

## Cobas E411

***In this issue of Clinics in Laboratory Medicine, guest editors Drs. Daimon P. Simmons and Peter H. Schur bring their considerable expertise to the topic of Detection of SARS-CoV-2 Antibodies in Diagnosis and Treatment of COVID-19. Top experts in the field cover key topics such as performance of central lab assays to detect SARS-COV-2 antibodies; alternative methods to detect SARS-CoV-2 antibodies; the role of antibodies in developing vaccines for COVID-19; SARS-COV-2 antibodies after immunization; and more. Contains 9 relevant, practice-oriented topics including disease-specific alterations in the cellular bases of the humoral immune response in COVID-19; coronavirus antigens as targets of antibody responses; approaches for SARS-CoV-2 antibody testing in a reference lab; use of IgM, IgA, and IgG in treatment and prognosis of patients with COVID-19; performance of lateral flow assays for COVID-19 serology; and more. Provides in-depth clinical reviews on detection of SARS-CoV-2 antibodies in diagnosis and treatment of COVID-19, offering actionable insights for clinical practice. Presents the latest information on this timely, focused topic under the leadership of experienced editors in the field. Authors synthesize and distill the latest research and practice guidelines to create clinically significant, topic-based reviews.***

***Electrogenerated chemiluminescence (ECL) is a powerful and versatile analytical technique, which is widely applied for biosensing and successfully commercialized in the healthcare diagnostic market. After introducing the fundamental concepts, this book will highlight the recent analytical applications with a special focus on immunoassays, genotoxicity, imaging, DNA and enzymatic assays. The topic is clearly at the frontier between several scientific domains involving analytical chemistry, electrochemistry, photochemistry, materials science, nanoscience and biology. This book is ideal for graduate students, academics and researchers in industry looking for a comprehensive guide to the different aspects of electrogenerated chemiluminescence.***

***The Guest Editors have assembled top international experts to present clinical reviews on the most current data being utilized in the diagnosis, treatment, and management of HBV. In fact, the most recent EASL meeting findings are included in many of the articles. Special focus is given to Results of Treatment of Chronic Hepatitis B with Pegylated Interferon; Impact of Therapy on the Long Term Outcome of Chronic Hepatitis B; HBsAg Quantification: Clinical; HBV Infection and Hepatocellular Carcinoma; HIV-HBV Co-Infection: An Update; Hepatitis Delta: The Rediscovery; and Treatment of Patients with HBV Related Decompensated Cirrhosis and Liver Transplanted Patients***

***This book is a printed edition of the Special Issue "Nutrition and Chronic***

**Conditions" that was published in Nutrients  
Advances in Clinical Chemistry  
Clinical Studies, Big Data, and Artificial Intelligence in Nephrology and  
Transplantation**

**Intracranial Pressure and Brain Monitoring XIV**

**Atlas of Thyroid and Neuroendocrine Tumor Markers**

**71st AACC Annual Scientific Meeting & Clinical Lab Expo**

The vitamin D is widely advertised as a solution for a large spectrum of diseases and health issues. Growing number of pharmaceuticals and supplements containing vitamin D, increasing availability of them in pharmacies, stores, online distribution and, sometimes, an intrusive commercial publicity campaigns have raised great interest, and have triggered reasonable controversies and fears. The self-administration of high doses of vitamin D has also appeared major concern in society. There is an increasing number of dilemmas regarding side effects including nephrocalcinosis, urinary stone disease, drug interactions and other adversity. On the other hand, it is recognized that vitamin D deficiency is a global health problem with potential negative consequences on health, welfare and morbidity during growth and adulthood, and therefore influencing health care services worldwide. According to current published reports, the vitamin D deficiency is regarded a significant risk factor for several civilization diseases including cancer, cardiovascular diseases, hypertension, autoimmune and metabolic disorders, infectious diseases and many other chronic conditions. Thus, it is essential to discuss vividly, and share scientific reports and evidence demonstrating both the safety issues and the significance of vitamin D for health of children, adolescents, middle-aged men and women, professionally active individuals, and seniors. This eBook is a collection of articles presented at the 3rd International Conference "Vitamin D - Minimum, Maximum, Optimum" (EVIDAS 2017) held in Warsaw (Poland) on September 22–23, 2017. EVIDAS (European Vitamin D Association) is a scientific society focused on vitamin D and its meaning for human health.

