Keynote lecture

Journal crisis at a transitional phase of the STM publishing

Toshio Kuroki
Japan Society for the Promotion of Science (JSPS)
Professor Emeritus, University of Tokyo
Self-Introduction

1960: Graduated from Tohoku U., Sch. of Med., Sendai

- **1961-2001: Oncologist**
  - Tohoku Univ. (1961-69)
  - NIH postdoc @ U. of Wisconsin (1969-71)
  - WHO-IARC (Lyon, France) (1973, 75-78)
  - Univ. of Tokyo (1971-96)
  - Showa Univ. (1996-2001)

- **2001- present: Administrator**
  - President of Japan Cancer Assoc.
  - President of Gifu Univ.
  - JSPS,
  - Program Director of WPI program
  - WPI Academy Director

- **2016- Misconductologist**
New Classification of Research Misconduct

RCR: Responsible Conduct of Research
QRP: Questionable Research Practice
FFP: Fabrication, Falsification and Plagiarism

Risk
Trust
Health
Daily life
Environment

Action
Linear

Outcome
Non-Linear
Multi vector

RCR
Truth

T. Kuroki  Accountability in Research 25, 404-408, 2018
STM Journal Kingdom

1. STM journals
2. Publication ethics
3. Open access science
4. Predatory journals
5. Overflow of information
6. STM journals of tomorrow

OA: Open access
* Not including Gold OA Nature communications and Nature Materials
1. STM Journals

- $10 billion (2017)
- 33,100 peer-rev. English Journals, 5% up/y
- Oligopoly by 10 mega publishers
- 3,000,000 article/y. 4% up/y.
- 7-8 million researchers. 20% repeat author.

<table>
<thead>
<tr>
<th>Publisher</th>
<th>No. of Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Springer Nature</td>
<td>&gt;3,000</td>
</tr>
<tr>
<td>Elsevier</td>
<td>2,500</td>
</tr>
<tr>
<td>Taylor &amp; Francis</td>
<td>2,500</td>
</tr>
<tr>
<td>Wiley</td>
<td>1,700</td>
</tr>
<tr>
<td>Sage</td>
<td>&gt;1,000</td>
</tr>
</tbody>
</table>

Exponential growth of peer reviewed journals since 1665

Growth of WoS articles after WWII
Universities vs Publishers

- Universities worldwide complain about high journal fees.
- University of California demanded Elsevier one fee contract covering subscriptions and free submission but was refused by Elsevier (2019).
- In UK universities, 56% of APC went to Elsevier, Springer Nature and Wiley in 2016. (Monitoring transition Open access 2017)
- UK universities are “no longer willing to pay for outdated systems”. Under the new contract, researchers are freely accessible to hybrid and gold OA journals of Springer Nature. (Qureshi, F. Editage Insights, April 14, 2019)

Now Plan S and Projekt DEAL in Europe

Japanese universities faced also financial difficulty, moving from the package subscription to individual journal deals.

Annual budget for journals
(Chiba University)

<table>
<thead>
<tr>
<th>Year</th>
<th>% of the total budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1.6%</td>
</tr>
<tr>
<td>2015</td>
<td>1.7%</td>
</tr>
<tr>
<td>2016</td>
<td>2.0%</td>
</tr>
<tr>
<td>2017</td>
<td>2.0%</td>
</tr>
<tr>
<td>2018</td>
<td>2.1% *</td>
</tr>
</tbody>
</table>

* % of the total budget
2. Publication Ethics
Peer review / Ghost writer / Retraction

Purpose
➢ Ensuring quality of papers
   - Soundness
   - Significance
   - Originality
➢ Help authors improve quality

Problems
➢ Slow process
➢ Unfair and biased judgement
➢ Ineffectiveness in detecting fraud

Nature
➢ Superconductivity by H. Schön
➢ STAP cell paper by Obokata

Science
➢ Superconductivity by H. Schön
➢ Stem cell by Hwang Woo Suk

The Lancet
➢ Measles vaccination by Wakefield
➢ Diovan affair by Novartis

Cell
➢ Image manipulation by Kato
2. Publication Ethics

Peer review / Ghost writer / Retraction

- **5-10%**
  - Nature Science
  - Subscription Only Journals
  - Rate of acceptance
  - Viewpoint of reviewing

- **20-50%**
  - Hybrid OA Journals
  - Soundness and Significance

- **30-70%**
  - Gold OA Journals
  - Soundness but not for Significance

- **100%**
  - Predatory Journals
  - No peer rev.
  - Preprint Repositories (e.g. arXiv)
  - 100% Integrity
  - Data sharing

- 100%
  - Soundness for Significance
2. Publication Ethics

Peer review / Ghost writer / Retraction

✓ Written by company employees or outsourced medical writers
✓ Exaggerating efficacy and concealing adverse side effects
✓ Published in reputable journals by a name of influential professor.

