



ADVANCES IN GYNECOLOGICAL ENDOCRINOLOGY

Volume 1

Edited by
A. R. Genazzani, F. Petraglia,
A. Volpe and F. Facchinetti

ADVANCES IN GYNECOLOGICAL ENDOCRINOLOGY

Volume 1

The Proceedings of the 1st Congress of the International
Society of Gynecological Endocrinology

Edited by
**A. R. Genazzani, F. Petraglia,
A. Volpe and F. Facchinetti**



The Parthenon Publishing Group

International Publishers in Science & Technology

Casterton Hall, Carnforth,
Lancs. LA6 2LA. U.K.

120 Mill Road, Park Ridge,
New Jersey. U.S.A.

ADVANCES IN GYNECOLOGICAL ENDOCRINOLOGY

Volume 4

The Proceedings of the 1st Congress of the International
Society of Gynecological Endocrinology

Edited by

A. R. Genazzani, F. Petraglia,
A. Volpe and F. Facchinetti

Published in the UK and Europe by
The Parthenon Publishing Group Ltd.
Casterton Hall
Carnforth, Lancs. LA6 2LA ISBN: 1-85070-208-X

Published in North America by
The Parthenon Publishing Group Inc.
120 Mill Road
Park Ridge
New Jersey, NJ, USA ISBN 0-940813-56-4

Copyright © 1988 The Parthenon Publishing Group Ltd.

No part of this publication may be reproduced, stored in a
retrieval system, or transmitted in any form or by any means,
electronic, mechanical, photocopying, recording or otherwise,
without prior permission from the publishers.

List of principal contributors

E. Y. Adashi

Dept. of Obstetrics & Gynecology
Div. of Reproductive Endocrinology
University of Maryland
School of Medicine
Baltimore
MD 21201
USA

J. Balasch

Dept. of Obstetrics & Gynecology
Faculty of Medicine
Hospital Clinico y Provincial
C/Casanova
08036 Barcelona
Spain

S. Bélisle

Faculty of Medicine
University of Sherbrooke
Sherbrooke
Quebec
Canada

Z. Blumenfeld

Reproductive Endocrinology Section
Dept. of Obstetrics & Gynecology "A"
Ramban Medical Center & Faculty of
Medicine
Technion-Israel Institute of Technology
Haifa 31096
Israel

B. Bohus

Dept. of Animal Physiology
University of Groningen
Biological Centre
P.O. Box 14
9750 AA Haren
The Netherlands

M. Breckwoldt

Universitäts Frauenklinik
Hugstetter Strasse 55
D-7800 Freiburg
West Germany

C. Bulletti

Esiopatologia Della Riproduzione
Universita di Bologna
Via Massarenti 13
40138 Bologna
Italy

H. Burger

Prince Henry's Hospital Campus
Monash Medical Centre
St. Kilda Road
Melbourne 3004
Australia

L. Cardozo

Consultant Gynecologist
King's College Hospital
Denmark Hill
London SE5 9RS
England

A. Cianci

2 Clinica Ostetrica e Ginecologia
Universita di Catania
Ospedale S. Bambino
95124 Catania
Italy

R. N. Clayton

Clinical Research Centre
Watford Road
Harrow
Middlesex HA1 3UJ
England

LIST OF PRINCIPAL CONTRIBUTORS

P. G. Crosignani
3 Dept. of Obstetrics & Gynecology
University of Milan
Via M. Melloni 52
20129 Milan
Italy

A. H. DeCherney
Div. of Reproductive Endocrinology
Dept. of Obstetrics & Gynecology
Yale University School of Medicine
333 Cedar Street
New Haven
CT 06510
USA

G. Delitala
Institute of Endocrinology & Hematology
Chair of Endocrinology
University of Sassari
Viale San Pietro 12
07100 Sassari
Italy

A. Demoulin
Dept. of Obstetrics & Gynecology
University of Liege
Citadelle Hospital
1 Boulevard du 12 Eme de Ligne
4000 Liege
Belgium

