THE CAMBRIDGE

ENCYCLOPEDIA OF

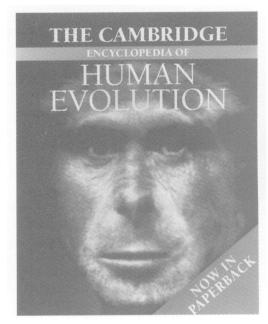
HUMAN EVOLUTION

Edited by STEVE JONES, ROBERT MARTIN, and DAVID PILBEAM Executive Editor: SARAH BUNNEY Foreword by RICHARD DAWKINS

Now available in paperback, this superbly illustrated encyclopedia is the most comprehensive exploration of the evolution of the human species ever produced in a single volume.

Written by an outstanding team of over 70 experts in the field, it covers a huge range, from genetics and fossil origins to human biology and ecology, brain function and behaviour.

- Foreword by Richard Dawkins, author of *The Selfish Gene*, and *The Blind Watchmaker*
- Distinguished volume editors, including Steve Jones, 1991 Reith Lecturer for BBC Radio
- Beautifully illustrated with over 500 photographs, line diagrams, maps and ready-reference tables



- '... There is no better single source ... for finding brief, accurate, and current synopses of the issues, problems, and methods of analysis within the domain of human evolutionary studies.'

 American Journal of Physical Anthropology
- '... this is a fine book; a worthy addition to the excellent *Cambridge Encyclopedia* series. Great to have on the shelves.'

 Colin Tudge, *New Scientist*

£24.95 Paperback 0 521 46786 1



The Edinburgh Building, Cambridge CB2 2RU, UK

Genetical Research

EDITORIAL BOARD

NICK H. BARTON ARTHUR CHOVNICK PIERRE COUBLE ELIZABETH DENNIS TIM HELENTJARIS WILLIAM G. HILL BRUCE W. HOLLOWAY PHILIP W. INGHAM DAVID ISH-HOROWICZ ALEC J. JEFFREYS MARY F. LYON ANNE McLAREN MARK VAN MONTAGU OLIVER E. NELSON ROLF NÖTHIGER RALPH RILEY FRANCESCO SALAMINI PAUL M. SHARP NEIL S. WILLETTS

EXECUTIVE EDITORS
ERIC C. R. REEVE
DAVID J. FINNEGAN TRUDY F. C. MACKAY

Volume 65 1995



Published by
The Press Syndicate of the University of Cambridge

The Pitt Building, Trumpington Street, Cambridge CB2 1RP 40 West 20th Street, New York, NY 10011-4211 10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press, 1995