● Arthritis drug by Merck
  88,000 heart attack and 27,000 lawsuits

● Adolescent anti depressant by GlaxoSmithKline
  No efficacy but suicide or suicide attempt

● Hormone replacing therapy by Pfizer
  10,000 court cases by cardiovascular side effects

● Prevalent practice by pharma company
  NEJM, 10.9% ; JAMA, 7.9%; The Lancet, 7.6% (NYT, 2009)
2. Publication Ethics
Peer review / Ghost writer / Retraction

Retraction Watch Database

- Articles:
  10,500 journal articles

- Authors:
  30,000 authors

- Journals:
  488 journals in 2016 (44 journals in 1997)

- Multiple retraction:
  100 authors retracted >13 papers due to deliberate misconduct.

- Editor:
  In 89 journals, editors are able to retract without consent of all authors

Brainard, Science 362,390, 2018
**Retraction Rate Levels Off**

- Increase of the rate is due to improved oversight by journals
- 40% of retraction are not due to fraud, e.g. errors, poor reproducibility.
- Half of retraction are involved in FFP

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Brainard, J. et al Science, 362, 391, 2018
**Worst 10 Scientists in Retraction Watch Leaderboard**

<table>
<thead>
<tr>
<th>Name*</th>
<th>No. of retraction</th>
<th>Country</th>
<th>Research area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fujii, Y.</td>
<td>183</td>
<td>Japan</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Boldt, J.</td>
<td>97</td>
<td>Germany</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Sato, Y.</td>
<td>84</td>
<td>Japan</td>
<td>Gerontology</td>
</tr>
<tr>
<td>Iwamoto, J.</td>
<td>64</td>
<td>Japan</td>
<td>Orthopedics</td>
</tr>
<tr>
<td>Stapel, D.</td>
<td>58</td>
<td>Holland</td>
<td>Psychology</td>
</tr>
<tr>
<td>Stapel, D.</td>
<td>58</td>
<td>Holland</td>
<td>Psychology</td>
</tr>
<tr>
<td>Saitoh, Y.</td>
<td>53</td>
<td>Japan</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Adrim Maxim</td>
<td>48</td>
<td>USA</td>
<td>Electronics engineering</td>
</tr>
<tr>
<td>Chen-Yuan (Peter) Chen</td>
<td>43</td>
<td>Taiwan</td>
<td>Engineering</td>
</tr>
<tr>
<td>Sarkar, F.</td>
<td>41</td>
<td>USA</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Zhong, H.</td>
<td>41</td>
<td>China</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

*Kupferschmidt Science August 2013*
Probability of repeating retractions

Repeating probability of the author who has retracted five papers will be 26% - 37% after 5 years, 45% - 60% after 10 years.

Repeating probability of the author who has retracted one paper will be 3% - 5% after 5 years, 5% - 10% after 10 years.

Kuroki, T. & Ukawa, A. Accountability in Res. 25 (4), 2018
3. Open Science

Open access journal / Preprint repository / Data sharing

OA journal

- Printed papers ➔ digital papers
- Pay-to-read ➔ pay-to-submit
- Soundness and Significance ➔ Soundness but Significance

- Gold OA: Immediate OA
- Self-archive (Green): OA by authors
- Hybrid: Journal with OA + non OA
- Delayed: OA after embargo period

* Not including Golden OA Nature communications
Rapid Growth of OA Journals

Movement to OA journals 2012-2016

Mega OA journals output 2006-2017

STM Report 1968-2018

APC; Article Publication Charge
Preprint Repository

- arXiv: Mathematics and physics
- RePEc: Economics
- PMC: Biomedicine
- BioRxiv: Biological science
- medRxiv: Clinical medicine

“Registry of Open Access Repositories”
4. Predatory Journals

S. Gedela
Founder of OMICS
Hyderabad, India

Jeffrey Beall
Colorado U. Library
Identified and pursued predatory journals

John Bohannon
Harvard U.
Disclosed nature of predatory journals by sting operation
Predatory Journals and Conferences

Predatory Journals

- Aiming profit by submission fee
- No or little reviewing
- Violating publication ethics.
- Destroying trust of STM journals
- Waste of money and time.
- Active marketing

Publication in predatory journals

Kyushu U. 147; U. Tokyo 132
Osaka U. 107; Niigata U. 102
Nagoya U. 99

Predatory conferences

- OMICS organizes 3,000 conferences worldwide. In October 2019, 13 conferences in Japan (9 in Tokyo, 2 in Osaka and 2 in Narita)
- Accepted by no peer review.
- No scientific values
- Providing local tourisms
- In Korea, 265 researchers spent $500 millions of R&D fund over recent 3 years. (Lee In Jae, WCRI, 2019)
Predatory Journals

- Rapid growth: 11,000 predatory journals (one-thirds of legitimate journal)
- Big market: $74 million for predatory journals.
- Clients: One-thirds are by India.

