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Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline: A Report of the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes and its Panel on Folate, Other B Vitamins, and Choline and Subcommittee on Upper Reference Levels of Nutrients Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodin ...

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of existing relationships between nutrition, age at menarche, and reproductive function. One flips back and forth between papers by Lipson and Vitzthum to try and work out the reasons behind their conflicting conclusions regarding the influence of condition and reproductive function. If assigned to students, both papers should be presented.

Addressing a critical question in our understanding of the evolution of human reproductive function (and of benchmarks by which to measure modern changes), Bentley et al. present a very thorough and engaging review of research regarding changes in fertility with the advent of agriculture. Combining paleodemography with ecological and ethnographic data, these authors consider maternal nutrition, weaning practices, disease loads, mortality patterns, and work loads. Although the constraints on identifying levels of infant mortality in paleodemographic studies are acknowledged, they conclude that a breadth of data indicate that agricultural populations experienced an environment selecting for early and high fertility associated with increased mortality of females and (at the least) older children than in preagricultural populations.

Ball and Panter-Brick emphasize the role of parental investment in mediating reproductive output in their review of the literature on maternal condition (physiological and social), breast-feeding (frequency, duration, and milk quality), and social interaction between mother and infant. Leidy Sievert reviews the endocrinology of reproductive senescence in humans with a focus on the nature and evolution of menopause. Her paper is best read along with that of Holman and Wood. Her conclusion that reproductive senescence is sex specific is uncontroversial, but the assertion that menopause is culture specific because there are demonstrable environmental influences on reproductive function is more problematic. Kaplan et al. present a more comparative summary of their "embodied capital theory of human evolution" model that may help explain why it is that humans have relatively low reproductive rates that are achieved via delayed first reproduction and prolonged intergenerational transfers of resources.

The comparative section provides succinct reviews of prosimian (Whitten and Brockman) and of New World monkey (Strier) reproductive ecologies, and a wide-ranging discussion of reproductive ecology in Old World monkeys (Bercovitch). Knott concludes the book with her review, *Female Reproductive Ecology of the Apes: Implications for Human Evolution*. The material is well organized and succinct. Knott uses captive and wild settings as alternative "ecological" states and supports an "ecological energetics model" to explain variation. She then lists a series of (purportedly) alternative

hypotheses from the literature and briefly presents her arguments against these. It is useful to have this series of hypotheses summarized and discussed even briefly rather than just cited.

The volume is a useful compendium of contemporary reviews and research reports of human reproductive ecology—heavily weighted toward the work produced by Ellison's Harvard laboratory and the energy balance hypotheses, with less attention to other regulatory mechanisms (such as suckling per se). It is rich in review material and in proposed heuristic models. The book is heartily recommended for graduate courses, and I will be using selections for upper-division undergraduate work. It is an excellent basis for broad discussions and suggestive of research topics for the next decade.

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DIETARY REFERENCE INTAKES FOR THIAMIN, RIBOFLAVIN, NIACIN, VITAMIN B<sub>6</sub>, FOLATE, VITAMIN B<sub>12</sub>, PANTOTHENIC ACID, BIOTIN, AND CHOLINE: A REPORT OF THE STANDING COMMITTEE ON THE SCIENTIFIC EVALUATION OF DIETARY REFERENCE INTAKES AND ITS PANEL ON FOLATE, OTHER B VITAMINS, AND CHOLINE AND SUBCOMMITTEE ON UPPER REFERENCE LEVELS OF NUTRIENTS.

*By the Food and Nutrition Board, Institute of Medicine. Washington (DC): National Academy Press. \$64.95 (hardcover); \$44.95 (paper). xxiii + 564 p; ill.; index. ISBN: 0-309-06411-2 (hc); 0-309-06554-2 (pb). 1998.*

DIETARY REFERENCE INTAKES FOR VITAMIN A, VITAMIN K, ARSENIC, BORON, CHROMIUM, COPPER, IODINE, IRON, MANGANESE, MOLYBDENUM, NICKEL, SILICON, VANADIUM, AND ZINC: A REPORT OF THE PANEL ON MICRONUTRIENTS, SUBCOMMITTEES ON UPPER REFERENCE LEVELS OF NUTRIENTS AND OF INTERPRETATION AND USES OF DIETARY REFERENCE INTAKES, AND THE STANDING COMMITTEE ON THE SCIENTIFIC EVALUATION OF DIETARY REFERENCE INTAKES.

