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Third Author and Fourth Author contributed equally. First Author and Second Author contributed equally to this work. Author order was determined XXXXXX.

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IMPORTANCE The Importance section should be no more than 150 words and should provide a nontechnical explanation of the significance of the study to the field. Avoid abbreviations and references, and indicate the specific organism under study. When it is essential to include a reference, use the format shown under “References” below.

KEYWORDS: keyword 1, keyword 2, keyword 3.

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The introduction should supply sufficient background information to allow the reader to understand and evaluate the results of the present study without referring to previous publications on the topic. The introduction should also provide the hypothesis that was addressed or the rationale for the present study. Choose references carefully to provide the most salient background rather than an exhaustive review of the topic.

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Sections **must** be ordered as follows:

- Abstract
- Importance
- Keywords
- Introduction
- Results
- Discussion
- Materials and Methods
- Supplemental Material file list (where applicable)
- Acknowledgments
- References

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16 × 9

(Original size: 320 × 180 bp)

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- (P. S. Satheshkumar, A. S. Weisberg, and B. Moss, *J Virol* 87:10700–10709, 2013, doi:10.1128/JVI.01258-13)
- (J. H. Coggin, Jr., p. 93–114, in D. O. Fleming and D. L. Hunt, ed., *Biological Safety. Principles and Practices*, 4th ed., 2006)

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TABLE 1 Automobile land speed records (GR 5-10)^a

Speed (mph)	Driver	Car	Engine	Date	Extra comments
407.447	Craig Breedlove	Spirit of America	GE J47	8/5/63	(Just to demo a full-width table with auto-wrapping long lines)
413.199	Tom Green	Wingfoot Express	WE J46	10/2/64	
434.22	Art Arfons	Green Monster	GE J79	10/5/64	
468.719	Craig Breedlove	Spirit of America	GE J79	10/13/64	
526.277	Craig Breedlove	Spirit of America	GE J79	10/15/65	
536.712	Art Arfons	Green Monster	GE J79	10/27/65	
555.127	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/2/65	
576.553	Art Arfons	Green Monster	GE J79	11/7/65	
600.601	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/15/65	
622.407	Gary Gabelich	Blue Flame	Rocket	10/23/70	
633.468	Richard Noble	Thrust 2	RR RG 146	10/4/83	
763.035	Andy Green	Thrust SSC	RR Spey	10/15/97	

^aSource is from this website: https://www.sedl.org/afterschool/toolkits/science/pdf/ast_sci_data_tables_sample.pdf

RESULTS

In the Results section, include the rationale or design of the experiments as well as the results; reserve extensive interpretation of the results for the Discussion section. Present the results as concisely as possible in one or more of the following: text, table(s), or figure(s). Data in tables (e.g., cpm of radioactivity) should not contain more significant figures than the precision of the measurement allows. Illustrations (particularly photomicrographs and electron micrographs) should be limited to those that are absolutely necessary to show the experimental findings. Number figures and tables in the order in which they are cited in the text, and be sure to cite all figures and tables. Figure 1 is just for show, but this sentence shows how a figure could be cited in the text of the manuscript.

The tabularx, booktabs and siunitx packages are loaded by asm-article.cls; see Table 1 for an example table. Use `\begin{fullwidth}...\end{fullwidth}` in your table for the table to span the entire width of the page. Shading in the field of tables is allowed, to demonstrate relationships among data. You can use the `\columncolor`, `\rowcolor` or `\cellcolor` commands to do this: allowed color values are `black!20` and `black!30`.

File types and formats. Illustrations may be continuous-tone images, line drawings, or composites. On initial submission, illustrations may be supplied as PDF files, with the legend on the same page, to assist review. At the modification stage, production quality digital files must be provided, along with text files for the legends. The legends are copyedited and typeset for final publication, not included as part of the figure itself.

