page 24, lines 1-17



5. During the investigation interview, Dr. Ilangovan was questioned about how Dr. [REDACTED] named his data files and he stated “I don't know how, what is the pattern of labeling. So when he stored all those things, I didn't pay attention how each file could be identified.”¹⁵⁷
6. Dr. Ilangovan was unable to explain how file “Figure1new” contained both unmanipulated and manipulated data that he sent to Dr. [REDACTED], but stated “Maybe he composed two different set of results what he got. So I don't have any explanation on this because I don't remember anything. So all those results would have come from him, I would have seen, I would have sent back to him.” And that when he looked through the slides he would not have done an “analysis what you have done. I would have seen the bare images appear in there. I might have not suspected anything or I might have not got any analysis done on that.”¹⁵⁸
7. During the investigation interview Dr. Ilangovan indicated that he would sometimes compile the individual figure images made by his lab and collaborators into a single PowerPoint file for distribution. “ILANGO VAN: The person as a primary author, the first author, would be responsible to put the figures together. I think during that time I had 160 other collaborations a lot, so he would be communicating, collecting. Or if I collect any data from (indiscernible) my collaborators, I used to give it to him. So he used to format the figure and, you know, whatever he sends, that figure, we add it. Before I have a copy, I used to copy the whole figure and put into another file for duplicative file, you know, for my use and things like that.”¹⁵⁹

Witness Responses:

1. Dr. [REDACTED] stated that Dr. Ilangovan was the one who compiled the data for publications.
 - a. “I submitted all the data to Ilangovan. I maintained the heat record book also, which I didn't carry forward with me when I left this lab. Everything I surrendered to him. And then it was he who used to compile the data, and it was he who decided who are going to be the coauthors. I didn't have any say on it.”¹⁶⁰
 - b. When asked who took the scanned images and made them into a PowerPoint slide, Dr. [REDACTED] stated “Yeah, at that time I wasn't that good in drawing Excel graph, also. Moreover, I didn't have time, that I have to splice it multiple time because I have to repeat my other experiments also. Some so of the data work, it went to Ilangovan, he was doing the Excel back then.”¹⁶¹ When asked if that included the PowerPoint images as well, Dr. [REDACTED] stated “PowerPoint. Everything” “See, finally, whatever we arrive at the correct images, everything was submitted to Ilangovan and he used to compile the

¹⁵⁷ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 121, line 1-25; page 122, lines 1-6

¹⁵⁸ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 112, lines 11-25; page 113, lines 1-13

¹⁵⁹ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 26, lines 13-23

¹⁶⁰ Ex. 093 Confidential Interview of [REDACTED], page 13, lines 22-25; page 14, lines 1-3

¹⁶¹ Ex. 093 Confidential Interview of [REDACTED], page 37, lines 19-24



data, and then he get backs to us and then he says this is how the final picture is, this is the conclusion we are getting, and then we write it and submit it.”¹⁶²

- c. When asked if he was responsible for a specific figure, Dr. [REDACTED] stated “No. These type of copy and paste Ilango would have done, I don't do. I just give him only the raw data. I think you can see that time I was totally naïve of computer operations. I don't know how to do these type of assembling of data. Everything, he has only done. All the data compilation was done by Ilangovan, not by me.”¹⁶³
 - d. During the investigation interview, Dr. [REDACTED] said that he asked Dr. Ilangovan many times to not list him as first author because he was only doing the experiments.¹⁶⁴
2. During her investigation interview, Dr. [REDACTED] the Ilangovan lab and witness, but not an author on this publication, said that in her experience [REDACTED] in the lab, both her and Dr. Ilangovan had a role in creating figures for specific journals,¹⁶⁵ but did not know if that was the same for other members of the lab.¹⁶⁶
 3. In a written statement provided to the investigation committee on July 7, 2023, Dr. [REDACTED] stated that “In our lab, once all the experiments are completed in the project, he [Dr. Ilangovan] takes care from there to work on the manuscript and the representative image will be chosen by him from the raw data.”¹⁶⁷

Respondent’s Responsibility and Intent:

1. Dr. Ilangovan is the senior and corresponding author of AJP 2006 and is the PI of the laboratory and of the grants that supported the experiments. A preponderance of the evidence suggests that the data for Figure 4A and another replicate experiment were intentionally and knowingly falsified.
2. The meta data shows that Dr. Ilangovan was the author of “Figure1new.ppt”, which contained direct evidence of this manipulation, and was sent to Dr. [REDACTED] by Dr. Ilangovan on 11/4/2005. This demonstrates that, at a minimum, Dr. Ilangovan was aware of the figure manipulation.
3. The committee could not, however, determine if Dr. Ilangovan was responsible for the manipulation or if he simply copied and pasted the manipulated data into the PowerPoint file that he created.
4. The committee found that even if Dr. Ilangovan was not the one that intentionally and knowingly falsified the image, he failed to have proper oversight of the data generated in his lab and missed opportunities to properly train his staff to prevent data manipulation.

Significance:

¹⁶² Ex. 093 Confidential Interview of [REDACTED], page 37, line 25; page 38, lines 1-8

¹⁶³ Ex. 093 Confidential Interview of [REDACTED], page 99, lines 21-25; page 100, lines 1-4

¹⁶⁴ Ex. 093 Confidential Interview of [REDACTED], page 102, lines 24-25; page 103, lines 1-5

¹⁶⁵ Ex. 075 3-39-23 Interview of Dr. [REDACTED] full size, page 22, lines 3-13

¹⁶⁶ Ex. 075 3-39-23 Interview of Dr. [REDACTED] full size, page 23, lines 10-18

¹⁶⁷ Ex. 109c Summary_ 7-12-2023_Redacted



1. The publication states that “Addition of DOX induced Bax, which increased with increasing DOX concentrations, suggesting that Bax is involved in DOX-induced apoptosis signaling”. The unmanipulated images show a decrease or stable expression with increasing concentrations of DOX, but the manipulated images support the authors conclusions. The committee therefore finds the impact of the falsification on the conclusions from the data to be significant.

The conclusions for this allegation are based on the following facts and observations:

1. The preponderance of the evidence suggests that the data in Figure 4A and in unpublished replicate experiments were intentionally and knowingly falsified.
2. After reviewing all the evidence, the committee found Dr. Ilangovan responsible for the falsified data in Figure 4A because he created and emailed the PowerPoint file containing direct evidence of data manipulation to Dr. [REDACTED], and both postdoctoral researchers testified that Dr. Ilangovan was responsible for compiling figures for publication. Therefore, the preponderance of the evidence indicates that at a minimum, Dr. Ilangovan recklessly reported falsified data in Figure 4A.

