



Communications and Publications Division (CPD) of the IFCC

Editor: Katherina Psarra, MSc, PhD

IFCC Office, Via C. Farini, 81

20159 Milano, Italy

E-mail: enews@ifcc.org

International Federation of Clinical Chemistry and Laboratory Medicine



N° 3 – March 2021



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EDITORIAL

Message from the eNews Editor

by *Katherina Psarra*
eNews Editor

Dear colleagues,

COVID-19 is here again in the beginning of my editorial but this time for a different reason. The IFCC virtual conference on COVID-19 was really successful and gave us pride and hope. Prof Adeli is presenting a summary of this success in his introductory message.

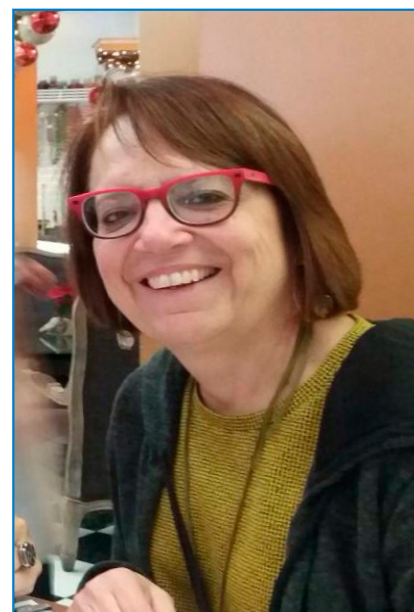
In this issue we have the opportunity to learn about the actions taken by the new IFCC task forces on Newborn Screening and of Corporate Members, the IFCC Working Group on Artificial Intelligence and Genomic Diagnostics. We also have a very interesting report of the survey about the IFCC webinars Live Series Fall 2020.

Unfortunately, there is again an obituary, a farewell to a well known Swedish Clinical Chemist Prof. Nils Trydin. You will see there an incredible, a beautiful photo. What makes us, the IFCC people, proud is that when we are reminded of the lives of the late IFCC officers, we take a glimpse of some really rich and wonderful lives. All these people are characterized by huge work in the field of Laboratory Medicine but at the same time they are full of surprises. They are scholars in many other areas; they are open to knowledge, to art, to life.

The group work, the collaboration is again celebrated in the Univants awards. Finally don't forget to read about the conferences, webinars from all over the world. Reports and descriptions are coming again. They may be virtual but they obviously offer a lot to a lot more people.

With the hope of meeting you in person soon.

Katherina Psarra



Katherina Psarra



8TH INTERNATIONAL SYMPOSIUM « ALAIN FEUILLU »

CRITICAL CARE TESTING AND BLOOD GASES

BIARRITZ - JUNE 10-11 TH, 2021

Registration

Posters (deadline 30/04/2021)

THE VOICE OF IFCC

IFCC President's Message – March 2021



Prof. Khosrow Adeli
PhD, FCACB, DABCC, FAACC

by Khosrow Adeli
IFCC President

My sincere greetings to you all in the IFCC family. I hope everyone is coping well with the ongoing pandemic although there is now clearly a light at the end of the tunnel and hope for a semi-normal life later this summer or fall. The strong evidence coming out of vaccination studies are showing that once vaccinated the risk of serious illness or death from COVID-19 is extremely low even in seniors. Thus, I am hopeful that we will soon begin our normal IFCC business and in person conferences and events.

I am pleased to inform you that we had a very successful virtual conference on COVID-19 last week. This was the first virtual conference held by IFCC and it turned out to be very popular. We had nearly 2900 registered participants from 118 countries around the world including a large number of Young Scientists. There were three plenary sessions, 10 scientific symposia, 16 industry workshops and a total of 116 speakers and chairs from 34 countries. Importantly, there was strong support from corporate members with 18 corporate sponsors and a special industry panel to

highlight the industry voice including four excellent presentations from different industry scientists in the field of clinical laboratory medicine. In addition, a special Young Scientists Forum was held with 6 young speakers from around the world followed with a very vibrant panel discussion. I want to take this opportunity to express my sincere thanks to all participants, speakers, chairs, and corporate sponsors. Special thanks also go to MZ Congressi who did a fabulous job of organizing the virtual presentations with no major technical issues. Over 100 presentations throughout the three days of the conference were delivered smoothly and with very few minor issues. This is a major achievement considering that the presentations were being given by speakers from every corner of the world. My congratulations to you all 😊. A survey has just been circulated to all participants to collect feedback on all aspects of the scientific program, industry workshops, eExhibits, and ePosters. I encourage you all to respond to the survey so that the IFCC can address any concerns and ensure even stronger conference programs in the future. A separate survey of corporate members is also planned through our IFCC Taskforce on Corporate Members.

Finally, I am happy to inform you that our new taskforces on Newborn Screening, Global Lab Quality, and Global eLearning/eAcademy have begun their work and are developing roadmaps to achieve their stated goals and terms of reference. They are meeting on a monthly basis and have already made significant progress on a number of fronts. Also, new IFCC Global LIVE webinars are being planned and you will be receiving a calendar of these live webinars from the IFCC office over the next few weeks.

Feel free to email me at: president@ifcc.org, with your feedback, questions, or concerns.

Till next time 😊
Khosrow



MAGLUMI® Special Test Menu

SARS-CoV-2 Neutralizing Antibody **NEW**

SARS-CoV-2 S-RBD IgG **NEW**

2019-nCoV IgM **FDA EUA**

2019-nCoV IgG **FDA EUA**

SARS-CoV-2 Ag **NEW**

25-OH Vitamin D **FDA**

Intact PTH

H.pylori IgG

hs-cTnl

NT-proBNP

Aldosterone

Direct Renin

Lp-PLA2

Anti-TPO

TRAb

Anti-IA2

CA 50

CYFRA 21-1

CA 242

CA 72-4

NSE

TPA

Pepsinogen I

Pepsinogen II

Gastrin-17

Cortisol

IGF-I

IGFBP-3

PCT(Procalcitonin)

free Testosterone

17-OH Progesterone

AMH

IAA (Anti Insulin)

GAD 65

HA

Vitamin B12

Folate (FA)

CSA (Cyclosporine A)

FK 506 (Tacrolimus)

THE VOICE OF IFCC

The new IFCC Task Force on Global Newborn Screening (TF-NBS)

by Dr. Van Leung-Pineda

*IFCC Task Force on Global Newborn Screening Co-Chair
Department of Pathology and Laboratory
Children's Healthcare of Atlanta, US*

Prof. James R. BONHAM

*IFCC Task Force on Global Newborn Screening Co-Chair
International Society of Neonatal Screening (ISNS)
National Newborn Screening Laboratory Lead United Kingdom, UK*



The Task Force NBS members during their inaugural meeting, with Prof. Adeli, IFCC President.
Dr. U. Ceglarek, not portrayed here, was in attendance as well.

