



**FINAL REPORT OF THE RESEARCH MISCONDUCT INQUIRY
AT THE OHIO STATE UNIVERSITY**

September 7, 2022 (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), the Research Integrity Officers (RIOs) in the Office of Research Compliance (ORC) initiated an inquiry on February 25, 2022, to review allegations of potential research misconduct against Dr. Govindasamy Ilangovan. Dr. Ilangovan is currently an Associate Professor in the Department of Internal Medicine, College of Medicine. The inquiry involved [REDACTED] allegations of falsified data in [REDACTED] publications, where Dr. Ilangovan was the senior and corresponding author.

[REDACTED]

Publication [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)

Publication [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

³ Ex. 017 AJP 2006



Allegation Summary

[REDACTED]

AJP 2006

Allegation [REDACTED]: 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.

AJP 2008

Allegation [REDACTED]: Figure 5A in AJP 2008 was falsified by 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.

Subsequent Use Summary

AJP 2006 and AJP 2008 are outside of the six-year time limit as specified in the Policy,⁹ therefore a subsequent use analysis was conducted per Six-Year Time Limitation & the Subsequent Use Exception Standard Operating Procedures.¹⁰ The conclusions or results 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”.¹¹

Notification to the Respondent

On February 25, 2022, ORC and Dr. Loren Wold, Associate Dean for Research Operations and Compliance, College of Medicine, met with Dr. Ilangovan to notify him of the additional allegations (AJP 2006 and AJP 2008, [REDACTED] and that an inquiry had been initiated for all [REDACTED] allegations of research misconduct.¹²

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.

⁹ Ex. 015 Policy-FINAL-Research-Misconduct-20210301-3

¹⁰ Ex. 019 Subsequent-Use-Exception-FINAL

¹¹ Ex. 024 20220616 -EMAIL Ilangovan to RIO _ interview follow up question

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



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).¹³ A forensic image was copied by WMC IT and provided to ORC. Dr. Ilangovan indicated that he had no 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 [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] would have been conducted were sequestered.¹⁴

Interviews

ORC has not been able to locate [REDACTED] [REDACTED] for interviews. Internally, ORC queried Human Resources and previous OSU supervisors for current contact information. No information was available for Dr. [REDACTED] and obtained email addresses and phone number for Dr. [REDACTED] were used for correspondence but did not yield responses. ORC also attempted to locate contact information [REDACTED] via internet searches, Scopus, LinkedIn, and social media. All contact information obtained by ORC were used for correspondence but no responses were received. ORC could not identify current employers [REDACTED].

ORC conducted an inquiry interview with Dr. Ilangovan on June 14, 2022.

¹³ Ex. 031 20220111 Data Sequestration Sheet_Ilangovan

¹⁴ Ex. 033 20220225 Data Sequestration Sheet_Ilangovan



TABLE 1: Timeline of Inquiry Activities

DATE	ACTIVITY	ATTACHMENT
February 25, 2022	Respondent notification of inquiry	Ex. 020 ¹⁵
February 25, 2022	Sequestration of western blots	Ex. 033 ¹⁶
April 19, 2022	60 day extension granted	Ex. 037 ¹⁷
May 4, 2022	ORI granted extension to July 29, 2022	Ex. 030 ¹⁸
June 14, 2022	Inquiry interview -respondent	Ex. 027 ¹⁹
June 27, 2022	Inquiry interview transcript emailed to respondent for review	Ex. 038 ²⁰
June 28, 2022	Respondent called RIO to request a 1 week extension to review the inquiry interview transcript	
June 29, 2022	RIO emailed respondent and granted extension to review inquiry interview transcript	Ex. 039 ²¹
July 8, 2022	Respondent emailed RIO regarding interview transcript and provided no errata	Ex. 034 ²²
July 12, 2022	Respondent notified that scope for Allegation [REDACTED] was expanded	Ex. 036 ²³
July 19, 2022	Respondent replied to the expanded scope for Allegation [REDACTED]	Ex. 040 ²⁴
July 26, 2022	Preliminary Inquiry Report sent to Respondent	Ex. 043 ²⁵
July 27, 2022	ORI Granted Extension to September 27, 2022	Ex. 042 ²⁶
August 1, 2022	Respondent requests extension for preliminary report response to August 30, 2022	Ex. 045 ²⁷
August 2, 2022	RIO grants extension for preliminary report to August 16, 2022	Ex. 046 ²⁸
August 15, 2022	Respondent called RIO and requested termination of the research misconduct proceedings without an admission	

