

INFECTION AND IMMUNITY

VOLUME 62 • NOVEMBER 1994 • NUMBER 11

Vincent A. Fischetti, *Editor in Chief* (1999)
Rockefeller University

Barry I. Eisenstein, *Editor* (1999)
Lilly Research Laboratories

Stanley Falkow, *Minireview Editor* (1995)
Stanford University School of Medicine

Dexter H. Howard, *Editor* (1996)
University of California

John M. Mansfield, *Editor* (1998)
University of Wisconsin

Roderick E. McCallum, *Editor* (1998)
Texas A&M University Health Science Center

Jerry R. McGhee, *Editor* (1999)
University of Alabama

Carol A. Nacy, *Editor* (1995)
EntreMed, Inc.

Alison O'Brien, *Editor* (1996)
Uniformed Services University of the Health Sciences

Philippe J. Sansonetti, *Editor* (1997)
Institut Pasteur

EDITORIAL BOARD

Soman N. Abraham (1994)
Julia W. Albright (1995)
Glen Armstrong (1995)
Sandra K. Armstrong (1996)
Joseph T. Barbieri (1995)
Alan G. Barbour (1995)
Scott Barnum (1995)
Joel B. Baseman (1994)
Robert E. Baughn (1996)
Patrik Bavoil (1996)
Kenneth W. Beagley (1996)
Blaine L. Beaman (1994)
Jorge L. Benach (1995)
Martin J. Blaser (1995)
Arnold S. Bleiweis (1996)
Ian Blomfield (1996)
W. Chaunce Bogard (1995)
Gregory A. Bohach (1996)
Patrice Boquet (1996)
Patrick Brennan (1994)
David E. Briles (1994)
Robert R. Brubaker (1996)
Drusilla L. Burns (1994)
Gerald Byrne (1994)
Stephen Calderwood (1994)
Harlan Caldwell (1996)
Priscilla A. Campbell (1996)
Janne G. Cannon (1996)
John Chan (1994)
Ambrose Cheung (1996)
Nicholas P. Cianciotto (1996)
Witold Cieplak (1994)
John O. Cisar (1994)
Josephine Clark-Curtiss (1996)
P. Patrick Cleary (1996)
Steven Clegg (1996)
Daniel Clemens (1996)
John D. Clements (1995)
Don B. Clewell (1996)
Paul S. Cohen (1996)
Stewart Cole (1996)
R. John Collier (1994)
Frank M. Collins (1995)
Guy Cornelis (1996)
Rebecca A. Cox (1996)
Jorge H. Crosa (1994)
Melanie T. Cushion (1996)
Jim E. Cutler (1996)

Charles J. Czuprynski (1995)
George S. Deepe, Jr. (1995)
Victor DiRita (1996)
Judith E. Domer (1995)
Michael S. Donnenberg (1996)
Gordon Dougan (1994)
Lawrence A. Dreyfus (1996)
Roman Dziarski (1996)
Toby K. Eisenstein (1996)
John H. Eldridge (1995)
Karen Elkins (1996)
Charles O. Elson (1995)
N. Cary Engleberg (1995)
Peter B. Ernst (1996)
Joseph J. Ferretti (1995)
Brett B. Finlay (1996)
Anne H. Fortier (1996)
Dara W. Frank (1996)
Rolf G. Freter (1996)
Jorge E. Galán (1996)
Ronald J. Gibbons (1994)
Janet R. Gilsdorf (1996)
Mae F. Go (1996)
William E. Goldman (1995)
Valery Gordon (1996)
Emil Gotschlich (1994)
Shawn J. Green (1996)
Patricia Guerry-Kopecko (1996)
Paul A. Gulig (1996)
Thomas L. Hale (1996)
Jane L. Halpern (1996)
Shigeyuki Hamada (1996)
Eric J. Hansen (1995)
David L. Hasty (1994)
Richard Hector (1995)
Fred Heffron (1996)
Erik Hewlett (1996)
James B. Hicks (1994)
Harry R. Hill (1996)
Susan Hollingshead (1995)
Jan Holmgren (1994)
Anne Morris Hooke (1995)
Ralph R. Isberg (1996)
Graham Jackson (1995)
Matt Jackson (1995)
Thomas R. Jerrells (1996)
James B. Kaper (1994)
Stefan H. E. Kaufmann (1995)