The newly formed Task Force on Global Newborn Screening (TF-NBS) held its inaugural meeting this January. This group is tasked with initiating and advancing NBS programs in developing countries in collaboration with multiple worldwide organizations. Newborn screening is one of the great successes in public health, providing actionable information that can result in the timely treatment of metabolic diseases before they can cause irreparable damage to affected children.

This has resulted in many benefits, for society as a whole significantly reducing the healthcare costs and most importantly saving lives for some and allowing many more to lead healthy and fulfilling lives contributing back to society. For example, data from 2013 showed that annual care for phenylketonuria (PKU) patients that are treated too late costs \$1-2 billion dollars. In contrast, the costs required for screening and treatment are only about \$342 million dollars. Newborn

screening for another condition, congenital hypothyroidism, can save an estimated \$400 million dollars annually. This means that if all PKU and congenital hypothyroidism patients could be detected and treated early, there could be a \$1-2 billion dollars saved per year just from those 2 conditions. Despite this, many children in the world are not screened for these conditions, leading to a poor quality of life for them and often their families.

The Global Task Force on Newborn Screening, TF-NBS, is composed of individuals from all corners of the world, united by a passion and desire to make NBS screening available for every child. The TF-NBS mandate is to identify and partner with local authorities and other global organizations to pilot advances in NBS programs in developing countries. The goal is not just to create or improve NBS programs but to ensure that there is an ethical pathway to ensure sustainability and development.

News from the IFCC Website



eJIFCC Vol 32 n°1 - February 2021

eJIFCC Vol 32 n°1 is now available!

In this issue: **Measurably better healthcare.**

Guest editors are Dr. Tim J. James and Dr. Ellie Dow.

The two guest editors of this this issue have the pleasure of sharing with readers some of the work being carried on around the world, highlighting new and successful ways of working, from local to regional implementation examples.

All of these examples have earned recognition within the global UNIVANTS of Healthcare Excellence™ program and represent a wide range of clinical environments, from emergency care through to the community setting, where there are impacts on population health.

The issue is completed with five other articles, two of them on COVID-19.

[Read more](#)

The IFCC Task Force of Corporate Members (TF-CM) unite with a passion to elevate laboratory medicine and the IFCC

by Tricia Ravalico
Chair, IFCC TF-CM
Abbott

Joe Passarelli
Corporate Representative, IFCC Executive Board
Roche

For nearly 70 years, the IFCC has long been leading health care advances in laboratory medicine for the betterment of health care worldwide. Healthcare companies are equally as passionate about innovation and the future of laboratory medicine, leading to a joint milestone in 1985 when the first corporate representative was invited to serve on the IFCC Executive Board. Since that time and through today, nearly all IFCC task forces, committees and/or working groups have corporate representation with active full and/or corresponding members from industry. These partnerships are both vital and symbiotic, leading to substantial success across countless, value-added joint initiatives.

Based on the legacy of active funding and contributions by corporate representatives to the IFCC, and with enhanced appreciation for the essential contributions of corporate members across divisions, the IFCC Executive Board created an additional opportunity for enhanced dialogue across leaders. With the goal of further strengthening existing partnerships with the IFCC and its corporate members, the IFCC established and elected corporate members to serve on a unique Task Force for Corporate Members (TF-CM), reporting directly to the IFCC Executive Board. Unlike other Task Forces, the TF-CM is exclusive to Corporate Members, and has the magnanimous aim of elevating key topics and priorities for the betterment of industry collaborations, laboratory medicine and health care.

“The creation of this task force was very special,” comments Joe Passarelli, former IFCC TF-CM chair and current member as well as the current Corporate Representative on the 2021-2023 Executive Board, “this task force gives corporate members the chance to connect with one another and together, propose ideas and projects that align with current unmet needs.” Joe

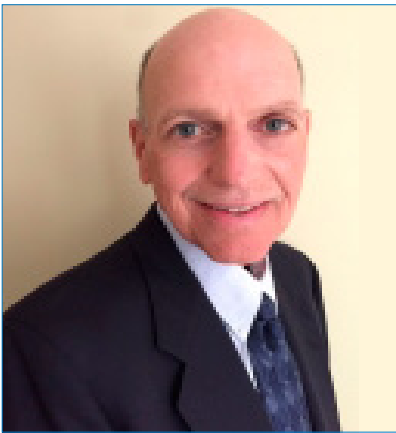
Passarelli is a global advocate for laboratory medicine and Senior Director in Scientific Relations for Roche, a long-time valued partner to the IFCC.

“I am honored to serve as the new chair of this task force,” comments Tricia Ravalico, Director of Scientific Leadership and Education for Abbott. “I encourage all companies who are interested in making a difference to get involved and join the team. The work we do is important with substantial influence to drive health-care transformation.” Tricia has been an active leader within the IFCC for years, currently also serving as the Corporate Representative of the IFCC Communications and Publications Division (CPD), as well as the Executive Lead of the UNIVANTS of Healthcare Excellence program.