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DISCUSSION

The Discussion section should provide an interpretation of the results in relation to previously published work and to the experimental system at hand and should not contain extensive repetition of the Results section or reiteration of the introduction. In short papers, the Results and Discussion sections may be combined.

$$\frac{\partial^2 \Phi}{\partial x^2} + \frac{\partial^2 \Phi}{\partial y^2} + \frac{\partial^2 \Phi}{\partial z^2} = \frac{1}{c^2} \frac{\partial^2 \Phi}{\partial t^2} \quad (1)$$

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$$\int_0^\infty e^{-\alpha x^2} dx = \frac{1}{2} \sqrt{\int_{-\infty}^\infty e^{-\alpha x^2} dx} \int_{-\infty}^\infty e^{-\alpha y^2} dy = \frac{1}{2} \sqrt{\frac{\pi}{\alpha}} \quad (2)$$

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MATERIALS AND METHODS

The Materials and Methods section should include sufficient technical information to allow the experiments to be repeated. When centrifugation conditions are critical, give enough information to enable another investigator to repeat the procedure: make of centrifuge, model of rotor, temperature, time at maximum speed, and centrifugal force ($\times g$ rather than revolutions per minute). For commonly used materials and methods (e.g., media and protein concentration determinations), a simple reference is sufficient. If several alternative methods are commonly used, it is helpful to identify the method briefly as well as to cite the reference. For example, it is preferable to state “cells were broken by ultrasonic treatment as previously described (9)” rather than to state “cells were broken as previously described (9).” This allows the reader to assess the method without constant reference to previous publications. Describe new methods completely and give sources of unusual chemicals, equipment, or microbial strains. When large numbers of microbial strains or mutants are used in a study, include tables identifying the immediate sources (i.e., sources from whom the strains were obtained) and properties of the strains, mutants, bacteriophages, and plasmids, etc.

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ACKNOWLEDGMENTS

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REFERENCES

- Caserta E, Haemig HAH, Manias DA, Tomsic J, Grundy FJ, Henkin TM, Dunny GM.** 2012. *In vivo* and *in vitro* analyses of regulation of the pheromone-responsive *prgQ* promoter by the PrgX pheromone receptor protein. *J Bacteriol* 194:3386–3394.
- Johnson J, Robinson VR.** 2016. Cleavage of JPS-1 in cells infected with human rhinovirus. *mSystems* 1:e00001–15.
- Winnick S, Lucas DO, Hartman AL, Toll D.** 2005. How do you improve compliance? *Pediatrics* 115:e718–e724.
- Falagas ME, Kasiakou SK.** 2006. Use of international units when dosing colistin will help decrease confusion related to various formulations of the drug around the world. *Antimicrob Agents Chemother* 50:2274–2275. (Letter) [*“Letter” or “Letter to the editor” is allowed but not required at the end of such an entry.*]
- Cox CS, Brown BR, Smith JC.** *J Gen Genet*, in press. [Article title is