¹⁵ Ex. 020 20220225 Notification of Additional Allegations and Inquiry _ Ilangovan

¹⁶ Ex. 033 20220225 Data Sequestration Sheet _Ilangovan

¹⁷ Ex. 037 20220419 EMAIL ORI to RIO _extension request granted

¹⁸ Ex. 030 Inquiry Extension 05-04-2022

¹⁹ Ex. 027 Inquiry Interview _Dr. Govindasamy Ilangovan

²⁰ Ex. 038 20220627 -EMAIL RIO to Ilangovan _Interview Transcript

²¹ Ex. 039 20220629 -EMAIL RIO to Ilangovan -extension request granted for transcript review

²² Ex. 034 20220708 -EMAIL Ilangovan to RIO _transcript review and document

²³ Ex. 036 20220712 Notification of [REDACTED] Expansion during Inquiry _ Ilangovan

²⁴ Ex. 040 20220719-Email Ilangovan to RIO _response to expanded scope

²⁵ Ex. 043 20220727 RIO to Ilangovan -CONFIDENTIAL Preliminary Inquiry Report

²⁶ Ex. 042 20220727 ORI to RIO -RE_ DIO 7639_ extension granted

²⁷ Ex. 045 20220802 EMAIL Ilangovan to RIO extension request for Preliminary Inquiry Report response

²⁸ Ex. 046 20220802 EMAIL RIO to Ilangovan extension granted for Preliminary Inquiry Report response



August 16, 2022	Respondent emailed RIO and requested termination of the research misconduct proceedings without an admission	Ex. 047 ²⁹
August 16, 2022	Respondent written response to preliminary inquiry report received	Ex. 044 ³⁰
August 17, 2022	Respondent request for termination of the research misconduct proceedings without an admission denied by RIO	Ex. 048 ³¹
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 ³²
August 26, 2022	RIO informed Respondent that the document for termination without an admission was sent via DocuSign and must be signed and returned by August 30, 2022	Ex. 050 ^{33, 34}
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	
	Final inquiry report and written responses from respondent sent to the Deciding Official	

²⁹ Ex. 047 20220816 EMAIL Ilangovan to RIO RE_ CONFIDENTIAL Preliminary Report -request fo AR without admission

³⁰ Ex. 044 20220816 Ilangovan Response to preliminary inquiry report

³¹ Ex. 048 20220817 EMAIL RIO to Ilangovan -RE_ CONFIDENTIAL Preliminary Inquiry Report -request for AR without admission denied

³² Ex. 049 20220824 EMAIL Ilangovan to RIO -request for termination without an admission

³³ Ex. 050 20220826 EMAIL RIO to Ilangovan -termination without admission document sent via docusign

³⁴ Ex. 051 CONFIDENTIAL -Resolution document



Allegation Inquiry Analysis

[REDACTED]

[REDACTED]

³⁵ Ex. 001 20210913 Email Att DIO 7252 Inquiry Cmte Report FINAL - [REDACTED]

³⁶ Ex. 021 Inquiry Analysis, slide 4

³⁷ Ex. 021 Inquiry Analysis, slide 5

³⁸ Ex. 023 Email -20110830 Samples Arrived

[REDACTED]

⁴⁰ Ex. 021 Inquiry Analysis, slide 5



10.