This volume presents the proceedings of the International Conference on Medical and Biological Engineering held from 16 to 18 March 2017 in Sarajevo, Bosnia and Herzegovina. Focusing on the theme of 'Pursuing innovation. Shaping the future', it highlights the latest advancements in Biomedical Engineering and also presents the latest findings, innovative solutions and emerging challenges in this field. Topics include: - Biomedical Signal Processing - Biomedical Imaging and Image Processing - Biosensors and Bioinstrumentation - Bio-Micro/Nano Technologies - Biomaterials - Biomechanics, Robotics and Minimally Invasive

*Surgery - Cardiovascular, Respiratory and Endocrine Systems  
Engineering - Neural and Rehabilitation Engineering - Molecular,  
Cellular and Tissue Engineering - Bioinformatics and  
Computational Biology - Clinical Engineering and Health  
Technology Assessment - Health Informatics, E-Health and  
Telemedicine - Biomedical Engineering Education - Pharmaceutical  
Engineering*

*Sanjeevani health, wellness, and fitness magazine is the first publication of TDO Nepal. With this newest member of the TDO Nepal family, we aim to reach more people with simple and accurate information. We are thankful to all our patrons and contributors. Edition: 1 Published Date: 15th July 2020 Table of Content: Cover Story: 1. Overview of health in Nepal 2. Covid-19 in Nepal, a summary of last three months 3. Fitness Trackers - Your mini personal trainers 4. God of Sight, Dr. Ruit Other Articles: 5. Interview with former Miss Nepal and her thoughts on healthy living 6. Acute Gastroenteritis 7. Garcinia Cambogia 8. Top Doctor speaks on food supplements 9. What is Uterine Prolapse? Its causes, symptoms & more 10. Top Doctor speaks on Uterine Prolapse 11. A checkup can tell your inside story 12. Health Astrology, 2020*

*Stemming from a 2012 conference entitled Brain Degenerations and Emerging Mental Health Challenges in Sub-Saharan Africa, this book is aimed at both the general practitioner interested in CNS disorders, and the specialist who would like to know more about CNS pathology in Africa. By employing a broad definition of what brain degeneration means, the authors are able to touch upon everything from dementias and CNS malignancy to traumatic brain injury and CNS infective processes. This book draws from and builds upon the original conference presentations, and incorporates the most up-to-date science behind brain degeneration as well as actual case reports. Each of the book's six sections offer the reader a deeper understanding of brain degeneration as it exists in Sub-Saharan Africa.*

*Biomarkers for Traumatic Brain Injury*

*Nutrition Support for Athletic Performance*

*Non-Infectious Complications of Primary Antibody Deficiency*

*Reproduction and the Inflammatory Response*

*Issue 19425 April 3, 2014*

***Biotin and Other Interferences in Immunoassays: A Concise Guide is aimed at clinical laboratory scientists, medical technologists and pathologists who are often the first individuals contacted by a clinician when a laboratory test result does not correlate with clinical presentation. Research scientists working in diagnostics companies will also find this information essential. Sources of errors in non-immunoassay based methods used in clinical chemistry and toxicology***

**laboratory are also discussed so readers can get all important information from one concise guide. This succinct, user-friendly reference provides the necessary information to address high levels of biotin in clinical laboratory results. Discusses issues of biotin interferences and ways to avoid them for accurate clinical laboratory results Provides sources of errors in non-immunoassay based methods used in clinical chemistry and toxicology laboratories Highlights how to handle specimens in the lab and how to eliminate the effect of biotin in precious samples**