L. Dennerstein
Key Centre for Womens Health in Society
209 Grattan Street
Carlton
Victoria 3053
Australia

S. Dexeus
Dept. of Obstetrics & Gynecology
Dexeus Institute
Faculty of Medicine
Universida Autonoma de Barcelona
Barcelona
Spain

J. Dor
Dept. of Obstetrics & Gynecology
Sheba Medical Center
Tel-Hashomer
Israel

A. Fabriani
Chair of 5th Medical Pathology
University of Rome 'La Sapienza'
Rome
Italy

E. Facchinetti
Clinica Ostetrica e Ginecologica
Via del Pozzo 71
41100 Modena
Italy

J.-P. Felber
Div. D'endocrinologie et Biochemie
Clinique
Centre Hospitalier Universitaire Vaudois
1011 Lausanne
Switzerland

S. Feldman
Dept. of Neurology
Hadassah University Hospital
Jerusalem 91 120
Israel

G. Ferraris
Dept. B. of Obstetrics & Gynecology
University of Turin
Turin
Italy

M. Filicori
Esiopatologia Riproduzione
Via Massarenti 13
40138 Bologna
Italy

S. Franks
Dept. of Obstetrics & Gynecology
St. Mary's Hospital Medical School
London W2 1PG
England

Ge Qin-Sheng
Div. of Reproductive Endocrinology
Dept. of Obstetrics & Gynecology
Peking Union Medical College Hospital
100730 Beijing
China

A. R. Genazzani
Dept. of Obstetrics & Gynecology
University of Modena
41100 Modena
Italy

A. D. Genazzani
National Institute of Child Health &
Human Development
Lab. of Theoretical Physical Biology
N.I.H.
Bethesda
USA

LIST OF PRINCIPAL CONTRIBUTORS

B. Gillham

Div. of Biochemistry
St. Thomas's Hospital
London SE1 7EH
England

R. Gimes

1st Dept. of Obstetrics & Gynecology
Simmelweis Medical University
Baross U. 27
1088 Budapest
Hungary

E. Gurpide

Prof. of Biochemistry & of Obstetrics,
Gynecology & Reproductive Science
The Mount Sinai Medical Center
1 Gustav L. Levy Place
New York 10029
USA

A. A. Haspels

Dept. of Obstetrics & Gynecology
University of Utrecht
Catharijnesingel 101
3511 GV Utrecht
The Netherlands

D. J. Hill

Dept. of Pediatrics
Clinical Sciences Centre
University of Sheffield
Northern General Hospital
Sheffield S5 7AU
England

I. Huhtaniemi

Dept. of Physiology
University of Turku
Kiinamylynkatu 10
SF-20520 Turku
Finland

H. S. Jacobs

Prof. of Reproductive Endocrinology
Cobbold Laboratories
Thorn Institute of Clinical Sciences
The Middlesex Hospital Medical School
London W1N 8AA
England

R. B. Jaffe

Reproductive Endocrinology Center
Dept. of Obstetrics, Gynecology &
Reproductive Sciences
University of California
San Francisco
California 94143
USA

A. Kauppila

Dept. of Obstetrics & Gynecology
Clinical Chemistry & Pathology
University of Oulu
SF-90220 Oulu
Finland

P. J. Keller

Dept. of Obstetrics & Gynecology
University Hospital
8091 Zurich
Switzerland

R. J. B. King

Hormone Biochemistry Department
Imperial Cancer Research Fund
Laboratories
P.O. Box 123
Lincoln's Inn Fields
London WC2A 3PX
England

A. Klopfer

Dept. of Obstetrics & Gynecology
Royal Infirmary
Aberdeen AB9 2ZB
England

T. Kumasaka

Dept. of Obstetrics & Gynecology
Dokkyo University School of Medicine
Mibu
Tochigi 321-02
Japan

F. Labrie

MRC Group in Molecular Endocrinology
Laval University Medical Center
2705 Laurier Boulevard
STE-FOY
Quebec
Canada G1V 4G2

B. Lunenfeld

Director, Institute of Endocrinology
Sheba Medical Center
Tel-Hashomer 52621
Israel

