

# Inside Nature Research

*and the future of scientific publishing*

Fabio Pulizzi

Chief Editor, *Nature Nanotechnology*

10.10.2018

## Brief outline

- *Nature yesterday - Nature Research today*
- *Nature Nanotechnology* as example
- Editorial process
- Publishing and peer review under review

# Part 1

*Nature yesterday*  
*Nature Research today*

## The Nature Success story



A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE

"To the solid ground  
Of Nature trusts the mind which builds for aye."—WORDSWORTH

THURSDAY, NOVEMBER 4, 1869

NATURE: APHORISMS BY GOETHE

NATURE! We are surrounded and embraced by her: powerless to separate ourselves from her, and powerless to penetrate beyond her.

Without asking, or warning, she snatches us up into her circling dance, and whirls us on until we are tired, and drop from her arms.

She is ever shaping new forms: what is, has never yet been; what has been, comes not again. Everything is new, and yet nought but the old.

We live in her midst and know her not. She is incessantly speaking to us, but betrays not her secret. We constantly act upon her, and yet have no power over her.

The one thing she seems to aim at is Individuality; yet she cares nothing for individuals. She is always building up and destroying; but her workshop is inaccessible.

Her life is in her children; but where is the mother? She is the only artist; working-up the most uniform material into utter opposites; arriving, without a trace of effort, at perfection, at the most exact precision, though always veiled under a certain softness.

Each of her works has an essence of its own; each of her phenomena a special characterisation: and yet their diversity is in unity.

She performs a play; we know not whether she sees it herself, and yet she acts for us, the lookers-on.

Incessant life, development, and movement are in her, but she advances not. She changes for ever and ever, and rests not a moment. Quietude is inconceivable to her, and she has laid her curse upon rest. She is firm. Her steps are measured, her exceptions rare, her laws unchangeable.

She has always thought and always thinks; though not as a man, but as Nature. She broods over an

all-comprehending idea, which no searching can find out.

Mankind dwell in her and she in them. With all men she plays a game for love, and rejoices the more they win. With many, her moves are so hidden, that the game is over before they know it.

That which is most unnatural is still Nature; the stupidest philistinism has a touch of her genius. Whoso cannot see her everywhere, sees her nowhere rightly.

She loves herself, and her innumerable eyes and affections are fixed upon herself. She has divided herself that she may be her own delight. She causes an endless succession of new capacities for enjoyment to spring up, that her insatiable sympathy may be assuaged.

She rejoices in illusion. Whoso destroys it in himself and others, him she punishes with the sternest tyranny. Whoso follows her in faith, him she takes as a child to her bosom.

Her children are numberless. To none is she altogether miserly; but she has her favourites, on whom she squanders much, and for whom she makes great sacrifices. Over greatness she spreads her shield.

She tosses her creatures out of nothingness, and tells them not whence they came, nor whither they go. It is their business to run, she knows the road.

Her mechanism has few springs—but they never wear out, are always active and manifold.

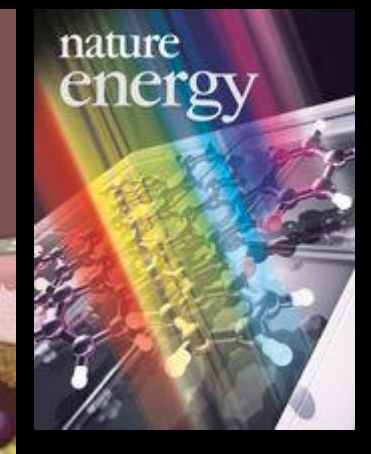
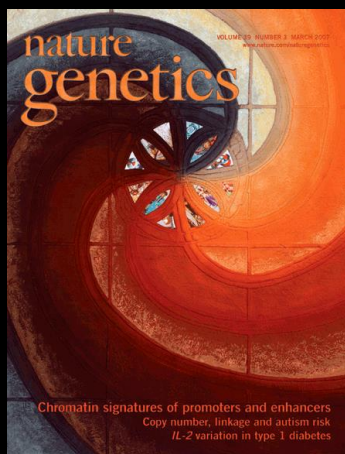
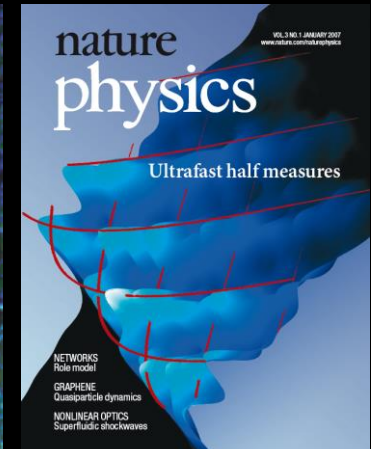
The spectacle of Nature is always new, for she is always renewing the spectators. Life is her most exquisite invention; and death is her expert contrivance to get plenty of life.

She wraps man in darkness, and makes him for ever long for light. She creates him dependent upon the earth, dull and heavy; and yet is always shaking him until he attempts to soar above it.