**Nearly 80 short papers originating from the 14th International Symposium on Intracranial Pressure and Brain Monitoring held in Tuebingen, Germany, in September 2010 present experimental as well as clinical research data related to the naming topics of the conference. The papers have undergone a peer-reviewing and are organized in the following sections: methods of brain monitoring and data analysis, methods of invasive and non-invasive ICP assessment, the role of autoregulation, the role of tissue oxygenation and near-infrared spectroscopy, hydrocephalus/IIH imaging and diagnosis, management and therapy of hydrocephalus, management and therapy of traumatic brain injury, management and therapy of subarachnoid and intracranial hemorrhage, experimental approaches to acute brain disease. The book gives a good overview on the latest research developments in the field of ICP and related brain monitoring and on management and therapy of relevant acute brain diseases.**

**Written from the perspective of the diagnostician, this bestselling book is the definitive text on the laboratory diagnosis of human viral diseases. It contains a wealth of illustrations, tables, and algorithms to enhance your understanding of this ever-evolving field. The book is a ready reference for virologists, microbiologists, epidemiologists, laboratorians, and infectious disease specialists, and students.**

**The poster abstracts accepted for the 71st AACC Annual Scientific Meeting & Clinical Lab Expo. AACC is a global scientific and medical professional organization dedicated to clinical laboratory science and its application to healthcare. Our leadership in education, advocacy and collaboration helps lab professionals adapt to change and do what they do best: provide vital insight and guidance so patients get the care they need.**

**AACC 2015 Abstracts eBook**

**Nutrition and Chronic Conditions**

**Accurate Results in the Clinical Laboratory**

**Proceedings of the International Conference on Medical and Biological Engineering 2017**

**A Guide to Error Detection and Correction**

This book covers ACS and Heart Failure, the chapters represent the most current, up to date and knowledgeable content on the topic available. It is written by the worlds most respected leaders in biomarkers, with a majority emphasis on what clinicians need to know. The Editors and their contributors have provided algorithms, annotated case discussions and caveats. They cover biomarkers to predict risk of heart disease, biomarkers of cardiorenal disease , and conclude with a section on new and emerging biomarkers. It be genuinely helpful and practical to those in the field, including not just people working in the field, but nurses, doctors, etc who practice medicine in the clinic, the emergency department and the hospital.

Acute kidney injury (AKI) is a frequent clinical syndrome among hospitalized patients, independently associated with both short- and long-term mortality. Previous investigations attempted to identify effective interventions to prevent AKI or promote kidney function recovery in patients with AKI. Most were unsuccessful. Hence, additional studies are required in the field of AKI research. In this Special Issue, we are making a call to action to stimulate researchers and clinicians to submit their studies on AKI conducted in nephrology, internal medicine, critical care, and other disciplines that will provide additional knowledge and skills in the field of AKI research, ultimately to improve patient outcomes.

The Manual of Commercial Methods in Clinical Microbiology 2nd Edition, International Edition reviews in detail the current state of the art in each of the disciplines of clinical microbiology, and reviews the sensitivities, specificities and predictive values, and subsequently the effectiveness, of commercially available methods – both manual and automated. This text allows the user to easily summarize the available methods in any particular field, or for a specific pathogen – for example, what to use for an Influenza test, a Legionella test, or what instrument to use for identification or for an antibiotic susceptibility test. The Manual of Commercial Methods in Clinical Microbiology, 2nd Edition, International Edition presents a wealth of relevant information to clinical pathologists, directors and supervisors of clinical microbiology, infectious disease physicians, point-of-care laboratories, professionals using industrial applications of diagnostic microbiology and other healthcare providers. The content will allow professionals to analyze all commercially available methods to determine which works best in their particular laboratory, hospital, clinic, or setting. Updated to appeal to an international audience, The Manual of Commercial Methods in Clinical Microbiology, 2nd Edition, International Edition is an invaluable reference to those in the health science and medical fields.