The objectives of the TF-CM are lofty, but essential with goals to (1) assist IFCC in promotion of science, innovation, and advancement of the essential contribution of laboratory medicine to health care, (2) to facilitate discussion among Corporate Members and identify common topics of interest and/or concern, (3) to improve the engagement of Corporate Members with the IFCC, (4) to serve as the “voice of industry” and be more accessible to all IFCC teams and leadership, enabling a more diverse understanding and appreciation of needs among corporate members and the IFCC, and (5) to increase awareness with other Corporate Members of IFCC TF-CM and to encourage their participation in IFCC activities.

If your company is a corporate member, and you are interested in learning more about the IFCC or the IFCC TF-CM, please contact us at www.ifcc.org. We welcome everyone wanting to join this exciting journey to advance excellence in laboratory medicine for better healthcare worldwide.

Article continued on next page



Joe Passarelli

“The IFCC, in collaboration with its corporate membership, is making a real difference in laboratory medicine. This Task Force, solely for corporate members, provides yet another opportunity to change the lives of the patients we serve. I encourage all companies to join in this endeavor.”

Joe Passarelli
Roche



Tricia Ravalico

“The IFCC is advancing healthcare worldwide. Join us in partnership with the IFCC and other leading corporate leaders to advance the profession of laboratory medicine.”

Tricia Ravalico
Abbott



Jordi Trafí Prats

“As an active member of the IFCC TF-CM for over 2 years, I want to share how valuable it is to enhance the communication across companies and drive change for the industry.”

Jordi Trafí
PratsOrth Clinical Diagnostics



Andy Quintenz

"I learned about the task force in 2020 and joined as a corresponding member. I thought this was a good way to learn more about IFCC initiatives and the task force. It didn't take long to understand and believe in what the team is aiming to accomplish."

Andy Quintenz
Bio-Rad Laboratories



Jan Gorka

"The task force is only as diverse as the members themselves. DiaSys is a smaller company compared to some, but our passion and voice in the industry is just as strong. I am an active member on this TF-CM and invite others to learn more about our team and the IFCC."

Jan Gorka
DiaSy



Colleen Strain

"As interim Secretary to the TF-CM, I've been so impressed with the full and corresponding members. This team cares and are comprised of industry leaders who are change champions and advocates for laboratory medicine."

Colleen Strain
Abbott



Jean-Sebastien Blanchet

“This task force (TF-CM) created a great forum for open communications between corporate members, to build a strong voice for the IVD industry and to contribute significantly to the IFCC for this common goal of advancing laboratory medicine worldwide.”

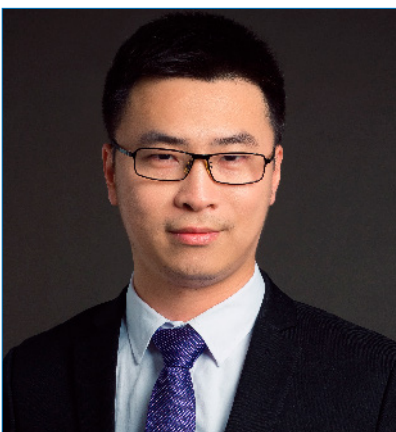
Jean-Sebastien Blanchet
Beckman Coulter



Brendan Meyer

“As a corresponding member of the IFCC TF-CM, I have welcomed the opportunity to contribute to the discussion. This has given me great insight into the way in which the IFCC and industry can work together, with a common goal of demonstrating the true value of laboratory medicine.”

Brendan Meyer
Becton Dickinson



Vincent Chen

“I am pleased to be part of the IFCC Task Force for Corporate Members and value the mission that we have as a collective team to work together and advance health care.”

Vincent Chen
Snibe

Introducing the IFCC Working Group on Artificial Intelligence and Genomic Diagnostics (WG-AIGD)

by Larry Kricka

WG AIGD Chair

Emeritus Professor of Pathology and Laboratory Medicine

Department of Pathology & Lab. Medicine

University of Pennsylvania Medical Center

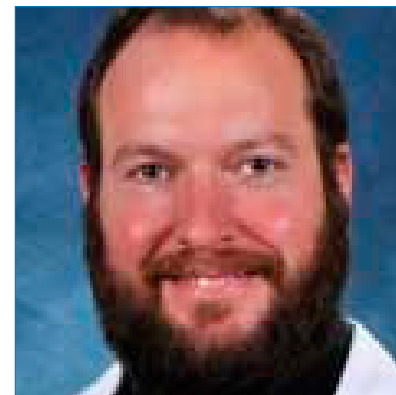
Philadelphia, USA



Larry Kricka (Chair)



Linnea Baudhuin (Member)



Adam Ertel (Member)



Paolo Fortina (Member)



Tom Hope (Member)



Christopher McCudden (Member)



Jason Park (Member)



Sergei Polevikov (Member)



Daniel Satchkov (Member)

Article continued on next page

The new Working Group on Artificial Intelligence and Genomic Diagnostics (WG-AIGD) is part of the Emerging Technology Division (ETD). Artificial intelligence (AI) is an important emerging technology, and in the future, it is likely that this technology will become embedded in many aspects of medicine. In particular, it is expected to play a key role in laboratory medicine. Accordingly, a familiarity with this technology and its scope, applications, accessibility, and limitations will become important in the practice of laboratory medicine in the future. The focus of this WG is the area defined by the intersection of artificial intelligence, genomics, and clinical diagnostics.

Members of the new WG-Vol are: Dr. Larry Kricka (Chair), Dr. Linnea Baudhuin (Member), Dr. Adam Ertel (Member), Dr. Paolo Fortina (Member), Dr. Tom Hope (Member), Dr. Chris McCudden (Member), Dr. Jason Park (Member), Dr. Sergei Polevikov (Member), Daniel Satchkov (Member).

The terms of reference for the new working group are (i) to evaluate and monitor emerging trends and directions of research and development in the field defined by the intersection of artificial intelligence, genomics, and clinical diagnostics, (ii) to develop an in-depth assessment of the application of AI (deep learning, machine learning) in genomic (molecular) diagnosis, (iii) to develop periodic updates of the applications

of AI in clinical genomic testing, (iv) to assess the accessibility and the barriers to routine implementation of AI in clinical genomic testing, and (v) to develop a resource that will inform the IFCC community on developments and trends in the applications of artificial intelligence in clinical genomic testing.

