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IFCC'S CALENDAR OF CONGRESSES, CONFERENCES & EVENTS

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Here we are again, dear colleagues, with a new issue of the eNews.

A lot of interesting information about Bioethics, a hot topic regarding science nowadays or about big data can be found in this issue.

We hope, you found the occasion to know better Professor Adeli and his successor in the previous issue.

You have the opportunity to learn about Edgard Delvin’s charismatic leadership in this issue by his committee colleagues. His successor presentation is also there for you to see.

Our younger colleagues, IFCC’s future, are also presented.

News from the national societies may offer you some glimpse of their accomplishments.

Thanking you again for your contribution and looking forward to an even better collaboration.

Katherina Psarra

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News from the IFCC Website

EuroMedLab Video - Why attend EuroMedLab Barcelona 2019?

Outstanding plenary lectures and educational sessions addressing important topics in Laboratory diagnostics in health care and research. "Whatever our field of laboratory medicine or work environment, it is important that we regularly come together to discuss, debate and decide on the best practice for laboratory medicine to improve the quality of healthcare for our patients and our communities" - H. Morris, IFCC President. "Laboratory Medicine has always been the cross-sectional discipline setting the pace for progress in many areas of modern medicine by thoroughly implementing analytical innovation and professional practice in the medical diagnostic laboratory, and she will continue to do so in the future" - M. Neumaier, EFLM President. Watch the IFCC video on YouTube!

Read more
Nilda E. Fink

The X CALILAB Congress organized by Fundación Bioquímica Argentina (FBA) is a Congress on Quality in the clinical laboratory and was held in the Convention Center of the city of Buenos Aires from 24 to 27 October 2018. The Congress covered a variety of subjects such as Biosafety, Quality in Clinical Biochemistry, Histocompatibility and Genetics, genomics and other relevant topics in the Clinical Laboratory.

Taking into consideration the IFCC recommendation to include activities on Ethics in every Congress, a symposium on “Bioethics and clinical cases related to pediatric laboratory” was included.

The presentation was given by Dr. Graciela Queiruga, member of the Board of Faculty of Chemistry at the University of the Oriental Republic of Uruguay, former President of COLAbiocli and SLEIMPN. Dr. Queiruga introduced the basics on Bioethics defined as the systematic study of human behavior in the field of life sciences and health care, examined in the light of values and moral principles (Encyclopedia of Bioethics, 4th Ed. Macmillan Reference USA, 2014). She pointed out that the word Bioethics has been used since the early 1970s, and is considered as the ethical concepts of medicine which seeks to offer to the patient justice and equal access to care. She remarked that the beneficence and autonomy of the patient must always be in mind of those dedicated to the task of alleviating suffering and illness.

She also emphasized that the natural limits of technical actions done by the human being are more and more imprecise, therefore, moral limits are needed more than ever. It is necessary to harmonize the amount of scientific information that presents ethical dilemmas and the need to be raised to the level of the international scientific community, in order to ensure respect for human life in the field of scientific research.

Dr. Queiruga pointed out that Pediatric Laboratory Medicine is an excellent field to apply the four principles of Ethics (Autonomy, Justice, Beneficence and Non-maleficence). For instance, an excellent example of the application of the principles of Bioethics is a national, free and mandatory program of Neonatal Screening that could detect a disease in time to treat and avoid mental retardation, neurological sequelae or death itself.

In a program that reaches all babies born in her country, Uruguay, without distinction of the place of birth, the principle of justice is applied. The resolution of the Health authority that makes the early detection of certain diseases obligatory enables them to take samples without need for consent or autonomy and

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by Nilda E. Fink
Chair IFCC Task Force on Ethics (TF-E)
Departamento de Ciencias Biológicas,
Facultad de Ciencias Exactas,
Universidad Nacional de La Plata,
La Plata - Argentina

Article continued on next page
the procedure harmlessness is an example of non-maleficence.

Dr. Queiruga mentioned that Medicine’s goals have moved from an approach aimed at disease diagnosis and treatment to disease prediction and prevention.

Millions of newborns are screened per year in the world; as an example 4,000,000 children are screened in USA for more than 50 diseases (29 central and 25 secondary diseases). The MsMs spectrometry has allowed these investigations in a single run with a single drop of blood.

WHO states that the screening should be mandatory and free of charge if early diagnosis and treatment benefit the newborn (Kerruish NJ, Robertson SP. 2005 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1734185/).

During her presentation Dr. Queiruga reviewed the most relevant international documents in the field such as the Universal declaration of bioethics and human rights UNESCO, 2005 https://unesdoc.unesco.org/ark:/48223/pf0000142825.page=80.

She accepted that not everything is beneficial and that there are still controversies and difficulties. The possibility of false negatives, as well as cut-off points definition and performance of external and internal quality controls should be a concern of laboratorians. On the other hand, false positives cause stress to the parents when a new sample is requested. The program must control that they are within reasonable margins, trying not to increase costs with many useless examinations.

During her presentation, four cases from her own experience were discussed based on the concept that deliberation is the best methodology to manage and resolve ethical quandaries.

She also pointed out that while residual samples are potentially a huge data bank for research purposes, the laboratory must be very careful to protect the identity of patients and the samples should only be used for charitable purposes.

Finally, she stressed that a Neonatal Screening governed by the principles of Bioethics can be an immense contribution to the quality of life.

The IFCC-Abbott Visiting Lecturer Programme
A tool to facilitate the international exchange of knowledge

by Nader Rifai
IFCC VLP Chair
Department of Laboratory Medicine,
Boston Children’s Hospital, MA, USA

With the generous support of Abbott Diagnostics, the IFCC Visiting Lecturer Programme (VLP) has been a flagship project and a highly successful effort to promote knowledge exchange in laboratory medicine throughout the world.

IFCC Member societies can apply for the VLP to obtain funding so prominent experts can visit and lecture in their countries or regions. Visiting lecturers are required to make at least two presentations usually one as a plenary lecture and the other as an interactive workshop on a topic of interest to the hosting country.

During the past three years (2016-2018), a total of 36 applications were awarded. They were submitted from a variety of regions including:

- 11 from Africa and the Middle East
- 11 from Latin America
- 10 from Asia
- 4 from Europe

The topics covered by the VLP include:

- Analytical Quality
- Laboratory management
- Laboratory accreditation
- The value of laboratory medicine in healthcare
- The role of global standardization
- Harmonization of laboratory practice and methods
Details of the VLP may be found at www.ifcc.org, following the link to the Education and Management Division.

Prof. Nader Rifai

PROF. NADER RIFAI, IFCC VLP CHAIR, EXPLAINS THE PROGRAMME TO THE READERS

• What are the objectives of the VLP and how does it work?

The VLP’s main goal is to facilitate the transfer and exchange of knowledge in laboratory medicine throughout the world. The programme helps to bridge the gap in the practice of laboratory medicine among the various world regions to improve the delivery of healthcare. National societies can apply for the VLP to invite recognized experts to their countries or regions to lecture and/or conduct workshops on topics of local interest. The VLP covers the cost of air travel while the host society covers the rest of the expenses such as accommodation, meeting registration fee, meals, and local transportation. The application process is very simple and the forms can be easily downloaded from the IFCC website.