Printed in Great Britain by the University Press, Cambridge

Contents

No. 1 (February 1995)	
GEBHARDT, C.; EBERLE, B.; LEONARDS-SCHIPPERS, C.; WALKEMEIER, B. and SALAMINI, F. Isolation, characterization and RFLP linkage mapping of a DNA repeat family of Solanum spegazzinii by which chromosome ends can be localized on the genetic map of potato	1
HARTINGS, HANS; LAZZARONI, NADIA; ROSSI, VINCENZO; RIBOLDI, GIORGIA R.;	
THOMPSON, RICHARD D.; SALAMINI, FRANCESCO and MOTTO, MARIO. Molecular analysis of opaque-2 alleles from Zea mays L. reveals the nature of mutational events	
and the presence of a hypervariable region in the 5' part of the gene	11
MARTIN, C. CRISTOFRE and McGOWAN, ROSS. Genotype-specific modifiers of transgene	21
methylation and expression in the zebrafish, Danio rerio	21
WEST, JOHN D.; FLOCKHART, JEAN H. and KISSENPFENNIG, ADRIEN. A maternal genetic	29
effect on the composition of mouse aggregation chimaeras HUGHES, KIMBERLY A. The inbreeding decline and average dominance of genes affecting	29
male life-history characters in <i>Drosophila melanogaster</i>	41
HILL, WILLIAM G.; BABIKER, HAMZA A.; RANFORD-CARTWRIGHT, LISA C. and	41
WALLIKER, DAVID. Estimation of inbreeding coefficients from genotypic data on	
multiple alleles, and application to estimation of clonality in malaria parasites.	53
GAVRILETS, SERGEY and HASTINGS, ALAN. Dynamics of polygenic variability under	
stabilizing selection, recombination, and drift	63
BOOK REVIEWS	75
Ecological Morphology. Integrative Organismal Biology. Edited by Peter C. Wainwright and Stephen M. Reilly. BRIAN CHARLESWORTH	
The Genetics of Populations. By Jay L. Lush. R. C. ROBERTS	
Animal Breeding. By Gerald Wiener. WILLIAM G. HILL	
Biological Inheritance: An Introductory Genetics Text. By W. J. C. Roberts. JAMES H.	
SANG	75
BOOKS RECEIVED	79
No. 2 (April 1995)	
· · ·	0.1
EDITORIAL	81
WILLIAMSON, CHRISTINE M.; DUTTON, ELIZABETH R.; ABBOTT, CATHERINE M.; BEECHEY, COLIN V.; BALL, SIMON T. and PETERS, JOSEPHINE. Thirteen genes (Cebpb, E2f1, Tcf4, Cyp24, Pck1, Acra4, Edn3, Kcnb1, Mc3r, Ntsr, Cd40, Plcg1 and Rcad) that probably lie in the distal imprinting region of mouse Chromosome 2 are not	
monoallelically expressed	83
BÉNASSI, VÉRONIQUE and VEUILLE, MICHEL. Comparative population structuring of molecular and allozyme variation of <i>Drosophila melanogaster Adh</i> , between Europe, West Africa and East Africa	95
PINYARAT, WARAPORN; SHIMADA, TORU; XU, WEI-HUA; SATO, YUKIHIRO;	
YAMASHITA, OKITSUGO and KOBAYASHI, MASAHIKO. Linkage analysis of the gene encoding precursor protein of diapause hormone and pheromone biosynthesis-activating neuropeptide in the silkmoth, Bombyx mori	105
KONDRASHOV, ALEXEY S. Dynamics of unconditionally deleterious mutations: Gaussian	
approximation and soft selection	113
BARTON, N. H. A general model for the evolution of recombination	123
SHORT PAPERS	
CABELLERO, ARMANDO; KEIGHTLEY, PETER D. and HILL, WILLIAM G. Accumulation of mutations affecting body weight in inbred mouse lines	145

WOOD, PHILIP A. and HAMM, DOUG A. Survey of genomic repeat sequence-PCRs that	
detect differences between inbred mouse strains	151
BOOK REVIEWS	157
DNA and Chromosomes. Cold Spring Harbor Symposia on Quantitative Biology.	
Volume LVIII. ERIC REEVE	
Lords of the Fly. By R. E. Kohler. James H. Sang	
Molecular Ecology and Evolution: Approaches and Applications. Edited by	
B. Schierwater, B. Streit, G. P. Wagner and R. Desalle. ERIC REEVE	
DNA-Protein Interactions: Principles and Protocols. Methods in Molecular Biology	
Volume 30. By Geoff Kneale. ARTHUR C. ROBINSON	
Biology Volume 30. By G. Geoff Kneale. ARTHUR C. ROBINSON	
Protocols for Gene Analysis – Methods in Molecular Biology 31. Edited by Adrian J.	
Harwood. ARTHUR C. ROBINSON	
BOOKS RECEIVED	165
No. 3 (June 1995)	
CHABOISSIER, MARIE-CHRISTINE; LEMEUNIER, FRANÇOISE and BUCHETON, ALAIN. IR	
hybrid dysgenesis increases the frequency of recombination in <i>Drosophila melanogaster</i>	167
JUDSON, OLIVIA P. Preserving genes: a model of the maintenance of genetic variation in a	• • •
metapopulation under frequency-dependent selection	175
JARNE, PHILIPPE. Mating system, bottlenecks and genetic polymorphism in	
hermaphroditic animals	193
RONFORT, J. and COUVET, D. A stochastic model of selection on selfing rates in structured	
populations	209
SHORT PAPERS	
LEBON, JEANNE M.; TAM, PATRICK P. L.; SINGER-SAM, JUDITH; RIGGS, ARTHUR D. and	
TAN, SEONG-SENG. Mouse endogenous X-linked genes do not show lineage-specific	
delayed inactivation during development	223
STYRNA, JÓZEFA. Partial deletion of the Y chromosome removes the effect of paternal	
genome imprinting on periovum sensitivity to hyaluronidase in mice	229
Abstracts of papers presented at the fifth Mammalian Genetics and Development	
Workshop held at the Wellcome Trust Building, Euston Road, London on 23rd-25th	
November 1994	233
BOOK REVIEWS	
Drosophila Inversion Polymorphism. Edited by Costas B. Krimbas and Jeffrey R. Powell.	
BRIAN CHARLESWORTH	247
Experimental Design and Analysis for Use in Tree Improvement. By E. R. Williams and	
A. C. Matheson. S. J. LEE	248
Molecular Mechanisms of the Immune Response. Cancer Surveys Volume 22. Edited by	
W. F. Bodmer and M. J. Owen. ELEANOR RILEY	248
The Families of Flowering Plants. Interactive Identification and Information retrieval. By L.	
Watson and M. J. Dallwitz. RICHARD PANKHURST	249
Dazzle 'Em with Style: The Art of Oral Scientific Presentation. By Robert R. II. Anholt.	
SIDNEY A. SIMON	250
BOOKS RECEIVED	251
INDEX	253