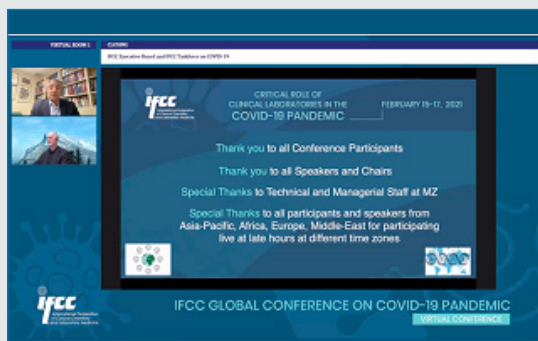
Planned projects include a survey of the clinical diagnostic applications of AI in genomics, including recent literature, companies, clinical diagnostic products, and clinical trials. Input into this survey will be solicited from the wider academic, clinical diagnostic, and industry community. In view of the continuing pandemic, we will specifically assess the role of AI in genomic tests for detecting COVID-19.

Other projects will explore the utility of AI-based search engines in searching the AI and genomics literature for emerging diagnostic applications. An important activity for the WG will be to develop recommendations/best practices for clinical laboratories validating and/or evaluating AI-based diagnostic or prognostic methods (e.g., minimum elements of a method that need to be shared to evaluate and/or validate a method).

For other information on the Working Group and its projects, visit: <https://www.ifcc.org/ifcc-emerging-technologies-division/etd-working-groups/wg-aigd/>.

News from the IFCC Website

IFCC Virtual Conference on the Critical Role of Clinical Laboratories in the COVID-19 Pandemic



The IFCC Virtual Conference on Critical Role of Clinical Laboratories in the Covid-19 Pandemic was a huge success!

This first virtual conference was made possible thanks to the hard work of many IFCC colleagues, the strong participation of our corporate sponsors, and the great technical and managerial assistance of MZ. But most important was the participation and support of all IFCC national societies and other non-member countries. IFCC has 95 national societies but we had participants from 118 countries!

All sessions have been recorded and are fully available for registrants.

[Read more](#)

A report on IFCC Webinars Live Series Fall 2020

IFCC Webinars

Live Series
Fall 2020

www.ifcc.org



by Rojeet Shrestha

IFCC eAcademy Co-Ordinator

Silvia Colli Lanzi

IFCC Office

Khosrow Adeli

IFCC President

As per the IFCC's top strategic plan laid out by the current executive board to expand our eLearning/Distance Learning program, the IFCC embarked on monthly live webinars in Fall 2020. IFCC aims to be the largest provider of free eLearning platforms that can be particularly helpful for young scientists, students and trainees around the globe. One of the beauties of eLearning is its flexibility in that trainees can access the content sitting at home at their convenient time and pace. The devastating pandemic has further made us realize the importance and effectiveness of eLearning / Distance Learning. The exciting news is that starting this year, a new IFCC Taskforce on Global eAcademy/eLearning is operational to achieve our goal to be a leading eLearning provider in the field of clinical chemistry and laboratory medicine supporting laboratory professionals worldwide.

In fall 2020, we provided four live webinars on various areas of laboratory medicine. We debuted with the important topic of the year, that is IFCC COVID-19 Guidelines on Molecular, Serological and Biochemical/Hematological Testing on September 23rd. Laboratory medicine professionals are playing a key role in this fight against COVID-19 pandemic by providing diagnostic tests and monitoring the progress of disease. Aiming to help lab professionals to mitigate the gap in knowledge and good practice in COVID testing, IFCC has been publishing various guidelines and this webinar provided a unique opportunity to hear directly from leading experts in this field. The session was chaired by Prof Khosrow Adeli and comprised

of three key talks on “IFCC Guidelines on Molecular Diagnostic Testing of SARS-CoV-2 Viral Infection” by Prof Giuseppe Lippi, “IFCC Guidelines on Serological Testing of Anti-SARS-CoV-2 Antibodies” by Prof Khosrow Adeli, and “IFCC Guidelines on Biochemical and Hematological Monitoring of Patients with COVID-19” by Prof Andrea Rita Horvath. Over 3800 participants registered for this live event and 850 additional participants viewed the on-demand program.

The second webinar was conducted on Oct 15th with the title “Advancing Internal and External Quality Assurance on a Global Scale” and chaired by Prof. Adeli. Three eminent scientists in this field, Dr. Sverre Sandberg [Norway], Dr. Mario Plebani [Italy], and Dr. Graham Jones [Australia] addressed this session with current challenges on Internal and external quality assurance in clinical laboratories around the world, the critical need for a new international strategy to support internal quality assurance and EQA in developing countries, and the IFCC's strategic plans to develop a global program to support both IQC and EQA around the world. Over 2600 participants registered for this event.

The third webinar was broadcasted live on the 4th of November. This webinar was focused on “Expanding Newborn Screening Globally: Reducing Infant Mortality Through Early Diagnosis”. The IFCC has made Newborn Screening (NBS) a major focus of its strategic plans and in this webinar three world-renowned speakers presented on the state of newborn screening around the world. Prof. Piero Rinaldo (USA), Prof.

Article continued on next page

Jim Bonham (UK), and Prof. Pranesh Chakraborty (Canada) talked about various aspects of NBS and laboratories initiatives to reduce infant morbidity and mortality by initiating early detection, treatment, and management of newborns with congenital disorders. Over 1750 participants attended the live event.

The last webinar in fall 2020 was on *“Value and Impact of Laboratory Medicine in Patient Care: Developing the Evidence”*. The event took place on November 25th and primarily focused on approaches that can identify the value of laboratory and medical testing. The session contained three key talks by Dr. Andrew St John (Australia) on *“The critical role of test implementation to deliver value”*, Dr. Paul Jülicher (Germany) on *“Health economic evaluation of medical tests: translating laboratory information into value”*, and Prof. Khosrow Adeli (Canada) on *“IFCC Strategic Plans to Develop the Evidence Supporting the Critical Role of Lab Medicine in Patient Care”*. Over 2450 laboratory professionals around the globe participated in the event.