Conclusions for Allegation [REDACTED]: By a preponderance of the evidence, the investigation committee finds by a 3-0 vote sufficient evidence that the respondent intentionally, knowingly, or recklessly falsified Figure 4A in AJP 2006. This act constitutes research misconduct as described under the Policy.

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

AJP 2008

Allegation ■: Figure 5A in AJP 2008 was falsified by (1) the reuse and relabeling of the p21 Western blot in H9c2 cells after 2hr treatment and in HSF-1^{+/+} wild type cells after 2hr treatment; and (2) the falsification of the 2021 corrigendum for Figure 5A by reuse and relabeling of the p21 Western blot in cardiac H9c2 cells 24h treatment (from Figure 4A in Lattest Figures.ppt) as HSF-1^{+/+} wild type cells after 2hr treatment.

Finding of Fact:

1. Forensic analysis conducted by ORC for AJP 2008 Figure 5A using the overlay action in Photoshop shows that when the second row of blots, H9c2 cells after 2hr treatment, is adjusted for brightness and contrast (-78/-50, respectively), the panels for H9c2 and HSF^{+/+} are highly similar and likely duplicated.²⁰²
2. Dr. Ilangovan was sent a letter from Dr. Christina Bennett, Publications Director, Policy, at the American Physiological Society, on June 24, 2020, regarding concerns with that the H9c2 and HSF-1^{+/+} panels were duplicates.²⁰³

²⁰⁰ Ex. 070 Investigation Analysis, slide 34

²⁰¹ Ex. 092 20060131 -reviewer comments from JBC _From the JBC re_ Manuscript M5_13753

²⁰² Ex. 070 Investigation Analysis, slide 39

²⁰³ Ex. 025 Ilangovan first letter



3. On November 4, 2020, Dr. Ilangovan responded to the concerns from the American Physiological Society.²⁰⁴ In this response Dr. Ilangovan included the following statements: (1) “I see that you are correct that these image rows seem to be of the same data only with contrasting differences”; (2) “there seems to have been an error that happened during revision and re-composition of the figure for publication in the final stage”; (3) “We could locate the digital figure file that was prepared for submission; (4) “the figure attached here (Attachment 1, red box) shows the correct figure 5A that was in the manuscript file I found from 12/08/2006”. *Note that the figure was not attached to the response, rather a pasted image into a PDF; (5) “the conclusion of the experiment is drawn from the quantitative data presented in the Fig.5C with multiple runs”; and (6) Dr. Ilangovan tried repeatedly, without success to trace and locate the first author.
4. In a letter dated November 13, 2020, Dr. Christina Bennett told Dr. Ilangovan that “given that you were able to locate data related to the results reported in Figures 5A of the 2008 paper a corrigendum can be published to correct the error.”²⁰⁵
5. A corrigendum of the corrected Figure 5A was published in 2021.²⁰⁶
6. The only difference between Figure 5A as published and Figure 5A in the published corrigendum is panel 2, which is labeled to represent p21 expression of HSF-1^{+/+} cells after 2hr treatment.²⁰⁷
7. The sequestered research record contained a ppt file, “Latest Figures.ppt”: ilan01 > Dr.IlangovaHard drive data > Papers > p53 that was originally created by Dr. Ilangovan on December 8, 2006, according to the associated metadata.^{208,209} This file includes a figure similar to AJP 2008 Figure 5A with the first two panels (H9c2 and HSF^{+/+} 2 hr after treatment) duplicated. However, the after 24 hr treatment H9c2 is a different panel as compared to the published Figure 5A.
8. ORC identified that the Figure 5A published in the corrigendum was manipulated by using the panel for H9c2 cells after 24 hr treatment from “Latest Figures.ppt” as the panel for HSF-1^{+/+} cells after 2 hr treatment. Therefore, panel 4 from “Latest Figures.ppt” labeled as p21 expression in H9c2 cells after 24hr treatment is included in the corrigendum incorrectly as HSF-1^{+/+} cells after 2 hr treatment.²¹⁰
9. A PowerPoint file was sent by Dr. Ilangovan to [REDACTED] in an email dated 11/13/2006.^{211,212} This file contained 4 unlabeled, 8 lane western blots and was created by and last saved by Dr. Ilangovan on 11/13/2006.²¹³ The third unlabeled western blot from Dr. Ilangovan was added to a poster (“SFRBM 2([REDACTED]) Conference”)²¹⁴ as H9c2 cells after 24 hour treatment and as HSF-1^{+/+} cells after 2h in the corrigendum (red boxes).²¹⁵

²⁰⁴ Ex. 041 ResponsetoAJPComments

²⁰⁵ Ex. 032 20201113 Letter from APS to Ilangovan

²⁰⁶ Ex. 028 Correction 2021- Venkatakrishnan et al Am J Physiol 2008

²⁰⁷ Ex. 070 Investigation Analysis, slide 41

²⁰⁸ Ex. 070 Investigation Analysis, slide 42

²⁰⁹ Ex. 029 Latest Figures

²¹⁰ Ex. 070 Investigation Analysis, slide 43

²¹¹ Ex. 122 Ilango to [REDACTED] 20061113

²¹² Ex. 123 20061113 email attachment [REDACTED] poster

²¹³ Ex. 070 Investigation Analysis, slide 44

²¹⁴ Ex. 124 20061114 email attachment SFRBM 2([REDACTED]) Conference

²¹⁵ Ex. 070 Investigation Analysis, slide 44



10. ORC determined that Dr. [REDACTED] was not affiliated with OSU after February 2007.

Respondent's Responses:

1. During his investigation interview on February 24, 2023, Dr. Ilangovan stated the following regarding his laboratory operations, data management and staff:
 - a. Dr. [REDACTED] was hired to conduct biochemistry experiments because Dr. Ilangovan did not have a lot of experience with these types of experiments.²¹⁶ During his time in the lab he was responsible for “the biochemistry -- biology experiments and the molecular biology experiments”.²¹⁷
 - b. Dr. [REDACTED] used to make the figure as a digital form.²¹⁸
 - c. Dr. Ilangovan did not do any of the Western blot experiments because he didn't have the expertise.²¹⁹
 - d. Dr. Ilangovan stated that Western data films were scanned by the postdoctoral researchers with films labeled and retained in a pouch. Scanned films were inserted into PowerPoint and used to make figures that were presented for discussion in laboratory meetings for review by the group.²²⁰
 - e. Dr. Ilangovan stated that the first authors were responsible for putting figures together.²²¹
 - f. Dr. Ilangovan confirmed that Dr. [REDACTED] asked not to be first author.²²²
 - g. Dr. Ilangovan did not think Dr. [REDACTED] had any integrity-related issues.²²³
 - h. Dr. Ilangovan did not have custody of the data until the person that generated the data left the laboratory.²²⁴
2. During his investigation interview on February 24, 2023, Dr. Ilangovan stated the following regarding Allegation #1:
 - a. Dr. Ilangovan was responsible for the correction.²²⁵
 - b. Dr. [REDACTED] was responsible for putting together the western blots for the original Figure 5A.²²⁶ When informed that Dr. [REDACTED] stated that at no point was he involved with figure compilation²²⁷, Dr. Ilangovan stated “That's not true. That's not true.”²²⁸