Athletes and their support personnel are constantly seeking evidence-informed recommendations to enhance athletic performance during competition and to optimize training-induced adaptations. Accordingly, nutritional and supplementation strategies are commonplace when seeking to achieve these aims, with such practices being implemented before, during, or after competition and/or training in a periodized manner. Performance nutrition is becoming increasingly specialized and needs to consider the diversity of athletes and the nature of the competitions. This Special Issue, Nutrition Support for Athletic Performance, describes recent advances in these areas.

A Concise Guide  
Biotin and Other Interferences in Immunoassays  
Daily Graphic  
Cardiac Biomarkers  
Case Studies and Clinical Correlations

Cardiac biomarkers such as troponins and natriuretic peptides have made a great impact on clinical decision making as well as improving our understanding of molecular mechanisms of different disease conditions. However, the biomarkers that are currently in use do not reflect all the multiple disease pathways that are involved in a broad spectrum of cardiac disease conditions ranging from acute coronary syndrome, to heart failure (and heart failure with preserved ejection fraction, HFpEF), to pulmonary hypertension or arrhythmias. In this Special Issue, we will provide an overview of the current developments in the field of biomarker research, beginning with research on molecular pathways and cellular communication (e.g., microRNA) up to the clinical use of biomarkers.

Laboratory Assessment of Vitamin Status provides a comprehensive understanding of the limitations of commonly used approaches used for the evaluation of vitamin status, reducing harm in the general health setting. It outlines the application of "Best Practice" approaches to the evaluation of vitamin status, giving physicians and other healthcare professionals the opportunity to make evidence-based interventions. Nearly every metabolic and developmental pathway in the human body has a dependency on at least one micronutrient. Currently, the clinical utility of approaches taken by laboratories for the assessment of vitamin status is generally poorly understood, missing the opportunity to diagnosis vitamin deficiencies. This essential reference gives clinical and biomedical scientists an understanding of the limitations of commonly used approaches to the evaluation of vitamin status in the general health setting through change in practice. Nutritionists and dietitians gain an understanding of more sophisticated markers of vitamin status. Describes specialist assays in sufficient detail to enable laboratories to replicate what is being performed by expert groups Provides detailed information that supports laboratories in the setting up of methods for the evaluation of vitamin status Informs laboratories looking for third party providers of specialist investigations Provides an essential overview of reference ranges for each vitamin

The poster abstracts presented at the 68th AACC Annual Scientific Meeting & Clinical Lab Expo and published in *Clinical Chemistry*, Vol. 62, No. 10, Supplement, 2016.

*Accurate Results in the Clinical Laboratory: A Guide to Error Detection and Correction, Second Edition*, provides a comprehensive review of the factors leading to errors in all areas of clinical laboratory testing. This trusted guide addresses interference issues in all laboratory tests, including patient epigenetics, processes of specimen collection, enzymes and biomarkers. Clinicians and laboratory scientists will both benefit from this reference that applies discussions to both accurate specimen analysis and optimal patient care. Hence, this is the perfect reference for clinical laboratorians, from trainees, to experienced pathologists and directors. Provides comprehensive coverage across endocrine, oncology, hematology, immunohistochemistry, immunology, serology, microbiology, and molecular testing Includes new case studies that highlight clinical relevance and errors to avoid Highlights the best titles published within a variety of medical specialties Reviewed by medical librarians and content specialists, with key selections compiled in their annual list

*Growth of the Medical Tourism Industry and Its Impact on Society: Emerging Research and Opportunities*

*Vitamin C in Health and Disease*

*Henry's Clinical Diagnosis and Management by Laboratory Methods E-Book*

*Lenette's Laboratory Diagnosis of Viral Infections, Fourth Edition*

CMBEBIH 2017

This book is a printed edition of the Special Issue "Vitamin C in Health and Disease" that was published in *Nutrients*

Healthcare and medical services have seen rapid development in various areas of the world, including Asia and Eastern Europe. These territories are now becoming a medical hub for many surrounding countries. Medical tourism is the practice of traveling to international regions for treatment that isn't available locally. This subject has gained significant attention throughout the tourism industry, as researchers and professionals are searching for specific advancements of medical care and hospital development in numerous countries. Growth of the Medical Tourism Industry and Its Impact on Society: Emerging Research and Opportunities is a collection of innovative research on the methods and advancement of medical travel for treatment in various global regions and provides insights for the growth prospects of the medical tourism business. While highlighting topics including destination branding, community impact, and hospital management, this book is ideally designed for medical executives, hospital directors, researchers, policymakers, academicians, practitioners, scholars, and students seeking current research on tourism practices within the medical field.