- November 4, 1869: First issue
- Mission statement: to place before the general public the result of scientific discovery and to help scientists to learn about advances in all branches of natural knowledge ...
- Published and privately owned by Springer Nature
- One of the leading scientific journals for original research
- Editorial offices in London, New York Shanghai, and now Berlin (smaller ones elsewhere)



# Nature Research Journals



and more

**Life and Health Sciences**

*Nature Cell Biology*  
*Nature Genetics*  
*Nature Immunology*  
*Nature Medicine*  
*Nature Neuroscience*  
*Nature Structural and Mol. Biol.*  
*Nature Plants*  
*Nature Microbiology*  
*Nature Ecology & Evolution\**  
*Nature Human Behaviour\**  
*Nature Metabolism\*\**

**Chemical and Applied**

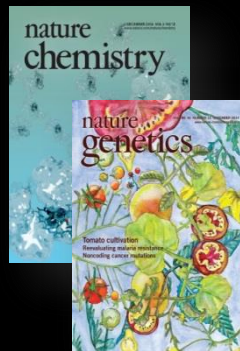
*Nature Biotechnology*  
*Nature Methods*  
*Nature Protocols*  
*Nature Chemical Biology*  
*Nature Chemistry*  
*Nature Biomedical Engineering\**  
*Nature Catalysis\**  
*Nature Electronics\**  
*Nature Machine Intelligence\*\**

**Physical and Environmental**

*Nature Physics*  
*Nature Photonics*  
*Nature Nanotechnology*  
*Nature Geoscience*  
*Nature Climate Change*  
*Nature Materials*  
*Nature Energy*  
*Nature Astronomy\**  
*Nature Sustainability\**

**Nature Reviews**

*Cancer*  
*Genetics*  
*Immunology*  
*Microbiology*  
*Molecular and Cellular Biology*  
*Neuroscience*  
*Drug Discovery*  
*Cardiology*  
*Clinical Oncology*  
*Endocrinology*  
*Gastroenterology and Hepatology*  
*Neurology*  
*Nephrology*  
*Rheumatology*  
*Urology*  
*Disease Primers*  
*Chemistry\**  
*Materials*  
*Physics\*\**



\*launched 2017 & 2018; \*\* launching in 2019



## Why so many journals?

- **Nature**
- Publishes the most significant advances with the widest implications
- Significance should be readily apparent to anyone from any field



- **Nature research journals**
- Publishes the most significant advances across the discipline each covers
- Significance should be apparent to anyone in that discipline

**Nature Reviews complement the research journals** In-depth summaries of field, context, research questions

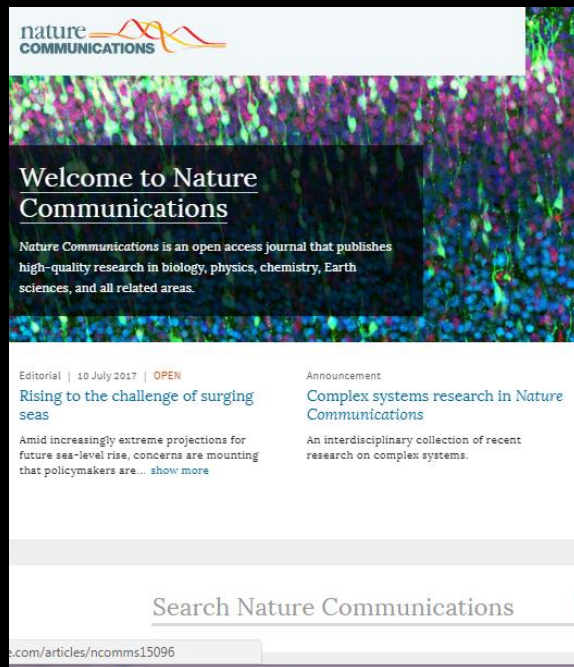
## What makes a *Nature* journal?



- Highly selective — only a fraction of submissions are published
- High impact
- Each journal is run by team of full-time, professional editors
- Journals are independent from each other journal — rejection from one doesn't prejudice consideration by another



## *Nature Communications*



- Same breadth of topics covered by *Nature*
- Fully open access
- Important advance – high quality
- No emphasis on interest for researchers in other areas

## *Communications journals*

COMMUNICATIONS   
**BIOLOGY**

COMMUNICATIONS   
**CHEMISTRY**

COMMUNICATIONS   
**PHYSICS**

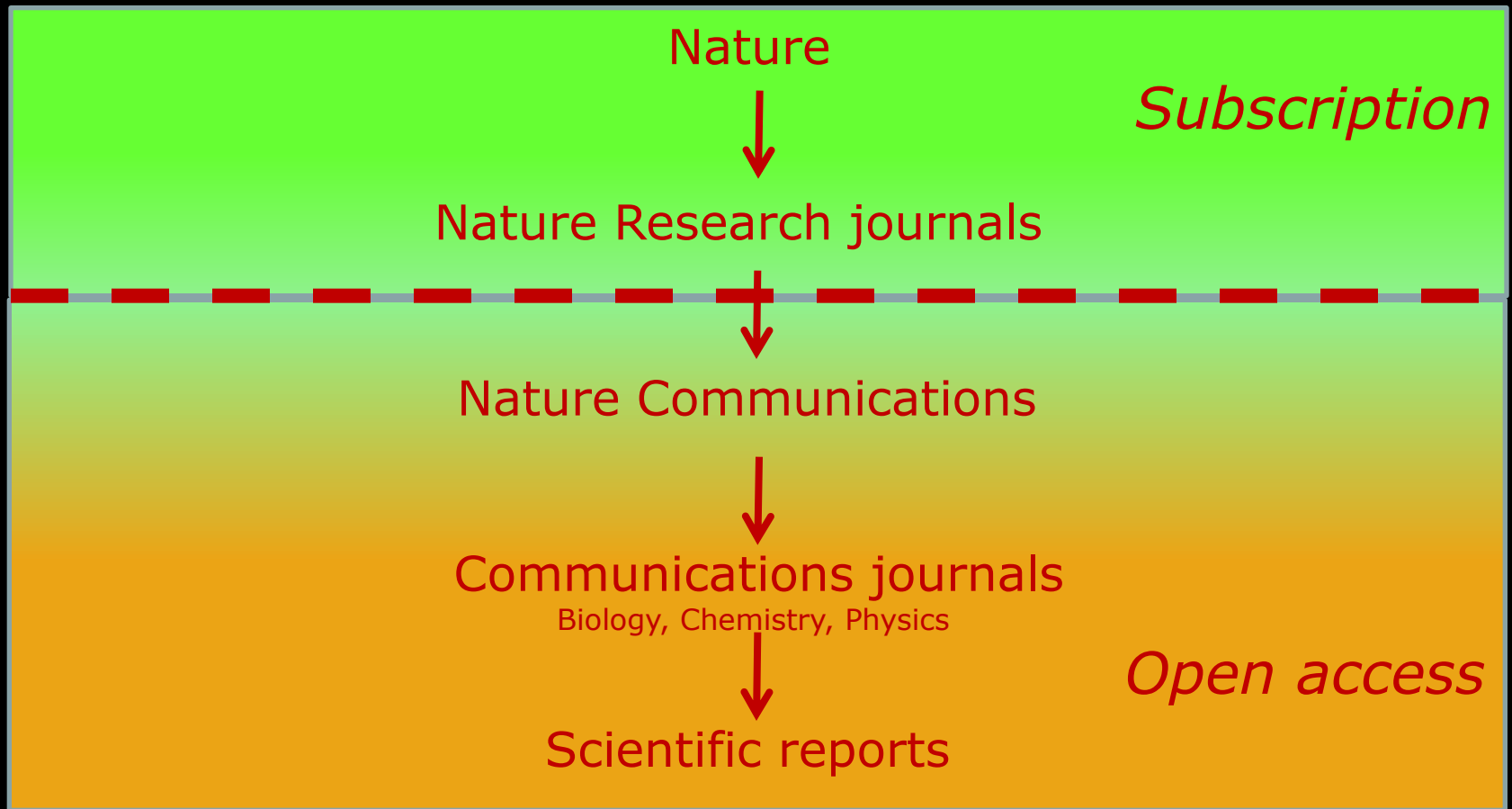
- The results are novel (novelty is not compromised by either abstracts or internet preprints)
- The paper provides strong evidence for its conclusions
- The data are technically sound
- The manuscript is important to scientists in the specific sub-field of biology/chemistry/physics.