²¹⁶ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 10, lines 1-5

²¹⁷ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 11; lines 18-21

²¹⁸ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 24; lines 11-16

²¹⁹ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 91, 12-22

²²⁰ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 21, lines 5-25; page 22, lines 1-21

²²¹ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 26, lines 10-15

²²² Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 41, lines 19-25

²²³ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 12, lines 2-7

²²⁴ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 40, lines 18-25; page 50, lines 1-11

²²⁵ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 136, lines 19-21

²²⁶ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 127, lines 19-24

²²⁷ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 128, lines 17-23

²²⁸ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 129, lines 5-6



- c. During the review of Allegation [REDACTED], a PowerPoint file (“Lattest Figures.ppt”) was identified on Dr. Ilangovan’s hard drive that included the duplicated first two blots in the originally published Figure 5A. This file was created by Dr. Ilangovan and last saved by Dr. Ilangovan.²²⁹ When questioned about why the meta data attached his name to this figure, Dr. Ilangovan said that he could have received the images from Dr. [REDACTED] and then added them to the PowerPoint file.²³⁰
 - d. During the review of Allegation [REDACTED], this same figure (“Lattest Figures.ppt”) shows that the H9c2 after 24h blot that was used by Dr. Ilangovan as the HSF-1^{+/+} After 2hr blot for the corrigendum.²³¹ Since it was not labelled correctly, Dr. Ilangovan was asked how he knew that the data for the HSF-1 that was correct was right. Dr. Ilangovan responded by stating “I had an image where the one what you have blocked with the red -- -- labelled as HSF-1 for two hours somewhere in the file, so I pulled it and I pop it in”.²³²
 - e. Dr. Ilangovan stated that he could send the file that proves that the corrected data in the corrigendum was accurate.²³³
3. In a written response to the investigation committee dated March 7, 2023, Dr. Ilangovan responded to the issues raised regarding the accuracy of the data he used in the corrigendum by the committee during his investigation interview. Dr. Ilangovan indicated that the file used for the corrigendum was “Lattest Figures” and that “my best judgement was that this should be the right image of HSF-1^{+/+} of 2hrs”.²³⁴ Dr. Ilangovan went on to explain that it could not be the correct data for H9c2 after 24h because the blot shows high intense blots which are not consistent with the quantitative data presented in Figure 5C and 5D.²³⁵

Witness Responses:

1. During his investigation interview with the committee on February 20, 2023, Dr. [REDACTED] witness, made the following statements:
 - a. Dr. [REDACTED] stated that he was “more of a technical staff” and that the compilation of the data was done by Dr. Ilangovan.²³⁶
 - b. Dr. [REDACTED] did not have much previous experience with protein biochemistry and initially struggled in doing a simple Western blot.²³⁷

²²⁹ Ex. 070 Investigation Analysis, slide 42

²³⁰ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 131, lines 3-19

²³¹ Ex. 070 Investigation Analysis, slides 42-43

²³² Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 136, lines 11-25; page 137, lines 1-4

²³³ Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan, page 139, lines 16-25; page 140, lines 1-17

²³⁴ Ex. 095 ResponseonCorrigendum

²³⁵ Ex. 095 ResponseonCorrigendum

²³⁶ Ex. 093 Confidential Interview of [REDACTED], page 65, lines 18-25; page 66, line 1

²³⁷ Ex. 093 Confidential Interview of [REDACTED], page 19, lines 4-15



- c. Dr. [REDACTED] would conduct the experiment and then show Dr. Ilangovan the results, who then decided if the results were acceptable or needed to be repeated.²³⁸
 - d. When shown a western blot from one of his publications, Dr. [REDACTED] said that he would have developed the blot and given it to Dr. Ilangovan. “After doing the analysis and then discussing with him, once he says this is somewhat clear and it is matching with our conclusion, then it is he who scans and then takes it for publication.
 - e. Dr. [REDACTED] never cropped Western blots.²³⁹
 - f. Dr. Ilangovan would compile the images into PowerPoint files.²⁴⁰
 - g. Dr. [REDACTED] did not write any of the text for the publications but would edit.²⁴¹
2. On March 29, 2023, during an interview with Dr. [REDACTED] in the Ilangovan lab and witness, but not an author on AJP 2008, she stated that data was reviewed in both lab meetings and in individual meetings with Dr. Ilangovan.²⁴² Dr. [REDACTED] also indicated that as a [REDACTED] student both her and Dr. Ilangovan worked on figures²⁴³ and that Dr. Ilangovan had her raw data.²⁴⁴
 3. In a written statement provided to the investigation committee on July 7, 2023, Dr. [REDACTED], former Postdoctoral Research in the Ilangovan lab and witness, [REDACTED], stated that “In our lab, once all the experiments are completed in the project, he [Dr. Ilangovan] takes care from there to work on the manuscript and the representative image will be chosen by him from the raw data.”²⁴⁵

Respondent’s Responsibility and Intent:

1. Dr. Ilangovan is the senior and corresponding author of AJP 2008 and is the PI of the laboratory and of the grants that supported the experiments.
2. There is clear evidence of duplicated data in the original published version of Figure 5A, and the alteration of the duplicated image makes it less likely to be the result of an honest error.
3. The statements from Dr. [REDACTED] and Dr. Ilangovan regarding who generated figures for publication are in direct opposition to one another but the witness statements from Dr. [REDACTED], not an author on this publication, support the statements made by Dr. [REDACTED], that Dr. Ilangovan compiled figures for publication.
4. Dr. Ilangovan also created and last saved a PowerPoint file on November 13, 2006, that contained 4 unlabeled western blots. He emailed that file to Dr. [REDACTED] on

²³⁸ Ex. 093 Confidential Interview of [REDACTED], page 20, lines 1-7

²³⁹ Ex. 093 Confidential Interview of [REDACTED], page 63, lines 2-4

²⁴⁰ Ex. 093 Confidential Interview of [REDACTED], page 37, lines 16-25; page 38, lines 1-8

²⁴¹ Ex. 093 Confidential Interview of [REDACTED], page 42, lines 4-13

²⁴² Ex. 075 3-29-23 Interview of Dr. [REDACTED], page 10, lines 13-24; page 11, lines 1-2

²⁴³ Ex. 075 3-29-23 Interview of Dr. [REDACTED], page 22, lines 3-13

²⁴⁴ Ex. 075 3-29-23 Interview of Dr. [REDACTED], page 23, lines 4-6

²⁴⁵ Ex. 109c Summary_ 7-12-2023_Redacted



that same day. This suggests that at a minimum, Dr. Ilangovan was involved in directing what raw data was used in figures.