IFCC webinar Fall 2020 series was a huge success with the involvement of thousands of participants from

over 104 countries. We would like to express our sincere gratitude to all speakers for their invaluable contributions and willingness to share their expertise with laboratory professionals globally. Based on our post-session survey, responded to by 721 participants, the fall session was largely satisfactory and helpful. On the 1 - 5 start scale, 59% and 33% of participants rated the overall satisfaction 5 and 4, respectively. Webinars met the expectation of 99% of respondents and 47% of participants found these webinars better than they expected. Importantly, these events provided us a unique opportunity to link with laboratory professionals as 56% of participants have never attended previous IFCC congress and conference.

The use of an appropriate platform is crucial for the success of our webinar series. We used the WorkCast platform to broadcast our webinar live and on demand. Based on the survey, 92% of participants found the platform easy to use. All the sessions were designed with three speakers each with 20 min presentation and additional 20 minutes at the end for the Q&A session.

Feedback and post-survey evaluation of IFCC webinar Fall 2020 series

	n	1	2	3	4	5
How would you rate the technology?	654	0.5%	0.9%	7.3%	39.5%	49.2%
How satisfied are you with the networking tools?	654	0.6%	2.6%	13.2%	40.1%	43.6%
How accurate was the webinar description?	645	0.0%	1.2%	7.8%	32.1%	56.9%
What percentage of the information was new to you?	614	0.7%	7.7%	33.6%	31.9%	26.2%
Please rate the content of the slides/virtual aids.	614	0.2%	0.8%	7.8%	38.3%	51.1%
How likely would you recommend the IFCC webinars to a friend?	606	0.2%	0.5%	4.0%	22.8%	72.3%
How would you rate your overall experience with the IFCC webinars.	606	0.2%	0.3%	6.4%	32.5%	59.1%

*n = number of response; Scale from 1 to 5 where 1 is poor and 5 is excellent.

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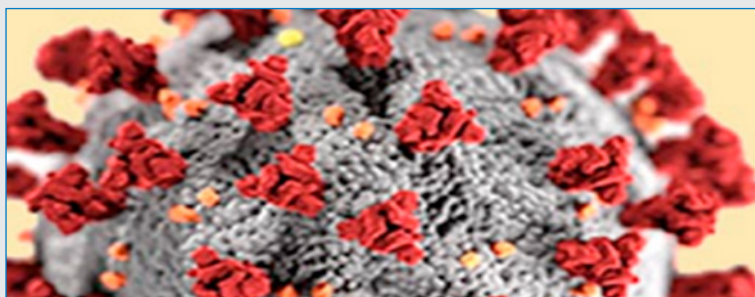
89% of participants reported that the duration of the webinar is perfect. Being a global program, considering the difference in time, we provided all the content to be viewed on-demand as per the feasibility of participants and also all the content was uploaded on IFCC eAcademy website. 97% of participants reported that on-demand content was useful with 88% willing to watch them again. The selection of appropriate topic is another key aspect for the success of our webinar series. 74% of respondents chose to attend these webinars because they found the topic interesting and over 90% of participants reported that they wanted to learn more on these topics. Some basic statistics and feedback generated from the post-session survey are provided in the Table above.

Based on the survey, we can conclude that the Fall webinar series was extremely helpful to participants and we hope that it can enhance professional development and is useful to improve the clinical laboratory service worldwide. The feedback from the survey is inspiring to us and we will continue to work on our eLearning platform to benefit lab professionals and clinical laboratory service. 92% of participants of our post-session survey are willing to join upcoming webinars.

As stated earlier, starting this year, the IFCC taskforce on eLearning is functional and will continue to provide useful webinars in coming days. Stay tuned and we welcome all our colleagues to join our upcoming events and webinars.

News from the IFCC Website

The IFCC is pleased to publish an online resource providing key information on laboratory guidelines, bio-safety, and other important resources to assist member societies around the world and their clinical laboratories as they face the challenges posed by the COVID-19 outbreak.



The page is constantly updated with the most recent information on a biweekly basis.

IFCC Information Guide on COVID-19 – biweekly updates – a NEW SECTION on VACCINATION has been included

Coronavirus disease 2019, abbreviated to COVID-19, is an emerging global pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). As the number of individuals infected with COVID-19 continues to rise globally and healthcare systems become increasingly stressed, it is clear that the clinical laboratory will play an essential role in this crisis, contributing to patient screening, diagnosis, monitoring/treatment, as well as epidemiologic recovery/surveillance. This guide aims to organize relevant available information on laboratory screening, testing protocols, diagnosis, and other general information on COVID-19 for laboratory professionals, including links to helpful resources and interim guidelines. It will be continually updated as new guidelines and literature become available

[Read more](#)

IFCC: THE PEOPLE

Welcome and thanks to the Chairs

WELCOME TO YOUNG BAE LEE HANSEN (DENMARK)



Dr. Young Bae Lee Hansen

Young Bae Lee Hansen is the new Chair of the IFCC Committee on Nomenclature, Properties and Units (C-NPU) in collaboration with International Union of Pure and Applied Chemistry (IUPAC)

Dr. Young Bae Lee Hansen is a clinical biochemist at Department of Clinical Biochemistry, North Zealand's Hospital, Denmark. Born and raised by Korean parents in Denmark, he graduated at Medical School at University of Copenhagen in 2007. His research focused on maternal biomarkers of fetal growth restriction.

Later, he worked as administrator in the International NPU Release center for four years at Danish Health Data Authority, Copenhagen. With insight in the foundation of Danish health data, his interest in laboratory informatics has grown. In addition, he has been a titular C-NPU member for almost two terms.

Best wishes for your new position, Dr. Young Bae Lee Hansen!

FAREWELL TO KARIN TOSKA (NORWAY)



Prof. Karin Toska

Prof. Karin Toska (Norway) ended her term as Chair of the IFCC Committee on Nomenclature, Properties and Units (C-NPU) in December 2020.