NOTES TO CONTRIBUTORS

GENETICAL RESEARCH publishes original work on all aspects of genetics, or in any field of research which has an important bearing on genetics. Reviews of topical interest will also be considered. Papers will be submitted to referees, and will generally be printed in order of acceptance. Short papers (see below) will be given priority in publication.

CONTRIBUTIONS are welcomed from scientists of all nationalities but must be written in English. Papers should be sent to one of the Executive Editors (see addresses inside front cover), or to a member of the Editorial Board with a particular interest in that area of genetics. Submission of a paper will be taken to imply that it is unpublished and is not being considered for publication elsewhere. Papers should be as concise as clarity permits, and illustrations should be restricted to the minimum needed.

SHORT PAPERS This category is designed for concisely written reports of work for which rapid publication is considered desirable. Such papers will normally be published within three months of receipt in acceptable form. They should not exceed 4 pages of print in length, and should include a summary.

TYPESCRIPTS A top copy and two other copies should be submitted. The top copy should be typed with double-spacing on one side of good quality paper, leaving margins of about 1½ inches at the left-hand side and at the top and bottom of each sheet. Each copy should include a complete set of illustrations. The title should ordinarily identify the organism. The address of the laboratory at which the work was carried out will be printed with the authors' names at the head of the paper, and changes of address may be added in footnotes. A footnote to the title page should also give the name and address to whom reprint requests may be made. Sources of financial support should be included with other acknowledgements at the end of the text. The title page of the typescript should include a short title for running headlines (limited to 50 letters and spaces), and the name and address of the author (or his proxy) to whom the proofs are to be sent, under the heading: Proofs to be sent to ... Main headings should be typed in capitals and (except summary and references) numbered consecutively. Subheadings should be typed in lower case, and underlined except for those words and symbols which would be italicized in the text. Subheadings should be numbered (i), (ii), etc., within each main heading. Numeral 1 and letter el: if your typewriter uses one symbol for both, please make clear to the Printer which is intended in formulae, gene symbols,

SUMMARY The summary will be printed at the beginning of the paper. It should give a concise abstract of the significant content and conclusions of the paper, in a form suitable for abstracting journals to use, and should not exceed 250 words.

ILLUSTRATIONS The separate category of Plates no longer applies in the new format. All illustrations, including photographs, diagrams, graphs etc. are to be labelled consecutively Figure 1, 2 . . . according to their relative positions in the text. Each figure should have a legend to be printed underneath it. Photographs should be supplied as unmounted glossy prints, with a sketch or separate set to show the arrangement required when several photographs are to form one figure. The names of the

authors and the orientation of the figure should be indicated on the back of each photograph. Diagrams should be about twice the size of the printed figure, but not larger than 12×8 inches, unless exceptionally complicated, and the thickness of lines and size of points should be determined accordingly. They may be submitted as glossy photographic prints or be drawn in indian ink on white Bristol-board, tracing linen or graph paper ruled in pale blue (but not other colours). The lettering on drawings should be lightly inserted in soft pencil only, so that the printer can put in the finished lettering. Legends to illustrations must be given on a separate sheet of paper. Each illustration must have the name of the author and figure number pencilled on the back.