5. In addition, the investigation committee determined that the practice of emailing files to postdoctoral researchers with unlabeled western blot panels is not an accepted practice and likely contributed to the publication of falsified data.
6. The witness statements from Dr. [REDACTED], were positive regarding the lab environment but did not provide clarification of figure generation.
7. Regarding the corrigendum that was published in 2021 for AJP 2008, Dr. Ilangovan stated in a letter to AJP that he agreed the first two blots were duplicated and the contrast adjusted. He provided the journal with a new figure that “shows the correct figure 5A that was in the manuscript file I found from 12/8/2006.”
8. Multiple files including the one Dr. Ilangovan referenced from 12/8/2006 were reviewed by the investigation committee but in each case the blot that Dr. Ilangovan used to represent p21 expression in HSF-1^{+/+} cells after 2h in the corrigendum, was labelled as p21 expression in H9c2 cells after 24h.^{246, 247}
9. A thorough review of the research record did not identify any files where this blot used for the corrigendum was labeled as Dr. Ilangovan labeled it.
10. ORC and the investigation committee asked repeatedly for Dr. Ilangovan to provide the file that he used for the corrigendum showing that specific blot labelled as HSF-1^{+/+} after 2h and he was unable to do so. In his response to the investigation committee sent following his investigation interview with the committee, Dr. Ilangovan stated that he used the western blot that was labelled as p21 expression in H9c2 cells after 24h and re-labelled it as HSF-1^{+/+} cells after 2h for the corrigendum because he felt it must have been mislabeled because it did not match the quantitative plots in Figure 5C and 5D.
11. The committee determined by a preponderance of the evidence that Dr. Ilangovan intentionally, knowingly, or recklessly submitted falsified data to AJP for the published corrigendum.

Significance:

1. The discussion of AJP 2008 states that “Overall, the present work has established that HSP27 can attenuate Dox-induced toxicity by regulating the transcriptional activity of p53 and upregulating p21”.
2. The comparison between p21 expression in HSF-1^{+/+} cells and HSF-1^{-/-} cells is critical since HSF-1 is a major transcription factor for HSP27. The investigation committee, therefore, finds the repeated falsification (in both Figure 5A of the original publication and Figure 5A of the corrigendum) of p21 expression in HSF-1^{+/+} cells to be significant.

The conclusions for this allegation are based on the following facts and observations:

1. The preponderance of the evidence suggests the falsification of the p21 western blot for HSF-1^{+/+} cells after 2h in Figure 5A of both the original publication and the 2021 corrigendum.

²⁴⁶ Ex. 029 Latest Figures

²⁴⁷ Ex. 124 20061114 email attachment SFRBM 2([REDACTED]) Conference



2. The investigation committee was unable to determine who was responsible for the duplication in Figure 5A of the original publication. Because the duplicated western blot was also modified, likely by adjusting the contrast and brightness, it is unlikely to be the result of honest error. This duplication appears in several files located in the research record that was reviewed and therefore, the investigation committee finds that at a minimum both Dr. [REDACTED] and Dr. Ilangovan missed opportunities to identify and prevent the dissemination of falsified data.
3. Dr. Ilangovan takes full responsibility for the corrigendum and Dr. [REDACTED] was no longer in Dr. Ilangovan's laboratory and not involved with the corrigendum in any way.
4. The preponderance of the evidence demonstrates that the research record contained files with the same western blot image labelled differently and that Dr. Ilangovan repeatedly emailed unlabeled western blot data to Dr. [REDACTED]. Neither is considered an acceptable practice in this specific research community and the committee found this to be a significant concern.
5. For the corrigendum, Dr. Ilangovan acknowledged that the raw data no longer existed. The electronic record for Figure 5A that did exist, contained the duplicated blots. Dr. Ilangovan acknowledged that for the correction he used a western blot from a PowerPoint file entitled "Lattest Figure" that contained the duplicated blot and a blot labelled as H9c2 after 24h with "high intense bands" for p21 that was not consistent with the quantitative plots shown in Figures 5C and 5D. Dr. Ilangovan stated that this was "most likely HSF-1^{+/+} mis-pasted" and without the reference of any raw data, he used the blot labeled as H9c2 after 24h as HSF-1^{+/+} after 2h for the correction. The investigation committee determined that this is not an accepted practice of the relevant research community and when preparing the corrigendum Dr. Ilangovan should have carefully reviewed the data and only provided western image data that could be verified as correct. The investigation committee finds that using data to correct a published duplicated blot that "most likely" represents the correct data demonstrates intentional, knowing, and/or reckless research misconduct.

Conclusions for Allegation [REDACTED] By a preponderance of the evidence, the investigation committee by a 3-0 vote finds that the respondent intentionally, knowingly, or recklessly falsified Figure 5A in the corrigendum. This act does constitute research misconduct as described under the Policy.

Allegation #5: Figures [REDACTED], 1B, and [REDACTED] of AJP 2008 were falsified and mislabeled by cropping and splicing Western blot bands from Figure 1A in AJP 2007, or bands from an unlabeled Western blot panel from 2006, [slide 6 of file "Figures1" emailed from Dr. Ilangovan to Dr.

[REDACTED] on 6/7/2006] to represent the expression of a different protein and different cell types. Specifically:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



b. [REDACTED]

Allegation 5B, in Figure 1B, AJP 2008:

- a. The **total and s-15 HSP25** Western blots for control and heat-shocked HSF-1^{+/+} cells were reused from lanes 5-6 and 3-4 respectively, of a 2006 **unlabeled blot** in the research record;
- b. The **s-86 Hsp25** (phosphorylated Ser 86) Western blot for control and heat-shocked HSF-1^{+/+} cells were reused and relabeled from previously published data representing **total Hsp27** Western blots for control and heat-shocked HSF-1^{+/+} cells in Figure 1A of AJP 2007; and
- c. The GAPDH Western blot data for control and heat-shocked **HSF-1^{+/+}** cells were reused and relabeled from previously published data representing GAPDH Western blot for heat-shocked **H9c2 cells and control HSF-1^{+/+} cells** in Figure 1A of AJP 2007.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Finding of Fact:

