

The background is a microscopic image of cells, likely yeast, with a blue tint. A large, semi-transparent circular overlay is centered on the right side of the image. Inside this circle, the text "Open for Discovery" is written in white. The text is arranged in two lines: "Open for" on the top line and "Discovery" on the bottom line. The font is a clean, sans-serif typeface. The overall aesthetic is scientific and modern.

Open for
Discovery

PLOS 2016 Annual Report

FROM THE CHAIRMAN AND INTERIM CEO

As a mission-driven Open Access publisher, innovator and advocacy organization, PLOS is committed to bringing scientific research and discovery into the public sphere. From the exciting breakthrough that transforms a field to the confirmatory or negative result, work published in PLOS journals truly reflects the breadth and depth of the scientific endeavor.

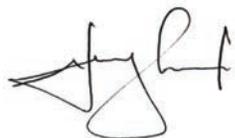
In the 15 years since our founding, we have had an extraordinary and positive impact on global Open Access to published scientific research. In a world that continues to present challenges of accessibility, accountability and discovery, we have maintained a rigorous commitment to our core values and mission to transform how research results are communicated—for scientists and all who rely on published scientific work.

To address these challenges, in 2016 PLOS brought to the public implementation of behind-the-scenes improvements and innovations that we hope will create an environment of open participation and success for authors, reviewers and editors. In addition, these changes seek to provide improved recognition, credit and discoverability for all who interact with our content, including readers, funders, librarians and evaluators. From a redesigned website and data service upgrades to a new submission system for *PLOS Biology*, implementation of unique digital identifiers and more granular methods of identifying contributions to a work for authors, these public-facing improvements reflect our continuing effort to better serve the scientific research community.

This past year we also shared in the excitement of new discovery and celebrated Open Access science with the second annual *PLOS Genetics* Research Prize, the second round of Early Career Researcher Travel Awards and the ten-year anniversary of *PLOS ONE*. We look forward to another challenging, exciting and rewarding year in 2017.

Now more than ever PLOS has a responsibility to ensure that trustworthy science reaches the largest audience possible, fostering distributed knowledge. In publishing Open Access, researchers advance scientific and biomedical discovery and leverage the potential to educate the public, inform policy decisions and accelerate innovation for the benefit of all society.

We thank all of the authors, editors, reviewers and readers who are essential collaborators with us in our ongoing efforts to advance science, medicine and the transformation of science communication.

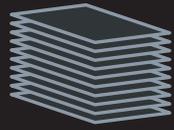


Gary Ward, *Chairman*



Richard Hewitt, *Interim Chief Executive Officer*

ARTICLE HIGHLIGHTS*



ARTICLES PUBLISHED

27,000+

12+ MILLION
MONTHLY ARTICLE VIEWS

2,000,000+
MONTHLY ARTICLE DOWNLOADS

195,000+ ARTICLES
PUBLISHED †

COMMUNITY HIGHLIGHTS*

2.1 MILLION
UNIQUE VISITORS
TO PLOS BLOGS



300,000+

TWITTER FOLLOWERS †

61 NOBEL LAUREATES
HAVE PUBLISHED
THEIR WORK WITH PLOS †

GLOBAL REPRESENTATION

7,000 EDITORS
78,000 REVIEWERS



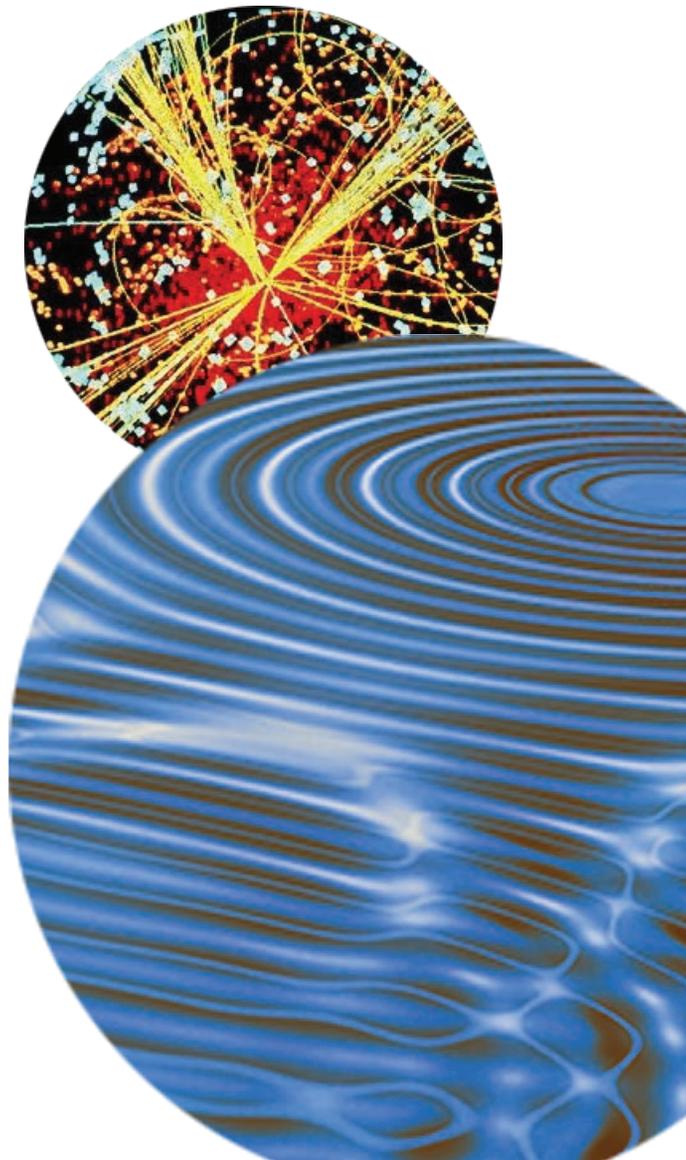
AUTHOR CONTRIBUTIONS
FROM
190+ COUNTRIES