## *Scientific Reports*



- Scientific validity is the only criterion
- Editorial board present

## *Nature Research family*



- Transfer between journals is possible
- Editors can discuss papers unless the authors forbid it



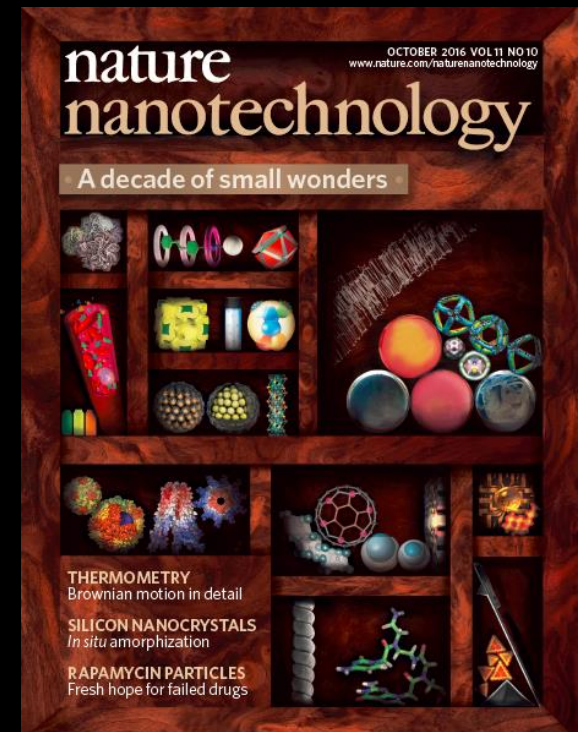
## Part 2

# *Nature Nanotechnology*

## What is *Nature Nanotechnology*?

*Nature Nanotechnology* is a monthly multi-disciplinary journal aimed at bringing together cutting-edge research across the entire spectrum of nanoscience and nanotechnology.

- Launched in October 2006
- Based in London, Berlin and Shanghai
- 6 editors that cover all sections



## Our contents

Front Half (actually  $\frac{1}{4}$ )

Editorial

Research highlights

Commentaries

News and Views

Correspondence

Back Half (actually  $\frac{3}{4}$ )

Letters

Articles

Analysis

Reviews

Perspectives

# Front Half: Engaging the community

editorial

## An opportunity not to be spoiled

Research on nanotechnology applied to agriculture should focus on understanding the aspects in which the small size can really make a difference.

nature  
nanotechnology

PERSPECTIVE

<https://doi.org/10.1038/s41565-018-0246-4>

## Minimum information reporting in bio-nano experimental literature

Matthew Faria<sup>1,2,3</sup>, Mattias Björnmalm<sup>1,2,4,5</sup>, Kristofer J. Thurecht<sup>1,6,7</sup>, Stephen J. Kent<sup>1,8</sup>, Robert G. Parton<sup>1,9,10</sup>, Maria Kavallaris<sup>1,11,12</sup>, Angus P. R. Johnston<sup>1,13</sup>, J. Justin Gooding<sup>1,12</sup>, Simon R. Corrie<sup>1,6,14</sup>, Ben J. Boyd<sup>1,13</sup>, Pall Thordarson<sup>1,12</sup>, Andrew K. Whittaker<sup>1,6</sup>, Molly M. Stevens<sup>1,4,5</sup>, Clive A. Prestidge<sup>1,15</sup>, Christopher J. H. Porter<sup>1,13</sup>, Wolfgang J. Parak<sup>1,6,17</sup>, Thomas P. Davis<sup>1,13,18</sup>, Edmund J. Crampin<sup>1,3\*</sup> and Frank Caruso<sup>1,2\*</sup>

Studying the interactions between nanoengineered materials and biological systems plays a vital role in the development of biological applications of nanotechnology and the improvement of our fundamental understanding of the bio-nano interface. A significant barrier to progress in this multidisciplinary area is the variability of published literature with regards to characterizations performed and experimental details reported. Here, we suggest a 'minimum information standard' for experimental literature investigating bio-nano interactions. This standard consists of specific components to be reported, divided into three categories: material characterization, biological characterization and details of experimental protocols. Our intention is for these proposed standards to improve reproducibility, increase quantitative comparisons of bio-nano materials, and facilitate meta analyses and in silico modelling.