- 1. The respondent was notified by ORC on July 20, 2023, of concerns with Figures [REDACTED], 1B, and [REDACTED] raised during the committee review of AJP 2008.²⁴⁸
- 2. On November 13, 2006, Dr. Ilangovan sent an email to Dr. [REDACTED] with an attached PowerPoint file named “[REDACTED]’s poster.ppt”.^{249,250} In the email Dr. Ilangovan wrote “I am sending the PPT figures. For Hsp27, I think you can use [REDACTED] figure . I have also include the Figure in the same slide.”_Forensic analysis conducted by ORC shows that “[REDACTED] figure” that Dr. Ilangovan sent to Dr. [REDACTED] to use in his poster, was the same as Figure 1A, AJP 2007.²⁵¹
- 3. [REDACTED]

²⁴⁸ Ex. 126 20230720 Ilangovan notification of additional allegations

²⁴⁹ Ex. 122 Ilango to [REDACTED] 20061113

²⁵⁰ Ex. 123 20061113 email attachment [REDACTED] poster

²⁵¹ Ex. 070 Investigation Analysis, slide 47



4. [REDACTED]

5. [REDACTED]

5. Forensic analysis shows that the bands for total and s-15 Hsp25 for control and heat-shocked HSF-1^{+/+} cells in Figure 1B, AJP 2008 were reused from lanes 5-6 and 3-4 respectively, of an unlabeled blot emailed from Dr. Ilangovan to Dr. [REDACTED] on 6/7/2006 (see Investigation Analysis, slide 49, blue and green boxes).²⁵⁵ In addition, the bands for **s-86 Hsp25 and GAPDH for control and heat-shocked HSF-1^{+/+} cells** in Figure 1B, AJP 2008, were reused and relabeled from previously published data representing the bands for **total Hsp27 for control and heat-shocked HSF-1^{+/+} cells and the bands for GAPDH for heat-shocked H9c2 cells and control HSF-1^{+/+} cells** from Figure 1A, AJP 2007 (see Investigation Analysis, slide 49, purple and red boxes).²⁵⁶

6. [REDACTED]

7. Dr. [REDACTED] incorporated the Hsp27 figure (“[REDACTED] figure) sent to him by Dr. Ilangovan on November 13, 2006, into his poster (SFRBM 2([REDACTED]) Conference) in the original, unmanipulated form.²⁶⁰ “SFRBM 2([REDACTED]) Conference” was last saved by Dr.

²⁵² Ex. 070 Investigation Analysis, slide 48, blue boxes
²⁵³ Ex. 070 Investigation Analysis, slide 48, red boxes
²⁵⁴ Ex. 070 Investigation Analysis, slide 48, purple boxes
²⁵⁵ Ex. 070 Investigation Analysis, slide 49, blue and green boxes
²⁵⁶ Ex. 070 Investigation Analysis, slide 49, purple and red boxes
²⁵⁷ Ex. 070 Investigation Analysis, slide 50, green boxes
²⁵⁸ Ex. 070 Investigation Analysis, slide 50, red boxes
²⁵⁹ Ex. 070 Investigation Analysis, slide 50, blue boxes
²⁶⁰ Ex. 070 Investigation Analysis, slide 51



2. Dr. [REDACTED] stated that Dr. Ilangovan was the one who compiled the data for publications.
 - a. “I submitted all the data to Ilangovan. I maintained the heat record book also, which I didn't carry forward with me when I left this lab. Everything I surrendered to him. And then it was he who used to compile the data, and it was he who decided who are going to be the coauthors. I didn't have any say on it.”²⁶⁸
 - b. When asked who took the scanned images and made them into a PowerPoint slide, Dr. [REDACTED] stated “Yeah, at that time I wasn't that good in drawing Excel graph, also. Moreover, I didn't have time, that I have to splice it multiple time because I have to repeat my other experiments also. Some so of the data work, it went to Ilangovan, he was doing the Excel back then.”²⁶⁹ When asked if that included the PowerPoint images as well, Dr. [REDACTED] stated “PowerPoint. Everything” “See, finally, whatever we arrive at the correct images, everything was submitted to Ilangovan and he used to compile the data, and then he get backs to us and then he says this is how the final picture is, this is the conclusion we are getting, and then we write it and submit it.”²⁷⁰
3. On March 29, 2023, during a witness interview with Dr. [REDACTED] she stated that data was reviewed in both lab meetings and in individual meetings with Dr. Ilangovan.²⁷¹ Dr. [REDACTED] also indicated that as a [REDACTED] student both her and Dr. Ilangovan worked on figures²⁷² and that Dr. Ilangovan had her raw data.²⁷³
4. In a written statement provided to the investigation committee on July 7, 2023, Dr. [REDACTED] witness, stated that “In our lab, once all the experiments are completed in the project, he [Dr. Ilangovan] takes care from there to work on the manuscript and the representative image will be chosen by him from the raw data.”²⁷⁴

Respondent's Responsibility and Intent:

1. Dr. Ilangovan is the senior and corresponding author of AJP 2008 and the forensic evidence clearly shows that, at a minimum, the data included in Figure 1B were intentionally and knowingly falsified.
2. In his written statement to the investigation committee Dr. Ilangovan states that the data from Figure 1A in AJP 2007 had to be reused in Figures [REDACTED], 1B and [REDACTED] in AJP 2008 because the data published in AJP 2007 and AJP 2008 were derived from the same cells and the data was needed to interpret the differences of the effects of Dox on p53 in control and heat-shocked cells. Dr. Ilangovan also indicates that the AJP 2007 was referenced in AJP 2008 and that it was clear that they were not claiming these results as

²⁶⁸ Ex. 093 Confidential Interview of [REDACTED], page 13, lines 22-25; page 14, lines 1-3

²⁶⁹ Ex. 093 Confidential Interview of [REDACTED], page 37, lines 19-24

²⁷⁰ Ex. 093 Confidential Interview of [REDACTED], page 37, line 25; page 38, lines 1-8

²⁷¹ Ex. 075 3-29-23 Interview of Dr. [REDACTED], page 10, lines 13-24; page 11, lines 1-2