Thank you, Prof. Toska, for your commitment towards leading this important IFCC project, in collaboration with the International Union of Pure and Applied Chemistry (IUPAC) and the best of wishes for your next projects!

Obituary

Never forgotten – in memory of professor Nils Tryding

by *By Oswald Sonntag*¹
*Per Simonsson*²
*Josef Breuer*³

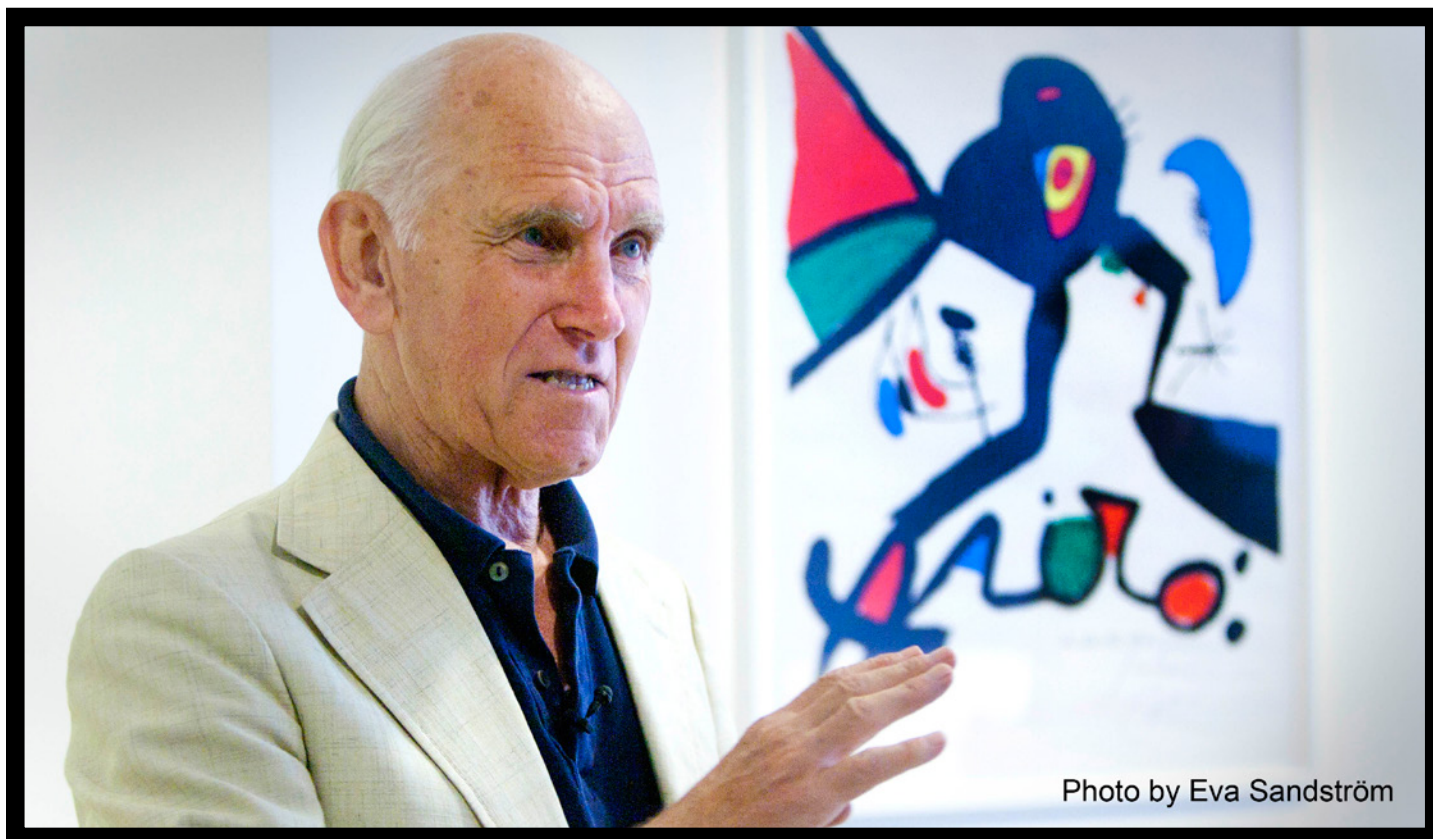


Photo by Eva Sandström

Professor Nils Tryding

Many friends and colleagues in laboratory medicine and in art are mourning the passing of Prof. Nils Tryding.

Nils was born in Tryde/Sweden in 1929.

As a student in 1949, he had no interest in studying medicine. For him, medicine was mostly about illness, misery, blood, urine and feces. However, he was interested in chemistry. He had received a scholarship in the subject and had read that Jöns Jakob Berzelius had already written at the beginning of the 19th century that “Advances in medicine will surprise the world”. However, after studying inorganic and organic chemistry for a year in Lund/Sweden, he got a problem. The part of chemistry that he was most interested

in, biochemistry, could not be studied in Lund at that time. To do so he would have to go all the way up to Uppsala/Sweden.

During the summer 1950 on a bike ride with Sweden’s united student unions along the Rhine he met two female medics who told him that there is a subject called medical chemistry. So he could learn biochemistry in Lund if he converted from the Faculty of Philosophy to the Faculty of Medicine.

It was in Heidelberg, Germany, that he bought three tapes of Rauber-Kopsch (books on anatomy) on the street at a very cheap price. With the anatomy books in his backpack, he cycled home and became a medical student.

Article continued on next page

Already after a year he was lucky and became an assistant professor in medical chemistry at the university of Lund.

His first assignment was to synthesize an explosive substance. When he had survived this first assignment, he was asked to synthesize branched fatty acids, which did not exist in nature. It was not known if the branched fatty acids were toxic but when rats tolerated them he ate them himself. Sune Bergström, his boss at that time and a future Nobel laureate, had been to the United States and heard that a prisoner had swallowed a probe that had passed through the entire gastrointestinal tract. In this way, it was possible to study the level at which the absorption of fatty acids took place. Nils tried this method on himself. He later told about the experiment: "It was not completely risk-free, but what does one not do for a dissertation?"