*By the Food and Nutrition Board, Institute of Medicine. Washington (DC): National Academy Press. \$79.95 (hardcover); \$59.95 (paper). xxiii + 773 p; ill.; index. ISBN: 0-309-07290-5 (hc); 0-309-07279-4 (pb). 2001.*

These two volumes of information and ideas discuss needed human nutrients and the toxic effects of their overdoses. One book deals with diverse B vitamins; the other with two additional B vitamins and a long list of minerals. The beginning of each volume includes lengthy summaries of total content. Most separate chapters have summaries, and there are other helpful supplements to the chap-

ters, which are written by a diversity of experts. The chapters do not have separate authors or lists thereof, and it is clear that most are the product of many contributors. These volumes should be kept readily available at any institution dealing with medical or dietary topics.



### BIOMEDICAL SCIENCES

#### THE BODY ELECTRIC: AN ANATOMY OF THE NEW BIONIC SENSES.

By James Geary. *New Brunswick (New Jersey): Rutgers University Press.* \$27.00. ix + 214 p; ill.; index. ISBN: 0-8135-3194-2. 2002.

The author introduces readers to over 100 scientists and tinkers who are leading a revolution in human sensory enhancement. Their bold subjects have eagerly embraced fantastic new silicon creations, with aspirations ranging from restoration of sight to techno-sex. The most invasive and perhaps dramatic examples are devices for restoring vision, which gain access to the visual system through any and all entry points imaginable, including optic nerve cuffs, retinal or cortical implants, skin vibration-substitution, and laser projection onto the retina. The latter device, implemented at MIT as the "virtual retinal display," could eventually replace video screens, as users directly experience virtual worlds through camera eyeglasses.

Sections are included for each sense, with engaging titles such as A new world Odour, which describes the *Cyranose*, a device that smells complex scents, and transmits them electronically via media to distant human or robotic sniffers. Telephones thus could diagnose diseases such as asthma by the odor of breath. A nanodevice that reports tastes is described in the section A little taste of Texas. Some of the devices discussed are already indispensable for many people, including the cochlear implant for hearing restoration and the Freehand for restoring grasp to paralyzed arms. A chapter on the ultimate bionic invasions—intermingling of brain neurons with silicon—highlights the blurring of distinction between man and machine. Well-researched references are included. In this updated version of the "I Sing the Body Electric," Walt Whitman's "fool that corrupted his own live body" has become wise.

WILLIAM CRAELIUS, *Biomedical Engineering, Rutgers University, Piscataway, New Jersey*

ANNUAL REVIEW OF IMMUNOLOGY. *Volume 21: 2003.* Edited by William E Paul, C Garrison Fathman, and Laurie H Glimcher. *Palo Alto (California): Annual Reviews.* \$75.00. x + 955 p + 29 pl; ill.; subject index and cumulative indexes (contributing authors and chapter titles, Volumes 11–21). ISBN: 0-8243-3021-8. 2003.

#### VECTOR TARGETING FOR THERAPEUTIC GENE DELIVERY.

Edited by David T Curiel and Joanne T Douglas. *Hoboken (New Jersey): Wiley-Liss.* \$135.00. xviii + 710 p + 8 pl; ill.; index. ISBN: 0-471-43479-5. 2002.

Gene therapy holds a great deal of promise for the treatment of various life-threatening diseases despite the recent problems that have occurred in several clinical trials. This book is a comprehensive review of gene therapy, its potential, and its problems. Curiel and Douglas have gathered some of the world's foremost experts in the area of gene therapy to review this important field. In addition, there is a great deal of personal insight in many of the chapters that takes it beyond a simple textbook.

The volume begins with four chapters that review delivery of nucleic acids that utilize liposome complexes. The authors provide a guide to using liposomes, the initial toxicities earlier investigators were faced with in *in vivo* studies, as well as the ability to target liposome complexes. The second part of the book, Transductionally Targeted Vectors—Viral, is a comprehensive discussion of adenoviral, retroviral, and other novel live vectors that can be used for gene delivery. There are a number of chapters in Part II that were of particularly high quality, including Chapter 14 that has among its authors W French Anderson, one of the founders of gene therapy.

Finally, there are a number of chapters that focus on Transcriptional Targeting and Target Definition (Parts III and IV). Targeting is a topic that is addressed throughout this book. If gene therapy is going to work, along with suppressing the immune response to live vectors, targeting gene delivery is vital. The editors have put together an excellent book that is highly informative and can provide guidance to new scientists in the area of gene therapy, which still has many gains to be realized.

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ANNUAL REVIEW OF PHYSIOLOGY. *Volume 65: 2003.* Edited by Joseph F Hoffman and David L Garbers. *Palo Alto (California): Annual Reviews.* \$70.00. xiv + 936 p + 59 pl; ill.; subject index and cumulative indexes (contributing authors and chapter titles, Volumes 61–65). ISBN: 0-8243-0365-2. 2003.