• Describe the selection process and criteria for acceptance

Upon receipt of an application, the IFCC staff evaluates it for completeness and the appropriateness of the budget then forward it to the VLP committee for input. The committee members evaluate the proposal and vote on the approval of each application. Each invited expert is expected to give at least two presentations, in the form of a lecture or a workshop. Speakers are instructed to tailor their presentations to meet local needs. Furthermore, in order to promote and enhance the IFCC e-Academy, the invited speaker may be asked to record a 20-minute lecture on the presented topic. This effort will help to enrich the e-Academy and provide an excellent resource for learning to IFCC members.

• How do you evaluate the success of this program?

We have recently modified our evaluation forms to better capture the feedback from the inviting national society regarding the VLP process and from the attendees regarding the quality of the speakers and presentations as well as the appropriateness of the meeting place. The feedback we have been receiving has been very positive.

• What is your vision for this programme?

As indicated above, this programme has been made available through the generous support of Abbott Diagnostics, for which we are eternally grateful. Based on the great success of this programme in 2018, Abbott had increased its level of support for 2019 to enable more societies to take advantage of this opportunity. The combination of the IFCC e-Academy and the VLP provides a powerful educational tool. I would like to see a richer, more comprehensive, and curriculum-based e-Academy that provides the needed lectures with the VLP focusing more on interactive workshops for knowledge and “how to” transfer and to train local talents to conduct similar workshops regionally.
Leadership basics for clinical laboratory professionals

C-CLM brings in a new manual to prepare laboratory leaders

by Sedef Yenice
C-CLM Chair

Most of us think we have a well-run laboratory because we have lots of resources such as guidelines, organizational policies, standard operating procedures, quality indicators, quality controls and all types of measurable data that help us manage and navigate through challenges we face on a daily basis. We also attempt to perfect our laboratory practice by means of in-services and inspections of all types, having continuing education, seminars, professional gatherings and meetings for all sorts of laboratory-related issues.

Furthermore, we feel confident using mobile phones and tablets, computers and the internet or other contemporary technologies. We also make good use of software, websites, and other electronic tools to help form our opinions or facilitate our work. But, do we pay close enough attention to the day-to-day routine? For instance, do we achieve co-operation through teamwork, do we emphasize common goals, establish self-confidence in others through talents promotion, do we encourage initiatives, lead towards the best utilization of manpower – through motivation, do we develop good human relations, improve morale and overcome resistance to change? Or more importantly, do we analyze our effectiveness, or do we ensure that what we are doing is really working?

As laboratory directors, we must make sure we devote enough quality time with the people who make our laboratories tick. They are the laboratory office clerks, phlebotomists, medical laboratory assistants and medical laboratory technologists at various stations throughout our laboratory, and they help make it sure that it runs smoothly and safely around the clock. They are the people that we cannot do without. As we all know, if it were not for these hard-working, dedicated professionals, our laboratories would be a chaotic place.

However, do these individuals work hard but not smartly enough? And how can we find that out? Such barriers become so much a part of our daily routine that we stop noticing them.

The success of organizational strategies is essentially dependent on an effective leadership strategy. Compiling the best players for a team is no guarantee for success without a great coach. Good leadership strategy ensures effective work teams.

Recognizing that these are the challenges most of us face, the Committee on Clinical Laboratory Management (C-CLM) aims to support clinical laboratory professionals to discover their leadership strengths and to help them reach the highest summits in work success. The Manual on “LEADERSHIP BASICS FOR CLINICAL LABORATORY PROFESSIONALS” is one installment towards achieving these goals.

This manual also complements the C-CLM Clinical Laboratory Leadership Certificate Program and it is part of the reading list for this program.

We promote six leadership pillars towards business and personal success including:

- demonstrating social intelligence;
- adopting a flexible leadership style;
- empowering others;
- developing trust;
- managing risks in an environment of uncertainty;
- seeing the big picture.

Article continued on next page
LEADERSHIP BASICS FOR CLINICAL LABORATORY PROFESSIONALS

These strengths provide a valuable model in the clinical laboratory workplace, whether one is already in a leadership position or aspiring to get there.

According to James Nichols from Vanderbilt University Medical Center, “Management training is as much art as science. We all struggle with how to teach management. There is no book you can go to and say, ‘This is the Bible of management, and if you read this, you have good management skills.’”

In accordance with this statement we have worked on the chapters of this manual in order to cast light on the major points, with a focus on the significance of leadership in medical laboratory management. This manual is simple, to the point and it offers direct information. The concepts discussed are beneficial to all laboratory management levels with sound advice about working with teammates. The leadership basics presented in this manual will make you reevaluate how you work towards a change.

It’s an easy read we would recommend to anyone in the laboratory medicine world. Each chapter presents the most important facts and concepts related to the subject area. The chapters address topics such as defining laboratory medicine leaders, effective leadership styles, skills/qualities of a good leader, the leader as a visionary and a motivator, work culture, and ethics in leadership. In addition, the assessment tools provided in the appendices are designed to provide readers with insight for the selection of the best leadership model, when starting to manage new people, selecting which leadership style to use and providing insight on the motivation level of persons under one’s authority.

All contributing authors have reflected on their own professional excellence in their chapters, being educators and outstanding professionals in the laboratory medicine field.

According to Keith Davis, “Leadership is the ability to persuade others to seek defined objectives enthusiastically. It is the human factor which binds a group together and motivates it towards goals”.

For many laboratory professionals, leadership skills and style develop out of mentoring by senior scientists, managers, and directors within the workplace. While there are clear benefits from sound mentoring, bad habits and ineffective behavior and strategies can also be adopted. Good mentoring alone is insufficient to offer good leadership skills, calling thus on the need for structured training, and guidance. This manual addresses this gap by providing instructional material to help the leaders in laboratory medicine toward more effective leadership strategies and practices.

We wish to thank the authors for their willingness to contribute to this publication and we hope that it is both educational and of practical use for chairs and managers.

“The greatest leader is not necessarily the one who does the greatest things. He is the one that gets the people to do the greatest things.” – Ronald Reagan

Prof. Dr. Sedef Yenice
C-CLM Chair
Istanbul Bilim University, Turkey

The Manual is downloadable at:
The new IFCC Committee on Bone Metabolism (C-BM) is now on its wheels!

by Etienne Cavalier  
Chair, IFCC Committee on Bone Metabolism

The new IFCC Committee on Bone Metabolism (C-BM) results from the merge of three different IFCC working groups, namely on PTH (Chairwoman: Dr. Catharine Sturgeon), vitamin D (Chairman: Dr. Christopher Sempos) and bone markers (Chairman: Dr. Etienne Cavalier) standardization.

The Chairmanship of this new Committee has been given by the IFCC Scientific Division Executive Committee to Etienne Cavalier (Belgium) for two years.