INSIGHT | COMMENT

## Are assumptions of consumer views impeding nano-based water treatment technologies?

Initial studies indicate that consumer concerns about nanomaterial use in point-of-use water systems may be overestimated by manufacturers. Nevertheless, manufacturers should continue to focus on building consumer confidence in the safety of their products.

Andrew D. Maynard and Justin Kidd

news & views

NANOELECTRONICS

## Soft micro-sensotransmitters emerging

Two-dimensional materials allow the realization of soft smart dusts.

Kourosh Kalantar-Zadeh



## Our contents

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Research highlights  
Commentaries  
News and Views  
Correspondence

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Reviews  
Perspectives

## Meet the editors

### Chemists

Alberto Moscatelli  
(physical chemistry)

Chiara Pastore  
(nanomedicine and bionanotech)

Wenjie Sun  
(surface chemistry and  
biochemistry)



### Physicists

Benjamin Heinrich  
(Magnetism and scanning probes)

Fabio Pulizzi  
(Environmental nanotech, some  
physics)

Olga Bubnova  
(Electronics and optoelectronics)

70 % of workload – assess manuscripts - **No editorial board**  
30% - commissioning and editing, writing, attending conferences and doing lab visits, planning content

## **Editor's background (Fabio Pulizzi)**

- Degree in Physics in Rome (La Sapienza) - Specialised in Solid State Physics - Master thesis on magneto-transport in the High Tc Superconductor BSCCO.
- PhD in Physics, University of Nijmegen - Thesis on excitonic complexes in semiconductor quantum wells.
- 2.5 years Postdoc, University of Nottingham  
Transport and optics in semiconductor QDs
- 1.5 years Postdoc, University of Sheffield  
Optical properties of semiconductor QDs
- Associate and Senior Editor at Nature Materials for 6.5 years

## Our contents

### **Nanomaterials physics and devices**

Electronic properties  
Nanophotonics and plasmonics  
Nanomagnetsim and spintronics  
Nano-optomechanical systems  
Quantum information  
Topological properties  
Mechanical and structural properties

### **Nanotechnology for societal challenges**

Nanotechnology for energy  
Nanotechnology for the environment  
Nanotechnology for food  
Environmental, health and safety of nanotechnology

### **Techniques and instrumentations**

Synthesis and fabrication  
Imaging and spectroscopy  
Scanning probes  
Nanosensors

### **Chemistry at the nanoscale**

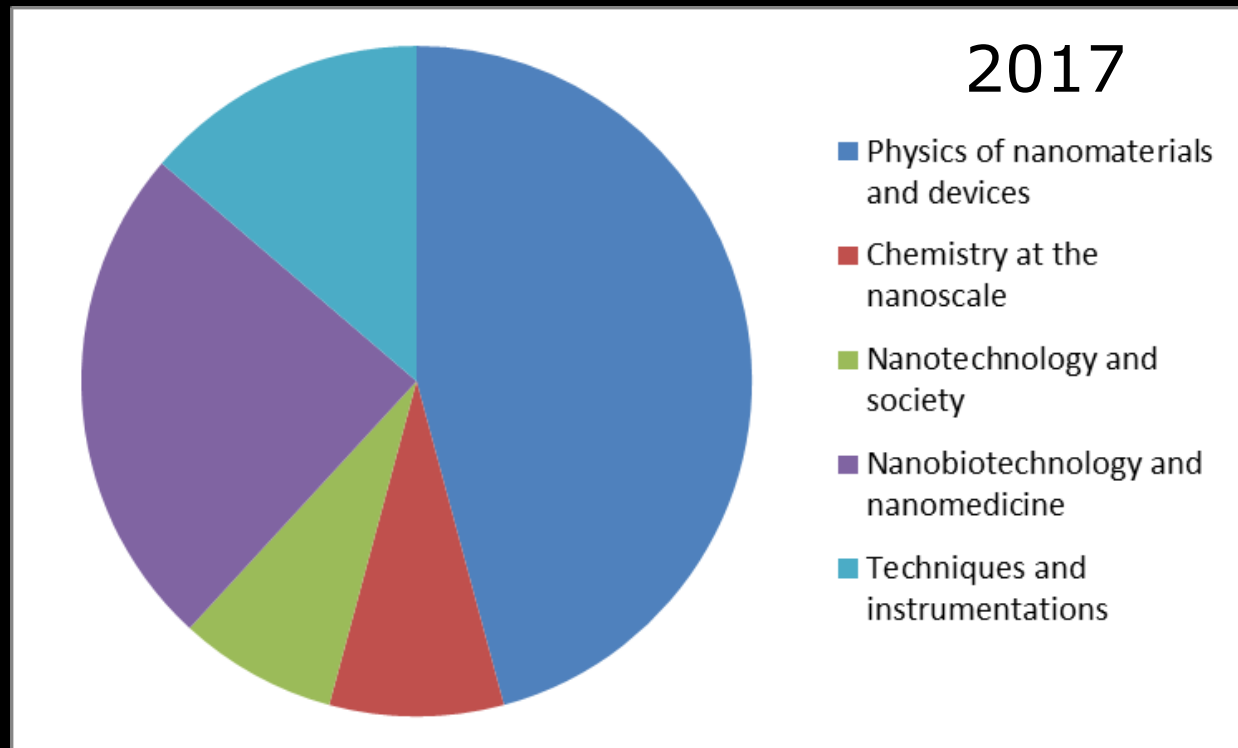
Molecular electronics  
Nanocatalysis  
Self-assembly  
Molecular machines  
Nanothermodynamics  
Surface chemistry  
Supramolecular chemistry