Paul M. Kaye (1994)
Mogens Kilian (1996)
Theo N. Kirkland (1995)
Hiroshi Kiyono (1995)
Dennis J. Kopecko (1995)
Malak Kotb (1994)
Thomas R. Kozel (1994)
J. P. Kraehenbuhl (1996)
Arnold Kreger (1995)
Howard K. Kuramitsu (1994)
David Leiby (1995)
Myron Levine (1994)
Stephen Lory (1996)
David M. Lyerly (1996)
Carl F. Marrs (1996)
Anthony Maurelli (1996)
Bruce McClane (1995)
Dennis W. McGee (1996)
John Mekalanos (1995)
Eleanor S. Metcalf (1995)
Suzanne M. Michalek (1995)
Virginia L. Miller (1996)
Michael L. Misfeldt (1994)
Harry Mobley (1995)
Robert L. Modlin (1995)
Robert N. Moore (1995)
J. Glenn Morris, Jr. (1996)
Steven L. Moseley (1996)
Stephen A. Moser (1996)
Martha H. Mulks (1995)
Robert S. Munson (1995)
Juneann W. Murphy (1996)
Thalia I. Nicas (1995)
Michael V. Norgard (1995)
Robert North (1995)
Dennis E. Ohman (1995)
Ian M. Orme (1996)
Paul Orndorff (1996)
Michael J. Parmely (1995)
Jeffrey Parsonnet (1995)
David Pascual (1996)
James C. Paton (1996)
Shelley M. Payne (1994)
Kenneth M. Peterson (1996)
Carol Pickett (1996)
Gerald B. Pier (1995)
Matthew Pollack (1996)
Daniel A. Portnoy (1995)

Richard A. Proctor (1996)
Justin D. Radolf (1996)
Reuben Ramphal (1994)
Jonathan I. Ravdin (1995)
Richard F. Rest (1996)
Judith C. Rhodes (1995)
Donald Robertson (1996)
Sara W. Rothman (1996)
Craig E. Rubens (1994)
Michael W. Russell (1994)
Roy R. B. Russell (1995)
Isabelle Saint-Girons (1996)
Abigail A. Salyers (1996)
James Samuel (1995)
Stewart Scherer (1994)
June R. Scott (1996)
Penelope G. Shackelford (1995)
Alan Sher (1995)
Thomas M. Shinnick (1994)
Richard P. Silver (1995)
Richard Silverstein (1995)
Jerry Simecka (1994)
Emil Skamene (1994)
Peter G. Sohnle (1996)
George Stewart (1996)
Susan C. Straley (1995)
Barnet M. Sultzer (1994)
Catharina Svanborg (1996)
Yoshifumi Takeda (1994)
Diane W. Taylor (1996)
Vernon Tesh (1996)
Trevor J. Trust (1994)
Elaine Tuomanen (1996)
Rodney K. Tweten (1996)
Ivo van de Rijn (1996)
Thomas E. Van Dyke (1995)
Jan D. A. van Embden (1994)
Michael L. Vasil (1996)
Peter A. Ward (1994)
Alison Weiss (1995)
Rodney A. Welch (1996)
Dwight M. Williams (1996)
Mark E. Wilson (1994)
Herbert H. Winkler (1995)
Douglas B. Young (1994)
Lowell Young (1994)
H. Kirk Zeigler (1995)