*2016

†Through 2016

MODERN TECHNICAL FRAMEWORK ACCELERATES INNOVATION

- Launched Aperta™, our streamlined [manuscript submission system](#), for *PLOS Biology*
- Completed a datacenter migration to improve speed and stability of our websites that deliver, on average, more than 2 million article downloads and 12 million article views per month
- Created a new registration system designed for easy account management by users and single sign-on for PLOS applications including Article-Level Metric (ALM) Reports, manuscript submissions and reviewer/editor services
- Provided more rapid dissemination of research for *PLOS Pathogens*, *PLOS Genetics*, *PLOS Neglected Tropical Diseases* and *PLOS Computational Biology* through publication of uncorrected proofs—early versions of peer reviewed work, formatted for layout but not final publication
- Modified the PLOS Thesaurus to accommodate Subject Area Landing Page URL data as a first step toward [Linked Open Data](#)



**WE'VE BEEN AN
AGENT OF CHANGE
SINCE OUR FOUNGING,
PROVIDING OPEN
ACCESS TO
THE SCIENTIFIC
LITERATURE 24/7, 365
DAYS A YEAR.**

As a leading [Open Access publisher](#), PLOS pursues a publishing strategy that optimizes the openness and integrity of the publication process to ensure that research outcomes are discoverable, accessible and available for discussion and reuse, and that science communication is constructive, transparent and verifiable. This past year we focused on easing and modernizing processes for our contributor community to more quickly bring work to the public, expanding opportunities for authors and readers to participate in the scientific discourse, updating policies and practices to improve recognition, credit and reproducibility and working from all angles to advance Open Access, Open Data and Open Science. Read more below about the milestones PLOS achieved in 2016.

Moving Beyond the Article Expands Author Opportunities

PLOS SCIENCE WEDNESDAY

In its first full year of program activity, [PLOS Science Wednesday on redditscience Ask Me Anything](#) (AMA) was an active forum for thought-provoking discussion of 75+ articles and three complete collections. Through these weekly AMAs more than 100 authors engaged with the public to share details and stories of their research beyond what any article communicates, raising article visibility an average of 15% based on ALMs.

PLOS COMMUNITIES

A collective 17,000+ scientists of all career stages and disciplines stayed up to date on the latest PLOS research and key topics of interest through PLOS Community newsletters focused on [Paleontology](#), [Synthetic Biology](#), [Ecology](#), [Neuroscience](#) and [Early Career Researchers](#). Growth in these communities ranged from 200% to over 400% in 2016.

RESEARCH MATTERS

In [Research Matters: PLOS Biology](#) and [Research Matters: PLOS Pathogens](#), scientists share the value of their research and describe how research is a powerful engine for immediate and future

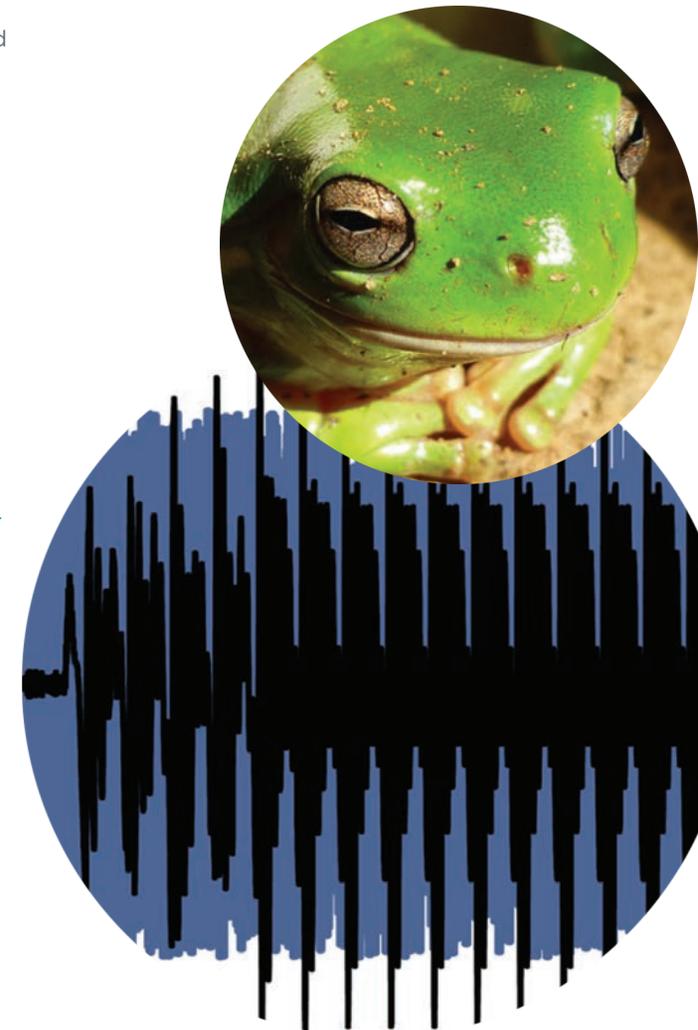
innovation, from discovery of basic mechanisms to applied and translational advances. Author narratives illustrate the impact – often in unexpected ways – of basic research on public health, human knowledge and the environment.

PLOS MEDICINE SPECIAL ISSUES

PLOS Medicine's new Special Issues reflect the expertise of guest editors chosen for their breadth and depth of knowledge in select fields. Developed through focused Calls for Papers, these Issues contain research articles, PLOS Science Wednesday AMAs, blog posts and other related content. In the first year of implementation, Special Issues in 2016 covered [Diabetes Prevention](#), [Translating the Cancer Genome](#) and [Dementia](#).

PLOSCAST

Listeners tuned in over 9,000 times in 2016 to [PLOScast](#), the PLOS podcast with key thought leaders pushing the boundaries of scholarly communication. From [communicating science](#) and [institutional repositories](#) to [fighting link rot](#) and [open source science communities](#), 14 interviews covered topics of interest to scientists of all career levels.