Finally, he completed his dissertation and was for many years an assistant professor and teacher in medical chemistry. His thesis: "Studies on the metabolism of branched-chain fatty acids" was successfully defended in 1957.

There is a story about the ceremony as he received the doctoral degree, illustrating Nils' sense of humor. In 1959 when he was promoted in Lund Cathedral, the promoter was so nervous that he put the hat on Nils head with the mark on the back. Instead of lifting the hat he tried to turn Nils head around 180 degrees. Nils could therefore boast of having been close to death in the cathedral.

In 1965 he left Lund University to become chief physician at the hospital laboratory in Kristianstad/Sweden. There he created a modern laboratory but instead of hiding in the shiny new facilities Nils directed his focus on the clinical environment. He became an active and appreciated member of the medical staff, leaving the laboratory to attend clinical staff meetings and rounds, leading courses and seminars in hospitals and GP offices, at golf courses and art exhibitions,

It was in this clinical environment he created his approach to laboratory medicine. His focus was on the medical usefulness and outcome of the analytical work. The selection of appropriate tests was essential

as was the correct interpretation, including interferences. Concepts like "evidence-based" and "lean" were yet to be introduced but Nils shaped his own pioneering approach. In so doing he inspired a generation of colleagues. Once the era of internet was born, Nils was early in picking up this new media. He was one of the first to create a home page with a database where relevant literature and recommendations were provided to doctors, particularly in general practice.

From 1965 until his retirement in 1994 he was director of Laboratories for Clinical Chemistry and Blood Bank at the Central Hospital in Kristianstad. In 1988 he was appointed professor at the University of Lund. In his entire career he published over 12 books and 86 scientific papers.

He is well known for his extensive work and books on "Drug Effects in Laboratory Medicine" which has been published in seven editions. In 2006 AACC announced: "Donald Young's Effects Online Now Merged with Nils Tryding's Drug Effects in Clinical Chemistry". The work of the two pioneers who worked extensively on effects of drugs on lab tests created the world largest database on this topic. It is worthwhile to note that Donald Young passed away just a couple of months before Nils in July 2020.

For IFCC he was member of the Expert Panel on Drug Effects in Clinical Chemistry from 1980 to 1990 and served as its chairman from 1986 to 1990. As outcome of this expert panel several IFCC recommendations had been published.

Nils was member of several committees e. g. Reference Values of the Scandinavian Society for Clinical Chemistry and Clinical Physiology 1970-1973.

He was member of the board of Swedish Society for Clinical Chemistry from 1981 to 1986 and served as its president from 1985 to 1986. Later he was recognized as honorary member.

Since clinical chemistry, according to Nils, is such a boring topic, he realized early that it could be easier digested by clinical doctors if it was diluted with a mix of humor and art. And Nils was a master of both these fields. He had a great interest in the Catalan artist Joan Miró. First time Nils met Miró in person was in 1970. Since the 1950s, Nils collected art posters and

materials about and by Miró. With over 150 posters, it became the world's only complete collection of Miró posters. Nils wanted to share them with others and donated his collection to Kristianstad municipality with a wish that it would remain intact and be able to benefit both researchers and art enthusiasts. The collection has since made several international tours. Together with Magnus Rutberg a short video named "Nils and Miró" was created to show the preparation work of an exhibition of Miró posters in 2013.

Nils' love of the posters of Miró clearly illustrates Nils approach to life in general and to clinical chemistry in particular. The poster is the most democratic and public of art forms, decorating bars and cafés, where ordinary people live their lives, chatting and arguing about their daily problems. In the same senses Nils own form of clinical chemistry was democratic, focusing not on charming academia but on being useful for ordinary doctors and patients in everyday life.

After his retirement he dedicated himself to art and organized many art tours. He guided interested art fans, as passionate as he was, through different exhibitions

and museums around the globe. He was also member of different art societies.

He is survived by his wife Lena and his son Sven with family.

His concluding remarks in his own CV are: "I am not religious and will be buried without church ceremonies with only the family present. I believe in the importance of genes and want my body to be buried in the same grave as my deceased siblings, parents and grandparents at Tryde cemetery".

We lost a true friend, an expert on drug interferences and on art. He is deeply missed and we will remember him with a warm smile on our lips.

*¹ Independent Consultant, Munich/Germany
corresponding author*

*² Associate professor, Department of Clinical Chemistry
Malmö, Lund University, Lund/Sweden*

*³ ex Lab Director, Marienhospital Gelsenkirchen/Germany
ex chair IFFCC WG „Drug Effects“*

IFCC call for nominations



The IFCC invites nominations for the following position:

EMERGING TECHNOLOGIES DIVISION

➔ **Committee on Omics Translation (C-OT):** one member position

- Time in office 2021-2023.
- Applications close on March 15th, 2021

ETD nominations should be sent to Silvia Colli Lanzi at the IFCC office (Colli-Lanzi@ifcc.org)

Refer to your National Representative or Corporate Representative for information on procedures for nominations. Find your representative [HERE](#).

IFCC: THE YOUNG SCIENTISTS

COLABIOCLI Leadership Workshop

by *Santiago Fares Taie*

*IFCC Task force for Young Scientists Co-Chair
Mar del Plata, Argentina*

IFCC
International Federation
of Clinical Chemistry
and Laboratory Medicine

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CURSO INTERNACIONAL

Liderazgo

DE LOS **JOVENES PROFESIONALES**
EN LOS LABORATORIOS CLINICOS UN DESAFIO DESPUÉS DE LA PANDEMIA

FECHAS: DEL 18 DE FEBRERO
AL 22 DE ABRIL 2021

Juan Pablo Grammatico
DOCENTE

CURSOS Virtuales

CERTIFICACIÓN Y CARGA HORARIA: CERTIFICADO DE APROBACIÓN Y 45 HORAS ACADÉMICAS

Objetivo: Promover el desarrollo de jóvenes líderes en las asociaciones profesionales de cada país.
Modalidad: Seminarios virtuales para el tratamiento de temas teóricos. Talleres para el asesoramiento y seguimiento de aplicaciones prácticas.
Condiciones para la aprobación: Planificación estratégica de un proyecto concreto para ser desarrollado en el marco de las actividades de la asociación representada.
Destinatarios: Jóvenes profesionales avalados por sus asociaciones profesionales de pertenencia.