Barbara H. Iglewski, *Chairman, Publications Board*

Jack Kenney, *Production Editor*

Linda M. Illig, *Director, Journals*

Karen MacKavanagh, *Assistant Production Editor*

Infection and Immunity, a publication of the American Society for Microbiology (ASM), 1325 Massachusetts Ave., N.W., Washington, DC 20005-4171, is devoted to the advancement and dissemination of fundamental knowledge concerning: (i) infections caused by pathogenic bacteria, fungi, and parasites; (ii) ecology, epidemiology, and evolution of pathogenic microbes; (iii) mechanisms of pathogenicity and virulence factors such as toxins and microbial surface structures; (iv) nonspecific factors in host resistance and susceptibility to infection; and (v) immunology of microbial infection; and (vi) development and evaluation of vaccines against pathogens. Instructions to authors are published in the January issue each year; reprints are available from the editors and the Journals Division. *Infection and Immunity* is published monthly, one volume per year. The nonmember print subscription prices are \$368 (U.S.) (Canadians add 7% GST) and \$431 (other countries) per year; single copies are \$43 (Canadians add 7% GST). The member print subscription prices are \$51 (U.S.) (Canadians add 7% GST) and \$89 (other countries); single copies are \$11 (Canadians add 7% GST). For prices of CD-ROM versions, contact the Subscriptions Unit, ASM. Correspondence relating to subscriptions, defective copies, missing issues, and availability of back issues should be directed to the Subscriptions Unit, ASM; correspondence relating to reprint orders should be directed to the Reprint Order Unit, ASM; and correspondence relating to disposition of submitted manuscripts, proofs, and general editorial matters should be directed to the Journals Department, American Society for Microbiology, 1325 Massachusetts Ave., N.W., Washington, DC 20005-4171. Phone: (202) 737-3600.

Claims for missing issues from residents of the United States, Canada, and Mexico must be submitted within 3 months after publication of the issues; residents of all other countries must submit claims within 6 months of publication of the issues. Claims for issues missing because of failure to report an address change or for issues "missing from files" will not be allowed.

Second class postage paid at Washington, DC 20005, and at additional mailing offices.

POSTMASTER: Send address changes to *Infection and Immunity*, ASM, 1325 Massachusetts Ave., N.W., Washington, DC 20005-4171.

Made in the United States of America. Printed on acid-free paper.

Copyright © 1994, American Society for Microbiology. All Rights Reserved.

ISSN 0019-9567

CODEN: INFIBR

The code at the top of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal use or for personal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per-copy fee through the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, for copying beyond that permitted by Sections 107 and 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale.

1995 APPLICATION FOR FULL MEMBERSHIP IN THE AMERICAN SOCIETY FOR MICROBIOLOGY

1325 Massachusetts Ave., NW • Washington, DC 20005-4171 • (202) 942-9319 • FAX (202) 942-9347

Eligibility ASM welcomes to full membership anyone who is interested in its objectives and has a minimum of a bachelor's degree or equivalent in microbiology or a related field.

Initiation Memberships are initiated and renewed in January each year. **Unless there are directions to the contrary**, membership nominations received prior to September 1 are credited to the current year. **Nominations received after September 1 will become effective the following January.**

NAME ^{MISS DR.} ^{MS.} ^(circle one) ^{MRS. MR.} _____ FIRST _____ INITIAL _____ LAST _____

MAIL NAME _____ AS YOU WOULD WANT IT TO APPEAR ON YOUR MAILING LABEL

ADDRESS _____ WHERE YOU WANT TO RECEIVE YOUR SUBSCRIPTIONS

(STATE/PROVINCE) _____ (ZIP/POSTAL CODE) _____ (COUNTRY) _____

PHONE (____) _____ FAX (____) _____ YEAR OF BIRTH _____ SEX _____

E-MAIL NUMBER _____ INTERNET ADDRESS _____

HIGHEST DEGREE _____ SUBJECT AREA _____ YEAR EARNED _____

EMPLOYER _____ PRESENT POSITION _____

SIGNATURE OF APPLICANT _____ DATE _____

*NOMINATED BY _____ MEMBER #

--	--	--	--	--	--	--	--	--	--

SIGNATURE OF ASM MEMBER

*If you are not associated with an ASM nominating member, you can still apply for membership and we will contact you if there is a problem.