In recent years, artificial intelligence has increasingly been playing an essential role in diverse areas in medicine, assisting clinicians in patient management. In nephrology and transplantation, artificial intelligence can be utilized to enhance clinical care, such as through hemodialysis prescriptions and the follow-up of kidney transplant patients. Furthermore, there are rapidly expanding applications and validations of comprehensive, computerized medical records and related databases, including national registries, health insurance, and drug prescriptions. For this Special Issue, we made a call to action to stimulate researchers and clinicians to submit their invaluable works and present, here, a collection of articles covering original clinical research (single- or multi-center), database studies from registries, meta-analyses, and artificial intelligence research in nephrology including acute kidney injury, electrolytes and acid-base, chronic kidney disease, glomerular disease, dialysis, and transplantation that will provide additional knowledge and skills in the field of nephrology and transplantation toward improving patient outcomes.

In complex systems, such as our body or a plant, the host is

living together with thousands of microbes, which support the entire system in function and health. The stability of a microbiome is influenced by environmental changes, introduction of microbes and microbial communities, or other factors. As learned in the past, microbial diversity is the key and low-diverse microbiomes often mirror out-of-control situations or disease. It is now our task to understand the molecular principles behind the complex interaction of microbes in, on and around us in order to optimize and control the function of the microbial community – by changing the environment or the addition of the right microorganisms. This Research Topic focuses on studies (including e.g. original research, perspectives, mini reviews, and opinion papers) that investigate and discuss:

- 1) The role of the microbiome for the host/environmental system
- 2) The exchange and change of microbes and microbial communities (interplay)
- 3) The influence of external factors toward the stability of a microbiome
- 4) Methods, possibilities and approaches to change and control a system's microbiome (e.g. in human or plant disease)
- 5) Experimental systems and approaches in microbiome research.

The articles span the areas: human health and disease, animal and plant microbiomes, microbial interplay and control, methodology and the built environment microbiome.

Microbiome Interplay and Control  
Laboratory Assessment of Vitamin Status

## Diets, Foods and Food Components Effect on Dyslipidemia Peripheral Nerve Imaging

The 2021 AACC Annual Scientific Meeting & Clinical Lab Expo showcased cutting-edge science and technology shaping the future of laboratory medicine. Dyslipidemia, and particularly hypercholesterolemia, remains a main cardiovascular disease risk factor, partly reversible with the improvement of life-style, including dietary, habits. Even when a pharmacological treatment is begun, dietary support to lipid-lowering is always desired. This book will provide a selection of new evidence on the possible lipid-lowering effects of some dietary and medicinal plant components, reporting some interesting reviews, experimental data and results from clinical trials. The book is adapted for experts in nutrition but also for all scientists involved in cardiovascular disease prevention. This book highlights the increase in thyroid tumors and NET and demonstrates the growing importance of circulating markers in diagnosis as well as treatment and follow-up. Dramatic technical improvements have heightened the clinical impact of well-established, conventional biochemical markers. In addition, more recent genetic and molecular approaches have provided innovative molecular markers. In this context, effective communication between clinicians and laboratory

physicians/scientists is essential in allowing all those involved to fully profit from these exciting advances. In this comprehensive, up-to-date book, authors from different laboratory and clinical areas link laboratory and clinical topics. Analytical problems such as interferences, false-negative and false-positive results are discussed in depth, and flow-charts offer insights into identifying and avoiding them. Illustrated clinical cases detail the clinical role and limitations of different tumor markers. Lastly, it explores health technology assessment and economic issues. This is a valuable resource for endocrinologists, oncologists, nuclear medicine physicians, scientists and technologists who want to keep abreast of the latest developments.