### **Nanobiotechnology and nanomedicine**

Cancer nanotechnology  
DNA nanotechnology  
Nanotechnology and neuroscience  
Nanoparticles for delivery  
Nanopores  
Nano-immunology  
Nanobioelectronics  
Nano-bio interactions



## Our contents



## What we look for

- Original
- *Substantial advance*
- *Conceptually novel*
- *Unexpected discovery*
- Broad interest / practical applicability
- Technically sound
- The results represent such a significant scientific or technological advance that colleagues who are not working in that field can appreciate it.
- It is likely to have an impact

## What do we look for



### Single photon emission from 2D layers

- Nature Nanotech.* **10**, 491–496 (2015).
- Nature Nanotech.* **10**, 497–502 (2015).
- Nature Nanotech.* **10**, 503–506 (2015).
- Nature Nanotech.* **10**, 507–511 (2015).

## What do we look for



### Oil spill clean up with graphene

*Nature Nanotech.* **12**, 434–440 (2017)

## What do we look for



### **Bacteria developing resistance to silver nanoparticles**

*Nature Nanotech.* **13**, 65–71 (2018)

## What do we look for



### Delivery of siRNA to endothelial cells

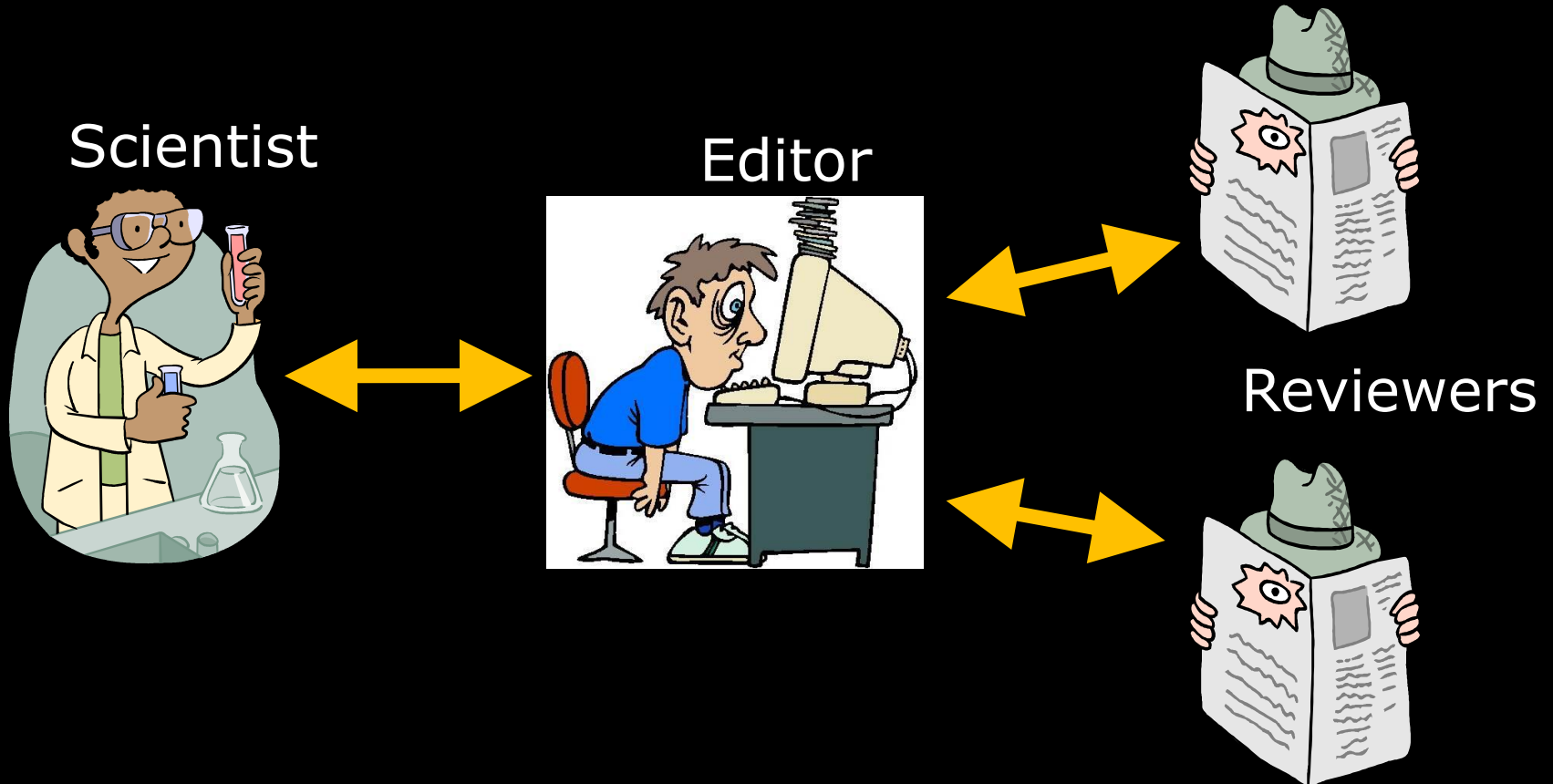
*Nature Nanotech.* **9**, 648–655 (2014)



