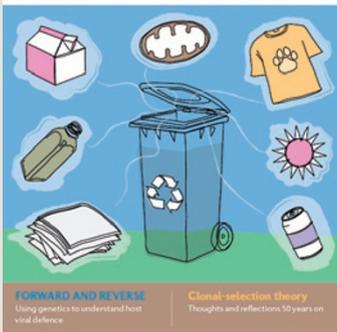




nature publishing group

nature
REVIEWSOctober 2007 Volume 7 No. 10
www.nature.com/naturereviews

IMMUNOLOGY



► **COVER:** 'Reduce, reuse, recycle' by Neil Smith, inspired by the Review on p767.



ELAINE BELL



KIRSTY MINTON



LUCY BIRD



OLIVE LEAVY



SHARON AHMAD

We can learn a lot by retracing the roots of immunological pathways and concepts that we study today. For example, understanding how ancient pathways of viral detection and suppression have evolved from flies to humans provides clues to our resistance to viral infection and reveals how viruses have shaped our genomes. Indeed, the need for multiple resistance strategies in mammals reflects the fact that viruses have evolved numerous mechanisms to evade individual defences. On page 753, Bruce Beutler and colleagues describe these recent insights into resistance to viral infection gleaned from genetic analyses of flies and mammals.

Another ancient pathway, conserved from yeast to humans, explains how the immune system disposes of a microorganism without disposing of the entire infected cell. Autophagy — a primordial cellular homeostatic process for recycling, remodelling or disposing of unwanted cytoplasmic constituents — is emerging as a central player in the immunological control of infection. As reviewed by Beth Levine and Vojo Deretic (on page 767), autophagy is now implicated in defence against pathogens, antigen processing and presentation, T-cell homeostasis and disease.

Elsewhere in this issue, we reminisce about the early beginnings of a key concept in immunology that has shaped our thinking today. In a Viewpoint article on page 823, six scientists cast their minds back 50 years to the days when the structure of DNA had only just been solved and Burnet published his theory for antibody diversity — the clonal-selection theory. With this was born the realization that the selectable element in immunity was the cell and not the antibody, and that specificity for diverse antigens exists before these antigens are encountered. Although there still remain some opponents to the theory, few can argue that it set the premise for modern immunology.

EDITORIAL OFFICES

LONDON NatureReviews@nature.com
The Macmillan Building, 4 Crinan Street,
London N1 9XW, UK
Tel: +44 (0)20 7843 3620;
Fax: +44 (0)20 7843 3629

CHIEF EDITOR: Elaine Bell
SENIOR EDITORS: Kirsty Minton, Lucy Bird
ASSOCIATE EDITORS: Olive Leavy, Sharon Ahmad
COPY EDITOR: Marta Tufet
SENIOR ART EDITOR (NRI)/CARTOONIST:
Neil Smith

EDITORIAL SUPPORT MANAGER:
Elinor Faulkner
SENIOR COPY EDITORS: David Holmes,
Carrie Patis

ART CONTROLLER: Susanne Harris
SENIOR ART EDITOR: Vicky Askew
MANAGING PRODUCTION EDITOR:
Judith Shadwell

DEPUTY PRODUCTION EDITOR: Simon Fenwick
PRODUCTION CONTROLLER: Natalie Smith

EDITORIAL ASSISTANTS: Laura Firman,
Robert Monk

WEB PRODUCTION MANAGER, UK:
Alexander Thurrell
MARKETING MANAGERS: Kellie Lane,
Amy Mauer

MANAGEMENT OFFICES

LONDON nature@nature.com
The Macmillan Building, 4 Crinan Street,
London N1 9XW, UK
Tel: +44 (0)20 7833 4000;
Fax: +44 (0)20 7843 4596/7

OFFICE MANAGER: Sheryl Ocampo
PUBLISHER: Hugh Blackburn

MANAGING DIRECTOR:
Annette Thomas
EDITOR-IN-CHIEF, NATURE PUBLICATIONS:
Philip Campbell

ASSOCIATE DIRECTORS:
Jenny Henderson, Tony Rudland
EDITORIAL PRODUCTION DIRECTOR:
James McQuat

PRODUCTION DIRECTOR:

Yvonne Strong

DIRECTOR, WEB PUBLISHING:
Timo Hannay

HEAD OF WEB PRODUCTION:
Jeremy Macdonald

NEW YORK nature@natureny.com
Nature Publishing Group,

75 Varick Street,
9th floor, New York,
NY 10013-1917, USA
Tel: +1 212 726 9200;
Fax: +1 212 696 9006

CHIEF TECHNOLOGY OFFICER:
Howard Ratner

DIRECTOR OF NEW TECHNOLOGY:
Greg Suprock

HEAD OF WEB SERVICES:
Anthony Barrera

NATUREJOBS PUBLISHER: Ben Crowe

**HEAD OF NATURE RESEARCH & REVIEWS
MARKETING:** Sara Girard

TOKYO nature@natureasia.com

Chiyoda Building 5F, 2-37-1 Ichigayatamachi,
Shinjuku-ku, Tokyo 162-0843, Japan
Tel: +81 3 3267 8751; Fax: +81 3 3267 8746

ASIA-PACIFIC PUBLISHER: Antoine E Bocquet
MANAGER: Koichi Nakamura

ASIA-PACIFIC SALES DIRECTOR:
Kate Yoneyama

SENIOR MARKETING MANAGER:
Peter Yoshihara

MARKETING/PRODUCTION MANAGER:
Takesh Murakami

INDIA 5A/12 Ansari Road, Daryaganj,
New Delhi 110 002, India
Tel/Fax: +91 11 2324 4186

SALES AND MARKETING MANAGER, INDIA:
Harpal Singh Gill

Copyright © 2007 Nature Publishing Group
Research Highlight images courtesy of
Getty Images unless otherwise credited.
Printed in Wales by Cambrian Printers
on acid-free paper