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Bacteriophage T4 head
(fold along edges)

Shigella reprograms host
histone code

Arf1 moonlighting
morphs mitochondria

Cohesion needs splicing



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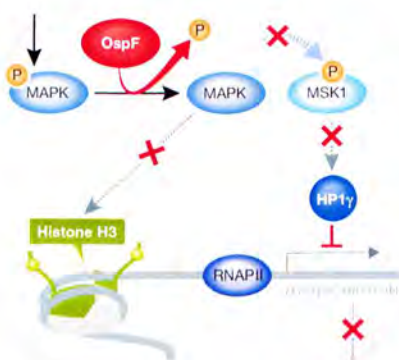
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Cover: The Mechanics of Bacteriophage T4 – The artist, Janice Wong, is a medical/scientific illustrator and animator (steampunk_medical@hotmail.com). Her passions include combining creativity, imagination, and science to create engaging images. Janice writes about this image, "Initially when I started composing this piece in 3D, I wanted a more 'natural' environment that is more typical of medical art. However, I was so captivated by the 'mechanical' nature of the bacteriophage T4 that I just ran with the idea and created something more original with a steampunk look and feel. I wanted it to look as if someone sat at his/her desk and worked meticulously in constructing an actual bacteriophage, fashioned from bits and pieces of scraps salvaged from all different sources. Despite the steampunk look, I took care in ensuring that the bacteriophage is accurately represented, eg, its head is icosahedral with all the surface proteins

Editorial

Transparent, Reproducible Data

Bernd Pulverer

New guidelines for the reporting of research and source data enhance the interpretation and reproducibility of published research.

Source Data—a new dimension for research papers

The scientific research paper remains the main mode of sharing scientific information. Two key aspects contribute to the unabated success of this format, despite the myriad possibilities for new ways to share research in an online world: Independent validation by peer review and the juxtaposition of research results—presented in figures, tables, and videos—with the authors' textual interpretation of these results. For many years, publishers have focused largely on rendering text for publication and search engines are limited to indexing the title, abstract, introduction, results, methods and discussion sections of a paper. Yet, the claims made in a paper rely on data selected by the authors and synthesized into figures that illustrate the findings for the human reader. Figures are the heart of the paper and should open a vista on the research data. Unfortunately, that view is currently often limited to data visualizations and illustrations. As we have reported previously (Lemberger, 2010; Pulverer, 2014a,b), we encourage the presentation of Source Data, and indeed links to Source Data are already available in many figures in the journal. Source Data provides access to minimally processed versions of the data underlying figures such as data files used to plot graphs and experimental replicates or less cropped versions of representative data shown in a figure panel. Source Data can also include higher resolution renderings of data compressed in figures for efficient downloading.

Source Data provides a foundation to a paper that affords a much richer view of the findings discussed and enables reanalysis and reuse by the interested reader, as well as computational access. (The data are published under a CC-0 license.) It also provides an efficient means to archive data in close juxtaposition with the paper that discusses the findings.

A central tenet of publishing is to ensure reproducibility. This requires the transparent and detailed reporting and sharing not only of the data, but also the underlying methods and reagents. Our goal is to develop method sections that satisfy these conditions, including detailed experimental protocols and reagents that can be identified unambiguously, and which link directly to the relevant figure panels and data. We are conscious that these enhancements will need to tie into the development of digital laboratory management tools that allow submission of this information without unreasonably burdening the authors.

Checklist for reporting life sciences research

This journal and its three EMBO Press siblings have introduced a **Checklist for Authors** in order to enhance and standardize the reporting of key information in research papers and to support reanalysis and repetition of experiments by the community. Reporting standards are well established in clinical research; the aim of this checklist is to consistently capture essential information in preclinical research and to ensure that authors, editors, and referees can cross-check efficiently whether these basic requirements for reporting reliable research have been met. While completion of the list at initial submission is welcome, we only require completion upon revision of a manuscript—a stage when publication is highly

likely at *The EMBO Journal* (Pulverer, 2014a). The checklist highlights requirements from the journal's guide to authors that are often overlooked, including key information for figure panels and captions, appropriate statistical treatment for data, the reporting of reagents, animal models and human subject-derived data, as well as guidance to optimize data accessibility. The focus is on the molecular and cell biological research typically reported in *The EMBO Journal*.

The checklist is similar to guidance issued by a number of other journals, including *Nature* and *Science*. It is consistent with the **Principles and Guidelines for Reporting Preclinical Research** published this month by a group of journals including the four EMBO Press journals. The principles were agreed at a workshop held under the auspices of the NIH earlier this summer, where it was agreed that journals have a responsibility to act as gatekeepers for a reliable literature.

Please review the checklist even if you are not preparing a manuscript for publication at this time—the points highlighted will help inform the planning of a successful research project wherever you plan to submit your results. Please also regard this as a living document—we hope to obtain your feedback to add to and revise the information periodically. The list is intended to help our authors publish transparent and reproducible research papers; it is emphatically not to make the publication process more cumbersome.

References

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