P. C. MacDonald

The Cecil H. & Ida Green Center for
Reproductive Biology Sciences & The
Dept. of Obstetrics & Gynecology &
Biochemistry
The University of Texas, Southwestern
Medical Center of Dallas
Texas 75235
USA

LIST OF PRINCIPAL CONTRIBUTORS

R. Maheux

Center De Recherche de L'Hopital
St-Francois d'Assise
Dept. of Obstetrics & Gynecology
Laval University
Quebec
Canada

L. Mäkäraäinen

Dept. of Obstetrics & Gynecology
University of Oulu
SF-90220 Oulu
Finland

S. Mancuso

Dept. of Obstetrics & Gynecology
Universita Cattolica Del S. Cuore
Largo Gemelli 8
00165 Roma
Italy

P. Marrama

University of Modena
Modena
Italy

L. Marzetti

3 Clinica Ostetrica e Ginecologica
Universita di Roma
Policlinico Umberto 1
00100 Roma
Italy

M. Massobrio

Dept. of Obstetrics & Gynecology
University of Turin
Turin
Italy

L.-A. Mattsson

Dept. of Obstetrics & Gynecology
East Hospital
University of Goteborg
S-416 85 Goteborg
Sweden

P. Mauvais-Jarvis

Dept. of Reproductive Endocrinology
Necker Hospital
75015 Paris
France

D. Mellstrom

Ass. Prof. in Geriatric Medicine
University of Goteborg
Sweden

A. Menard

Dept. of Obstetrics & Gynecology
C.M.C.O.
19 Rue L. Pasteur
67300 Schiltigheim
France

G. E. Menchini-Fabris

Postgraduate School of Andrology
University of Pisa
1-A Clinica Medica
Policlinico S. Chiara
56100 Pisa
Italy

M. Mizuno

Dept. of Obstetrics & Gynecology
Faculty of Medicine
University of Tokyo
7-3-1-Hongo
Bunkyo-Ku
Tokyo 113
Japan

E. E. Muller

Dept. of Pharmacology
University of Milan
20129 Milan
Italy

C. Nappi

Istituto de Ginecologia, Ostetricia e
Fisiopatologia della Riproduzione
Umana
2 Facolta di Medicina e Chirurgia
Via Pansini 5
80131 Napoli
Italy

J. Newton

Dept. of Obstetrics & Gynecology
Birmingham Maternity Hospital
Edgbaston
Birmingham B15 2TG
England

A. Palumbo

Dept. of Obstetrics & Gynecology
Yale University Medical School
333 Cedar Street
New Haven
CT 06510
USA

A. Pellicer

Dept. of Obstetrics & Gynecology
Valencia University School of Medicine
Avda. Blasco Ibanez 17
Valencia 46010
Spain

LIST OF PRINCIPAL CONTRIBUTORS

U. Pesch

Div. of Gynecological Endocrinology
Dept. of Obstetrics & Gynecology
J.-W. Goethe University
Frankfurt am Main
West Germany

F. Petraglia

Dept. of Obstetrics & Gynecology
University of Modena
School of Medicine
41100 Modena
Italy

R. Rappaport

Hopital des Enfants Malades
149 Rue de Sevres
75015 Paris
France

S. S. Ratnam

Dept. of Obstetrics & Gynecology
National University Hospital
Lower Kent Ridge Road
Singapore 0511

F. Riphagen

International Health Foundation
8 Avenue don Bosco
1150 Brussels
Belgium

P. J. Rowe

Special Programme of Research,
Development & Research Training in
Human Reproduction
World Health Organization
20 Avenue Appia
1211 Geneva 27
Switzerland

B. Runnebaum

Dept. of Obstetrics & Gynecology
Div. of Gynecological Endocrinology
University of Heidelberg
Voss Strasse 9
D-6900 Heidelberg
West Germany

K. J. Ryan

Laboratory of Human Reproduction and
Reproductive Biology
Harvard Medical School
Boston
Mass. 02115
USA

G. Samsioe

Dept. of Obstetrics & Gynecology
Sahlgrens Hospital
University of Goteborg
S-413 Goteborg
Sweden