<table>
<thead>
<tr>
<th></th>
<th>Publisher</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>27.1</td>
<td>34.7</td>
</tr>
<tr>
<td>Asia w/o India</td>
<td>11.6</td>
<td>25.6</td>
</tr>
<tr>
<td>Africa</td>
<td>5.5</td>
<td>16.4</td>
</tr>
<tr>
<td>North America</td>
<td>17.5</td>
<td>9.2</td>
</tr>
<tr>
<td>Europe</td>
<td>8.8</td>
<td>8.8</td>
</tr>
<tr>
<td>Others</td>
<td>2.7</td>
<td>3.8</td>
</tr>
<tr>
<td>Unknown</td>
<td>26.8</td>
<td>1.5</td>
</tr>
</tbody>
</table>

How to Avoid Predatory Journals

- No black lists for predatory journals.
- Choose right journals following the advice of “thinkchecksubmit”

⚠️ THINK ✓ CHECK ➔ SUBMIT

- Do you or your colleagues know the journal?
- Can you easily identify and contact the publisher?
- Is the journal clear about the type of peer review it uses?
- Do they belong to the Committee on Publication Ethics (COPE)?
- Is it listed in the Directory of Open Access Journals (DOAJ)?
- Does the publisher belong to the Open Access Scholarly Publishers’ Association (OASPA).
Preys of Predators or Symbiosis with them

- Rampant of predatory journals cannot be explained by Predators vs preys relationship.
- Ugly symbiosis exists between predators and science community.
- A majority of clients are from developing countries. They are hard to publish in qualified journals under poor conditions. Strong pressure to “publish or perish”.
- Without PhD, they are unable to study abroad
- Predatory journals provides venues for disadvantaged students and scholars.
"Publish or Perish" as Background

- Culture of science especially “Publish or Perish” exists behind predatory journals.
- Indian government changed requirements for PhD degree in 2019.
  - Previously, at least one peer reviewed article and two papers at conferences are required.
- In some Japanese universities, two peer-reviewed articles are required for PhD degree
“A list of Publications” as Background

- A list of publications has not been needed for application to Kakenhi of JSPS, a major grant for research since FY2018

FY2018
Research achievement by PI and co-PI
(A list of publications)

FY 2019
Applicant’s ability to conduct the proposed research and research environment.
(Only a list of relevant publications proving PI’s ability).
5. Overflow of Information

- Researchers read 200-250 papers a year. (STM report).

- Mining of useful information from billions of articles, preprints and datasets may be impossible without help of AI.
Yuval Noah Harari
Israeli historian

- Humans were supposed to distil data to information, information into knowledge, and knowledge into wisdom.
- However, dataists believe that human can no longer cope with immense flows of data, hence they cannot distil data into information, let alone into knowledge or wisdom. (Homo Deus)

- “Technological revolution might soon push billions of human out of the job market and create massive new useless class,...” (21 Lessons).
- Analogously, AI might screen billions of scholarly papers and label massive papers as “useless”.
Ruling and Useless Papers
6. STM Journals of Tomorrow

Plan S / Projekt DEAL

- Initiative proposed by Science Europe Consortium with twelve countries excepting for Germany.
- Scholarly publication supported by public grants must be published in compliant OA journals, not including hybrid journals.
- Publication fees are covered by the funders or institutions but not by individual researchers.
- “S” stands for science, speed, solution, shock (and sanction too).
STM Journals of Tomorrow
Plan S / Projekt DEAL

- Projekt DEAL is a “Publish and Read” contract between German institutions and Springer Nature and Wiley, valid from 2020.

- Publish: German articles (about 13,000 a year) will be published in hybrid and gold OA journals of Springer Nature.

  Article publishing charge (APC) will be 20% less and charged to participation institutions via Max-Planck.

- Read: German scientists can read articles of Springer Nature back to 1997.

- Nature and Nature branded subscription journals are not included.
STM Journals of the Day after Tomorrow

Nature Science
Hybrid OA Journals

Gold OA Journals
Preprint Repositories (arXivs)
Data sharing
Lessons Learnt

- Movement toward OA is an inevitable process.

- OA increases productivity, creativity and visibility of scholarly publications.

- Japan is less aware of OA compared to European countries.

- Projekt DEAL is a role model for Japan and may be achieved by sharing few percent of "indirect cost" of research funds (30%).

- Predatory journals are problematic but does not make a serious threat to science.

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