The members of this committee’s board have just been elected and are:
- Dr. Annemieke Heijboer (The Netherlands),
- Dr. Candice Ulmer (USA),
- Dr. Samuel Vasikaran (Australia) and
- Dr. Harjit Pal Bhattoa (Hungary).

They will be helped in their new tasks by Drs. Sturgeon, Sempos and Vesper (consultants), Dr. Konstantinos Makris (IFCC SD liaison), National and IVD representatives.

The terms of reference for the new committee include the standardization/harmonization of PTH, vitamin D metabolites and bone markers assays.

Indeed, the lack of standardization amongst these assays results in important issues potentially leading to different clinical decisions.

The details of the projects of the C-BM can be found on the IFCC website http://www.ifcc.org/ifcc-scientific-division/sd-committees/c-bm/.

In short, we aim to promote the use of commutable international standards, reference measurement procedures, accuracy-based external quality assessment schemes and performance guidelines for standardized methods. The C-BM will also try to find partnerships with clinical societies to involve clinicians in the process. We are already proud to announce that this committee will be a joined committee with the IOF (International Osteoporosis Foundation).

The C-BM will have its first official meeting during the Euromedlab 2019 event in Barcelona on May 20th.

From a personal perspective, I am really proud to lead such a talented team and I would like to thank Professor Morris, Professor Gillery and the IFCC office for their confidence, as well as our corporate partners for their support.

Etienne Cavalier, PharmD, EuSpLM, PhD  
Professor of Clinical Chemistry  
University of Liège, CHU de Liège  
Belgium
News from the IFCC Website

The electronic Journal of IFCC (eJIFCC) now fully indexed in MEDLINE/PUBMED

IFCC announces that the Electronic Journal of IFCC (eJIFCC) has completed indexing of all issues in MEDLINE/PUBMED. All issues of the journal are indexed and searchable, downloadable, citable from PubMed.

“This is an important step forward for IFCC as PubMed indexing significantly improves access to eJIFCC articles and promotes IFCC internationally. Thanks to the many that contributed to this important achievement”.

eJIFCC has seen a major improvement in both scientific content and publication format over the past few years again thanks to tireless efforts of current and past editors and the Editorial Board.

Click here to access eJIFCC issues archived in PubMed Central

News from the IFCC Website

eJIFCC Vol 30 n°1 - February 2019

The first issue of eJIFCC for 2019 is now available.

It includes articles on: recent tests that have revolutionized clinical practice, a Nepal experience on factors affecting turnaround time in the clinical laboratory, studies on sodium ion interference in hemolysis, prevalence of anemia and associated factors among hospitalized children, a study on waist circumference cutoff point determination for defining metabolic syndrome in type 2 diabetes mellitus in Ethiopia, a report on critical issues and new trends on stat tests in clinical laboratory, and articles on Diamond Blackfan Anemia and on Gaucher disease. Three case reports complete the issue.

Read more

News from the IFCC Website

EuroMedLab News

The third issue of EuroMedLab News is available on the website of the 23rd IFCC-EFLM European Congress of Clinical Chemistry and Laboratory Medicine to be held in Barcelona (ES) from 19 to 23 May 2019. Download your copy now to learn everything you need to know how to benefit fully from your participation in the congress!

Read more
IFCC: THE PEOPLE

Welcome and thanks to the Chairs

FAREWELL EDGARD DELVIN

Edgard Delvin, chaired the IFCC Committee for Public Relations (C-PR) as well as being Vice-Chair of the CPD-EC. Prof Edgard Delvin has been Editor-in-chief of the IFCC eNewsletter from 2006 till 2012, and Chair of the IFCC Working Group WE-News.

After obtaining a PhD degree in Biochemistry at the University of Montreal, Dr. Delvin pursued his post-doctoral training in Biochemical Genetics at the Montreal Children’s Hospital (McGill University).

In 1973 he joined the Shriners Hospital for Children, affiliated to McGill University, where he became senior investigator and Associate Director of the Genetics Unit as well as being Associate Professor in the Department of Experimental Medicine.

In 1992, the University of Montreal recruited him to chair the Department of Clinical Biochemistry at the University-affiliated Sainte Justine Hospital. He also was appointed as full Professor of Biochemistry in the Department of Biochemistry of the Faculty of Medicine.

After his retirement in 2012 he acted as consultant for the Montreal Children’s Hospital, affiliated with McGill University until 2014. He has served on the Paediatric Endocrinology Teaching Program of the University of Montreal until August 2012.

Prof. Edgard Delvin receiving an appreciation plaque for his role as C-PR Chair by Prof. Howard Morris, IFCC President

Article continued on next page
After being Editor-in-Chief of the Journal of Clinical Biochemistry from 2006 to 2012, he is now the Special Issues Editor.

He has authored or co-authored 245 articles, published in internationally recognized journals, and 9 book chapters. In 2003 he received the research Excellence Award from the Canadian Society of Clinical Chemists, and he is a Member of the French Académie Nationale de Médecine.

Some words by his colleagues within the C-PR

Dear Edgard,

As your term as C-PR has recently come to a close, I would like to take this opportunity to thank you for your hard work and commitment in building and growing our Committee to what it is today. Over the last years, your leadership of C-PR has been characterized by not only many creative ideas, but most valuable, your tireless efforts to increase the visibility of the role of IFCC in the regional and international space.

More personally, since I know you from my first days in IFCC, you were not only a brilliant chair, a real leader and mentor, but also a true friend. Always kind, cheerful and willing to help.

It is my great pleasure to thank you for your great job and for everything you have accomplished in your term as C-PR Chair. I wish you all the very best in your future. We will all miss you, Edgard!

Dr. Magdalena Krintus (PL)

I have worked with Dr. Edgard Delvin, in the Public Relations Committee.

He has led this group for the last 6 years. His warmth as a human being and his knowledge have made possible for people from different continents to work together in an atmosphere of absolute camaraderie, seeking solutions and trying to bring the advances in our profession through the effort of the IFCC to all corners of the planet.

I deeply thank Dr. Delvin for allowing me to broaden my experience with issues related to the dissem-
inatation of fundamental concepts for Biochemistry.
Thank you very much, dear Edgard.

Dr. Monica Spalvieri (Argentina)
---------------------------------------------------------

Dr. Edgard as Chairman of C-PR interacted well with members and encouraged full participation in all activities of the Committee. His leadership role was very good. I like to congratulate and wish him well in his next assignment.

Dr. Emanuel O. Agbedana (Nigeria)
---------------------------------------------------------

Dear Edgard,
Thank you so much for showing us the way how to be a gentle and at the same time efficient leader. Your gentleman manners should be an example to all the scientists. The accomplishment of your constant efforts have definitely helped IFCC world and our profession to be more visible and understood.

I wish all the best to you and your family.

Dr. Katherina Psarra (Greece)
---------------------------------------------------------

WELCOME RAJIV ERASMUS

Rajiv Erasmus, MBBS,FMC.Path(Nig), FWACP, DABCC (Am Board Certified), DHSM(Natal), FCPath(SA), is the new chair of the IFCC Committee on Public Relations.