C. Scaroni

Institute of Semeiotica Medica
University of Padua
Padua
Italy

J. G. Schenker

Dept. of Obstetrics & Gynecology
Hadassah University Hospital
Jerusalem 91 120
Israel

J. Schoemaker

Div. of Reproductive Endocrinology
& Fertility
Dept. of Obstetrics & Gynecology
Acad Hospital of the Vrije University
P.O. Box 7079
1007 MB Amsterdam
The Netherlands

M. Seppälä

Dept. of Obstetrics & Gynecology
Helsinki University Central Hospital
00290 Helsinki
Finland

W. G. Sippell

Dept. of Pediatrics
University of Kiel
Schwanenweg 20
D-2300 Kiel
West Germany

R. Sitruk-Ware

Medical Department
Ciba Geigy
4002 Basle
Switzerland

P. C. Sizonenko

Dept. of Obstetrics & Gynecology
University of Geneva
University Canton Hospital
Geneva
Switzerland

L. Spätling

Dept. of Obstetrics & Gynecology
University of Bochum
Marienhospital Holkeskampring 40
4690 Herne 1
West Germany

LIST OF PRINCIPAL CONTRIBUTORS

P. Strata

Dept. of Human Anatomy & Physiology
Section of Neurophysiology
C. So Raffaello 30
10125 Turin
Italy

J. H. H. Thijssen

Dept. of Endocrinology
University Hospital of Utrecht
Catharijensingel 101
3511 GV Utrecht
The Netherlands

R. Trevoux

F. R. H. 67
Boulevard Pasteur 94
Fresnes 360
France

U. Ulmsten

Dept. of Obstetrics & Gynecology
Uppsala University Hospital
Uppsala
Sweden

W. H. Utian

Dept. of Obstetrics & Gynecology
The Mount Sinai Medical Center of
Cleveland
Case Western Reserve University
Cleveland
Ohio
USA

P. F. Van Look

Special Programme of Research
Development & Research Training in
Human Reproduction
World Health Organization
1211 Geneva 27
Switzerland

M. Vignali

4 Clinica Ostetrico Ginecologica
Istituto Scientifico H. San Raffaele
Universita di Milano
Milano
Italy

G. M. H. Waites

Special Programme of Research &
Development & Research Training in
Human Reproduction
World Health Organization
1211 Geneva 27
Switzerland

A. Wisanto

Center for Reproductive Medicine
Academic Hospital Vrije Universiteit
Laarbeeklaan 101
B-1090 Brussels
Belgium

O. Ylikorkala

Dept. of Obstetrics & Gynecology
University of Helsinki
Haartmaninkatu 2
SF-00290 Helsinki
Finland

M. M. Zufferey

Division of Endocrinology
Department of Medicine and Department
of Gynecology
Vaud University Hospital Center
1011 Lausanne
Switzerland

Foreword

We welcome the publication of the Proceedings of the 1st Congress of The International Society of Gynecological Endocrinology held at Crans Montana, Switzerland in March, 1988. It represents a major addition to the literature on this important subject.

The material from the main Plenary Sessions is divided into six sections. The first concerns neuroendocrinology and reproductive function and therapeutical strategies for some of the disorders in this field. This is followed by a section on the ovary as an endocrine organ. The next section treats the biochemistry and hormones of the female reproductive tract and breast and, in particular, pelvic inflammatory diseases. The fourth section considers endocrine events in implantation and pregnancy and this is followed by a section reporting on the epidemiology and treatment of infertility and sterility and new developments in hormonal contraception. The last section discusses the expanding horizons in climacteric endocrinology. The Proceedings of the main Special Symposia are also available and provide authoritative reviews of a variety of areas of significant current research.

We thank the various contributors for their participation. We hope that this publication will be helpful both in advancing research and in assisting teaching.