Biomarkers for Traumatic Brain Injury provides a comprehensive overview on the selection and implementation of serum-based and saliva-based biomarkers for traumatic brain injury. The book presents an economic analysis for implementing TBI biomarkers into clinical practice. In addition, it discusses the analytical tools needed to implement TBI biomarkers, including specifications for testing instruments and interpretative software. Neurologists, emergency department physicians, intensivists, and clinical laboratorians will find this book a great resource from which to familiarize themselves with the issues and processes regarding TBI biomarkers. Approximately 2 million people in the U.S. sustain a traumatic brain injury (TBI) each year with over 250,000 hospitalizations and 50,000 deaths. There has been a significant rise in interest in diagnosing mild concussions, particularly in the sports world. While imaging has been the gold standard, these procedures are costly and not always available. There is great potential in using serum-based biomarkers, hence the book seeks to enlighten readers on new possibilities. Offers strategies for the selection and implementation of traumatic brain injury biomarkers Discusses the importance of autoantibodies and post translational modifications for TBI Covers the analytical tools needed to implement TBI biomarkers, including the specifications for testing instruments and interpretative software

Detection of SARS-CoV-2 Antibodies in Diagnosis and Treatment of COVID-19, An Issue of the Clinics in Laboratory Medicine, E-Book

Manual of Commercial Methods in Clinical Microbiology

68th AACC Annual Scientific Meeting Abstract eBook

Sanjeevani - December 2020 Edition (English)

2021 AACC Annual Scientific Meeting & Clinical Lab Expo

Advances in Clinical Chemistry, Volume 82, the latest installment in this internationally acclaimed series, contains chapters authored by world-renowned clinical laboratory scientists, physicians and research scientists. This updated volume includes chapters on Calcium and Bone Metabolism Indices, Cytokines and MicroRNA in Coronary Artery Disease, Biological and molecular characterization of circulating tumor cells: A creative strategy for precision medicine?, Towards a blood-borne biomarker of chronic hypoxemia: Red cell distribution width and respiratory disease, miRNAs: nanomachines that microManage the pathophysiology of Diabetes mellitus, and Fortilin, A Potential Target for the Prevention and Treatment of Human Diseases. The serial discusses the latest and most up-to-date technologies related to the field of clinical chemistry, and is the benchmark for novel analytical approaches in the clinical laboratory. Provides the most up-to-date technologies in clinical chemistry and clinical laboratory science

Authored by world renowned clinical laboratory scientists, physicians and research scientists Presents the international benchmark for novel analytical approaches in the clinical laboratory

Recognized as the definitive book in laboratory medicine since 1908, Henry's Clinical Diagnosis and Management by Laboratory Methods, edited by Richard A. McPherson, MD and Matthew R. Pincus, MD, PhD, is a comprehensive, multidisciplinary pathology reference that gives you state-of-the-art guidance on lab test selection and interpretation of results. Revisions throughout keep you current on the latest topics in the field, such as biochemical markers of bone metabolism, clinical enzymology, pharmacogenomics, and more! A user-friendly full-color layout puts all the latest, most essential knowledge at your fingertips. Update your understanding of the scientific foundation and clinical application of today's complete range of laboratory tests. Get optimal test results with guidance on error detection, correction, and prevention as well as cost-effective test selection. Reference the information you need quickly and easily thanks to a full-color layout, many new color illustrations and visual aids, and an organization by organ system. Master all the latest approaches in clinical laboratory medicine with new and updated coverage of: the chemical basis for analyte assays and common interferences; lipids and dyslipoproteinemia; markers in the blood for cardiac injury evaluation and related stroke disorders; coagulation testing for antiplatelet drugs such as aspirin and clopidogrel; biochemical markers of bone metabolism; clinical enzymology; hematology and transfusion medicine; medical microbiology; body fluid analysis; and many other rapidly evolving frontiers in the field. Effectively monitor the pace of drug clearing in patients undergoing pharmacogenomic treatments with a new chapter on this groundbreaking new area. Apply the latest best practices in clinical laboratory management with special chapters on organization, work flow, quality control, interpretation of results, informatics, financial management, and establishing a molecular diagnostics laboratory. Confidently prepare for the upcoming recertification exams for clinical pathologists set to begin in 2016.