²⁷² Ex. 075 3-29-23 Interview of Dr. [REDACTED], page 22, lines 3-13

²⁷³ Ex. 075 3-29-23 Interview of Dr. [REDACTED], page 23, lines 4-6

²⁷⁴ Ex. 109c Summary_ 7-12-2023_Redacted



- new. Although AJP 2007 was referenced in AJP 2008, it was not referenced in the results section and nowhere did the reference to AJP 2007 make it clear that the data was being re-used. The committee finds the reuse of data in AJP 2008 that was previously published in AJP 2007 without explicitly stating such, to be unacceptable.
3. Even if the committee accepted Dr. Ilangovan's justification for the reuse of the data from AJP 2007, the expectation would be that the western blot panels in Figures [REDACTED], 1B, and [REDACTED] would be identical to the western blot panel in Figure 1A of AJP 2007, and the forensic evidence demonstrates that this is not the case. Figure [REDACTED], 1B, and [REDACTED] have been manipulated more than by simply splitting the western blots into three panels as Dr. Ilangovan suggests.
 - a. The most apparent falsification is in Figure 1B of AJP 2008, where there are numerous issues: (1) total Hsp27/Hsp25 expression from AJP 2007 was reused and relabeled as s-86 Hsp27/Hsp25 in AJP 2008, which Dr. Ilangovan had no explanation for; (2) total Hsp27/Hsp25 and s-15 Hsp27/Hsp25 in AJP 2008 did not come from AJP 2007 as expected, but from an unlabeled Western blot sent in an email from Dr. Ilangovan to Dr. [REDACTED], dated 6/7/2006. The committee finds Dr. Ilangovan's explanation that it didn't need to be labelled and represented "intermediate slides temporally used to compose final figures" as not adequate or credible. One contiguous western blot panel cannot represent two different proteins as it does in Figure 1B.
 - b. The GAPDH western blot panels for all three cell lines are incorrect in AJP 2008, making it less likely that this is the result of a copy and paste error as Dr. Ilangovan suggests.
 4. Despite Dr. Ilangovan's statements that the first authors were responsible for composing figures for publication, both [REDACTED] interviewed agreed that Dr. Ilangovan composed figures for publication. With this specific allegation the preponderance of the evidence also points to Dr. Ilangovan as the person responsible for composing Figures [REDACTED], 1B, and [REDACTED] in AJP 2008, and not Dr. [REDACTED]. The email containing the unlabeled blot that was used as the source of some of the falsified data in Figure 1B of AJP 2008 came from Dr. Ilangovan. The latest version of the draft figures for AJP 2008 (Lattest Figures) prior to Dr. [REDACTED] leaving OSU was last saved on December 11, 2006, and did not contain manipulated data. The first appearance of the falsified data in the sequestered research record was in a later version of that same file (dated 1/16/2008) dated after Dr. [REDACTED] left OSU.

Significance:

In reference to Figure 1, the discussion section of AJP 2008 states "In the present study, we have found that the difference in HSP27 level correlates with the difference in p53 transcriptional activity, which in turn correlates with Dox-induced toxicity. HSPs are expressed by activation of transcription factors such as HSF-1 and HSF-2. As shown in Fig. 1, heat shock yields different responses in terms of HSP27 expression in our three cell lines. Heat shock activates HSF-1, forming a homotrimer complex, which translocates into the nucleus and binds to heat shock elements to express heat shock genes and, subsequently, HSPs. However, HSF-1 knockdown has been reported to significantly reduce HSP27 expression (75% reduction compared with wildtype),



whereas HSP70 and HSP90 are moderately affected (34, 39). Thus, as we expected, HSP27 expression was much lower in HSF-1^{-/-} cells than in cardiac H9c2 and HSF-1^{+/+} cells. The present results are consistent, in that neither heat shock nor Dox could enhance HSP27 in HSF-1^{-/-} cells. Thus, any difference between HSF-1^{-/-} cells and HSF-1^{+/+} and H9c2 cells is most likely due to lack of HSP27.” The conclusions made by the authors in AJP 2008 is supported by the falsified data in Figure 1B, more so than the unmanipulated data presented in Figure 1A of AJP 2007. Figure AJP 2007 shows more of a similarity in phosphorylated HSP27 between HSF-1^{+/+} and HSF-1^{-/-} cells and does not support the conclusion that any difference between HSF-1^{+/+} and HSF-1^{-/-} cells is most likely due to a lack of HSP27.

The conclusions for this allegation are based on the following facts and observations:

1. The committee finds that the preponderance of the evidence shows that at a minimum, the data represented in Figure 1B of AJP 2008 were intentionally and knowingly falsified.
2. If it is in fact true that the data from Figure 1A in AJP 2007 needed to be incorporated into Figures ■, 1B, and ■ of AJP 2008 for “CONTINUITY”, the authors should have made it explicitly clear that the data was previously published in AJP 2007 and all three western blot panels in Figures ■, 1B, and ■ should have overlapped with the corresponding lanes from Figure 1A, AJP 2007. The evidence does not support Dr. Ilangovan’s claim that AJP 2007 was split into three panels and reused in AJP 2008.
3. If the committee concurs with the assertion of Dr. Ilangovan that Hsp25 and Hsp27 and s-86 and s-82 were used interchangeably at the time of publication, there are at least 8 inconsistencies that exist between Figure 1A in AJP 2007 and Figures ■, 1B, and ■ in AJP 2008.
4. ■ interviewed as witnesses made corroborating statements indicating that Dr. Ilangovan was the one who would compile figures for publication and Dr. ■ had already returned to ■ before the manipulated data first appeared in the sequestered research record.

Conclusions for Allegation #5: By a preponderance of the evidence, the investigation committee finds by a 3-0 vote that the respondent intentionally and/or knowingly falsified Figure 1B of AJP 2008. This act does constitute research misconduct as described under the Policy.

Response to the Preliminary Investigation Report

The Investigation Committee received Dr. Ilangovan’s response to the Preliminary Investigation Report on October 26, 2023.^{275,276,277,278,279} Dr. Ilangovan stated that he “did not commit any of these alleged misconducts” and restated previous objections to the committee’s use of the meta data as

²⁷⁵ Ex. 138 R01HL078796-01A2

²⁷⁶ Ex. 139 R21EB004658-01

²⁷⁷ Ex. 140 RecommendationAppeal

²⁷⁸ Ex. 141 Specific aims of the referenced grants

²⁷⁹ Ex. 142 20231026 Screenshot email Ilangovan to RIO



evidence that he committed research misconduct.²⁸⁰ Dr. Ilangovan also stated that the three grants that were cited in AJP 2006 and AJP 2008 were listed only to acknowledge that experiments in those papers used equipment that was purchased with funds from those grants and the experiments in the papers were not part of the proposed specific aims or experiments outlined by those grants.²⁸¹

Dr. Ilangovan provided specific responses to Allegations █, █, and █:

Allegation █ -Dr. Ilangovan restated his previous assertion that he may have created a new file to transfer the data that was handed over to him, which was why the meta data had his name on it.²⁸²

Allegation █ – Regarding the corrigendum, Dr. Ilangovan restated that he carefully reviewed the data set after he was contacted by the journal and based on a logical understanding of the data, he determined that the data set he reviewed was mislabeled.²⁸³

Allegation █ -Dr. Ilangovan stated that “some additional experiments might have been done, showing some difference in the images.