Professor Rajiv Erasmus obtained his early education in India, Malaysia and Ghana and obtained his medical and specialist degrees from Nigeria. He subsequently moved to the University of Papua New Guinea, Port Moresby, Papua New Guinea in 1988.

In 1994 he was appointed as Professor and foundation head of the department of Chemical Pathology (Clinical Biochemistry) at the University of Transkei, Mthatha, South Africa.

In 2002 he became the head of Chemical Pathology at Stellenbosch University, Cape Town, South Africa and executive head of Pathology in 2013 and is currently an Emeritus Professor.

He has been a research fellow at the department of Pathology, University of Virginia Health Sciences Centre, Charlottesville, USA (1993) and more recently (2014) at Karolinska Institute, Stockholm, Sweden.

Professor Erasmus is a founder member of the College of Pathologists of East, Central and Southern Africa (COPECSA) and its current vice president. He has been the secretary of the South African Federation of Societies of Pathology (FSASP) since 2011.

Professor Erasmus is interested in the epidemiology of diabetes mellitus and associated cardiovascular risk, laboratory and quality management, point of care testing (POCT) and more recently in the role of bio-banking in personalized medicine. In 2011 he set up the first integrated laboratory management training program in Africa, which has been embraced by
If you are interested, please refer to your National Representative or Corporate Representative for information on procedures for nominations. To find your representative, click here.
Team is described simply as “a group of people who are working through collective endeavour toward a common goal”. Successful teams can help transform an organisation, increase output and offer new objectives. 

**IFCC** initiated Task Force - Young Scientists (TF-YS) in 2010 with the aim to ensure that young scientists make a significant and growing contribution to the activities of IFCC and other National programmes.

IFCC-TF-YS was proved able to cross the barrier and created a strong young scientist support group involving 47 members globally.

Modern information technology & social media (24/7 Facebook, Twitter, Linked In and others) are used to establish networks and to facilitate the communication. As such, TF-YS partnered with other National and International societies to deliver educational workshops,

TF-YS members:
(L-R) Danni Li (US), member until Dec 2018; Santiago Fares Taie (AR); Pradeep Kumar Dabla (IN), TF-YS Chair; Damien Gruson (BE), TF-YS consultant; Omolara Olutosin Popoola (NG), member until Dec 2018; Miljan Savkovic (SRB), member until Dec 2018, Guilaine Boursier (FR)

TF-YS is working with commitment to help the new generation facing challenges in the field of laboratory medicine.

TF-YS is thankful to our outgoing members Danni Li, Omolara Olutosin Popoola, Miljan Savkovic and appreciate all their efforts as Team members. We wish them success for their new ventures.

TF-YS WELCOMES OUR NEW CORE MEMBERS

Giulia M. Sancesario (IT), University Hospital of Tor Vergata, Rome, Italy, Chair of Italian Society of Clinical Biochemistry and Clinical Molecular Biology (SIBioC) Working Group of Young Scientists (YS-WG).

My current research is in the field of translational medicine, in the discovery and validation of novel biomarkers in complex diseases.
Since 2017 I have been the Chair of the SIBioC Young Scientists working group (SIBioC-YS). Promoting the development of cooperation mechanisms and training programs among young specialists in laboratory medicine is a fundamental challenge for scientific societies. Furthermore, the strength of young scientists is a precious resource that must grow.

**Joe El-Khoury (US),** Co-Director of the Clinical Chemistry laboratory and fellowship program at Yale-New Haven Health and Assistant Professor of Laboratory Medicine at Yale University in New Haven, CT, USA.

His research interests include mass spectrometry methods, pre-analytical errors, as well as the markers of kidney disease.

**Ashlin Rampul (ZA),** is training to become a chemical pathologist and he is a registrar/resident in Chemical Pathology in the department of Chemical Pathology, University of Pretoria and National Health Laboratory service.

He holds a Bachelor of Medical Science Hons degree (cum laude) and a Bachelor of Medicine, Bachelor of Surgery degree (MBChB) (equivalent to US MD degree). He holds various leadership positions within his community. His major interests are to extend the mentorship programme across the African continent especially because of the great need to develop science in disadvantaged communities within the African continent.

We hope to achieve new success stories with “TEAM TF-YS”.


Thanks,
Dr. Pradeep KUMAR DABLA
IFCC TF-YS Chair
Professor, Department of Biochemistry,
G.B. Pant Institute of Postgraduate Medical Education & Research (GIPMER), India
Artificial Intelligence, open digital resources and open science

by Bernard Gouget
Chair, IFCC Committee on Mobile Health and Bioengineering in Laboratory Medicine (C-MHBLM)
SFBC-International Committee
General Secretary of the International Francophone Federation of Clinical Biology and Laboratory Medicine (FIFBCML)
Counselor for Public Health-FHF
Chair, Human Health Care Committee-COFRA-C

Updating and improving the interpretation of images, predicting treatment response, drawing on genetic data to better understand disease, developing predictive and preventative medicine via genome sequencing algorithms, building data bases of previously inaccessible wealth, all things that Artificial Intelligence (AI) was made possible via improving computer calculation capacities and the progress on the part of AI, using neural networks and their ability to learn.

Digital transformation has become an essential lever for the transformation of the health system and the increase of efficiency and quality.

This revolution assumes quick renewal of health professional training and practice. It simultaneously poses technical and technological challenges due to the volume of data, ethical and legal challenges to protect personal data and especially the challenge of trust to persuade and overcome reluctance.

AI has become everyone’s business. Digital technology allows a collaborative approach and better information, available everywhere, at any time. The capacities of the laboratory medicine specialist are increased. They are better equipped to analyze and make decisions, closer to the patient and to the professionally great days to come.

The challenge is to truly improve diagnostic strategies and therapeutic choices and to be more available to the patient and clinician at the same time. In the past, it was necessary to consult a collection of works before issuing a hypothesis, producing data and finally analyzing them. Today, the logic is reversed: we try to make sense of a gigantic set of data as well as test their meaning. The paradigm is evolving, and an awareness is needed on the part of biologists and researchers: that of understanding new issues arising from big data and their various aspects. Analyzing these data is complex and requires specific interdisciplinary expertise. AI is done with trained brains, so the training of a new generation of scientists with a “health-mathematics” interface becomes a major challenge as much as the need for large high-performance storage and computing centers, platforms whose role is not just
to host and archive data but also to ensure the standardization thereof.

Digital technology in general will transform the working methods of the youngest and oldest researchers alike. We no longer have to pay to access scientific articles. The open access movement is trying to remedy this by putting forth a model where scientific articles are accessible to everyone. Open science is linked to a generational change. Digital technology takes on an increasingly important role in the collection of research processes and in the researcher’s workflow.