UPDATED POLICIES AND PRACTICES ADDRESS REPRODUCIBILITY, DISCOVERY AND AUTHOR RECOGNITION

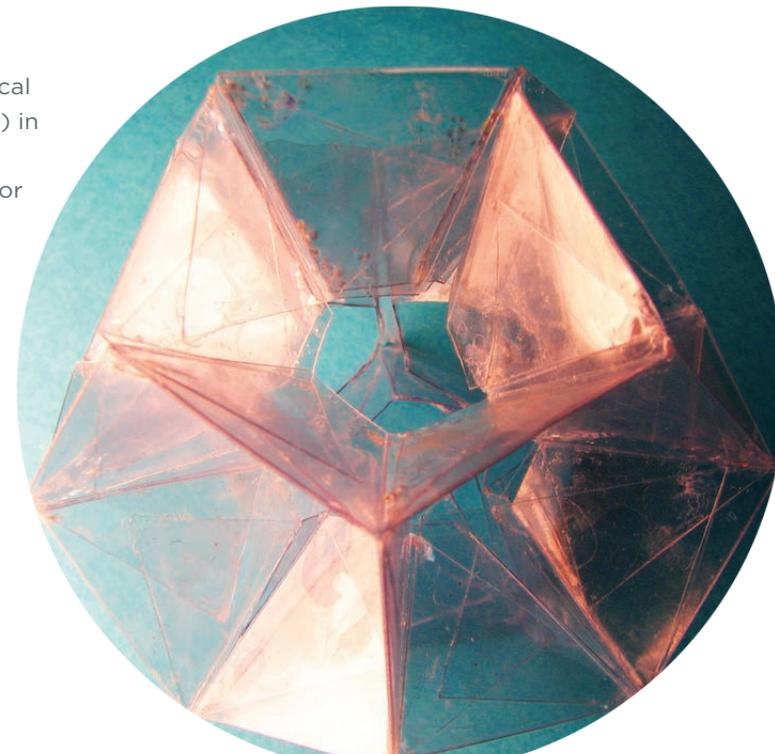
- PLOS takes a leadership role in addressing [research reproducibility](#) with reinforcements to reporting guidelines for authors and making [research on research](#) available to the public with *PLOS Biology's* [meta-research articles](#). For ease of discovery and comprehensive coverage, research articles and dialogues from the PLOS Science Wednesday on redditscience AMA series are curated into sections on [Methods](#), [Evaluation, Policy and Interventions](#), [Reproducibility](#), [Reporting](#) and more.
- We redesigned our [PLOS.org website](#) to provide quick and easy access to all PLOS web properties—from who we are ([Open](#) and [Innovative](#)) and what we do ([Publications](#) and [Advocacy](#)) to Featured Articles from PLOS journals. Visitors to [PLOS.org Spotlight](#) find a centralized hub with informative and topical weekly content and links to [AMA](#), our interview forum [PLOScast](#) and the newly-launched

[PLOS Research News](#)—covering the latest press-released research articles, videos and author interviews. See the [Top 10 PLOS Research News articles of 2016](#).

- Our [collaboration with bioRxiv](#) means that authors are now able to concurrently submit their work directly to select PLOS journals from this preprint server. Authors can make their findings immediately available to the scientific community, establish intellectual precedence for ideas, methods and results, and [receive feedback on draft manuscripts](#) before they are submitted for publication. *PLOS Genetics* engaged [Preprint Editors](#) to actively recruit manuscripts from bioRxiv.
- In collaboration with Project THOR (Technical and Human infrastructure for Open Research) in Europe, we have begun to set the stage for consensus on integrations and connectivity for research objects through persistent digital identifiers.
- To provide more granular information on author contributions to a work we [implemented the CRediT taxonomy](#) for our authors. PLOS collaborated with publishers and other stakeholders

in the development of this taxonomy (under the auspices of the Consortia Advancing Standards in Research Administration Information) to facilitate a shift in focus for tenure and promotion committees – and other evaluators – away from how many times an individual is a first-or last-named author and toward their specific contributions to a work.