Thyroid function tests are utilized by essentially all medical practitioners, across every clinical setting, in patients from newborns to the elderly. They are the most frequently measured endocrine tests. The sensitive thyrotropin (TSH) assay reflects thyroid hormone feedback to the pituitary, and is diagnostic of both thyroid hormone excess as well as deficiency. The log-linear relationship between serum TSH and thyroxine concentrations means that small changes in serum thyroxine are amplified by changes in serum TSH. The availability of the sensitive TSH assay in essentially all clinical laboratories has improved and simplified the assessment of thyroid function for the diagnosis of thyroid disease and to monitor treatment. Serum free thyroxine and thyrotropin concentrations, as well as other thyroid tests, can be measured utilizing an automated immunoassay platform that provides rapid and accurate results. This simplified approach to thyroid assessment, often requiring only a serum TSH measurement, and rapid availability of the thyroid function

tests results, has expanded the scope of thyroid testing and clinicians ordering and interpreting thyroid tests. There remain, however, many challenges in selecting the appropriate thyroid function test to order, the correct interpretation of results, and applying these results to the diagnosis and management of thyroid diseases. It is especially important to be aware of limitations of thyroid function tests, as well as special clinical circumstances that can influence thyroid function measurements. The serum TSH concentration, for example, may not accurately reflect thyroid status in many situations including after prolonged hyperthyroidism when serum TSH remains suppressed for months, in the presence of hypothalamic or pituitary disease, or due to a number of interfering medications. The serum free thyroxine, measured by the analog method, is not accurate with high or low serum binding proteins and during pregnancy. Hospitalized patients often have thyroid function test abnormalities that are transient and return to normal after recovery from the acute illness. Iodine excess and deficiency can dramatically influence thyroid function tests. Significant insights have been gained into the regulation of thyroid hormone synthesis and especially the role of thyroid hormone metabolism in supplying tissues locally with an adequate supply of thyroid hormone. In a number of instances, these factors influence the selection and interpretation of thyroid function tests. Polymorphisms, common sequence variations, in genes of components that regulate thyroid function and thyroid hormone action may also contribute to variability in thyroid function tests in a population.

v vi Preface

This volume draws on an outstanding international panel of experts in thyroid function tests and thyroid function assessment. They represent clinicians, clinical researchers, and basic science researchers, all with a focus on some aspect of the assessment of thyroid function. The chapters all provide a clinical perspective, but are informed by the most recent scientific advancements. The first section of the book (Chaps. 1-3) presents the most recent advances in thyroid physiology, a review of genetic influences on thyroid function tests, and a discussion on the influence of iodine on thyroid function. In Chap. 1, Drs. Huang and de Castro Neves describe thyroid hormone metabolism, emphasizing the key role of thyroid hormone activation and inactivation in thyroid hormone action. Dr. Visser is a world leader in studies of thyroid metabolism and genetic influences on thyroid function. In Chap. 2, Dr. Visser and his colleagues, Drs. van der Deure, Medici, and Peeters, provide a clear view of this important and rapidly expanding field. The population variation in the TSH "set point" (relationship between serum TSH and thyroxine in an individual), for example, is thought to be genetically determined, and influences the evaluation of thyroid function and thyroid function targets for treatment of thyroid disease. Dr. Zimmerman, an internationally recognized expert in iodine, and his colleague, Dr. Andersson, provide in Chap. 3 an in-depth treatment of the most significant influence on thyroid function throughout the world—iodine intake. The influence of iodine deficiency and excess on individual thyroid function is discussed, as well as the population effects on t-