We slowly arrive at a general movement of researchers training in open science, big data and open data. On the European scale, there is the Foster initiative (Facilitate Open Science To European Research) which seeks to establish training in this field. Open science presents various aspects: free access to scientific publications (open access), open data, open source software and participative and contributive research. For example, the accessibility of software whose development cost is sometimes exorbitant allows also non-researchers to be involved. This concept is encompassed by a particularly attractive term for young generations: open science, open data and open knowledge. This open spirit and culture also aligns the role and participation of patients in their care pathway and research processes. Open science is therefore a particularly broad concept that allows rallying a large number of stakeholders. Open data is part of this. Big data, in return, is not necessarily open.

The question is knowing whether open means better science. Each emergent practice brings its own economic challenges with potential detours. Open data obviously poses ethical questions from the angle of personal data. Open access is a new market, facing challenges of information quality and new quality control protocols remain to be created. Open science certainly aims for a greater efficacy and a better idea of science.

Currently all countries that wish to be included in innovation are developing AI programs. Data has become a major player for understanding, anticipating and resolving major political, economic, social and scientific issues. Data also transform our professional practices, our cultural environment, the way we live our daily lives, even going as far as restructuring our way of thinking.

Science is a common good and a factor for collective enrichment that we should share as widely as possible. It has become vital to generalize open access to publications, to structure and open up research data when it is reasonably compliant with legal and ethical requirements and to be part of a sustainable European and international dynamic. Open science is not a technical evolution, but a profound paradigm change, which involves changes at different levels of scientific processes, both upstream and downstream. It constitutes an opportunity to improve research itself as well as its collaborative aspect and its relationship with society. Open science is the ideal vehicle for knowledge in the face of rumors!
UNIFY FOR SOMETHING GREATER

Announcing the 1st Annual UNIVANTS of Healthcare Excellence Award, celebrating teams of UNIFIERS who have applied AVANT-GARDE approaches to achieve measurably better healthcare outcomes.

Learn more and apply for the UNIVANTS of Healthcare Excellence Award at UnivantsHCE.com.
WORK CONFERENCE AND SEMINAR, SANUR DENPASAR BALI, 19-21 JULY 2018

“DRIVING IMPACTS IN LABORATORY MEDICINE”

After the completion of the Human Genome Project, the diagnosis and treatment of various diseases began to enter a new stage, namely Next Generation Medicine based on Precision Medicine. All medical aspects, including the clinical laboratory are required to follow these developments.

These changes include exploration and development of various new biomarkers based on genomics, transcriptomics or proteomics as well as refinement of the inspection methodology for the implementation of improved Quality Assurance qualifications as good laboratory standards.

The Indonesian Association for Clinical Chemistry, as a forum for experts who have clinical chemistry competency in developing laboratory aspects, has the responsibility to initiate and participate in this change in Indonesia.

For this reason, it has been necessary to organize a work conference with symposia and workshops, in order to mediate, initiate and synchronize the renewal of knowledge by various experts from across Indonesia.
In the work conference, we held symposia and workshops where the development of issues on reproduction, infections, geriatrics and oncology and various other disciplines were discussed in line with the renewal of diagnosis and treatment based on Next Generation Medicine.

SEMINAR AND WORKSHOP MOLECULAR DIAGNOSTIC - JAKARTA, 30 NOVEMBER 2018

IACC in cooperation with Indonesian Association of Clinical Pathologist and Laboratory Medicine (IACP) held a Seminar and Workshop on Molecular diagnostics with Applications of PCR to Infection and Cancer. The Seminar participants were around 100 people, Clinical Pathologist Doctors, Lab Scientists and Medical Technologists. The Workshop participants were 26 people.

Seminar: Basic Molecular Diagnostics
Moderator: Dr. Sri Hartini, SpPK(K), MARS
1. Introduction to Molecular Diagnostics: From Cell to DNA
   Speaker: Dr. Lyana Setiawan, SpPK
2. The Key Concept of Nucleic Acid Extraction
   Speaker: Dr. Yusra, SpPK, PhD
3. Conventional and Real Time PCR
   Speaker: Dr. Dennis Jacobus, SpPK
4. Application of PCR in Infectious Disease
   Speaker: Dr. Dewi Lokida, SpPK
5. Application of PCR in Cancer
   Speaker: Dr. Demak L Tobing, SpPK
6. Standardization and Quality Control in Molecular Diagnostics
   Speaker: Miswar Fattah, SSi, MBiomed, PhD

Workshop
1. Introduction
2. DNA Isolation
3. RNA Isolation
4. Automatic RNA extraction and PCR
5. HPV genotyping
6. Interpretation of Real-Time PCR Results

WORKSHOP TOTAL VALUE OWNERSHIP

IACC held a Workshop on Laboratory Management with the topic “Total Value Ownership”. The speaker was Patrick Gontard Group CEO, Labexa Group, France; CEO and Founder, Gontard and Cie, Switzerland. The Workshop was held in cooperation with Abbott Diagnostics in Jakarta. We invited some Clinical Laboratory CEOs, COOs and Managers to discuss about business aspects of Clinical Laboratory.

In today’s healthcare environment, leaders are increasingly asked to demonstrate value in terms of operational and clinical care excellence across their healthcare institutions. The clinical laboratory is viewed as an important contributor to key performance indicators,
and as a result, laboratory managers want to maximize the value that the laboratory brings to their institutions.

The concept of Total Value of Ownership (TVO) considers all aspects of a laboratory’s processes and equipment and identifies areas where improvements can be made to maximize value. When the laboratory delivers services to its full potential, it can help improve outcomes system-wide, enabling the institution to make a positive impact on patient outcomes.

The MACB organised an APFCB-MACB Statistics Workshop on 14th January 2019 in Premiera Hotel, Kuala Lumpur. Lectures were delivered by Dr. Tony Badrick from Australia and Dr. Loh Tze Ping from Singapore. Topics covered were basic statistics, linear regression, method evaluation, uncertainty of measurement, reference intervals, six sigma, diagnostic sensitivity and specificity. The workshop was attended by 150 local participants. The workshop received very good feedback from participants.

The MACB also organised the APFCB-MACB Chemical Pathology Course on 15-16 January 2019 in Premiera Hotel, Kuala Lumpur. The course is an intermediary course in Chemical Pathology and it is the third in the series. The course was coordinated by Dr. Tony Badrick, Chair of the APFCB committee for Education and Laboratory Management and consists of lectures and case studies. Topics covered were bone and mineral markers, cardiac markers and CVD, pituitary function, liver disease, reproductive hormones,

News from the Malaysian Association of Clinical Biochemists (MACB)

APFCB-MACB Statistics Workshop
14 January 2019 – Kuala Lumpur, Indonesia

by Raja Elina Raja Aziddin
MACB President
IFCC MACB National representative
Drug & Research Lab, Pathology Department
Kuala Lumpur, Malaysia

Participants at the APFCB-MACB Statistics Workshop on 14th January 2019 in Premiera Hotel, Kuala Lumpur

Article continued on next page
prolactin and macro prolactin, enzymes, HCG measurement, GIT function, chromatography, pre-analytical factors affecting test results, interferences in immunoassay, circulating DNA, nucleic acid techniques, natriuretic peptide, biological investigation of abnormal growth, urine and fluid analysis. Lectures were delivered by Dr. Tony Badrick (Australia), Dr. Loh Tze Ping (Singapore) as well as local speakers including Assoc. Prof. Dr. Asmah Hamid, Prof. Pavai Sthaneswar, Prof. Dr. Nor Fadilah Rajab, Malarvili Ramachandran, Dr. Nurul Farhana Jufri, Raja Dr. Elina Raja Aziddin and Dr Farah Wahida Ibrahim. The course was attended by 120 local participants. Participants found the course very informative and beneficial and have requested a similar course to be conducted next year.