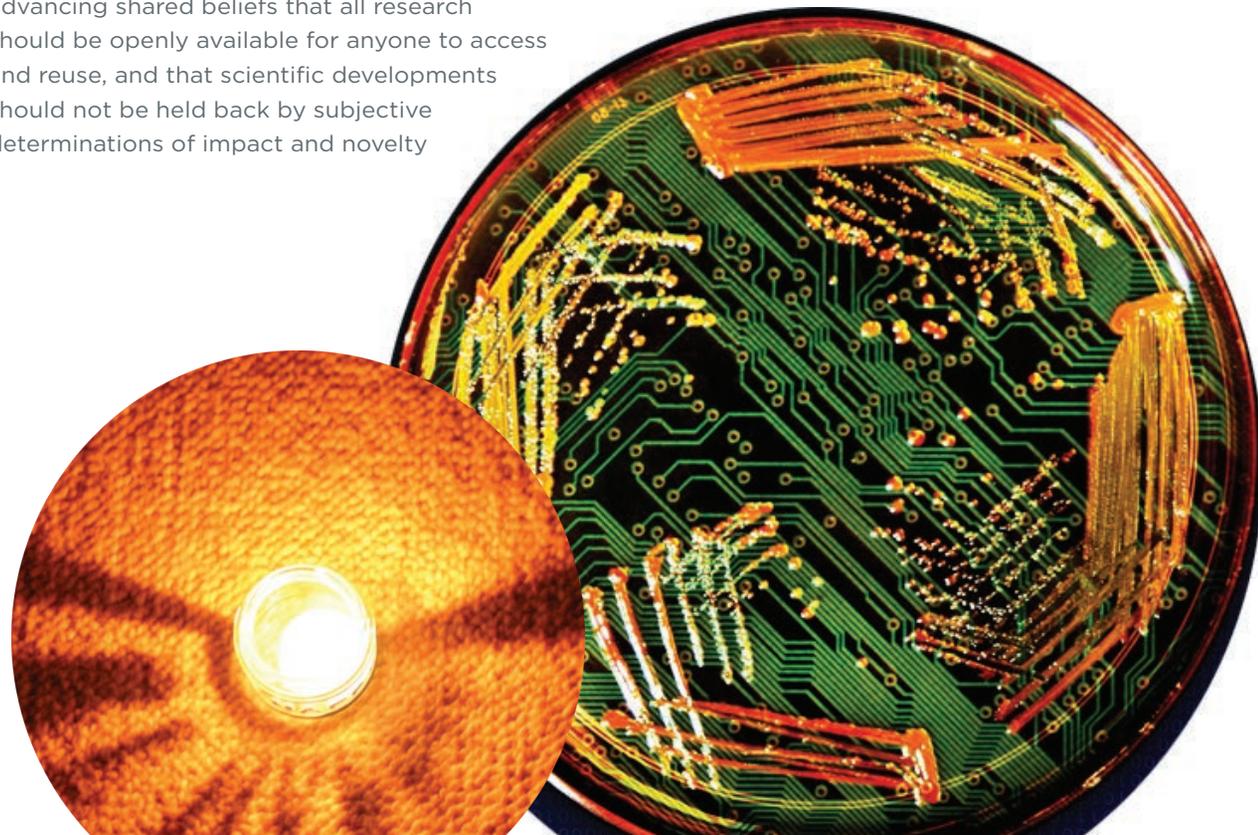
- As follow-up of an earlier, public commitment in the form of a [publisher's Open Letter](#), we implemented an [ORCID iD requirement](#) for corresponding authors of submitted manuscripts, providing instructions and suggested uses for researchers [on our website](#).



MULTIFACETED APPROACH ADVANCES OPEN DATA AND OPEN SCIENCE

- Encouraged researchers submitting Zika-related work to post their manuscripts on bioRxiv while under consideration for more rapid dissemination
- Committed to work in partnership with funders and other publishers to [ensure data sharing in the case of public health emergencies](#), with the [PLOS Zika Collection](#) and [Featured Zika](#) blog posts providing a comprehensive resource for this 2016 public health crisis
- Launched the [Open Data Collection](#) of articles on open data policies and practices, together with commentaries
- Established the Open Highlights Collection, curated to provide depth of coverage on select research topics across PLOS journals, with Keystone Symposia research articles rounding out select collections: [A Swarm of Bee Research](#), [The Emotional Brain](#), [Sex Chromosome Transcription](#), [In Search of Autism's Roots](#), [Wreaking Reproductive Havoc One Chemical at a Time](#) and [Understanding Disease Tolerance and Resilience](#)

- Transitioned our ALM source code to CrossRef to provide ALMs as a community service to all publishers and [articulated a commitment](#) to provide Aperta open source in the future
- Collaborated with the International Committee of Medical Journal Editors on an Editorial proposing data sharing for clinical trials, in response to a World Health Organization request; this was accompanied by a [Perspective](#) from the pharmaceutical industry in an issue of *PLOS Medicine* [focused on data sharing](#)
- Initiated experimentation in [open peer review](#) with the [synthetic biology iGEM community](#), advancing shared beliefs that all research should be openly available for anyone to access and reuse, and that scientific developments should not be held back by subjective determinations of impact and novelty



Global Media Extends Article Reach and Impact

GIZMODO

“Spontaneous Decoding of the Timing and Content of Human Object Perception from Cortical Surface Recordings Reveals Complementary Information in the Event-Related Potential and Broadband”

PLOS Computational Biology

DER SPIEGEL

“Identification of Multiple Loci Associated with Social Parasitism in Honeybees”

PLOS Genetics

NATIONAL GEOGRAPHIC

“Catastrophic Decline of World’s Largest Primate: 80% Loss of Grauer’s Gorilla (*Gorilla beringei graueri*) Population Justifies Critically Endangered Status

PLOS ONE

NewScientist

“CRISPR/Cas9-Mediated Genome Editing of Herpesviruses Limits Productive and Latent Infections”

PLOS Pathogens

Business Standard

“The Evolutionary Origins of Hierarchy”

PLOS Computational Biology

Los Angeles Times

“First-Year Evaluation of Mexico’s Tax on Nonessential Energy-Dense Foods: An Observational Study”

PLOS Medicine

THE CHRISTIAN SCIENCE MONITOR

“An Unusual New Theropod with a Didactyl Manus from the Upper Cretaceous of Patagonia, Argentina”

PLOS ONE

n p r

“Minimally Symptomatic Infection in an Ebola ‘Hotspot’: A Cross-Sectional Serosurvey”

PLOS Neglected Tropical Diseases

The Telegraph

“Genome-Wide Association Study Reveals Multiple Loci Influencing Normal Human Facial Morphology”

PLOS Genetics

theguardian

“Comparison of Outcomes before and after Ohio’s Law Mandating Use of the FDA-Approved Protocol for Medication Abortion: A Retrospective Cohort Study”

PLOS Medicine

hindustantimes

“Membrane Vesicles of Group B Streptococcus Disrupt Feto-Maternal Barrier Leading to Preterm Birth”

PLOS Pathogens

NBC NEWS

“Zika Virus Infection and Stillbirths: A Case of Hydrops Fetalis, Hydranencephaly and Fetal Demise”

PLOS Neglected Tropical Diseases

CBC

“Climate-Related Local Extinctions Are Already Widespread among Plant and Animal Species”

PLOS Biology

The Washington Post

“Associative Mechanisms Allow for Social Learning and Cultural Transmission of String Pulling in an Insect”

PLOS Biology

Serving the scientific community and the greater public good encapsulate our foremost concerns. Aside from instrumental work in shifting the scientific publishing landscape toward Open Access, we are particularly proud that researchers of all stripes – from Nobel laureates and Lasker Awardees to Early Career Researchers and others influencing the world with their openly available research and data – choose to publish in our journals. This past year, 27,000 research articles, together with Perspectives, Essays and Editorials, documented the observations and discoveries of a diverse scientific community. Below are select highlights published within the past year from each of the PLOS journals. Work below is significant either for the attention it's drawing from readers, the policy change it's affecting or the potential it has to shape our world.