## Part 3

# Our editorial process

## Editorial process



## Editorial process

- Manuscript is submitted (cover letter, reviewers suggestions request for exclusions, potential duplicate submission)
- 1<sup>st</sup> decision: back to authors or to reviewers – 180 pcm, 20% OTR
- Selection of reviewers: usually 3, careful editorial choice
- Decision after review: arguments, no counting votes
- Reject or revise – long or short term revision
- Publication after at least 2 rounds – (6 % of submitted mss)
- Potential for appeal – No editorial board

## Part 4

# Changes in publishing and in peer review

## Evolution or revolution?

*When Tim Berners-Lee created the Web in 1991, it was with the aim of better facilitating scientific communication and the dissemination of scientific research. Put another way, the Web was designed to disrupt scientific publishing.*

*From the vantage of 1991, it would have been impossible to predict all that has happened in the last 18 years. No one would have believed that much could change that quickly.*

*And yet it has.*

*The one thing that one could have reasonably predicted in 1991, however, was that scientific communication—and the publishing industry that supports the dissemination of scientific research—would radically change over the next couple decades.*

*And yet it has not.*

Michael Clarke (Scholarly Kitchen, 2010)

## Evolution of publishing and of peer review ?

Increasing openness, transparency, reproducibility

- Green and gold open access
- Data availability
- Reproducibility checklists
- Experiments for fairer and more transparent peer review

**What is Nature Research doing?**



## Open access

**Green open access:** sharing research that has not been peer reviewed



**Gold open access:** authors (or better, funders) pay for a paper to be published and accessed by all



PHYSICAL REVIEW X

ACS  
central  
science

iScience



PeerJ

## Other ways to make things accessible

Journals like *Nature* or *Nature Nanotechnology* cannot operate open access

**Green open access** permitted on submitted versions

Posting of the accepted version permitted after an embargo  
– 6 months

<https://www.nature.com/authors/policies/preprints.html>

Read only version shared by anyone with access to a paper



SharedIt

<https://www.springernature.com/gp/researchers/sharedit>

## Data availability

We do not mandate public deposition of data. But...

Data has to be made available upon request

We have introduced a compulsory data availability statement

### Data availability

The data associated with this paper are openly available from the University of Leeds data repository, <https://doi.org/10.5518/262>.

### Data availability

The data that support the plots within this paper and other findings of this study are available from the corresponding author upon reasonable request.

In 2014, what was known as Nature Publishing Group launched *Scientific Data*, publishing data descriptors

SCIENTIFIC DATA 

<https://www.nature.com/sdata/>

## Reproducibility checklists

Aim: increasing transparency and reproducibility of research  
**Life Sciences** Reporting summary provided for peer review and then published with the paper.

nature research

Corresponding author(s): Byung Hee Hong  
Han Seok Ko

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### Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see [Authors & Referees](#) and the [Editorial Policy Checklist](#).

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### Statistical parameters

When statistical analyses are reported, confirm that the following items are present in the relevant location (e.g. figure legend, table legend, main text, or Methods section).

n/a	Confirmed
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

The exact sample size ( $n$ ) for each experimental group/condition, given as a discrete number and unit of measurement

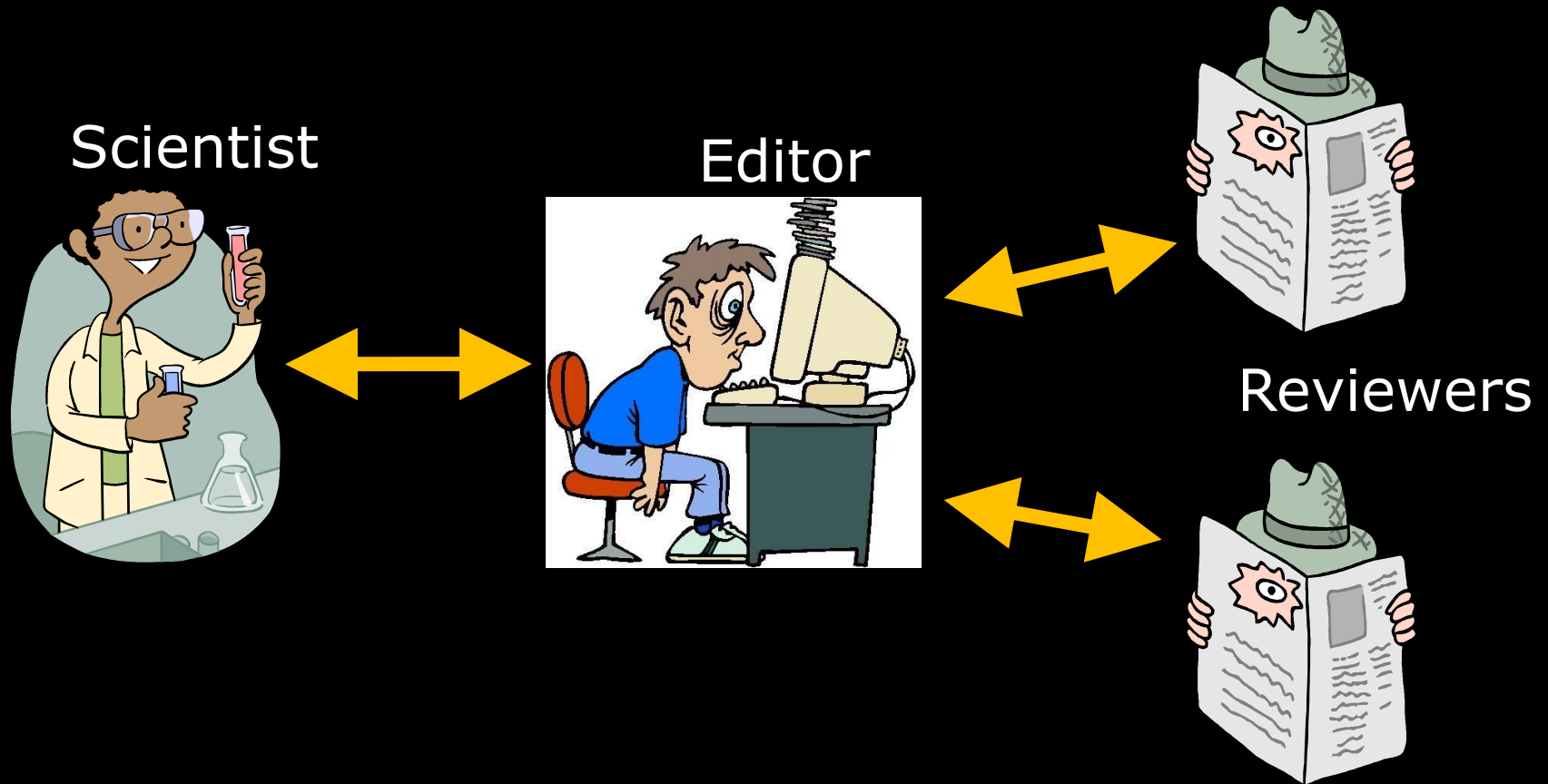
An indication of whether measurements were taken from distinct samples or whether the same sample was measured repeatedly