⁴¹ Ex. 021 Inquiry Analysis, slide 6

⁴² Ex. 021 Inquiry Analysis, slide 8

⁴³ Ex. 022 email -clarification on use of homo vs hetero

⁴⁴ Ex. 026 Abstract 21513

⁴⁵ Ex. 021 Inquiry Analysis, slide 13

⁴⁶ Ex. 010 20220118 -EMAIL Ilangovan to RIO -Re_ CONFIDENTIAL_Electronic copies

⁴⁷ Ex. 011 OSUInvestRes Doc4 2



3.

⁴⁸ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 12, lines 19-25; pg 13, lines 1-4

⁴⁹ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 13, lines 8-10

⁵⁰ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 13, lines 13-19; pg 18, lines 14-18

⁵¹ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 20, lines 1-5

⁵² Ex. 007 20220112 -Ilangovan to RIO -Re_ CONFIDENTIAL_ Electronic copies

⁵³ Ex. 008 OSUInvestResDoc 2

⁵⁴ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 24, lines 23-25; pg 25, lines 1-22

⁵⁵ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 17, lines 12-20; pg 34, lines 12-19; pg 35, lines 5-10

⁵⁶ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 31, lines 7-23; pg 32, lines 1-12



[REDACTED]

[REDACTED]

[REDACTED]

⁵⁷ Ex. 021 Inquiry Analysis, slide 7



AJP 2006

Allegation [redacted]: 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. Forensic analysis conducted by ORC using the overlay action in Photoshop shows that the 0.25 μ M and 5 μ M DOX treated Bax band in the control blot appear to be the same image (red boxes slide #16) and that the 5 μ M and 10 μ M DOX treated Bcl-2 band in the control blot appear to be the same image (purple boxes slide #16). The initial forensic analysis of the 5 μ M and 10 μ M DOX treated Bcl-2 band in the HS blot (green boxes slide #16) was not conclusive and requires additional analysis.⁵⁸
2. ORC identified the same western blot that was used in AJP 2006, Figure 4A 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, 2008.⁵⁹ Additional analysis by ORC using the "ungrouping" function in PowerPoint demonstrated that a band was inserted over the band corresponding to Bax expression after treatment with 5 μ M DOX in the control blot. The band cut and pasted over Bax 5 μ M DOX was the same as the band corresponding to Bax expression after treatment with 0.25 μ M DOX in the control blot.⁶⁰ Similarly, ORC found that two bands were inserted over the bands corresponding to Bcl2 expression after treatment with 0.25 μ M and 5 μ M DOX in the control blot. Those bands correspond to bands for Bcl2 expression after treatment with 5 μ M and 10 μ M DOX in the control blot.⁶¹
3. ORC identified a similar replicate experiment in the sequestered research record and emails that also contained duplicated images covering original images: (1) ppt file attached to an email dated 11/11/2005 from Dr. [redacted] to Dr. Ilangovan,

⁵⁸ Ex. 021 Inquiry Analysis, slide 16

⁵⁹ Ex. 021 Inquiry Analysis, slide 21

⁶⁰ Ex. 021 Inquiry Analysis, slide 22

⁶¹ Ex. 021 Inquiry Analysis, slide 22



“SFRBM() Conference.ppt; and (2) ilan01 > Dr. IlangovaHard drive data > Talks, “Lorrillard2005.ppt”.⁶²

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”.⁶³
5. In all cases where duplicated images were identified covering original images, 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.
6. Dr. Ilangovan was notified of the problems with Figure 4A on June 24, 2020, by a letter from Dr. Christina Bennett, Publications Director, Policy, American Physiological Society.⁶⁴
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 original blots from the first author”; and (6) “I believe the overall conclusions of the paper are valid”.⁶⁵
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”.⁶⁶

Respondent’s Responses:

1. During the inquiry interview on June 14, 2022, Dr. Ilangovan stated that Dr. [REDACTED] conducted the experiments and put together the figures for publication.⁶⁷
2. On June 14, 2022, during the inquiry interview Dr. Ilangovan confirmed that he could not find this image, digitally or the original film.⁶⁸ He also indicated that he had another image where the second band was different.⁶⁹ He explained that Dr. [REDACTED] may have repeated this experiment 7 or 8 times to get the quantitative data shown in Figure 4B.⁷⁰ The image shown in the publication would represent one replicate but the image that Dr. Ilangovan had could have represented another. Dr. Ilangovan indicated that he would send to ORC the replicate image that he did find.⁷¹

⁶² Ex. 021 Inquiry Analysis, slides 18-20

⁶³ Ex. 017 AJP 2006

⁶⁴ Ex. 025 Ilangovan first letter

⁶⁵ Ex. 041 ResponsetoAJPCComments

⁶⁶ Ex. 032 20201113 Letter from APS to Ilangovan

⁶⁷ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 40, lines 11-19

⁶⁸ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 42, lines 17-22

⁶⁹ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 45, lines 4-9

⁷⁰ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 46, lines 11-18

⁷¹ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 47, lines 11-16



3. During the June 14, 2022, inquiry interview Dr. Ilangovan was asked if he knew why Dr. [REDACTED] may have duplicated this image. He stated that there would be no reason to do so because this is just a representative image. He also indicated that when he saw this image, he did not see any difference with his bad eyes.⁷²
4. During the June 14, 2022, inquiry interview, Dr. Ilangovan was shown a slide that demonstrated how the control blot images were manipulated by duplicating bands and using them to insert over the original bands. He was also shown that the original ppt file was originally created by him. He denied that he manipulated this image and said that he was unaware of the manipulation.⁷³ He explained that even if he created the ppt file, it doesn't mean that he created all of the content in that file.⁷⁴ He also stated that it was standard practice for people to email him files or create the files on the same computer that he would then incorporate into his PowerPoint presentations.⁷⁵

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

1. Forensic analysis conducted by ORC shows that the 0.25 μ M and 5 μ M DOX treated Bax band in the control blot are duplicated.
2. Forensic analysis conducted by ORC shows that the 5 μ M and 10 μ M DOX treated Bcl-2 band in the control blot are duplicated.
3. ORC found the same image was used in a PowerPoint file created by Dr. Ilangovan on September 26, 2002. ORC analyzed the PowerPoint image and found that the image was manipulated by copying and pasting other bands on top of the original data to give the desired result and was different from how the original data would have been interpreted.
4. Copying and pasting of data to obscure the true experimental outcomes highly reduces the chances of the falsification occurring by honest error.
5. When asked about concerns with this figure, Dr. Ilangovan responded to Dr. Bennett, Publications Director, at the American Physiological Society, that "unfortunately we have not been able to find any data even in digital format from this time".⁷⁶ Conversely, he stated in his inquiry interview that he had a different image in his file that "may be corresponding to one set". Dr. Ilangovan did not provide this image to ORC following the inquiry interview and restated that he could not find the published figure and that the journal agreed that a corrigendum was not required.⁷⁷ Additionally, ORC was able to find a similar replicate experiment in the sequestered research record that also contained similarly manipulated images. This replicate experiment was found in a ppt file that was created by Dr. Ilangovan on October 8, 2004. Responding to the publisher and to ORC with such opposing statements brings Dr. Ilangovan's credibility and integrity into question.

⁷² Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 47, lines 17-25; pg 48, lines 1-7

⁷³ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 52, lines 9-21

⁷⁴ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 53, lines 4-16

⁷⁵ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 53, lines 10-14, lines 23-25; pg 54, lines 1-22

⁷⁶ Ex. 041 ResponsetoAJPCComments

⁷⁷ Ex. 034 20220708 -EMAIL Ilangovan to RIO _transcript review and document



Conclusions for Allegation [REDACTED]: Allegation [REDACTED] of research misconduct against Dr. Ilangovan does have substance to warrant an investigation under the Policy.