The Investigation Committee carefully reviewed Dr. Ilangovan’s response to the Preliminary Investigation Report and met as a committee to discuss the response. Dr. Ilangovan’s response to the Preliminary Investigation Report did not change the Investigation Committee’s findings or their recommendations for sanctions.

Summary of Committee Findings

Following a review of all data and evidence and conducting interviews, the committee found by a preponderance of the evidence that Dr. Ilangovan intentionally, knowingly, or recklessly falsified the data in Figure 4A of Allegation # █ and the data included in the corrigendum of Allegation # █ and that he intentionally and/or knowingly falsified the data in Figure 1B of Allegation # █, therefore making the determination that Dr. Ilangovan committed research misconduct. The committee found that the preponderance of the evidence for Allegations # █ and # █, did not support a finding of research misconduct against Dr. Ilangovan and should be dismissed.

The investigation committee found Dr. Ilangovan to be negligent in his oversight of the research as he failed to ensure that the data was being collected, analyzed, and properly reported. For █ allegations reviewed by the investigation committee, the preponderance of the evidence suggested that falsification occurred but for Allegations # █ and # █ the committee was unable to determine who was responsible. The statements made by two different postdoctoral researchers, whose time in Dr. Ilangovan’s laboratory did not overlap, suggest that it was Dr. Ilangovan who was responsible, but the committee did not feel that it rose to the level of the preponderance of the evidence standard for Allegations # █ and # █. Dr. Ilangovan failed to take any responsibility for the issues with the data published by his laboratory and instead placed the responsibility with the █ of the publications in question. Honest errors occur in scientific research and are certainly outside the definition of

²⁸⁰ Ex. 140 RecommendationAppeal

²⁸¹ Ex. 140 RecommendationAppeal

²⁸² Ex. 140 RecommendationAppeal

²⁸³ Ex. 140 RecommendationAppeal



research misconduct, but the number of images that were published in the [REDACTED] papers reviewed in these research misconduct proceedings that did not accurately represent the research record is very concerning to the investigation committee. The integrity and accuracy of the published research record should be the goal of every researcher, every research institution, and every journal. Throughout the research misconduct process, Dr. Ilangovan has asserted that the original research data no longer exist because of how long ago the experiments took place and multiple laboratory relocations over the years. The research misconduct proceedings have identified serious inaccuracies in [REDACTED], AJP 2006, and AJP 2008, and since the research data no longer exists and/or is not accurate, the committee has determined that all [REDACTED] publications must be retracted.

Based on the findings of research misconduct and negligence in oversight of research, the committee recommends to the College of Medicine that Dr. Ilangovan be required to complete the PI Program through Washington University in St. Louis within one-year and to have all publication and grant data reviewed by a College of Medicine panel prior to submission for a period of three years. Dr. Ilangovan should also be required to work with the other authors to retract all three papers. Dr. Ilangovan should remove these publications from his CV and they should not be used in presentations, publications, or grant applications moving forward.

The Investigation Committee would like to specifically note that although they believe that Dr. Ilangovan should be given the opportunity for remediation, they have significant concerns that additional training will have a meaningful impact. The reviewed research record covered a span of over 10 years, with the most recent allegation of research misconduct occurring in 2021. Similar types of data falsification were found in all five allegations reviewed. Furthermore, throughout the research misconduct proceedings, Dr. Ilangovan's responses deviated from what the Investigation Committee would consider standard scientific practice. In each allegation Dr. Ilangovan was shown overwhelming evidence that there were serious issues with the published research record and that corrections would not be possible because the original research data are no longer available. Despite this evidence, Dr. Ilangovan responded that the overall conclusions of each manuscript remain valid and there is no need for correction. The primary concern for a scientist should be the integrity of the published research record and in these circumstances, the voluntary retraction of the questioned publications would be expected.

Known Federal Support

[REDACTED]

Venkatakrishnan AJP HCP 2006 cites funding support by the National Institutes of Health to Dr. Ilangovan: R21 EB-004658 and R01 HL-078796-02 and American Heart Association Grant BGIA 0365203B.

Venkatakrishnan AJP HCP 2008 cites funding support by the National Heart, Lung and Blood Institute to Dr. Ilangovan: R01-HL-7876.



Justification for Length of Inquiry

Per the Policy, the investigation should be completed within 120 days of its initiation, February 24, 2023. On February 23, 2023, ORC requested and received an extension from ORI to provide sufficient time to conclude interviews and the investigation report and any potential appeals. The investigation deadline of May 25, 2023, was granted.²⁸⁴ On May 24, 2023, ORC requested and received an extension from ORI to provide sufficient time to finalize the reports and account for any potential appeals. The investigation deadline of August 23, 2023, was granted.²⁸⁵ On August 22, 2023, ORC requested and received an extension from ORI to provide sufficient time to finalize the reports and account for any potential appeals. The new investigation deadline is November 21, 2023.²⁸⁶

Legal Representation

[Redacted]

Research Records and Evidence Exhibit List

- Ex. 001 20210913 Email Att Inquiry Cmte Report FINAL – Alleg11_Redacted
- Ex. 007 20220112 -Ilangovan to RIO -Re_ CONFIDENTIAL_ Electronic copies
- Ex. 008 OSUInvestResDoc 2
- Ex. 010 20220118 -EMAIL Ilangovan to RIO -Re_ CONFIDENTIAL_ Electronic copies
- Ex. 011 OSUInvestRes Doc4 2
- Ex. 013 PubPeer post December 2019
- [Redacted]
- Ex. 015 Policy-FINAL -Research-Misconduct-20210301-3
- Ex. 016 20220218 Ilangovan PA
- Ex. 017 AJP 2006
- Ex. 018 AJP 2008
- Ex. 019 Subsequent-Use-Exception-FINAL
- Ex. 020 20220225 Notification of Additional Allegations and Inquiry _ Ilangovan
- Ex. 021 Inquiry Analysis
- Ex. 022 email -clarification on use of homo vs hetero
- Ex. 023 Email -20110830 Sample Arrived
- Ex. 024 20220616 -EMAIL Ilangovan to RIO _ interview follow up question
- Ex. 025 Ilangovan first letter
- Ex. 026 Abstract 21513
- Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan
- Ex. 028 Correction 2021- Venkatakrisnan et al Am J Physiol 2008
- Ex. 029 Latest Figures
- Ex. 030 Inquiry Extensions 05-04-2022
- Ex. 031 20220111 Data Sequestration Sheet_Ilangovan
- Ex. 032 20201113 Letter from APS to Ilangovan
- Ex. 033 20220225 Data Sequestration Sheet