**FOR MORE INSIGHTS
DIRECT FROM OUR
AUTHORS, LISTEN TO THESE
NEWS INTERVIEWS:**

Paleontologist Matt Lamanna on [Sauropods](#)

Veterinary Epidemiologist Cheryl Meehan on [fitness tracking of elephants](#)

Ecologist Lydia Beaudrot on [animal selfies and biodiversity](#)

Neuroscientist Srivas Chennu on [monitoring consciousness during surgery](#)

Entomologist Constanca F. Junqueira Ayres on [genetically modified mosquitoes to fight Zika](#)

Psycho-Social Scientist Paul Montgomery on [girls dropping out of school in Africa](#)

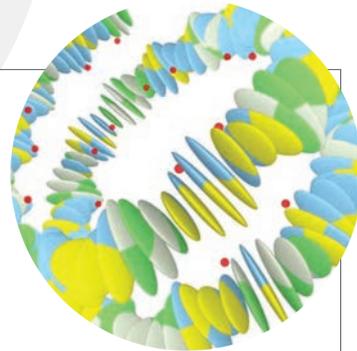
Anthropologist Connie Mulligan on [discrimination and stress](#)

Biologist Eric Yip on [cannibalism in orb spiders](#)

2016 Research Highlights

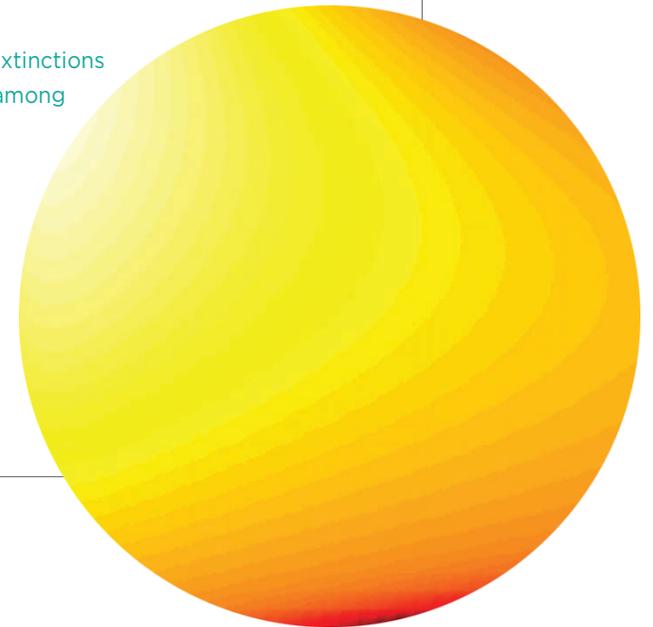
PLOS ONE

- Multiplexing Genetic and Nucleosome Positioning Codes: A Computational Approach
- An Unusual New Theropod with a Didactyl Manus from the Upper Cretaceous of Patagonia, Argentina
- An Economic Geography of the United States: From Commutes to Megaregions
- Twelve Weeks of Sprint Interval Training Improves Indices of Cardiometabolic Health Similar to Traditional Endurance Training despite a Five-Fold Lower Exercise Volume and Time Commitment
- The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014
- Catastrophic Decline of World's Largest Primate: 80% Loss of Grauer's Gorilla (*Gorilla beringei graueri*) Population Justifies Critically Endangered Status



PLOS BIOLOGY

- Brain Connectivity Predicts Placebo Response across Chronic Pain Clinical Trials
- Revised Estimates for the Number of Human and Bacteria Cells in the Body
- Current Incentives for Scientists Lead to Underpowered Studies with Erroneous Conclusions
- Relative Citation Ratio (RCR): A New Metric That Uses Citation Rates to Measure Influence at the Article Level
- Climate-Related Local Extinctions Are Already Widespread among Plant and Animal Species

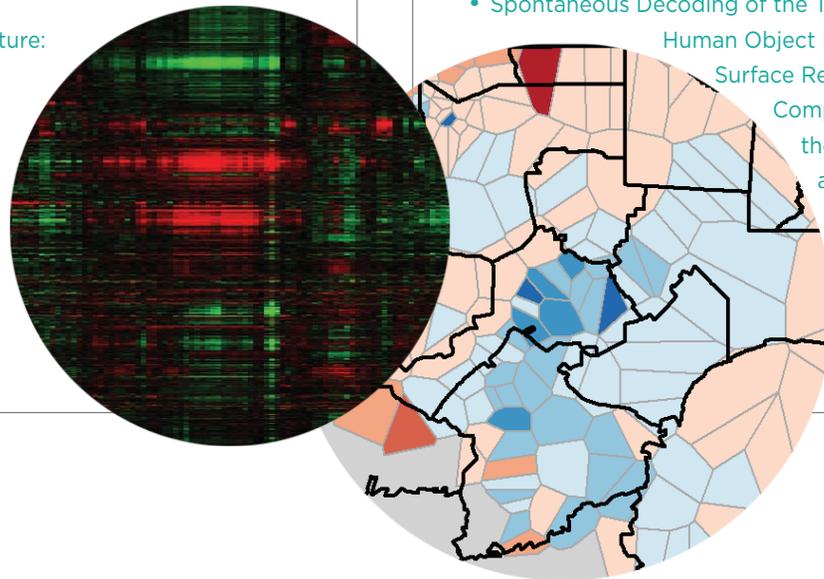


PLOS MEDICINE

- Tumor Evolution in Two Patients with Basal-like Breast Cancer: A Retrospective Genomics Study of Multiple Metastases
- Projected Impact of Mexico's Sugar-Sweetened Beverage Tax Policy on Diabetes and Cardiovascular Disease: A Modeling Study
- Lifestyle Advice Combined with Personalized Estimates of Genetic or Phenotypic Risk of Type 2 Diabetes, and Objectively Measured Physical Activity: A Randomized Controlled Trial
- Toward a Common Secure Future: Four Global Commissions in the Wake of Ebola
- Comparison of Outcomes before and after Ohio's Law Mandating Use of the FDA-Approved Protocol for Medication Abortion: A Retrospective Cohort Study