A. R. Genazzani, F. Petraglia, A. Volpe and F. Facchinetti

Contents

List of principal contributors	xv
Foreword	xxi
Section 1	NEUROENDOCRINOLOGY AND REPRODUCTIVE FUNCTION
Part A	<i>Physiology and pathology</i>
Chapter 1	Hormonal regulation of gonadotropin gene expression R. N. Clayton, S. D. Abbot, G. Saade, M. R. A. Lalloz and A. Detta 3
Chapter 2	Modulation of α subunit and LH β mRNA in the rat anterior pituitary gland by sex steroids and an LHRH agonist F. Labrie, J. Simard, C. Labrie, J. F. Hubert, N. Barden and B. Gagné 15
Chapter 3	Inhibin and the gynecological endocrinologist H. G. Burger 23
Chapter 4	Inhibin regulation of FSH secretion A. Demoulin and P. Franchimont 31
Chapter 5	Maturation of the gonadal axis in adolescent girls and effect of oral contraception M. M. Zufferey, T. Lemarchand-Béraud, F. Rey, M. J. Raymond, M. Rais and I. Rey 37
Chapter 6	Pulsatile luteinizing hormone secretion in hypothalamic amenorrhea J. Schoemaker, H. Schoemaker, G. Berkhouit and H. C. Schoemaker 43

ADVANCES IN GYNECOLOGICAL ENDOCRINOLOGY

Chapter 7	LH secretory pattern in normal men and women and in patients with idiopathic hypogonadotropic hypogonadism: an example of 'DETECT' algorithm performance and of its sensitivity and specificity <i>A. D. Genazzani, G. Forti, M. Serio, V. Montanini, G. F. Baraghini and D. Rodbard</i>	51
Chapter 8	Aspects of the neural control of growth hormone secretion related to the first postnatal period of the rat <i>E. E. Müller, S. G. Cella and V. De Gennaro Colonna</i>	67
Chapter 9	Central regulation of gonadotropin secretion in males <i>G. Delitala, P. Tomasi and R. Viridis</i>	75
Chapter 10	Spermarche – the time sequence from the first production of sperm to attainment of fertilizing capacity <i>B. Lunenfeld and R. Weissenberg</i>	85
Chapter 11	Pathophysiology of central precocious puberty <i>P. C. Sizonenko</i>	97
Chapter 12	Mechanisms of adrenocortical secretion following afferent neural stimuli <i>S. Feldman</i>	101
Chapter 13	γ -Aminobutyrate and the stress response <i>B. Gillham, B. B. L. Oon, J. C. Norman, A. Di Sciullo, T. T. Chuang, K. A. Karim and M. T. Jones</i>	107
Chapter 14	Stress and reproduction <i>A. R. Genazzani, F. Petraglia, A. Monzani, G. Alessandrini and A. Volpe</i>	119
Chapter 15	Catecholamines and behavioral physiology of stress <i>B. Bohus, J. M. Koolhas, A. B. Steffens, D. S. Fokkema and A. J. W. Scheurink</i>	125
Chapter 16	Dark season, a stress factor in human reproduction in a region with a strong seasonal contrast in luminosity <i>A. Kauppila, A. Kivelä, A. Pakarinen and O. Vakkuri</i>	131
Chapter 17	Psychological and hormonal factors in premenstrual tension <i>L. Dennerstein, C. Morse, J. Brown and M. Smith</i>	137

CONTENTS

Chapter 18	Neuroendocrine findings in patients with premenstrual syndrome <i>F. Facchinetti, E. Martignoni, F. Petraglia, M. G. Sances, L. Fioroni, G. Nappi and A. R. Genazzani</i>	141
Chapter 19	Prostaglandins in dysmenorrhea <i>M. Massobrio, C. Benedetto, A. Rosi and L. Marozio</i>	145
Chapter 20	Stress-coping mechanisms in infertile women with luteal phase insufficiency <i>U. Pesch, G. Weyer and H.-D. Taubert</i>	151
Chapter 21	Primary amenorrhea, hypertension and hypokalemia in six cases of 17-hydroxylase deficiency syndrome <i>C. Scaroni, G. Opocher, G. Carpenè and F. Mantero</i>	159
Part B	<i>Therapeutical strategies</i>	
Chapter 22	Female isosexual precocious puberty: treatment with chlormadinone <i>Ge Qin-sheng and Xu Ling</i>	171
Chapter 23	Clinical and biological effects of the slow-release GnRH agonist decapeptyl-depot in girls with central precocious puberty <i>W. G. Sippell, C. J. Partsch, R. Hümmlink, S. L. S. Drop, W. Oostdijk and R. J. H. Odink</i>	175
Chapter 24	Effect of 3 years LHRH analog treatment on growth, bone maturation and somatomedin-C in children with central precocious puberty <i>R. Rappaport, R. Brauner and H. Crosnier</i>	181
Chapter 25	Induction of ovulation with pulsatile GnRH: an overview <i>M. Filicori, P. Ferrari, L. Michelacci, E. Campaniello, A. Pareschi, A. Valdiserri, C. Meriggiola, N. Ucci and C. Flamigni</i>	187
Chapter 26	Comparison of inducing ovulation between hypothalamic amenorrhea and polycystic ovary disease with pulsatile GnRH administration <i>T. Kumasaka, K. Masaoka, M. Kitazawa and T. Sakamoto</i>	195