Member Information How did you first learn about membership in ASM? (Check one):

A colleague An ASM journal Presenting a paper at an ASM meeting A professor

An ASM Branch Direct mail promotion An advertisement in ASM journal ASM News

Dues Annual dues for 1995 are \$80. Dues include ASM News (monthly) and a \$51 credit which may be deducted from the total cost of the journal(s) you purchase at the special membership rates indicated below.

Divisions Please select a Division based upon your specialized scientific interest (Check one):

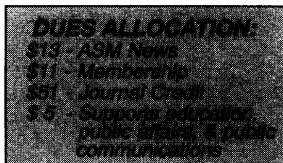
<input type="checkbox"/> (A) Antimicrobial Chemotherapy	<input type="checkbox"/> (I) General Microbiology	<input type="checkbox"/> (Q) Environmental & General Applied Microbiology
<input type="checkbox"/> (B) Microbial Pathogenesis	<input type="checkbox"/> (J) Ultrastructure & Function	<input type="checkbox"/> (R) Systematic & Evolutionary Microbiology
<input type="checkbox"/> (C) Clinical Microbiology	<input type="checkbox"/> (K) Microbial Physiology & Metabolism	<input type="checkbox"/> (S) DNA Viruses
<input type="checkbox"/> (D) General Medical Microbiology	<input type="checkbox"/> (L) Nosocomial Infections	<input type="checkbox"/> (T) RNA Viruses
<input type="checkbox"/> (E) Immunology	<input type="checkbox"/> (M) Bacteriophage	<input type="checkbox"/> (U) Mycobacteriology
<input type="checkbox"/> (F) Medical Mycology	<input type="checkbox"/> (N) Microbial Ecology	<input type="checkbox"/> (V) Clinical & Diagnostic Immunology
<input type="checkbox"/> (G) Mycoplasmaology	<input type="checkbox"/> (O) Fermentation & Biotechnology	<input type="checkbox"/> (W) Microbiology Education
<input type="checkbox"/> (H) Genetics & Molecular Biology	<input type="checkbox"/> (P) Food Microbiology	

Journals Please check:

Enclosed is my dues payment (U.S. dollars only) \$80

Please send me the following ASM journal(s) at the Member Price(s):

	U.S.		Non - U.S.			Amount	
	Print Only	CD - ROM Only	Print Only (airdrop*)	Print Only (airmail*)	CD - ROM Only		
For CD-ROM select:							
<input type="checkbox"/> MS - DOS (non-Windows)							
<input type="checkbox"/> MAC							
<input type="checkbox"/> Windows							
Antimicrobial Agents & Chemotherapy	\$51	\$151	\$89	\$224	\$181		AA
Applied & Environmental Microbiology	\$51	\$152	\$91	\$308	\$182		AE
Molecular & Cellular Biology	\$80	\$155	\$110	\$480	\$185		CB
Clinical Microbiology Reviews	\$30	\$75	\$49	\$60	\$90		CM
Infection & Immunity	\$51	\$153	\$94	\$403	\$183		IA
Int'l Journal of Systematic Bact.	\$40	\$76	\$54	\$89	\$91		IJ
Journal of Bacteriology	\$79	\$154	\$109	\$593	\$184		JB
Journal of Clinical Microbiology	\$51	\$150	\$89	\$248	\$180		JC
Journal of Virology	\$81	\$156	\$111	\$481	\$186		JV
Microbiological Reviews	\$30	\$79	\$49	\$84	\$94		MR
Clinical & Diagnostic Lab. Immunology	\$45	\$120	\$73	\$95	\$140		LI
ASM News	\$0	N/A	\$0	\$80	N/A		



Total Journal Fees \$ _____

Subtract your \$51 Member Journals Credit **-\$51**

Subtotal (if less than zero, enter zero) \$ _____

Add your \$80 Membership Dues **+\$80**

Total (Dues plus Journals). If total is less than \$80, enter 80 \$ _____

PAYMENT IN U.S. DOLLARS MUST ACCOMPANY APPLICATION

A membership card, voting division form, and the journal(s) of your choice will be sent within 90 days upon completion of processing. ASM dues are tax deductible to the extent permitted by law. Rates are for 1995 only. Applicants must remit in U.S. Dollars by check or draft payable to ASM through a U.S. bank located within the continental U.S. Applicants may choose to pay with VISA, MasterCard, Eurocard, or American Express. If that is your preference, please fill in the box below. *Prices for non-U.S. print include airdrop shipping (delivery: 10 to 30 days) or airmail (delivery: 7 to 14 working days).