News from the IFCC Website

The IFCC C-CB Tables

The IFCC Committee on Clinical Applications of Cardiac Bio-Markers (C-CB) has updated the set of tables on the analytical characteristics of contemporary, point of care (POC) and high sensitivity (hs) cardiac troponin I and T assays, as well as natriuretic peptide assays. The IFCC C-CB plans to update these tables quarterly. The cardiac troponin tables are referenced in the Fourth Universal Definition of Myocardial Infarction (2018) recommendations paper.

Read more
The Technology Award of Japan Society of Clinical Chemistry (JSCC) is given annually to companies who have made progress in clinical chemistry. Four winners received the JSCC Technology Award in 2018. The award presentation ceremony was held at the 58th Annual Meeting of JSCC in Nagoya, Japan, on August 24-26, 2018. During the presentation, the award recipients were congratulated by Dr. Masato Maekawa, president of JSCC for their contribution to the advancement of clinical chemistry.

In this issue, we would like to introduce briefly the winners of the JSCC Technology Award and their outstanding work.

Kaori Morota, PhD, works in Scientific Affairs, Abbott Japan Co., Ltd. The title of her awarded work is “Development and clinical application of AKI biomarker urinary NGAL”. Acute kidney injury (AKI) is a syndrome which has a broad range of etiologic factors depending on different clinical settings. Because AKI has significant impacts on prognosis in any clinical setting, early detection and intervention is necessary to improve the outcome of AKI patients.

Urinary neutrophil gelatinase-associated lipocalin (NGAL) is a useful biomarker for early diagnosis of AKI, differentiation of pre-renal AKI from renal AKI, and prediction of the AKI severity and mortality. In the clinical performance evaluation with Japanese patients admitted to the intensive care unit (ICU), urinary NGAL values of the AKI patients on admission were significantly higher than those of non-AKI patients. Since urinary NGAL test was covered by public insurance in February 2017, its clinical application has been started mainly at emergency department, ICU, and division of nephrology and metabolism. By deciding treatment approach for AKI patients based on urinary NGAL value in conjunction with other data such as symptoms and results of other tests, it would be expected in the future to reduce length(s) of hospital stay and ICU stay, and to improve renal outcome and mortality.

Naofumi Yoda, MS works in the Scientific Marketing Department, LSI Medience Corporation. The title of his awarded work is “Development of the rapid assay system of presepsin, a sepsis biomarker using CLEIA technology”. Sepsis is organ dysfunctions caused by infectious diseases and early detection and prompt treatment are encouraged by the guidelines. Because blood culture test, which is thought as a gold standard of infections, is of low sensitivity and time-consuming, a new biomarker for early diagnosis of sepsis had been long awaited. Presepsin is a novel sepsis biomarker, found in Japan, whose concentration in blood is increased specifically in sepsis patients. In vitro experiments showed that phagocytosis without any gene expression is one of the production mechanisms of presepsin, which explained the prompt elevation of presepsin after the onset of infection. The reagent of presepsin for the PATHFAST, a compact automated instrument has been developed.

This reagent makes it possible to measure presepsin i) with high sensitivity, ii) easily, iii) at bed side, iv) in a very short time (within 17 min). PATHFAST Presepsin was approved in Japan with a reimbursement in 2014, and it is recommended to be measured for severe stage patients as an aid of diagnosis of sepsis in the latest version of Japanese guidelines for sepsis (Strength of recommendation: 2B). PATHFAST Presepsin is now used in countries all over the world, including some Asian countries. This rapid assay system of
presepsin is expected to contribute for decreasing mortality caused by sepsis.

**Tomohide Tsuda**, PhD and **Xiuri Jin**, PhD work in the Immunology and MDx Unit, R&D Center, Shino-Test Corporation. The title of their awarded work is “Development of novel methodology and assay systems for protein S.” Protein S deficiency is classified into three types, all of which are risk factors for venous thromboembolism (VTE) in Japanese people. Among the three types of protein S abnormalities, type II deficiency is characterized by a normal level of protein S and reduced levels of protein S activity. Approximately 2% of the ethnic Japanese population carries a genetic mutation known as protein S-Tokushima, a variant showing decreased activity as a cofactor of activated protein C. This mutation is a major cause of type II deficiency. Because these carriers are more likely to develop VTE than non-carriers, according to their odds ratios of 3.7–8.6, measurement of protein S may be a useful diagnostic tool for VTE risk assessment. However, accurate diagnosis of type II deficiency has proven difficult by conventional methods. Recently, Tsuda et al. developed assay systems for total protein S activity and total protein S mass. These assays reveal the specific activity of protein S, enabling detection of type II protein S deficiency. The specific activity of protein S is determined as the ratio of total protein S activity to total protein S mass, and type II deficiency is known to show a low specific activity.

Using their novel method, 57 patients with various clinical backgrounds were analyzed for their specific activities and the cut-off value, calculated from the receiver operating characteristic (ROC) curve, was 0.78. When healthy volunteers were screened, 6 of 238 individuals showed specific activities below the cut-off value. After obtaining consent, two of these individuals were subjected to further genetic analysis, which revealed the protein S-Tokushima variant.
Furthermore, when 19 individuals with a confirmed Tokushima variant gene were tested, the specific activities of all subjects were less than 0.78. Analysis of protein S specific activity can be used to detect protein S-Tokushima with high sensitivity and specificity. Because VTE is life-threatening, understanding the risks of individuals, especially borderline populations such as pregnant women and perioperative patients, and taking preventive measures for them are important. It is also important to ensure rapid diagnosis and treatment for VTE patients. New diagnostic kits for evaluating the specific activity of protein S specific can be used to screen easily and quickly not only for abnormalities in protein S activity and mass, but also for mutations such as protein S Tokushima in the routine setting of clinical testing. This system can be clinically applied for the prevention, diagnosis, and intervention of VTE.

Satoshi Kojima, PhD works in the CL New Product Develop Department, FUJIREBIO INC. The title of his awarded work is “Development of Lumipulse 25-OH Vitamin D.” 25-OH vitamin D (25-OHD) assay is widely used for the monitoring of the status for vitamin D in human blood. Immunoassays are routinely used for the quantification of 25-OHD in each hospital or clinical laboratory today. FUJIREBIO INC. developed a fully automated 25-OHD immunoassay, “Lumipulse G 25-OH Vitamin D” based on novel non-competitive immunoassay. Sandwich assay has theoretically advantages of specificity and/or sensitivity against conventional competitive format. However, a competitive assay on the detection of hapten molecules is generally chosen because of the circumvention of steric hindrance of two antibodies. They established a quite unique anti-metatype antibody, which recognizes the immunocomplex between 25-OHD and its monoclonal antibody. The use of this antibody permitted to construct the non-competitive assay for the detection of 25-OHD.