ADVANCES IN GYNECOLOGICAL ENDOCRINOLOGY

Chapter 27	Idiopathic hypogonadotropic hypogonadism: response to low dose pulsatile LHRH administration <i>P. Marrama, V. Montanini, M. Simoni, G. F. Baraghini and M. F. Fustini</i>	205
Chapter 28	Severe hypothalamic amenorrhea: treatment with pulsatile GnRH <i>C. Nappi, C. Di Carlo, M. Mastrocinque, G. Colace and U. Montemagno</i>	215
Chapter 29	LHRH agonists in gynecology <i>R. Maheux and A. Lemay</i>	227
Chapter 30	Hormonal models of suppression and recovery of pituitary-ovarian axis under GnRH analog treatment <i>A. Cianci, M. C. Fornito, A. Mongioi, E. Vicari, S. Caruso and G. Palumbo</i>	243
Section 2	OVARY AS AN ENDOCRINE ORGAN	
Chapter 31	Growth factors and the ovary <i>K. J. Ryan and A. Makris</i>	253
Chapter 32	Plasminogen activators in follicular development <i>A. Pellicer, A. Lightman, A. H. DeCherney, F. Naftolin and B. A. Littlefield</i>	261
Chapter 33	Use of growth hormone to augment the ovarian response to treatment with gonadotropins <i>H. S. Jacobs, R. Homburg, E. Owen, A. Eshel, H. I. Abdalla and C. West</i>	267
Chapter 34	The ovarian renin-angiotensin system (OVRAS) <i>A. Palumbo, C. Jones, R. T. Duby, A. Lightman, A. Pellicer, M. Alam, E. Lunenfeld, M. L. Carcangiu, P. J. Rzasa, V. Caride, M. D. Culler, A. F. Negro-Vilar, J. J. Ireland, G. Aguilera, A. H. DeCherney and F. Naftolin</i>	271
Chapter 35	The potential role of insulin in the genesis of ovarian hyperandrogenism <i>E. Y. Adashi</i>	277
Chapter 36	Androgen insensitivity <i>M. Breckwoldt, P. Wieacker and J. Neulen</i>	283

CONTENTS

Chapter 37	Physiopathology and diagnosis of polycystic ovary syndrome: the significance of 11β-hydroxy-androstenedione <i>S. Franks, D. W. Polson and M. J. Reed</i>	289
Chapter 38	PCO syndrome: treatment by hypothalamo-pituitary stimulation <i>P. G. Crosignani, P. Barbacini, A. M. Mattei, V. Cavioni and M. Carena</i>	295
Chapter 39	Prolonged treatment with cyproterone acetate administered as antiandrogenic and contraceptive drug <i>R. Gimes and G. Lada</i>	299
Chapter 40	Luteal phase defect: controversial clinical aspects <i>J. Balasch and J. González-Merlo</i>	307
Chapter 41	Pathophysiology of the corpus luteum function <i>B. Runnebaum and T. Rabe</i>	311
Chapter 42	The application of antiprogestins during the luteal phase <i>A. A. Haspels and M. R. Van Santen</i>	321
Chapter 43	Luteal dysfunction in ovulation induction: the role of repetitive human chorionic gonadotropin supplementation during the luteal phase <i>Z. Blumenfeld and F. Nahhas</i>	329
Section 3	FEMALE REPRODUCTIVE TRACT AND BREAST: BIOCHEMISTRY AND HORMONES	
Part A	<i>Physiology and pathology</i>	
Chapter 44	Biochemical characteristics of isolated human endometrial cells <i>E. Gorpide</i>	337
Chapter 45	Differential permeability of human endometrium to ovarian steroids <i>C. Bulletti, V. M. Jasonni, F. Cappuccini, S. Naldi, E. Di Cosmo, V. Polli and C. Flamigni</i>	345