roid diseases and especially fetal and neonatal development. The basics of thyroid function measurements, approaches, limitations, and clinical applications are described for the major categories of thyroid function tests (Chaps. 4-7). The authors of these chapters are innovators in the field, strongly identified with the origination or significant refinement of the core tests utilized in thyroid assessment. In Chap. 4, Dr. Hershman describes the measurement of TSH, the clinical application and utilization. This remains the cornerstone of thyroid testing, but must be interpreted with an understanding of the dynamics of thyroid regulation. An active controversy in thyroid measurement involves the appropriate use of serum thyroxine measurements and especially the value of the analog free thyroxine measurement, the most commonly used thyroxine assay. In Chap. 5, Dr. Stockigt provides a detailed assessment of thyroxine and triiodothyronine measurements and a clear message for their use and limitations. The most common etiology of thyroid disease is autoimmune, and the appropriate use of thyroid autoantibody measurements remains confusing to many clinicians. In Chap. 6, Dr. Weetman and his colleague, Dr. Ajjan, clearly describe the range of thyroid autoantibody tests and how they should be utilized clinically. Thyroglobulin measurement is the key tumor marker to follow thyroid cancer patients and Dr. Spencer and her colleague, Ivana Petrovic, describe the essential features of this measurement in Chap. 7. It is essential that clinicians using thyroglobulin measurements to monitor thyroid cancer are aware of the performance of the assay being used and the factors that can interfere with the measurement. Application of thyroid function testing to the key clinical settings is discussed by expert clinicians and clinical researchers in Chaps. 8-13. The appropriate selection of thyroid function tests in the diagnosis and monitoring of thyroid disease in the ambulatory setting is discussed by Drs. Farwell and Leung in Chap. 8. This is the most common setting for thyroid function test measurement and a rational approach is described. Specific issues of thyroid function in infants and children are discussed in Chap. 9 by Drs. LaFranchi and Balogh. Screening for thyroid disease among newborns has been a highly effective approach to prevent mental retardation. The assessment of thyroid function in newborns, especially premature infants, is challenging as are the interpretation of thyroid function tests in infancy through childhood. Illness has a significant impact on thyroid function tests and assessment in this group is described by Drs. LoPresti and Patil in Chap. 10. A logical approach to these patients is provided as are ways to identify those patients with thyroid disease that need to be treated. Assessment of thyroid function in pregnancy is challenging and is being increasingly recognized as a crucial time to normalize maternal thyroid status. Adverse outcome for mother and her child can result from thyroid hormone deficiency or excess. In Chap. 11, Drs. Lazarus, Soldin, and Evans carefully describe the use and limitations of thyroid tests in pregnancy and provide an approach to testing and monitoring thyroid function. The incidence of autoimmune thyroid disease increases significantly with age and in

Chap. 12 Dr. Samuels provides a clear approach to the assessment of thyroid status in the elderly and interpretation of thyroid studies. The influence of drugs on thyroid function testing remains a major clinical issue with recognition of an ever increasing list of medications that influence thyroid function and thyroid testing. In Chap. 13, Drs. Pearce and Ananthakrishnan comprehensively describe these medications with a special emphasis on their mechanism of action and on iodine-containing medications. I am most grateful to my colleagues for their enthusiasm and willingness to provide such outstanding contributions to this book. The editorial team at Springer is excellent and has been highly supportive and effective. My special thanks to Editor Laura Walsh, Associate Editor Dianne Wuori, Editorial Assistant Stacy Lazar, Senior Production Editor Jenny Wolkowicki and Crest Premedia Solutions for final production.

This eBook is a collection of poster abstracts presented at the AACC 2015 Annual Meeting. As the leading event for laboratory medicine worldwide, the AACC Annual Meeting & Clinical Lab Expo is the place where breakthrough innovations in clinical testing and patient care are introduced to the healthcare world.

Emerging Research and Opportunities

Novel Biomarkers for Heart Disease

Thyroid Function Testing

Autoimmune Thyroid Pathology - Specificity of the Pediatric Age

Analytical Electrogenenerated Chemiluminescence