The assay showed good performance regarding sensitivity and reproducibility in wide range. Moreover, the measurement value was well correlated with ID-LC-MS/MS, recognized as a reference measurement procedure by the JCTLM. The conventional assay for hapten molecule sometimes limits the dynamic range, accuracy or reproducibility. The use of an anti-metatype antibody might achieve sustainable performance improvement.
Vincent Delatour (LNE, France) discussed the need for commutable certified reference materials to be used in EQA schemes and Marc Thelen (SKML, Netherlands) showed their multi-sample approach.

Anja Kessler (Referenzinstitut for Bioanalytik, Germany) analysed the present and future of EQA and Hassan Bayat (Shahid Beheshti University of Medical Sciences, Iran) instructed the participants on the Max E(Nuf) quality control model and the need of understanding the required frequency in the laboratories QC planning.

New acquaintances were made during the breaks and especially at the get together cocktail party after the first day. It was nice to see busy mingling taking place and to hear the vivid discussions between the lecturers and the participants painting mental pictures of the quality control procedures of the future.

On the second day, the topics and the discussion moved towards future and new solutions around Digital Health.

Anu Jalanko (Institute for Molecular Medicine, Finland) showed how genomic information is utilized now and how it should be used in the future and Markus Perola (National institute for Health and Welfare, Finland) gave examples of scientific discoveries encouraged by the Finnish biobank.

Also new information and experiences regarding fast fluid exchange technology was shared with the audience by Saska Brajkovic, representing Lunaphore Technologies SA.

Sten Westgard took the floor for the second time to describe the quite unbelievable case of the rise and fall of a 9-billion-dollar diagnostic disrupter company.

Vilmundur Gudnasson (University of Iceland) showed information on the new risk assessment tools to identify individuals with atherosclerotic disease and the last session was presented by Sami Blom (Fimmic, Finland) about the empowering tool, deep learning AI offers to the pathologists.

To summarize the two successful days, the lectures were of excellent scientific quality and the audience also had the privilege to hear the presenters in a panel discussion about quality control, which was held on the first day. The speakers’ calibre was impressive and they gave their insights in great detail into upcoming changes in laboratory segments quality in the near and further future.
3rd and 4th SERbian Biomarker Symposium (SERBIS 2018) (www.serbis.rs) with the overall theme ‘Men’s and Women’s Health: Biomarkers in Clinical Practice and Future Approaches’ was held on 5 - 8 June 2018 in Belgrade (Serbia).

This international symposium was organized by the Center for Medical Biochemistry and Serbian Society for Clinical Laboratory Medicine and Science (SCLM), supported by several Serbian clinical societies. It was organized under the auspices of IFCC, EFLM, ESPT, Ministry of Health and Ministry of Education, Science and Technological Development of Republic of Serbia, and under honorary patronage of TRH Crown Prince Alexander and Princess Katherine Karadjordjevic. The four days symposium included 30 foreign (from 17 different countries) and 30 Serbian expert speakers who presented their lectures and it was attended by 1702 health care professionals from Serbia and abroad.

This international symposium was arranged to bring together clinicians, clinical chemists, biologists, pathologists, geneticians, scientists, to bridge clinical and laboratory work, emphasizing the importance of teamwork and interactions between professionals of various disciplines involved in improving women’s and men’s health across their life cycle and to build a partnership based on a common goal-reducing morbidity, improving patient care and increasing life span, brightening the health futures for women and men in the 21st century.

The symposium was inaugurated by the SCLM President and symposium director Asst. Prof. Sanja Stankovic. The official opening included a welcome address by Prof. Howard Morris-IFCC President, SERBIS honorary presidents Prof. Philippe Gillery (FRA) and Prof. Mauro Panteghini (ITA), a welcome on behalf of the Ministry of Health Republic of Serbia, Serbian Health Council, and Serbian Academy of Sciences and Arts.
The greatest honour to the SERBIS 2018 was made by the attendance and addressing of HRH Crown Princess Katherine of Serbia during the opening ceremony. In the end of the opening ceremony, charter award and the statue of SERBIS 2018 was delivered to the honorable Presidents of the SERBIS 2019, Prof. Howard Morris (AUS) and Prof. Joris Delanghe (BEL), in recognition of their outstanding contribution toward the success of this symposium, followed by a show by the most famous Serbian dance troupe, Una Saga Serbica.

By combining well-known folk rhythms, words, notes, colours and people, Una Saga Serbica presented in a unique way, the beauty of the Balkans, its history, heritage, culture and generated a new local culture and a new form of artistic communication.

With such a momentous opening ceremony, it was clear that the SERBIS2018 was going to be packed full of inspiring, field-changing advances from the laboratory medicine sphere.

Four days programme, divided into 13 sessions, provided participants with an overview of the impact of biomarkers and genomics on the current state of men’s and women’s health. Lectures covered following topics: male and female infertility, IVF, non-invasive prenatal testing, critical, evidence-based look at the efficacy of new biomarkers for preeclampsia and how they are challenging medical practice, pregnancy health, neonatal screening, bone diseases, women’s cancers (breast, ovarian and cervical cancer), benign/malignant prostate disease and testicular cancer, menopause, and differences in risk between males and females for shared diseases (cardiovascular disease, diabetes, etc.).

For the first time, in 2018, SERBIS introduced practical sessions, rediscovering laboratory and clinical aspects of urinalysis through the world-famous experts’ lectures, who covered preanalytics in urinalysis, the urine sediment and practical teaching, urinary flow cytometry analysis and specific urinary proteins.

The symposium was finished by unravelling taboos. During SERBIS, breaking taboos session participants listened about gender identity disorder form, the interface of systems medicine and sexual medicine for facing non-communicable diseases in a gender-dependent manner and Emotional intelligence: Men vs. Women.

In addition to exhibition booths by companies working in laboratory medicine, the scientific programme of the congress was diverse and included workshops and lectures covering various topics in laboratory medicine.

With the idea to support education and expanding the horizons of colleagues who work in the field, in the closing ceremony, a clinical chemist - lucky winner of SERBIS2018, was awarded with the registration fee for the EuroMedLab 2019.