- optional; journal title is mandatory].
6. **Forman MS, Valsamakis A.** 2003. Specimen collection, transport, and processing: virology, p 1227–1241. *In* Murray PR, Baron EJ, Pfaller MA, Jorgensen JH, Tenover FC (ed), *Manual of clinical microbiology*, 8th ed. ASM Press, Washington, DC.
 7. **da Costa MS, Nobre MF, Rainey FA.** 2001. Genus I. *Thermus* Brock and Freeze 1969, 295, ^{AL} emend. Nobre, Trüper and da Costa 1996b, 605, p 404–414. *In* Boone DR, Castenholz RW, Garrity GM (ed), *Bergey's manual of systematic bacteriology*, 2nd ed, vol 1. Springer, New York, NY.
 8. **Fitzgerald G, Shaw D.** *In* Waters AE (ed), *Clinical microbiology*, in press. EFH Publishing Co, Boston, MA. [Chapter title is optional].
 9. **Green PN, Hood D, Dow CS.** 1984. Taxonomic status of some methylophilic bacteria, p 251–254. *In* Crawford RL, Hanson RS (ed), *Microbial growth on C₁ compounds*. Proceedings of the 4th International Symposium. American Society for Microbiology, Washington, DC.
 10. **Rotimi VO, Salako NO, Mohaddas EM, Philip LP.** 2005. Abstr 45th Intersci Conf Antimicrob Agents Chemother, abstr D-1658. [Abstract title is optional].
 11. **Smith D, Johnson C, Maier M, Maurer JJ.** 2005. Distribution of fimbrial, phage and plasmid associated virulence genes among poultry *Salmonella enterica* serovars, abstr P-038, p 445. Abstr 105th Gen Meet Am Soc for Microbiol. American Society for Microbiology, Washington, DC. [Abstract title is optional].
 12. **Garcia CO, Paira P, Burgos R, Molina J, Molina JF, Calvo C.** 1996. Detection of salmonella DNA in synovial membrane and synovial fluid from Latin American patients. *Arthritis Rheum* 39 (Suppl):S185. [Meeting abstract published in journal supplement].
 13. **O'Malley DR.** 1998. PhD thesis. University of California, Los Angeles, CA. [Title is optional].
 14. **Stratagene.** 2006. Yeast DNA isolation system: instruction manual. Stratagene, La Jolla, CA. [Use the company name as the author if none is provided for a company publication].
 15. **Odell JC.** April 1970. Process for batch culturing. US patent 484,363,770. [Include the name of the patented item/process if possible; the patent number is mandatory].
 16. **Harrison F, Roberts AEL, Gabriliska R, Rumbaugh KP, Lee C, Diggle SP.** 2015. A 1000-year-old antimicrobial remedy with antistaphylococcal activity. *mBio* 6:e01129–15. [Original article that describes how data submitted to a database were generated].
 17. **Harrison F, Roberts AEL, Gabriliska R, Rumbaugh KP, Lee C, Diggle SP.** 2015. Data from “A 1000-year-old antimicrobial remedy with antistaphylococcal activity”. Dryad Digital Repository <https://doi.org/10.5061/dryad.mn17p>. [Citation for the database where the data in the previous reference were deposited; the URL is necessary].
 18. **Wang Y, Rozen D.** 2016. Colonization and transmission of the gut microbiota of the burying beetle, *Nicrophorus vespilloides*, through development. *bioRxiv* <https://doi.org/10.1101/091702>.
 19. **Magalon A, Mendel RR.** 15 June 2015, posting date. Biosynthesis and insertion of the molybdenum cofactor. *EcoSal Plus* 2015 doi: [10.1128/ecosalplus.ESP-0006-2013](https://doi.org/10.1128/ecosalplus.ESP-0006-2013). [In some online journal articles, posting or revision dates may serve as the year of publication; a DOI (preferred) or URL is required for articles with nontraditional page numbers or electronic article identifiers. A posting or accession date is required for any online reference that is periodically updated or changed.].
 20. **Wang GG, Pasillas MP, Kamps MP.** 15 May 2006. Persistent transactivation by Meis1 replaces Hox function in myeloid leukemogenesis models: evidence for cooccupancy of Meis1-Pbx and Hox-Pbx complexes on promoters of leukemia-associated genes. *Mol Cell Biol* doi: [10.1128/MCB.00586-06](https://doi.org/10.1128/MCB.00586-06). [Citations of accepted ASM manuscripts (articles from other, issue-based ASM journals that are published ahead of the issue).].
 21. **Zhou FX, Merianos HJ, Brunger AT, Engelman DM.** 13 February 2001, posting date. Polar residues drive association of polyleucine transmembrane helices. *Proc Natl Acad Sci United States Am* doi: [10.1073/pnas.041593698](https://doi.org/10.1073/pnas.041593698). [Journals not published by ASM may use various styles for their publish-ahead-of-print manuscripts, but citation entries must include the following information: author name(s), posting date, title, journal title, and volume and page numbers and/or DOI.].
 22. **Christian SL, McDonough J, Liu C-Y, Shaikh S, Vlamakis V, Badner JA, Chakravarti A, Gershon ES.** 2002. Data from “An evaluation of the assembly of an approximately 15-Mb region on human chromosome 13q32-q33 linked to bipolar disorder and schizophrenia”. *GenBank* <https://www.ncbi.nlm.nih.gov/nuccore/AF339794> (accession no. AF339794). [Accession number].
 23. **Sun Z.** 2013. Reprocessed: in-depth membrane proteomic study of breast cancer tissues. *ProteomeXchange* <http://proteomecentral.proteomexchange.org/cgi/GetDataset?ID=RPXD000665> (accession number requested). [Unassigned accession number].
 24. **Hogle S.** 2015. Supplemental material for Hogle et al. 2015 *mBio*. figshare <https://doi.org/10.6084/m9.figshare.1533034.v1>. Retrieved 16 March 2017. [Code and/or software.].
 25. **Nesbitt HK, Moore JW.** 2016. Data from “Species and population diversity in Pacific salmon fisheries underpin indigenous food security”. *Dryad Digital Repository* <https://doi.org/10.5061/dryad.ng8pf>. [Data set in repository].