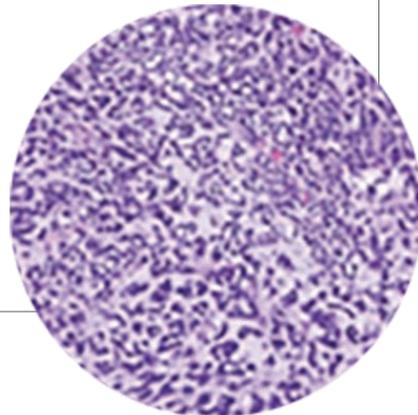
PLOS COMPUTATIONAL BIOLOGY

- Electrophysiology of Heart Failure Using a Rabbit Model: From the Failing Myocyte to Ventricular Fibrillation
- Identifying Malaria Transmission Foci for Elimination Using Human Mobility Data
- Reservoir Computing Properties of Neural Dynamics in Prefrontal Cortex
- A Quick Introduction to Version Control with Git and GitHub
- Spontaneous Decoding of the Timing and Content of Human Object Perception from Cortical Surface Recordings Reveals Complementary Information in the Event-Related Potential and Broadband Spectral Change



PLOS GENETICS

- The Great Migration and African-American Genomic Diversity
- Dynamics of Chloroplast Translation during Chloroplast Differentiation in Maize
- Fragment Length of Circulating Tumor DNA
- Combating a Global Threat to a Clonal Crop: Banana Black Sigatoka Pathogen *Pseudocercospora fijiensis* (Synonym *Mycosphaerella fijiensis*) Genomes Reveal Clues for Disease Control
- Identification of Multiple Loci Associated with Social Parasitism in Honeybees



PLOS NEGLECTED TROPICAL DISEASES

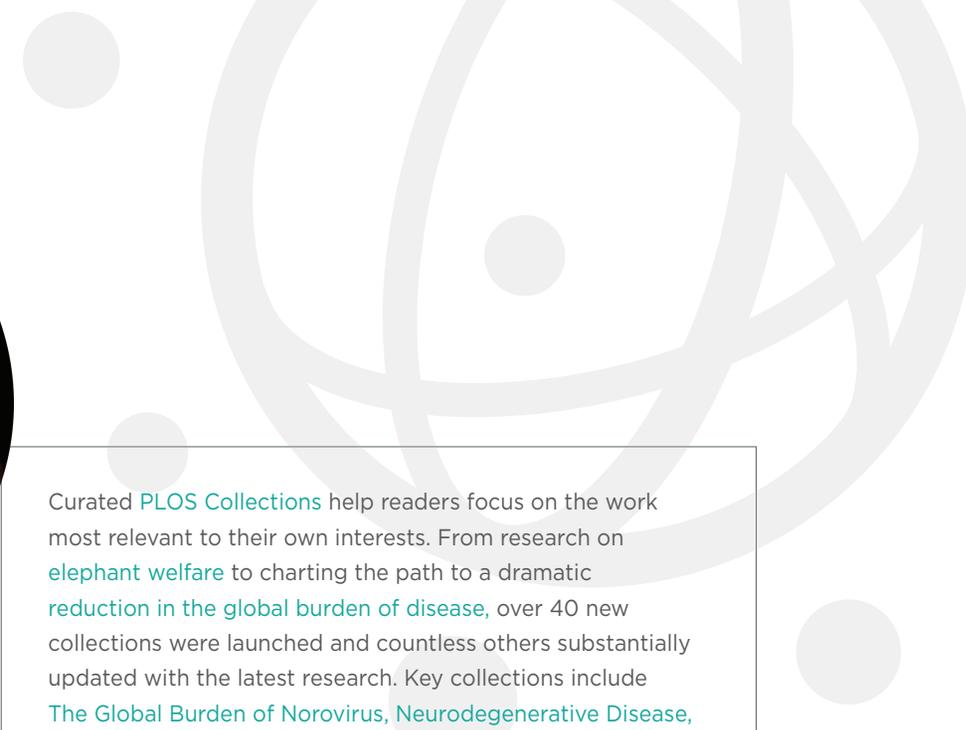
- *Culex quinquefasciatus* from Rio de Janeiro Is Not Competent to Transmit the Local Zika Virus
- Zika Virus: Medical Countermeasure Development Challenges
- Co-infection of Ticks: The Rule Rather Than the Exception
- Mycetoma: A Long Journey from Neglect
- Global Assessment of Schistosomiasis Control Over the Past Century Shows Targeting the Snail Intermediate Host Works Best





PLOS *PATHOGENS*

- [Open Source Drug Discovery with the Malaria Box Compound Collection for Neglected Diseases and Beyond](#)
- [A Computationally Designed Hemagglutinin Stem-Binding Protein Provides In Vivo Protection from Influenza Independent of a Host Immune Response](#)
- [The Tree\(s\) of Life: The Human Placenta and My Journey to Learn More About It](#)
- [In Vivo Molecular Dissection of the Effects of HIV-1 in Active Tuberculosis](#)
- [CRISPR/Cas9-Mediated Genome Editing of Herpesviruses Limits Productive and Latent Infections](#)



Curated [PLOS Collections](#) help readers focus on the work most relevant to their own interests. From research on [elephant welfare](#) to charting the path to a dramatic [reduction in the global burden of disease](#), over 40 new collections were launched and countless others substantially updated with the latest research. Key collections include [The Global Burden of Norovirus](#), [Neurodegenerative Disease](#), [Forest Conservation](#) and the [PLOS Zika Collection](#)—an essential resource for the global community to immediately access the most current and important information.