<input type="checkbox"/> VISA #	<input type="checkbox"/> MASTERCARD #	<input type="checkbox"/> AMEX #	<input type="checkbox"/> EUROCARD #	EXPIRATION DATE: _____ MO. YR.
TODAY'S DATE _____ SIGNATURE _____				NAME AS IT APPEARS ON YOUR CREDIT CARD _____
SIGNATURE _____				

Author Index

- Ahrens, Meike, 5066
Al-Daccak, R., 4716
Alouf, Joseph E., 4831, 4915
Andersen, Kurt A., 5133
Andrew, Peter W., 5187
Arnon, Ruth, 5198
Arora, Naveen, 4955
Ashman, R. B., 5151
Aydintug, M. Kemal, 4929
Azad, Abdu F., 4844
- Bark, T., 4768
Barnewall, Roy E., 4804
Barrett, Tim J., 5142
Bartizal, Ken, 4887
Bažil, Vladimir, 4709
Beecroft, Robert P., 4893
Behrens, Annett, 5066, 5075
Belden, William J., 5095
Benhar, Itai, 5055
Bercovier, Hillel, 5198
Bhattacharjee, J. K., 5027
Birkelund, Svend, 4900
Bishai, William R., 4855
Blasco, J. M., 4990
Bolton, A., 4722
Bowie, M. D., 5164
Brade, Helmut, 4709
Brandtzaeg, Petter, 4874
Braun, R., 4811
Brennan, Michael J., 5010
Britigan, Bradley E., 5133
Bronze, Michael S., 4868
Brooks, Donald E., 5020
Brown, James F., 5161
Brown, Wendy C., 4697
Bryla, Dolores A., 5048
Buckley, Helen R., 5154
Buick, Ronald N., 5040
- Campagnari, Anthony A., 4909
Cano-Gauci, Danielle F., 5040
Carmichael, Jenny, 5187
Casadevall, Arturo, 4755
Cavailon, J.-M., 4915
Cavanagh, John, 5020
Chakraborty, Trinad, 5102
Chitko-McKown, Carol G., 4697
Christiansen, Gunna, 4900
Cochran, Joel, 4997
Cohen, Dani, 5198
Cook, James A., 4997
Cooper, Gerard L., 4739, 4747
Courtney, Harry S., 4868
Cunha, Fernando Q., 5177
Czuprynski, Charles J., 5161
- Dale, James B., 4868
Dean-Nystrom, Evelyn A., 4789
de Kort, G., 4722
Delfino, Demetrio, 4997
Demuth, Andreas, 4795, 5102
Duncan, Randall, 5112
Dyer, David W., 4909
Dziarski, Roman, 4709
- Eckert, J., 4811
Elased, K., 5157
Elzer, P. H., 4990
Enright, F. M., 4990
- Fernandez, Rachel C., 4727
Ferrero, Richard L., 4981
Fierer, Joshua, 5183
Finlay, B. Brett, 4969
Fitting, Catherine, 4915
Flad, Hans-Dieter, 4709
Flattery, Amy M., 4887
Fló, Juan, 4948
Forsgren, Arne, 4848
Foubister, Vida, 4969
Fujihara, Yasuko, 4975
- Garrad, Richard, 5027
Gerlach, Dieter, 4915
Gilsdorf, Janet R., 4922
Goebel, Werner, 4795, 5102
Goldman, David, 4755
Gross, Wolfgang L., 4838
Gu, Yan, 4929
Guiney, Donald G., 5183
- Hannah, Julie H., 5010
Hansen, Eric J., 4861
Hansen, M. B., 4825
Hash, Stephen M., 4697
Hasty, David L., 4868
Hazenbos, Wouter L. W., 4818
He, Qing, 5173
Hébert, J., 4716
Heffernan, Edwin J., 5183
Heller, Martin, 5066, 5075
Henderson, Douglas P., 5120
Henke-Dührsen, Kimberly, 4762
Hermansson, Ann, 4848
Hinz, Karl-Heinz, 4962
Hobolth, Palle, 5191
Høgåsen, Kolbjørn, 4874
Holmgren, Jan, 4781
Hone, David M., 5168
Hormaeché, Carlos E., 4739, 4747
Howard, Nathan S., 4855
Hsieh, Matthew M., 5040
Huerre, Michel, 4981
Huntenburg, C. C., 4825
Huttner, Kenneth M., 5040
- Igietseme, Joseph U., 5195
- Janson, Håkan, 4848
Jardim, Armando, 4893
Jarosik, Gregory P., 4861
Jiménez de Bagüés, M. P., 4990
Johnsen, Helle, 4900
Jones, S. M., 4990
Jonson, Gunhild, 4781
Jung, Sun-Hee, 5055
- Kasper, Dennis L., 4881
Katouli, M., 4768
Kekow, Jörn, 4838
Kelly-Wintenberg, K. D., 4825
Kirchhoff, Helga, 4962, 5066, 5075
Knight, L. S., 4825