ADVANCES IN GYNECOLOGICAL ENDOCRINOLOGY

Chapter 46	Androgens in human endometrium <i>J. H. H. Thijssen, C. Vermeulen-Meiners and M. A. Blankenstein</i>	355
Chapter 47	Sensitivity of neoplastic human endometrium to progestins <i>R. J. B. King</i>	363
Chapter 48	Prostaglandins and endometriosis <i>O. Ylikorkala</i>	371
Chapter 49	Prostaglandins and menorrhagia <i>L. Mäkkäräinen</i>	377
Chapter 50	Antiproliferative effect of antiestrogens on normal human breast cells in culture <i>P. Mauvais-Jarvis, F. Kuttann, C. Malet and A. Gompel</i>	385
 Part B <i>Pelvic inflammatory diseases</i>		
Chapter 51	Pelvic inflammatory disease: microbiological aspects <i>G. Ferraris, M. A. Latino, G. Gordini, A. Re, M. Raspollini, D. Proserpio, R. Bellini and A. Lanza</i>	395
Chapter 52	Pelvic inflammatory disease: laparoscopic and ultrasonic evaluation <i>L. Marzetti, M. L. Framarino dei Malatesta, M. G. Piccioni and D. Enea</i>	401
Chapter 53	Reproductive and sexual consequences of infections and inflammations of male genital tract: results of treatment with aztreonam <i>G. F. Menchini-Fabris, P. Giorgi, P. M. Giorgi and D. Canale</i>	407
Chapter 54	<i>Chlamydia trachomatis</i> genital infections: morphological and clinical aspects and therapeutic possibilities using miokamycin <i>A. Cianci, G. Tempera and S. Cianci</i>	411

CONTENTS

Section 4	ENDOCRINE EVENTS IN IMPLANTATION AND PREGNANCY	
Chapter 55	Uterine protein secretion with respect to endocrine stimuli <i>M. Seppälä, M.-L. Huhtala, A. Kauppila, L. Rönnerberg, E. Vartiainen and M. Julkunen</i>	417
Chapter 56	Hormonal profiles during the perinidation period in conception cycles, abortions and biochemical pregnancies <i>B. Lunenfeld, K. A. Hutchinson-Williams, G. Lavy, M. P. Diamond and A. H. DeCherney</i>	421
Chapter 57	Role of prostaglandins in egg implantation <i>M. Mizuno, N. Mitsuhashi, O. Tsutsumi, O. Ishihara, K. Kinoshita and K. Satoh</i>	433
Chapter 58	Development and physiological role of pituitary-gonadal function in the fetus and neonate <i>I. Huhtaniemi, P. Pakarinen and K.-L. Kolho</i>	441
Chapter 59	Peptide regulation of hormone production and growth in the primate fetus <i>R. B. Jaffe, J. J. Mulchahey, A. M. DiBlasio, M. C. Martin, Z. Blumenfeld and D. Dumesic</i>	447
Chapter 60	Growth factors and the fetoplacental unit <i>D. J. Hill</i>	455
Chapter 61	Endocrine control of hCG and hPL production by human placentas <i>S. Bélisle, D. Bellabarba and J.-G. Lehoux</i>	465
Chapter 62	<i>In vitro</i> techniques for the study of paracrine relationships between the trophoblast and the endometrium <i>A. Klover</i>	473
Chapter 63	Inhibins in human placenta <i>F. Petraglia</i>	477
Chapter 64	Collagen metabolism in pregnancy and parturition <i>U. Ulmsten</i>	481