The growing choices for readers of *PLOS ONE* Editor's Picks now includes curated [Cell Biology](#), [Stem Cell Research](#) and [Microbiology](#) collections while data sharing, data practices and data policies are the focus of the [Open Data Collection](#). *PLOS Currents* continues to provide a critical forum for rapid sharing of preliminary work with articles included in collections for greater visibility.



Investment for Current and Future Research Communication

PLOS published approximately 31,000 research articles in 2015, bringing the total number of Open Access articles published by PLOS to more than 165,000. The transition to Open Access that PLOS, together with others, has led for more than a decade continues to drive growth in the overall market share of Open Access publishing, in line with the goals of PLOS.

As of December 31st 2015, PLOS had net assets of \$30.6 million, equivalent to the previous year. Of the 2015 year-end net assets, cash and unrestricted investments totaled \$24.5 million compared to \$28.9 million at year-end 2014 primarily due to investments in capitalized software development activities. For the year ending December 31st 2015, PLOS generated total revenues of \$42.9 million compared to total revenues of \$45.6 million for the year ending December 31st 2014, due to declines in publication fees and investment income.

BALANCE SHEET

December 31, 2015
(\$000's)

ASSETS 2015

Current Assets

Cash and cash equivalents	1,757
Program and accounts receivable, net	1,845
Prepaid expenses and other	814
Total current assets	<u>4,417</u>

Noncurrent Assets

Investments	22,745
Restricted investments, long term	281
Loan receivable	56
Property and equipment, net	1,931
Software development costs	6,738
Deposits	8
Total noncurrent assets	<u>31,759</u>

Total Assets **36,176**

LIABILITIES AND NET ASSETS 2015

Current Liabilities

Accounts payable	2,072
Accrued liabilities	1,688
Institutional deposits	712
Deferred revenue	564
Total current liabilities	<u>5,036</u>
Deferred rent liability	494
Total liabilities	<u>5,531</u>

Net Assets

Unrestricted	30,524
Temporarily restricted	122
Total net assets	<u>30,645</u>
Total liabilities and net assets	<u>36,176</u>

STATEMENT OF ACTIVITIES

For the Year Ended December 31, 2015
(\$000's)

REVENUE, GAINS (LOSSES) AND SUPPORT 2015

Public support revenue	208
Program revenue	
Publication fees, gross	44,604
Less: Publication fee assistance	<u>(2,329)</u>
Publication fees, net	<u>42,275</u>
Reprints and sponsorships	69
Advertising	496
Total program revenue	<u>42,840</u>
Unrealized losses on investments	(1,259)
Other income, net	227
Interest and dividend income	849
Total revenue, gains, (losses) and support	<u>42,866</u>

Expenses

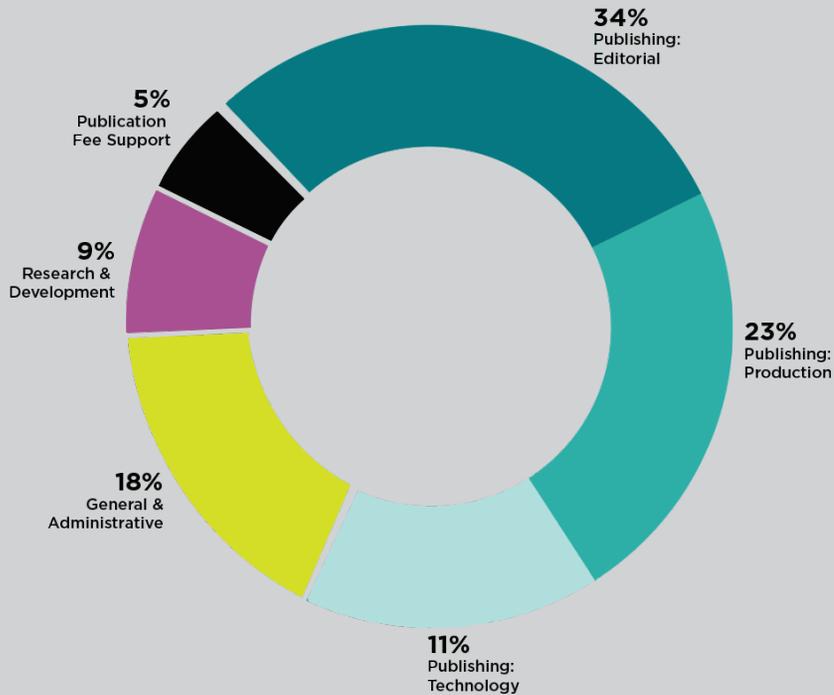
Publishing program expenses	34,239
General and administrative expenses	8,610
Total expenses	<u>42,850</u>

Increase in net assets

16

The volume of submissions to PLOS journals in 2015 was comparable to 2014 at approximately 65,000. To offset the costs of handling submitted articles – from peer review management and journal production to online hosting and archiving – Article Processing Charges for *PLOS ONE* were increased for the first time in six years, from \$1,350 to \$1,495.

Total expenses in 2015 were \$42.8 million compared to \$40.7 million in 2014 due to increases in overall head-count costs as PLOS continued to invest in internal publishing and development resources. Expenses including capitalized development costs were \$46.6 million in 2015 compared to \$43.5 million in 2014. Total expenses – including both capitalized development costs and publication fee support – were \$48.9 million in 2015.