AJP 2008

Allegation [REDACTED]: Figure 5A in AJP 2008 was falsified by 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.

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.⁷⁸
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.⁷⁹
3. On November 4, 2020, Dr. Ilangovan responded to the concerns from the American Physiological Society.⁸⁰ 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".⁸¹
5. A corrigendum of the corrected Figure 5A was published in 2021.⁸²
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.⁸³
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.^{84,85} This file includes a

⁷⁸ Ex. 021 Inquiry Analysis, slide 25

⁷⁹ Ex. 025 Ilangovan first letter

⁸⁰ Ex. 041 ResponsetoAJPCComments

⁸¹ Ex. 032 20201113 Letter from APS to Ilangovan

⁸² Ex. 028 Correction 2021- Venkatakrisnan et al Am J Physiol 2008

⁸³ Ex. 021 Inquiry Analysis, slide 27

⁸⁴ Ex. 021 Inquiry Analysis, slide 28

⁸⁵ Ex. 029 Latest Figures



- 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.⁸⁶
 9. ORC determined that Dr. [REDACTED] was not affiliated with OSU after February 2007.
 10. An email from Dr. Ilangovan to Dr. [REDACTED] dated July 31, 2006, states “I have determined that you are not working with me now and also that not going to continue in the future”.⁸⁷

Respondent’s Responses:

1. During his inquiry interview on June 14, 2022, Dr. Ilangovan indicates that Dr. [REDACTED], was responsible for performing the experiments and for constructing the figure for publication.⁸⁸
2. During the inquiry interview Dr. Ilangovan stated that the first author made a copying and paste error that resulted in the duplication of panels 1 and 2 and that it was corrected in the journal.⁸⁹
3. Dr. Ilangovan confirmed during his inquiry interview that he was able to find the original data and that when he compared the published figure to the original data, the second panel is almost the same.⁹⁰ Dr. Ilangovan also stated that he would send the original file to ORC.⁹¹
4. Dr. Ilangovan thought that Dr. [REDACTED] may have adjusted the brightness and contrast of the duplicated image to make it clearer and that he didn’t know that this was done.⁹²
5. During his inquiry interview Dr. Ilangovan stated that he made the corrigendum by “pulling from the original data”.⁹³ Later, in the interview he indicated that the figure that he submitted for the corrigendum was already put together and that he would send ORC the file.⁹⁴ In an email from Dr. Ilangovan to ORC on July 8, 2022, Dr. Ilangovan stated “I have attached here the original data file submitted to the journal office and published as corrigendum in 2021”.⁹⁵ The attached document was a PowerPoint file titled “Allegation 3 Figure”.⁹⁶

⁸⁶ Ex. 021 Inquiry Analysis, slide 29

⁸⁷ Ex. 021 Inquiry Analysis, slide 30

⁸⁸ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 59, lines 7-9

⁸⁹ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 58, lines 20-25

⁹⁰ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 60, lines 10-15

⁹¹ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 61, lines 15-19

⁹² Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 63, lines 7-21; pg 64, lines 1-4

⁹³ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 65, lines 21-25; pg 66, lines 1-4

⁹⁴ Ex. 027 Inquiry Interview_Dr. Govindasamy Ilangovan, pg 66, lines 20-25; pg 67 lines 1-4

⁹⁵ Ex. 034 20220708 -EMAIL Ilangovan to RIO _transcript review and document

⁹⁶ Ex. 035 Allegation [REDACTED] Figure



6. In response to notification that the scope for Allegation #3 was being expanded to include the potential falsification of the correction of Figure 5A, Dr. Ilangovan stated that several incomplete versions of the figure may have existed, and they were perfected/corrected in the final version submitted for publication and that the mix-up could have been caused by a copying and pasting error.⁹⁷ In addition, Dr. Ilangovan state that the data was 16 years old and he “tried the best of my knowledge to assimilate the data, before sending the required data for corrigendum” and “to the best of my knowledge, the data in the corrigendum is accurate.

