THE ROYAL SOCIETY OF EDINBURGH



PROCEEDINGS

Section B (Biological Sciences)

ISSN-0308-2113

PUBLISHED BY THE ROYAL SOCIETY OF EDINBURGH 22 GEORGE STREET, EDINBURGH EH2 2PQ

EDITORIAL BOARD

Executive Editors

R. WATLING Royal Botanic Garden Edinburgh A. E. H. EMERY University of Edinburgh

J. S. BECK University of Dundee

W. C. BOWMAN University of Strathclyde

J. J. CONNELL Aberdeen

B. D. HarrisonScottish Crop Research Institute, Invergowrie

R. C. KIRKWOOD University of Strathclyde

J. A. McFadzean Rhone-Poulenc Ltd, Dagenham, Essex

C. D. WATERSTON

General Secretary

Royal Society of Edinburgh

A. D. McIntyre
DAFS Marine Laboratory
Aberdeen

M. PEAKER
Hannah Research Institute
Ayr

J. A. RAVEN University of Dundee

N. F. ROBERTSON Walkerburn

J. A. Strong Edinburgh

R. J. WHEATER Royal Zoological Society of Scotland

W. DUNCAN

Executive Secretary

Royal Society of Edinburgh

Publications Secretary, Royal Society of Edinburgh: E. A. INGPEN

Copyright

© 1989 The Royal Society of Edinburgh and the authors of individual papers.

It is the policy of the Royal Society of Edinburgh not to charge any royalty for the production of a single copy of any one article made for private study or research. Specific permission will not be required for photocopying multiple copies of copyright material, to be used for *bona fide* educational purposes, provided this is done by a member of the staff of the university, school or other comparable institution, for distribution without profit to student members of that institution and provided the copies are made from the original journal. Requests for the copying or reprinting of any article for any other purpose should be sent to the Royal Society of Edinburgh, 22/24 George Street, Edinburgh EH2 2PQ.

PROCEEDINGS

OF THE

ROYAL SOCIETY OF EDINBURGH

PROCEEDINGS

OF

THE ROYAL SOCIETY OF EDINBURGH

Section B (Biological Sciences)

VOL. 95

PUBLISHED BY
THE ROYAL SOCIETY OF EDINBURGH
22 GEORGE STREET
EDINBURGH EH2 2PQ

1989

OESTROGEN AND THE HUMAN BREAST

Edited by J. S. BECK

Proceedings of the Symposium held at the Royal Society of Edinburgh, 22–24 September 1988

OESTROGEN AND THE HUMAN BREAST

A symposium held at the Royal Society of Edinburgh, 22–24 September 1988

U. CHETTY, Royal Infirmary, Edinburgh.

M. Dowsett, Royal Marsden Hospital, London.

Organising Committee:

R. A. HAWKINS, Royal Infirmary, Edinburgh.		
R. J. B. KING, ICRF Laboratories, London.		
W. R. MILLER, Royal Infirmary, Edinburgh.		
CONTENTS		
Introduction	xi	
by W. R. MILLER Endocrine management of breast cancer by A. P. M. FORREST	1	
THE INVOLVEMENT OF OESTROGEN IN THE DEVELOPMENT AND FUNCTION OF THE NORMAL BREAST		
Clinical evidence on the role of oestrogens in the development of the breasts by Z. LARON, R. KAULI and A. PERTZELAN	13	
The involvement of oestrogen in the development and function of the normal breast: histological evidence by Thomas J. Anderson and Sharon Battersby	23	
THE INVOLVEMENT OF OESTROGEN IN THE DEVELOPMENT AND PROGRESSION OF BREAST DISEASE		
The involvement of oestrogen in the development and progression of breast disease: epidemiological evidence by M. P. Vessey	35	
Clinical evidence for the involvement of oestrogen in the development and progression of breast cancer by Anthony Howell	49	
Immunohistochemical expression of oestrogen receptor in normal breast tissue by Sarah Carpenter, Gregory Georgiade, Kenneth S. McCarty Sr. and Kenneth S. McCarty Jr.	59	
Oestrogens in the initiation and promotion of breast cancer by R. D. Bulbrook, R. E. Leake and W. D. George	67	
A new approach to the prevention of breast cancer	77	

by H. LEON BRADLOW and JON J. MICHNOVICZ

Contents

MECHANISMS AND MARKERS OF OESTROGEN ACTION IN THE BREAST

Growth control of normal and malignant breast epithelium by Marc E. Lippman and Robert B. Dickson	89
Oestrogen-induced pro-cathepsin D in breast cancer: from biology to clinical applications by Henri Rochefort, Patrick Augereau, Pierre Briozzo, François Capony, Vincent Cavailles, Gilles Freiss, Marcel Garcia, Thierry Maudelonde, Muriel Morisset, Isabelle Touitou and Françoise Vignon	107
Effects of oestrogen on human breast cancer cells in culture by Philippa D. Darbre and Roger J. Daly	119
Oestrogen-receptors: an overview of recent advances in their structure and function by R. J. B. KING	133
The clinical usefulness of oestrogen-receptor and other markers of hormone dependence by Gary M. Clark and William L. McGuire	145
PERIPHERAL SYNTHESIS AND ENDOGENOUS OESTROGENS	
The regulation of oestrogen biosynthesis in human adipose tissue by E. R. Simpson and C. R. Mendelson	153
Oestrogens in breast tumours and fat by J. H. H. Thijssen and M. A. Blankenstein	161
Oestrogens and other biochemical and cytological components in nipple aspirates of breast fluid: relationship to risk factors for breast disease by Nicholas L. Petrakis	169
LOCAL OESTROGEN METABOLISM	
Oestrogen uptake and metabolism <i>in vivo</i> by V. H. T. James, M. J. Reed, E. F. Adams, M. Ghilchick, L. C. Lai, N. G. Coldham, C. J. Newton, A. Purohit, A. M. Owen, A. Singh and S. Islam	185
Biosynthesis of active oestrogens in the breast by A. Vermeulen and J. P. Deslypere	195
The relevance of local oestrogen metabolism within the breast by W. R. MILLER and J. S. O'NEILL	203
OESTROGEN DEPRIVATION – ANTIOESTROGENS	
Current controversies in the role of antioestrogens in the treatment of carcinoma of the breast	221
by M. Baum, S. C. A. Fraser, A. A. Colletta and S. R. Ebbs Clinical experience in the use of the antioestrogen tamoxifen in the treatment of breast cancer	231

Contents

Optimisation of antioestrogen therapy: laboratory and clinical concepts by V. Craig Jordan	239
Novel antioestrogens	247
by A. E. Wakeling and J. Bowler	
OESTROGEN DEPRIVATION – NOVEL METHODS	
Novel methods of oestrogen deprivation for treatment of breast diseases	255
by Richard J. Santen	
Use of LH-RH agonists in the treatment of breast disease	271
by R. I. Nicholson and K. J. Walker	
Aromatase inhibitors in human breast cancer	283
by R. C. Coombes, R. C. Stein and M. Dowsett	
Inhibitors of oestrogen biosynthesis: preclinical studies with CGS 16949A,	293
a new nonsteroidal aromatase inhibitor	
by Ajay S. Bhatnagar, Klaus Schieweck, Albert Häusler, Leslie J.	
Browne and Ronald E. Steele	
Concluding Remarks	305
by A. P. M. Forrest	
Index	309

(Issued 10th July 1989)