

## Results of Research Misconduct Investigation at OIST

This report presents the results and action following an investigation into an allegation of research misconduct at OIST.

### 1. Overview

#### Timing and incidents leading to a substantial investigation

- May 9, 2019: The paper in question was published in an academic journal.
- May 14, 2019: The Whistleblower, a former postdoctoral researcher at OIST, filed a report against an OIST faculty member for specified research misconduct via the OIST hotline mediator.
- May 22, 2019: A Preliminary Investigation Committee (PIC) had its first meeting.
- June 10, 2019: The Respondent published a revised version of the paper in the same journal.
- June 14, 2019: The PIC concluded that a substantial investigation was warranted.

#### Types of specific research misconduct:

Falsification (Allegation 1) and Plagiarism (Allegation 2).

#### Respondent:

Prof. Ye Zhang, Assistant Professor at OIST, PI of “Bioinspired Soft Matter” Unit.

#### Paper suspected of research misconduct:

The alleged falsification and plagiarism occurred in connection with publication of a paper entitled “Enzyme-mediated dual-targeted-assembly realizes a synergistic anticancer effect” published in the academic journal *Chemical Communications* on May 9, 2019. An extensive correction was published by the same journal on June 10, 2019 without giving reasons for the alterations.

### 2. Substantial Investigation

#### Organizational structure of the investigation

A Committee to Promote the Responsible Conduct of Research (CPR) chaired by the OIST Dean of Faculty Affairs (DFA) with three OIST internal members, including the DFA, five external experts, and an external legal advisor without voting rights.

#### Composition of the CPR

*OIST:* Dr. Milind Purohit (Dean of Faculty Affairs, Chair), Dr. Robert Baughman (Executive Vice-President and Vice-CEO), Professor Erik De Schutter (Chair of the Faculty Assembly)

*External:* Professor Hiroyuki Isobe (Department of Chemistry, University of Tokyo), Professor Yukari Fujimoto (Department of Chemistry, Keio University), Professor Hongbin Zhai (Shenzhen Graduate School of Peking University), Professor Zhi-Xiang Yu (College of Chemistry and Molecular Engineering, Peking University), Professor Yoshiki Katayama (Department of Applied Chemistry, Kyushu University)

*External Legal Advisor:* David Case (Asia Pacific Advisory)

#### Substantial Investigation Period:

- September 2, 2019: The CPR membership was finalized and had its first meeting.
- Late 2019: The CPR met on September 19, October 9, November 21, December 4, and 18.
- January 10, 2020: A hearing with the Whistleblower was scheduled, and the Whistleblower attended.
- January 22, 2020: Hearing with the Respondent was scheduled, but the Respondent did not attend.
- February 10, 2020: The CPR had its final working meeting.
- April to July 2020: The CPR conducted hearings with the co-authors.
- August 2020: Writing, checking, correcting, and finalizing the report in consultation with the CPR.
- August 31, 2020: The President notified the parties of the CPR conclusions.

- September 17, 2020: The Respondent filed an appeal.
- November 16, 2020: The President notified the Respondent of the CPR's Response to the Appeal.

#### **Investigation methods and procedures**

Examination of documents, including both original and corrected papers with their Supporting Information. Examination of email communications, biological / chemical experimental data, analysis data, and original lab notebooks submitted by the parties. Responses from the parties to questions from the CPR. Video hearings with the Whistleblower and co-authors. Forensic examination of the origin of various images and figures in the original and corrected papers by the OIST Information Security Section.

### **3. Results of Investigation**

#### **Findings:**

1. Figures obtained by the Whistleblower were used without acknowledgment.
2. TEM images of lysosomes isolated from A549 cells were incorrectly described as from HeLa cells.
3. The existence of compounds 1 and 2 reported in the paper is not supported by the published spectra.

A partially corrected paper was published after the Respondent was informed of the complaint.

#### **Conclusion**

The quality of the work described in this paper and its corrected version falls far below the standards expected at OIST. The violation of scientific ethics (plagiarism, falsification, or fabrication), whether deliberate or through negligence, is serious research misconduct.

#### **Researcher determined to be responsible for the research misconduct**

Prof. Ye Zhang, Assistant Professor of Bioinspired Soft Matter Unit at OIST.

#### **Involvement of co-authors**

For the co-authors that were under the supervision of the Respondent, it was not possible to determine the extent of their individual involvement. The principal co-authors are no longer at OIST, and no further action was taken. The co-author from a research support section was not involved with the misconduct.

#### **Funding for which specific research misconduct occurred:**

The investigation found no university funding source directly involved in the paper in question.

### **4. Measures taken by investigating organization to date**

- The President has requested that the Respondent retract the paper. The Respondent refused to retract the paper and therefore OIST will register an expression of concern with the journal.
- The Respondent has been suspended for six months.

### **5. Factors behind the occurrence of specific research misconduct and measures to prevent a recurrence**

#### **Causal factors**

- The Respondent as PI failed to enforce compliance with OIST international standards of research ethics among the co-authors under her supervision.
- There was a failure to keep accurate notes in laboratory notebooks, making attribution and description of work difficult.

#### **Measures for preventing recurrence of such misconduct**

OIST will take the following corrective measures to prevent recurrence of research misconduct:

- a. Promote education on research integrity and ethics
  - OIST will strengthen and enforce training on research integrity and ethics for all researchers. The implementation plan was described in the Research Integrity On-site Inspection Report submitted to the MEXT.
  - OIST Graduate School will emphasize the mandatory research ethics education program as part of its Professional Development course for students to strengthen awareness of the importance of research ethics.
  - OIST will improve mandatory online training for all researchers in Responsible Conduct of Research.
  - OIST continually implements new training in addition to existing ones. For instance, in December 2020, Harvard University's Research Integrity Officer was invited to provide new training in research integrity.
- b. Implement improved Research Data Archiving

New policy on Research Data Archiving was developed in 2017. Under the leadership of the Provost and the Dean of Faculty Affairs, this policy will be enforced with a newly hired Data Archiving Coordinator who began service at OIST on December 21, 2020.
- c. Improve awareness of contact points for reporting potential research misconduct

OIST will enhance awareness of mechanisms it has established to flag potential research misconduct, including the whistleblower hotline mediator, an ombudsperson's office, and an open-door policy by which anyone at OIST can discuss concerns about potential research misconduct with the Provost or the DFA.