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

1. The original publication contained data in Figure 5A that was duplicated and manipulated, making it difficult to attribute to honest error.
2. Dr. Ilangovan admitted that he was responsible for the corrigendum. He stated that he found the original figure from December 8, 2006, but the figure in the sequestered research record from December 8, 2006, identified by ORC, shows the figure for the corrigendum was manipulated and included incorrect data for HSF^{+/+} after 2hr treatment.
3. The file from December 8, 2006, was created by Dr. Ilangovan and Dr. [REDACTED] was no longer working for Dr. Ilangovan at that time.

Conclusions for Allegation [REDACTED]: Allegation [REDACTED] of research misconduct against Dr. Ilangovan does have substance to warrant an investigation under the Policy. Allegation [REDACTED] should include the potential falsification of AJP 2008, Figure 5A and the potential falsification of the correction of Figure 5A in 2021.^{98,99}

Response to the Preliminary Report

The respondent received a copy of the Preliminary Inquiry Report and access to all exhibits on July 26, 2022. The deadline for response was August 9, 2022. On August 1, 2022, Dr. Ilangovan requested his deadline be extended to August 30, 2022¹⁰⁰ because he needed IT support to open the PDF exhibit files and access old emails. ORC granted an extension to August 16, 2022.¹⁰¹ Dr. Ilangovan provided his response on August 16, 2022,¹⁰² and his responses are summarized below.

Dr. Ilangovan reiterated his objections to the inclusion of AJP 2006 and AJP 2008. The respondent’s objections are that the citations were in unfunded grant proposals as grouped references without any specific scientific context. He also states that the grants are acknowledged in AJP 2006 and AJP 2008 “just to describe the use of some equipment and other resources of the funded projects as used to carry out the experiments in these papers”. Dr. Ilangovan’s current objections along with his objections in an email dated June

⁹⁷ Ex. 040 20220719-Email Ilangovan to RIO_response to expanded scope

⁹⁸ Dr. Ilangovan was notified of the expanded scope of Allegation [REDACTED] via email on July 12, 2022.

⁹⁹ Ex. 036 20220712 Notification of Allegation [REDACTED] Expansion during Inquiry _ Ilangovan

¹⁰⁰ Ex. 045 20220802 EMAIL Ilangovan to RIO extension request for Preliminary Inquiry Report response

¹⁰¹ Ex. 046 20220802 EMAIL RIO to Ilangovan extension granted for Preliminary Inquiry Report response

¹⁰² Ex. 044 20220816 Ilangovan Response to preliminary inquiry report



16, 2022,¹⁰³ are noted but do not alter the outcome and conclusions of the subsequent use analysis conducted by ORC. In addition, despite notification of allegations regarding AJP 2006 and AJP 2008 on February 25, 2022, Dr. Ilangovan submitted NIH grant 1 R01 HL161067-01A1 on March 7, 2022, and, continued to cite these papers.¹⁰⁴

[REDACTED]

Regarding Allegation [REDACTED], the respondent stated the following:

1. Figure 4A was composed by Dr. [REDACTED].
2. The falsification of Figure 4A was not done by the respondent.
3. The respondent used the data as received from Dr. [REDACTED] for his slides.
4. The respondent concludes by stating "I did not do anything wrong here. As I wrote to the publisher, after these many years there is no way to verify with original raw data at this time. Therefore, I would abide by the publisher's decision that there is no need for any correction at this point.

Regarding Allegation [REDACTED], the respondent stated the following:

1. Dr. Ilangovan "found that the image was mis-pasted in the wrong place".
2. Dr. Ilangovan stated that he did not manipulate the figure.