nature research | reporting summary

Also for **solar cells**, **lasers**, **ecology and environment**, **social sciences**

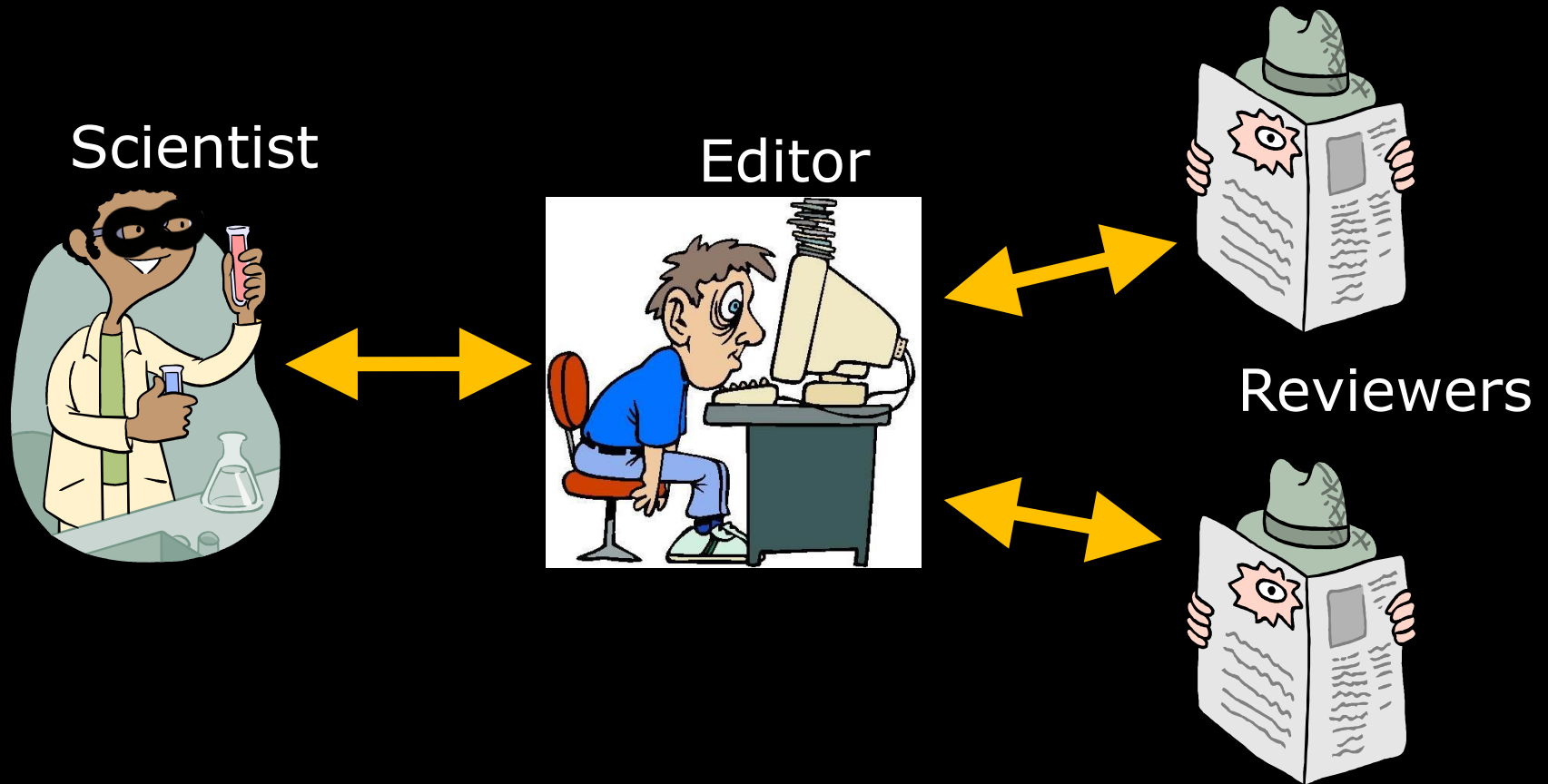
# Increasing fairness and transparency in peer review

## Traditional peer review



# Increasing fairness and transparency in peer review

## Double blind peer review





# Increasing fairness and transparency in peer review

## Double blind peer review

Common in the humanities

Optional at *Nature* and Nature Research Journals since 2013

Results between March 2015 and February 2017 by 25 Nature-branded journals published in *Research Integrity and Peer Review* 2018 **3:5** <https://doi.org/10.1186/s41073-018-0049-z>