SERBIS 2018 was a great success! We hope to see you all again on SERBIS 2019 on March 26-28, 2019! Outspoken, adventurous, proud and audacious Belgrade (‘White City’) waits for you with its gritty exuberance that makes it one of Europe’s most full of events cities.
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
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<tr>
<td>May 19 - 23, 2019</td>
<td>XXIII IFCC - EFLM EuroMedLab</td>
<td>Barcelona, ES</td>
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<tr>
<td>Sep 10 - 13, 2019</td>
<td>COLABIOCLI Regional Congress 2019</td>
<td>Panama, PA</td>
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<td>Sep 26 - 28, 2019</td>
<td>AFCC Regional Congress</td>
<td>Marrakesh, MA</td>
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<td>Nov 17 - 20, 2019</td>
<td>APFCB Regional Congress 2019</td>
<td>Jaipur, IN</td>
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<td>May 24 - 28, 2020</td>
<td>XXIV IFCC WorldLab</td>
<td>Seoul, KR</td>
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<tr>
<td>May 16 - 20, 2021</td>
<td>XXIV IFCC - EFLM EuroMedLab</td>
<td>Munich, DE</td>
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### Calendar of events with IFCC auspices

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<th>Date</th>
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<tr>
<td>Feb 23 - Dec 31, 2019</td>
<td>Bolivian Continuing Education Program (PROBOECO) of the Bolivian Society of Clinical Biochemistry</td>
<td>Different cities, BO</td>
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<tr>
<td>Mar 13, 2019</td>
<td>Conducting Research in Laboratory Medicine - An Online Interactive Session with Experts</td>
<td>Karachi, PK</td>
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<td>Mar 14 - 16, 2019</td>
<td>VIIIth Congress of the Syndicate of Clinical Biologists of Lebanon, VIIIth Days of the International Francophone Federation of Clinical Biology and Laboratory Medicine</td>
<td>Beirut, LB</td>
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<td>Mar 15 - 17, 2019</td>
<td>XXII Congreso Nacional para el Análisis de la Garantía de la Calidad en el Laboratorio Clínico</td>
<td>San Juan del Río, Querétaro, MX</td>
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<tr>
<td>Mar 21 - 23, 2019</td>
<td>Annual academic sessions for doctors and workshop on medical laboratory science</td>
<td>Colombo, LK</td>
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<td>Mar 22 - 23, 2019</td>
<td>5th EFLM European Conference on Preanalytical Phase “Preanalytical Challenges - time for solutions”</td>
<td>Zagreb, HR</td>
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<td>Mar 28 - 29, 2019</td>
<td>XVII Meeting of the SEQCML Scientific Committee</td>
<td>Madrid, ES</td>
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<td>Apr 4 - 5, 2019</td>
<td>10th European Symposium on Clinical Laboratory and In Vitro Diagnostic Industry: 'The Clinical Laboratory in the Pregnancy Monitoring'</td>
<td>Barcelona, ES</td>
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<td>Apr 5, 2019</td>
<td>Cardiac Marker Dialogues</td>
<td>Glasgow, UK</td>
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<td>Apr 11 - 12, 2019</td>
<td>The 15th Belgrade Symposium for Balkan Region</td>
<td>Belgrade, SRB</td>
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<td>Apr 18 - 21, 2019</td>
<td>The 12th International &amp; 17th National Congress on Quality Improvement in Clinical Laboratories</td>
<td>Tehran, IR</td>
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<td>Apr 19 - 20, 2019</td>
<td>International Congress of Laboratory Medicine in Kazakhstan</td>
<td>Almaty City, KZ</td>
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<tr>
<td>Apr 25 - 27, 2019</td>
<td>32th Biology National Days</td>
<td>Hammamet, TN</td>
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*Calendar continued on next page*
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<th>Date</th>
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<tr>
<td>May 1 - 3,  2019</td>
<td>Focus 2019 – Annual Meeting of the ACB</td>
<td>Glasgow, UK</td>
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<td>May 19, 2019</td>
<td>International Symposium: Standardization and Recommendations in the Laboratory of Haematology - Satellite Meeting IFCC-EFLM EUROMEDLAB 2019</td>
<td>Barcelona, ES</td>
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<td>Jun 2 - 5,  2019</td>
<td>CSCC 2019 Annual Conference</td>
<td>Saint John, CA</td>
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<td>Jun 5 - 7, 2019</td>
<td>The 3rd Conference of Romanian Association of Laboratory Medicine (RALM)</td>
<td>Iași, RO</td>
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<tr>
<td>Sep 9 - 14,  2019</td>
<td>XLIII Congreso Nacional de Químicos Clínicos y Expoquim</td>
<td>Mexico City, MX</td>
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<td>Sep 10 - 13, 2019</td>
<td>XXIV Congreso Latinoamericano de Bioquímica Clínica (COLABIOLCI) and XIV Congreso Nacional de Laboratoristas Clínicos de Panamá</td>
<td>Panama City, PA</td>
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<td>Sep 25 - 27, 2019</td>
<td>Congreso Nacional Bioquímico CUBRA XV 2019</td>
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<td>Oct 3 - 4, 2019</td>
<td>CELME 2019</td>
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<td>Oct 16 - 18, 2019</td>
<td>5th ESPT Congress – Precision Medicine and Personalized Health</td>
<td>Seville, ES</td>
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<td>Oct 23, 2019</td>
<td>From Bench to Diagnostic-Therapeutic Pathways - Symposium Dedicated to the Memory of Professor Angelo Burlina</td>
<td>Padua, IT</td>
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<td>Nov 1 - 4, 2019</td>
<td>ISOBM Annual Conference 2019</td>
<td>Athens, GR</td>
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<td>Nov 1 - 4, 2019</td>
<td>19 International Congress of the Colegio Nacional de Bacteriologia, CNB Colombia</td>
<td>Bogotà, CO</td>
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<td>Nov 6 - 8, 2019</td>
<td>3èmes Journées Francophones de Biologie Médicale</td>
<td>Monaco, MC</td>
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<td>Nov 7 - 9, 2019</td>
<td>The Value of Laboratory Medicine into Clinical Medicine</td>
<td>Erice, IT</td>
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<td>Nov 28, 2019</td>
<td>13th International Scientific Meeting - The Internal Quality Control in the Traceability Era</td>
<td>Milan, IT</td>
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<tr>
<td>Jun 9 - 12, 2020</td>
<td>XXXVII Nordic Congress in Medical Biochemistry</td>
<td>Trondheim, NO</td>
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## IFCC MEMBERSHIP

### Full Members

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<td>Korea (KR)</td>
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<td>Kosovo (KK)</td>
<td>Zimbabwe (ZW)</td>
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- Abbott
- ADx Neurosciences
- Agappe Diagnostics, Ltd.
- Asahi Kasei Pharma Corp., AS
- BD Life Sciences – Preanalytical Systems
- Beckman Coulter, Inc.
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- Jordan: Society for Medical Technology & Laboratories (SMTL)
- Kazakhstan: Public Association - Federation of Laboratory Medicine (FLM)
- Mexico: Federación Nacional de Químicos Clínicos (CONAQUIC A.C.)
- Nepal: Nepalese Association for Clinical Chemistry (NACC)
- Philippines: Philippine Council for Quality Assurance in Clinical Laboratories (PCQACL)
- Russia: Regional Association for Clinical Laboratory Diagnosis, St. Petersburg
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- Asia-Pacific Federation for Clinical Biochemistry and Laboratory Medicine (APFCB)
- European Federation of Clinical Chemistry and Laboratory Medicine (EFLM)
- Latin America Confederation of Clinical Biochemistry (COLABIOCLI)
- North American Federation of Clinical Chemistry and Laboratory Medicine (NAFCC)
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