Köller, M., 4831
Komisar, Jack L., 4775
Konadu, Edward, 5048
König, B., 4831
- König, W., 4831
Kopecko, Dennis J., 5142
Kristensen, Claus S., 5191
Kroghfelt, Karen A., 5191
Krohne, Georg, 5102
Kuhn, Michael, 4795
Kunz-Jenkins, Cynthia, 5112
Kusumoto, Shoichi, 4709
- Labigne, Agnès, 4981
Lan, Fusheng, 5191
Landsperger, W. J., 4825
Lång, Hannu, 4781
Lee, B. K., 5055
Lee, Sunhee C., 4755
Leeson, Michael C., 4975
Leitch, Gordon J., 5173
Leppla, Stephen H., 4955
Levine, Myron M., 5168
Levisohn, Sharon, 4962
Li, Ellen, 5112
Liebau, Eva, 4762
Ljungqvist, O., 4768
Locht, Camille, 5010
Losonsky, Genevieve, 5168
Louie, Janice, 5183
Lowell, George H., 5198
Lowrie, Douglas B., 5187
Lutwyche, Peter, 5020
- Magee, D. Mitchell, 5195
Mäkinen, Kauko K., 4938
Mäkinen, Pirkko-Liisa, 4938
Mancuso, Giuseppe, 4997
Maneval, Dave R., 5168
Mann, M. D., 5164
Manns, Joanne M., 5154
Marrs, Carl F., 4922
Martin, G., 4722
Massouh, Ernesto, 4948
Matsushita, Osamu, 5032
McCabe, K., 5164
McCrea, Kirk W., 4922
McFadden, Diane C., 4887
Mecheri, S., 4716
Mehindate, K., 4716
Melhus, Åsa, 4848
Menaker, Dimitry, 4962
Menozi, Franco D., 5010
Migliardo, Maria, 4997
Miller, C. M. D., 4811
Miller, Samuel I., 5095
Minami, Junzaburo, 5032
Molin, Søren, 5191
Möllby, R., 4768
Mollnes, Tom Eirik, 4874
Montie, T. C., 4825
Mooi, Frits R., 4818
Morrison, David C., 4975
Mosser, David M., 5154
Mourad, W., 4716
Müller-Alouf, Heide, 4915
- Nakano, Misao, 5032
Ninomiya, Masaki, 5032
Noriega, Fernando R., 5168
Nosek, Michael T., 5040
- O'Brien, Lyn, 5187
Oelschlaeger, Tobias A., 5142
Okabe, Akinobu, 5032
Okamoto, Sharon, 5183
Olafson, Robert W., 4893
- Oliveira, Sergio C., 5201
Onderdonk, Andrew B., 4881
Orr, Nadav, 5198
Ortega-Mora, L. M., 5003
Ouellette, Andre J., 5040
Ozegowski, Jorg-Hermann, 4915
- Pai, Lee, 5055
Palva, E. Tapio, 4781
Papadimitriou, J. M., 5151
Park, Jaechan, 5126
Pastan, Ira, 5055
Payne, Shelley M., 5120
Pearson, Terry W., 4893
Philipp, Mario T., 4929
Piemont, Y., 4831
Playfair, J. H. L., 5157
Podschun, Rainer, 4838
Poulsen, Lars K., 5191
Powles, Mary Ann, 4887
Prevost, G., 4831
- Ramegowda, Belakere, 5085
Rank, Roger G., 5195
Renauld, Geneviève, 5010
Rice-Ficht, Allison C., 4697
Rietschel, Ernst T., 4709
Rikihisa, Yasuko, 4804, 5126
Rink, L., 4716
Robbins, John B., 5048
Roscoe, Donna M., 5055
Rosengarten, Renate, 4962, 5066, 5075
Rosenshine, Ilan, 4969
Roux, Maria E., 4948
Rubin, Guy, 5198
Rupps, Rosemarie, 5020
Ruschkowski, Sharon, 4969
- Sachse, Konrad, 5066
Sahly, Hany, 4838
Sakamoto, Haruhiko, 5032
Samuel, James E., 4789, 5085
Schaff, Marco, 4838
Scheller, Libia F., 4844
Schmatz, Dennis M., 4887
Schmidt, T. M., 5027
Schneidkraut, M. J., 4825
Schnur, Lionel F., 4893
Schreiner, A., 4831
Schurig, G. G., 4990
Schwan, William R., 4795
Selsted, Michael E., 5040
Shanks, Kathryn L., 4909
Shiloach, Joseph, 5048
Silva, João S., 5177
Small-Harris, Shelia, 4775
Smith, Hamilton O., 4855
Smith, Jeffrey G., 4887
Smith, N. C., 4811
Smith, Roger S., 4881
Splitter, Gary A., 5201
Stanley, Samuel L., Jr., 5112
Stebeck, Caroline, 4893
Steinberg, H., 5161
Stenson, William F., 5112
Stephen, J., 4722
Stetefeld, Anja, 5066
Strutzberg, Katrin, 4962
Svenberg, T., 4768