68% Publishing
 (34% Editorial, 23% Production, 11% Technology)
 Efforts related to editorial and production, operations and advocacy, including staffing, productivity tools and enhancement of Ambra

18% General & Administrative
 Non-publishing costs that support staff and outsourced services in human resources, legal and accounting; also includes rent and bank fees

9% Research & Development
 Efforts include innovations in content management systems and publishing architectures, enhancements to PLOS Article-Level Metrics (ALMs) and development of Aperta™ inclusive of capitalized development

5% Publication Fee Support
 Fee assistance provided by PLOS to authors unable to pay all or part of their article publication fees; including those qualifying under the PLOS Global Participation Initiative

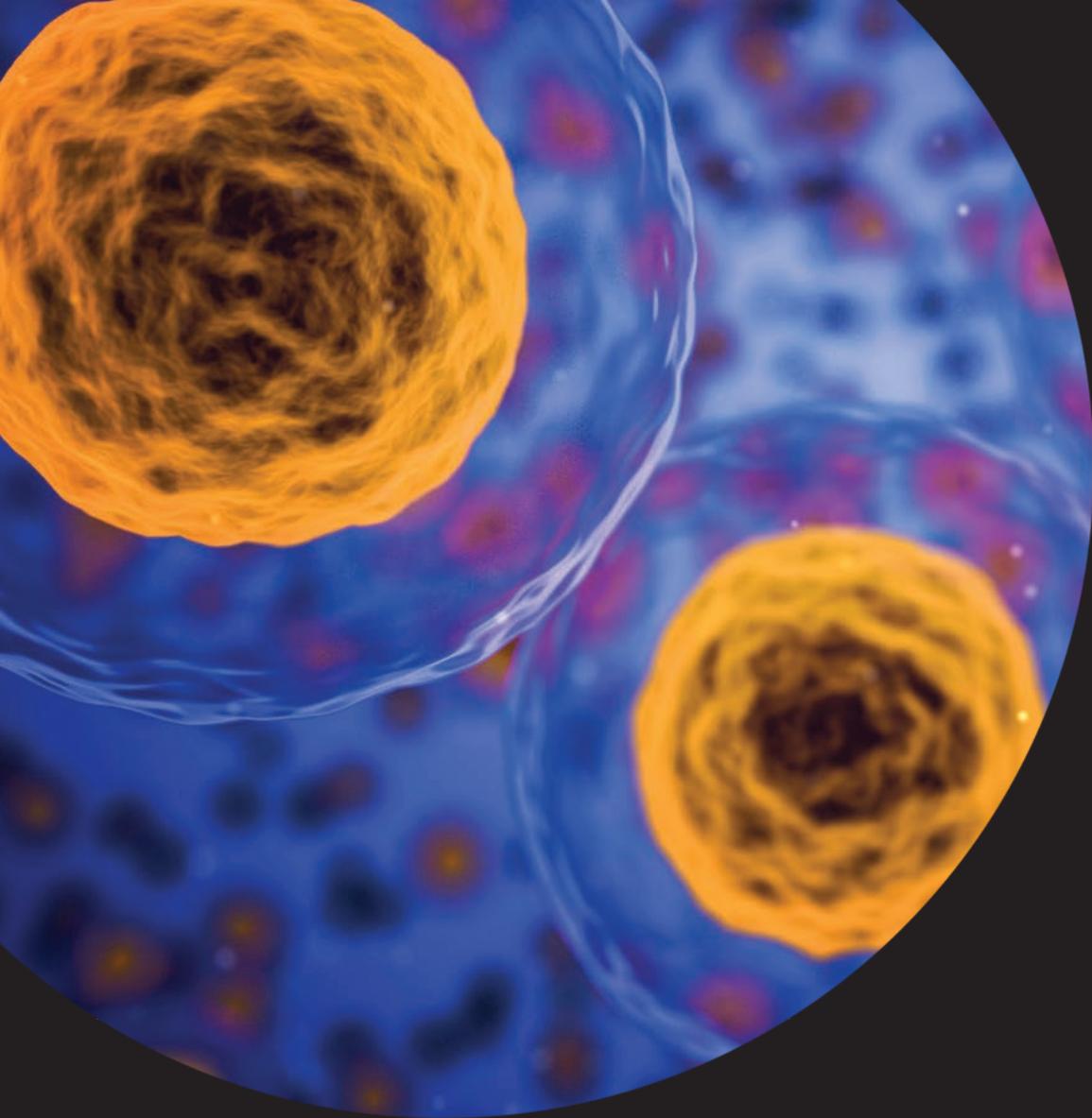
PLOS continued to put its available surplus to use to support the organization’s mission to transform scientific research communication, most notably in the investment to develop Aperta™, a new submission system that provides a more efficient publishing experience as well as a foundation for further publishing innovations. For the year ended December 31st, 2015, PLOS invested \$3.7 million in development of Aperta, bringing PLOS’ total investment in the project to \$6.7 million with work continuing into 2016. The spending associated with this investment has been capitalized due to the multi-year nature of its anticipated future use.

At the same time PLOS continued to enhance its content management tool suite and publishing platform infrastructure, Ambra™, laying the foundation for community engagement in new modes of research assessment, open review and the early posting of research content.

PLOS continues to responsibly manage its investments in innovation alongside maintaining the long-term sustainability of its journals which will directly benefit from these investments. Sustainability is core to supporting PLOS’ mission and will be ongoing, but as a nonprofit, financial returns are not our primary driver.

PLOS has shown - and continues to demonstrate - that Open Access publishing can be associated with a viable and healthy business model. PLOS continues to provide financial support to authors with a demonstrated need and is committed to being transparent and equitable with its pricing.

Different modes of publishing and new partnership channels represent additional opportunities to diversify and extend PLOS’ reach and influence. Continued improvements in our own publishing program and our commitment to faster, more transparent peer review and greater discoverability of research content puts PLOS at the forefront of the next wave of innovation in science publishing.



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