¹⁰³ Ex. 024 20220616 -EMAIL Ilangovan to RIO _ interview follow up question

¹⁰⁴ Ex. 052 1 R01 HL161067-01A1 recvd 03072022



3. For the corrigendum, Dr. Ilangovan “found that 2hrs p21 image was mis-pasted in 24 hrs image panel within the same figure” and that “to the best of my knowledge, the data in the corrigendum is correct”.
4. No original raw data is available to cross check this since the experiments are from 16 years ago.
5. Students and other co-workers sometimes used Dr. Ilangovan’s login so the fact that the meta data shows that he created the file doesn’t mean that he falsified the image.
6. The respondent concludes by stating “I did not do anything wrong. The 2hrs Bax data was mistakenly pasted at 24 hrs panel as per the stored images. The corrigendum has been published and the correction made in the corrigendum makes sense.

The Dr. Ilangovan’s responses to the preliminary inquiry report do not change the decision to move all three allegations to an investigation so that a faculty committee can determine if research misconduct occurred and by whom. The charge of the inquiry is to determine if each allegation has substance (i.e., that sufficient evidence exists that research misconduct may have occurred to warrant an investigation). Dr. Ilangovan did not provide any data, information, or explanations in his response dated August 16, 2022, to now conclude that the allegations have no substance. In fact, some of the responses provided by Dr. Ilangovan are not supported by the research data obtained from Dr. Ilangovan’s digital research records.

On several occasions after the preliminary inquiry report and exhibits were provided to the respondent, Dr. Ilangovan requested that the research misconduct proceedings be terminated without an admission,^{105,106} as permitted in § IV of “the Policy”. ORC provided Dr. Ilangovan with a resolution document on August 26, 2022,¹⁰⁷ but Dr. Ilangovan failed to agree to the resolution prior to the deadline on August 30, 2022. To date, Dr. Ilangovan has not completed the resolution document.

Institutional Decision

Based on the injury, ORC concludes the following allegations have sufficient substance to warrant further investigation:

[REDACTED]

Allegation [REDACTED]: 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; and (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.

¹⁰⁵ Ex. 047 20220816 EMAIL Ilangovan to RIO RE_ CONFIDENTIAL Preliminary Report -request for AR without admission

¹⁰⁶ Ex. 049 20220824 EMAIL Ilangovan to RIO -request for termination without an admission

¹⁰⁷ Ex. 051 CONFIDENTIAL -Resolution document



Allegation [redacted]: 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 after 24hr treatment (from Figure 4A in Latest Figures.ppt) as HSF^{+/+} wild type cells after 2 hr treatment.

The investigation committee will be charged to conduct a formal review of all evidence to determine if research misconduct occurred and by whom [redacted]

Known Federal Support

[redacted] ational Institutes of Health to Dr. Ilangovan: R21HL094881 and R01HL078796-02.

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 inquiry should be completed within 60 days of its initiation. ORC requested and received an extension from ORI after the respondent requested an extension due to a family medical emergency. The inquiry deadline was extended to July 29, 2022.¹⁰⁸ On July 26, 2022, ORC requested a 60 day extension from ORI to provide sufficient time for the inquiry report and any potential appeals permitted in the Policy. On July 27, 2022, ORI granted the extension, and the inquiry deadline is now September 27, 2022.¹⁰⁹

Legal Representation

Dr. Ilangovan did not disclose legal representation during the Research Misconduct Inquiry.

Research Records and Evidence Exhibit List

- Ex. 001 20210913 Email Att DIO 7252 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

¹⁰⁸ Ex. 030 Inquiry Extension 05-04-2022

¹⁰⁹ Ex. 042 20220727 ORI to RIO -RE_ DIO 7639_ extension granted



- 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- [REDACTED] 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
- Ex. 034 20220708 -EMAIL Ilangovan to RIO _transcript review and document
- Ex. 035 Allegation [REDACTED] Figure
- Ex. 036 20220712 Notification of Allegation [REDACTED] 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 ResponsetoAJPComments
- 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