- Swanson, Paul E., 5112
Syed, Salam A., 4938
Szu, Shousun C., 5048
- Teh, Hung-Sia, 4893
Tesh, Vernon L., 5085
Teti, Giuseppe, 4997
Thiberge, Jean-Michel, 4981
Tolson, Douglas L., 4893
Tomasello, Francesco, 4997
Tseng, Jeenan, 4775
Tuckey, Corinna, 4893
Tzianabos, Arthur O., 4881
- Ullmann, Uwe, 4838
Ulmer, Artur J., 4709
van de Klundert, J. A. M.,
4722
van den Berg, Bernard M.,
4818
van Furth, Ralph, 4818
van't Wout, Jan W., 4818
Venables, Lindsay M., 4739,
4747
Vespa, Glauca N. R., 5177
Wagner, R. D., 5161
- Wallach, M., 4811
Walter, Rolf D., 4762
Wang, Jin Yuan, 5168
Warren, R. Antony J., 5020
Watson, Wendy J., 4922
Weidemann, Birgit, 4709
Weiss, Alison A., 4727
Wildenburg, Gabriele, 4762
Williams, Dwight M., 5195
Wilson, Mary E., 5133
Winkelstein, Jerry A., 4855
Winter, A. J., 4990
Wirtz, Robert A., 4844
- Woods, Vivienne M., 4697
Woodward, Martin J., 4739,
4747
Wright, S. E., 5003
Wu, Lydia, 5183
- Yogev, David, 4962, 5066,
5075
- Zaleznik, Dori F., 4881
Zhang, Yilan, 5126