Journal group	DBPR	SBPR
Nature	2782 (14%)	17,624 (86%)
Sister journals	8053 (12%)	57,181 (88%)
Nature Communications	3900 (9%)	38,914 (91%)

# Increasing fairness and transparency in peer review

## Double blind peer review

Outcome	DBPR		SBPR	
Rejected outright	13,493 (92%)		87,734 (77%)	
	Nature	2634	Nature	13,499
	Nature Communications	3328	Nature Communications	27,728
	Sister journals	7531	Sister journals	46,507
Out to review	1242 (8%)		25,985 (23%)	
	Nature	148	Nature	4125
	Nature Communications	572	Nature Communications	11,186
	Sister journals	522	Sister journals	10,674

Before review

After review

Outcome	DBPR		SBPR	
Accepted	242 (25%)		8692 (44%)	
	Nature	24	Nature	1116
	Nature Communications	137	Nature Communications	4077
	Sister journals	81	Sister journals	3499
Rejected	732 (75%)		11,040 (56%)	
	Nature	108	Nature	2226
	Nature Communications	294	Nature Communications	3843
	Sister journals	330	Sister journals	4971

# Increasing fairness and transparency in peer review

## Transparent peer review

### Editorials

Opening up BMJ peer review

*BMJ* 1999 ; 318 doi:

<https://doi.org/10.1136/bmj.318.7175.4> (Published 02  
January 1999)



Collaborative

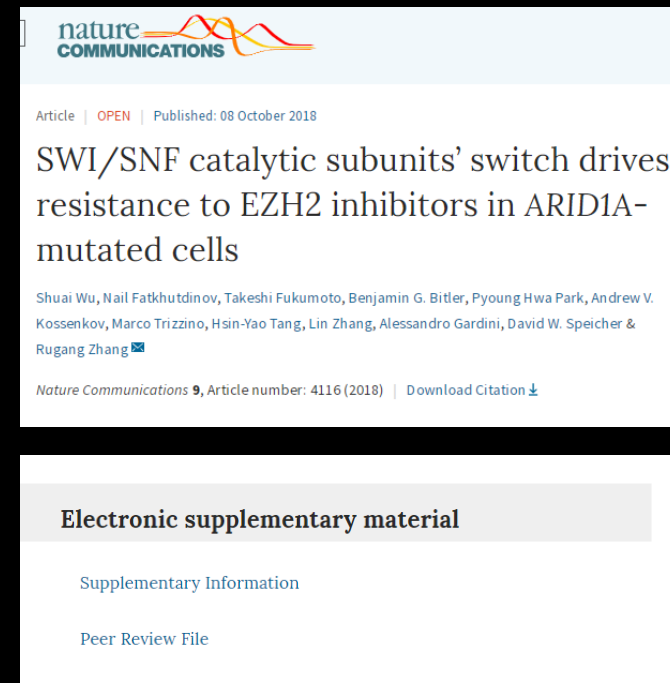
# Increasing fairness and transparency in peer review

## Transparent peer review

### Transparency at Nature Communications

Publication of the anonymous peer review file (Reports and rebuttal), upon author's approval.

90 % of authors agree – 60 % of reports are published



nature COMMUNICATIONS

Article | OPEN | Published: 08 October 2018

SWI/SNF catalytic subunits' switch drives resistance to EZH2 inhibitors in ARID1A-mutated cells

Shuai Wu, Nail Fatkhutdinov, Takeshi Fukumoto, Benjamin G. Bitler, Pyoung Hwa Park, Andrew V. Kossenkov, Marco Trizzino, Hsin-Yao Tang, Lin Zhang, Alessandro Gardini, David W. Speicher & Rugang Zhang

Nature Communications 9, Article number: 4116 (2018) | [Download Citation](#)

**Electronic supplementary material**

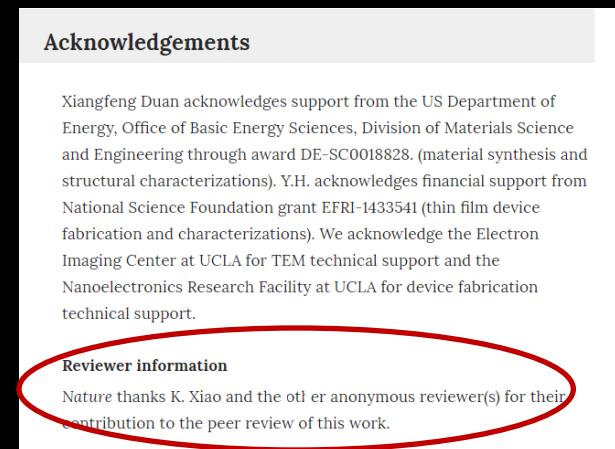
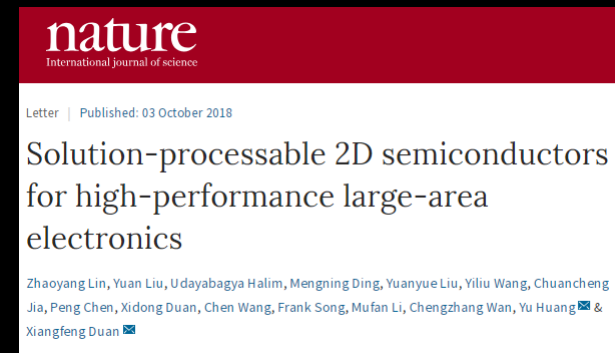
- [Supplementary Information](#)
- [Peer Review File](#)

# Increasing fairness and transparency in peer review

## Transparent peer review

Reviewers' accreditation at  
*Nature*

Publication of reviewers name  
with the paper – upon  
reviewer's approval



## Working with and for the community

- Our reputation stems from the work submitted by the authors
- We depend on thorough referees to detect and improve suitable papers
- We would fail without support from the community

**THANK YOU !**