TABLES Each table should be typed on a separate sheet of paper and its approximate position in the text indicated on the typescript. Each should be numbered and carry an appropriate title. The table should be designed, whenever possible, to be printed in the normal orientation of the text. The data should be grouped so as to make the use of rules unnecessary. Vertical rules, in particular, are expensive to print, and will only be included at the Editor's discretion. Table footnotes should ordinarily employ the symbols *, †, ‡, §, ||, ¶, **, etc., in that order.

symbols Gene and mathematical symbols should generally be printed in italics. Please underline those to be italicized when they appear in the text and tables. Bold letters add to printing costs and should only be used where they are necessary to avoid confusion. The author must assume responsibility for the accurate printing of complex mathematical formulae submitted in typewritten form, by differentiating between letters and numbers which are open to misinterpretation, and identifying all Greek, Hebrew and script letters by means of marginal notes at their first appearance. Note that Greek symbols cannot be italicized and that '+' as the symbol for a wild-type allele should not be italicized.

NOMENCLATURE Wherever possible, standardized nomenclature should be employed. The author should refer to the following publications for guidance: Novick et al. (Bacteriological Reviews 40, 168-189) for plasmids; O'Brien (Ed.), Genetic Maps 6, Cold Spring Harbor 1993, for recent information on most species and recent gene lists.

REFERENCES should follow the normal usage in the journal. In the list of references at the end of the paper, both titles of articles and names of periodicals should be written out in full

PROOFS Two sets of single-sided page proofs, together with the typescript of each paper will be sent to the author. The printers' marked proof should be returned after correction to the Executive Editor, together with the typescript. Excessive alterations, other than corrections of printers' errors, may be disallowed or charged to the author. Corrections should be made using the symbols in British Standard 1219: 1958, or its shortened version B.S. 1219C: 1958

OFFPRINTS Fifty offprints of each paper, or short paper, are provided free of charge. Additional offprints may be ordered in the form sent out with proofs, provided this is returned within fourteen days of receipt.

Cambridge University Press

The Pitt Building, Trumpington Street, Cambridge CB2 1RP 40 West 20th Street, New York, NY 10011-4211, USA 10 Stamford Road, Oakleigh, Melbourne 3166, Australia

Printed in Great Britain by the University Press, Cambridge

Genetical Res., Camb.

Genetical Research

Contents

- 167 CHABOISSIER, MARIE-CHRISTINE; LEMEUNIER, FRANÇOISE and BUCHETON, ALAIN. IR hybrid dysgenesis increases the frequency of recombination in *Drosophila melanogaster*
- 175 JUDSON, OLIVIA P. Preserving genes: a model of the maintenance of genetic variation in a metapopulation under frequency-dependent selection
- 193 JARNE, PHILIPPE. Mating system, bottlenecks and genetic polymorphism in hermaphroditic animals
- 209 RONFORT, J. and COUVET, D. A stochastic model of selection on selfing rates in structured populations
 SHORT PAPERS
- 223 LEBON, JEANNE M.; TAM, PATRICK P. L.; SINGER-SAM, JUDITH; RIGGS, ARTHUR D. and TAN, SEONG-SENG. Mouse endogenous X-linked genes do not show lineage-specific delayed inactivation during development
- 229 STYRNA, JÓZEFA. Partial deletion of the Y chromosome removes the effect of paternal genome imprinting on periovum sensitivity to hyaluronidase in mice
- 233 Abstracts of papers presented at the fifth Mammalian Genetics and Development Workshop held at the Wellcome Trust Building, Euston Road, London on 23rd–25th November 1994

 BOOK REVIEWS
- 247 Drosophila Inversion Polymorphism. Edited by Costas B. Krimbas and Jeffrey R. Powell. BRIAN CHARLESWORTH
- 248 Experimental Design and Analysis for Use in Tree Improvement. By E. R. Williams and A. C. Matheson. S. J. LEE
- 248 Molecular Mechanisms of the Immune Response. Cancer Surveys Volume 22. Edited by W. F. Bodmer and M. J. Owen. ELEANOR RILEY
- The Families of Flowering Plants. Interactive Identification and Information Retrieval. By L. Watson and M. J. Dallwitz. RICHARD PANKHURST
- 250 Dazzle 'Em with Style: The Art of Oral Scientific Presentation. By Robert R. H. Anholt. SIDNEY A. SIMON
- 251 BOOKS RECEIVED
- **253** INDEX





0016-6723(199506)65:3;1-C