Statement of Ownership, Management, and Circulation
(Required by 39 U.S.C. 3685)

1. Publication Title
Infection and Immunity

2. Publication No.
0 0 1 9 - 9 5 6 7

3. Filing Date
9-29-94

4. Issue Frequency
Monthly

5. No. of Issues Published Annually
12

6. Annual Subscription Price
\$51 mbr., \$368 nonmbr

7. Complete Mailing Address of Known Office of Publication (Street, City, County, State, and ZIP+4) (Not Printer)
American Society for Microbiology
1325 Massachusetts Ave., N.W.
Washington, DC 20005-4171

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not Printer)
(Same as above)

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do Not Leave Blank)
Publisher (Name and Complete Mailing Address)
(Same as above)

Editor (Name and Complete Mailing Address)
Vincent A. Fischetti
(Address same as above)

Managing Editor (Name and Complete Mailing Address)
Linda M. Illig
(Address same as above)

10. Owner (If owned by a corporation, its name and address must be stated and also immediately thereafter the names and addresses of stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Do Not Leave Blank)

American Society for Microbiology
1325 Massachusetts Ave., N.W.
Washington, DC 20005-4171

11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check here. None

Full Name Complete Mailing Address

12. For completion by nonprofit organizations authorized to mail at special rates. The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes: (Check one)

Has Not Changed During Preceding 12 Months
 Has Changed During Preceding 12 Months
(If changed, publisher must submit explanation of change with this statement)

(See instructions on Reverse)

PS Form 3526, October 1994

13. Publication Name
Infection and Immunity

14. Issue Date for Circulation Data Below
SEPTEMBER

15. Extent and Nature of Circulation	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
a. Total No. Copies (Net Press Run)	7,808	7,500
b. Paid and/or Requested Circulation (1) (Not Mailed)		
(2) Paid or Requested Mail Subscriptions (Include Advertisers' Proof Copies/Exchange Copies)	6,196	6,613
c. Total Paid and/or Requested Circulation (Sum of 15b(1) and 15b(2))	6,196	6,613
d. Free Distribution by Mail (Samples, Complimentary, and Other Free)	45	44
e. Free Distribution Outside the Mail (Carriers or Other Means)		
f. Total Free Distribution (Sum of 15d and 15e)	45	44
g. Total Distribution (Sum of 15c and 15f)	6,241	6,657
h. Copies Not Distributed (1) Office Use, Leftovers, Spoiled	1,567	843
(2) Return from News Agents		
i. Total (Sum of 15g, 15h(1), and 15h(2))	7,808	7,500
Percent Paid and/or Requested Circulation (15c/15g x 100)	99.28	99.34

16. This Statement of Ownership will be printed in the November issue of this publication. Check box if not required to publish.

17. Signature and Title of Editor, Publisher, Business Manager, or Owner
Ronda M. Ullis Director, Journals 9-29-94
Date

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including multiple damages and civil penalties).

Instructions to Publishers

1. Complete and file one copy of this form with your postmaster on or before October 1, annually. Keep a copy of the completed form for your records.

2. Include in items 10 and 11, in cases where the stockholder or security holder is a trustee, the name of the person or corporation for whom the trustee is acting. Also include the names and addresses of individuals who are stockholders who own or hold 1 percent or more of the total amount of bonds, mortgages, or other securities of the publishing corporation. In item 11, if none, check box. Use blank sheets if more space is required.

3. Be sure to furnish all information called for in item 15, regarding circulation. Free circulation must be shown in items 15d, e, and f.

4. If the publication had second-class authorization as a general or requester publication, this Statement of Ownership, Management, and Circulation must be published; it must be printed in any issue in October or the first printed issue after October, if the publication is not published during October.

5. In item 16, indicate date of the issue in which this Statement of Ownership will be printed.

6. Item 17 must be signed.

Failure to file or publish a statement of ownership may lead to suspension of second-class authorization.

PS Form 3526, October 1994 (Reverse)