²⁸⁴ Ex. 060c 20230223 -EMAIL ORI to RIO RE_ CONFIDENTIAL -DIO 7639 Extension Request_Redacted

²⁸⁵ Ex. 074c 20230522 -Email ORI to RIO -RE_ CONFIDENTIAL DIO 7639 Extension Request_Redacted

²⁸⁶ Ex. 120c 20230822 -Email ORI to RIO RE_ CONFIDENTIAL_ DIO 7639 Extension Request_Redacted



- Ex. 034 20220708 -EMAIL Ilangovan to RIO _transcript review and document
- Ex. 036 20220712 Notification of Allegation 3 Expansion during Inquiry _ Ilangovan
- Ex. 037 20220419 EMAIL ORI to RIO _extension request granted
- Ex. 038 20220627 -EMAIL RIO to Ilangovan _Interview Transcript
- Ex. 039 20220629 -EMAIL RIO to Ilangovan -extension request granted for transcript review
- Ex. 040 20220719 -Email Ilangovan to RIO_response to expanded scope
- Ex. 041 ResponsetoAJPCComments
- Ex. 042 20220727 ORI to RIO -RE_ DIO 7639_ extension granted
- Ex. 043 20220726 EMAIL RIO to Ilangovan -CONFIDENTIAL Preliminary Inquiry Report
- Ex. 044 20220816 Ilangovan Response to preliminary inquiry report
- Ex. 045 20220802 EMAIL Ilangovan to RIO extension request for Preliminary Inquiry Report response
- Ex. 046 20220802 EMAIL RIO to Ilangovan extension granted for Preliminary Report response
- Ex. 047 20220816 EMAIL -Ilangovan to RIO RE_ CONFIDENTIAL Preliminary Inquiry Report - request for AR without admission
- Ex. 048 20220817 EMAIL RIO to Ilangovan -RE_ CONFIDENTIAL Preliminary Inquiry Report - request for AR without admission denied
- Ex. 049 20220824 EMAIL Ilangovan to RIO -request for termination without an admission
- Ex. 050 20220826 EMAIL RIO to Ilangovan -termination without admission document sent via docusign
- Ex. 051 CONFIDENTIAL -Resolution document
- Ex. 052 1 R01 HL161067-01A1 recvd 03072022
- Ex. 053 20220915-Email RIO to R_initiate investigation
- Ex. 054 20220929 Notification of Investigation Committee Members
- Ex. 055 20220927 NIH Notification Memo DIO 7639
- Ex. 056 20220927 ORI Notification of Investigation DIO 7639
- Ex. 057c Investigation Committee Charge_Redacted
- Ex. 058 Confidential Interview of [REDACTED]
- Ex. 059 Confidential Interview of Dr. Govindasamy Ilangovan
- Ex. 060c 20230223 -EMAIL ORI to RIO RE_ CONFIDENTIAL -DIO 7639 Extension Request_Redacted
- Ex. 063 20230103 Notification of new allegations
- Ex. 064 20230124 -EMAIL RIO to [REDACTED] _Investigation Interview
- Ex. 065 20230127 -EMAIL RIO to [REDACTED] _RE_ Investigation Interview
- Ex. 066 20230221 -EMAIL RIO to [REDACTED] _RE_ Investigation Interview
- Ex. 067 RISC Interview Slides_ [REDACTED]
- Ex. 068 20220907 Final Inquiry Report -Ilangovan
- Ex. 069 20220915-Email DO to RIO_initiate investigation
- Ex. 070 Investigation Analysis
- Ex. 071 Mice Diet Sets
- Ex. 072 Confidential Interview of Dr. Govindasamy Ilangovan
- Ex. 073 20160222 email [REDACTED] to ilangovan [REDACTED] etal. Manuscript-R2
- Ex. 074c 20230522 -Email ORI to RIO -RE_ CONFIDENTIAL_ DIO 7639 Extension Request_Redacted
- Ex. 075 3-29-23 Interview of Dr. [REDACTED] full size
- Ex. 088 Figure1new.ppt



- Ex. 089 Ilango to [REDACTED] 20051104
- Ex. 090 Figure1new.pdf
- Ex. 091 ManuscriptJBC 20051104 email attachment
- Ex. 092 20060131 -reviewer comments from JBC _From the JBC re_ Manuscript M5_13753
- Ex. 093 Confidential Interview of [REDACTED]
- Ex. 094 [REDACTED] to Ilango 20051111
- Ex. 095 ResponseonCorrigendum
- Ex. 097 SFRBM ([REDACTED]) Conference
- Ex. 098 Ilango to Venkat et al 20051104
- Ex. 101 20051223 -JBC to Ilango Your JBC submission has been received
- Ex. 106 Bax (2min, Dox only)
- Ex. 107 Bcl-2 (2 min, Dox only)
- Ex. 108 Lorrillard2005
- Ex. 109c Summary_ 7-12-2023_Redacted
- Ex. 110 Response to RISC interview slides_7-12-2023
- Ex. 111c Response to the Investigation committee_7-12-2023_Redacted
- Ex. 112c 20221005 -EMAIL [REDACTED] to RIO_Redacted
- Ex. 113c 20221009 -EMAIL [REDACTED] to RIO Re_ CONFIDENTIAL_Redacted
- Ex. 115 Phone call only i did
- Ex. 120c 20230822 -Email ORI to RIO RE_ CONFIDENTIAL_ DIO 7639 Extension Request_Redacted
- Ex. 121 20230809 -EMAIL Ilangovan to RIO -Re_ CONFIDENTIAL -Notification of additional allegations
- Ex. 122 Ilango to [REDACTED] 20061113
- Ex. 123 20061113 email attachment [REDACTED] poster
- Ex. 124 20061114 email attachment SFRBM 2([REDACTED]) Conference
- Ex. 126 20230720 Ilangovan notification of additional allegations
- Ex. 128 20230809 -EMAIL Ilangovan to RIO -Re_ CONFIDENTIAL -Notification of additional allegations
- Ex. 129 Responseto [REDACTED]
- Ex. 131 AJP 2007
- Ex. 134 [REDACTED] to Ilango 20061114
- Ex. 135 20070312 [REDACTED] to Ilango
- Ex. 136 Lattest Figures
- Ex. 137 20231011 -EMAIL RIO to Ilangovan RE_ Extension Request Approved
- Ex. 138 R01HL078796-01A2
- Ex. 139 R21EB004658-01
- Ex. 140 RecommendationAppeal
- Ex. 141 Specific aims of the referenced grants
- Ex. 142 20231026 Screenshot email Ilangovan to RIO