PLAZAS LIMITADAS 2 POR PAIS

The COLABIOCLI Young Professionals Group started late in 2020, and two months later we are glad to present the Leadership Workshop for Young Professionals of Latin America.

The Leadership Workshop will be in virtual mode from February 18th until April 22nd with a weekly frequency. The workshop consists of 2 hours of class per week + written activities and a forum in the courses platform. Each country member of COLABIOCLI can present 2 young candidates to participate in the workshop.

Article continued on next page

Juan Pablo Grammatico is a professor of the Leadership chair at the School of Engineering of UNMDP and will be in charge of the workshop. Three young scientists of the 'COLABIOCLI Young Professional Group' will be helping with the coordination of the workshop: Sofía Duarte from Guatemala, Jorge Hernandez Bello from Mexico, and Santiago Fares Taie from Argentina.

Learning leadership skills is of great value to young professionals, and an extremely popular subject among us. Frequently, professionals find themselves in circumstances where they need to manage people, interact with other groups or companies, start a project, or make decisions without proper training. Learning some of these skills being young can be of enormous help in our career.

A requirement to approve the workshop is to present a strategic plan to develop a project in the National Organization that they represent. The project is not limited to a specific issue, but we plan to present different activities related to the Week of Quality in Health 2021, which will be celebrated from April 5th to 11th.

If the experience is successful, we plan to replicate this workshop in different regions with the IFCC TF-YS to attend to the young scientists' needs all around the globe.



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Improving patient safety in patients with Indeterminant Pulmonary Nodules: an integrated clinical care team in China wins distinction



Members of the winning team from China get honored, with the following representatives pictured above:
(L-R) Sullin Mo, Min Liu, Wen Xie, Yanbin Zhou, Lixia Huang, Tingfei Chen



When a nodule is identified on the lung of a patient, physicians must determine the most appropriate course of action to pursue. Thus, a cascade of investigations and tests begins. The goal of nodule evaluation is to improve patient outcome by safely diagnosing and quickly treating malignant nodules, while minimizing testing and invasive procedures for patients with benign nodules.

With the introduction of widespread screening programs, coupled with the effectiveness of low-dose computed tomography (CT) for identifying nodules, the prevalence of newly identified lung nodules has been increasing. Most patients require multiple investigations and potentially invasive procedures to confirm their diagnosis. As such, delays in care can happen for patients with malignant disease. Moreover, unnecessary invasive

Article continued on next page

procedures are possible for patients with benign nodules, creating potential safety risks. Thus, any opportunity to enhance pre-operative decision-making can profoundly impact patient care.

In an effort to expedite care for patients with malignant disease and to avoid unnecessary procedures/ investigations for patients with benign nodules, an integrated clinical care team at The First Affiliated Hospital in Guangdong Province, China, led a best practice for streamlining diagnosis and treatment. This cross-divisional team collaborated to implement a 'Nodule Risk Model' into clinical care to enable safe and expedited care for patients with indeterminate lung nodules found by CT.

This novel diagnostic pathway combines the use of clinical data, including CT, age, sex and smoking with results of a lung cancer biomarker panel (LCBP) to determine the likelihood of malignancy, without using invasive procedures. The LCBP includes Progastrin-releasing peptide (ProGRP), Carcinoembryonic antigen (CEA), Squamous cell carcinoma antigen (SCC), Cytokeratin 19 fragment (CYFRA21-1).

Implementation of the nodule risk model at The First Affiliated Hospital, Sun Yat-Sen University has yielded significant benefits for patients, clinicians, the health system and payors. Of note, their work enabled a 24.1% increase in accuracy of preoperative diagnosis, resulting in substantial opportunities for protected patient health. Invasive thoracic surgeries were avoided in 27% of patients with benign lung nodules whose CT was not definitive of disease. The latter reduced surgical risks and potential complications. Additionally, it is equally important that 36% of patients with malignant lung nodules had expedited surgical intervention that would not have been triggered by CT alone.

Thus, strategic implementation of the lung nodule risk model substantially improved overall accuracy of preoperative diagnosis, maximizing safety and health outcomes, while reducing overall healthcare costs.

To make such an impact on patient care, collaboration across key stakeholders has been a paramount for success. Leaders, representing key departments at The First Affiliated Hospital include Yanbin Zhou, MD, PhD, Vice Director, Respiratory Department and Respiratory Disease Institute, Lixia Huang, MD, Specialist, Pulmonary and Critical Care Medicine, Min Liu, MD, Director, Core Laboratory, Honghe Luo, MD, Vice Director, Lung Cancer Institute, Suilin Mo, MD, Director, Physical Examination Center. In recognition for their success, this care team was awarded 'Merit of Distinction' for the 2020 UNIVANTS of Healthcare Excellence Award.

THREE KEY TAKEAWAYS:

1. ProGRP (progastrin-releasing peptide), CEA (carcinoembryonic antigen), SCC (squamous cell carcinoma antigen), and CYFRA21-1 (cytokeratin 19 fragment) are key biomarkers with collective predictive value in the evaluation of patients with lung nodules
2. Predictive risk models that combine lung cancer biomarker panels (LCBP) in addition to clinical parameters (patient age, history, smoking status, nodule size, etc.) can improve the efficacy of CT screening for determining malignancy without invasive procedures
3. Real-time clinical implementation of a validated pulmonary nodule risk model can lead to improved outcomes including earlier diagnosis of malignant tumors and mitigating the need for invasive procedures for patients with benign tumors

For more details on this best practice and/or other best practices that received recognition by the UNIVANTS of Healthcare Excellence Award program, please visit www.UnivantsHCE.com.



Reducing medical errors and enhancing patient care through strategic point-of-care testing led by laboratory medicine



Pictured here are innovative leaders and members of the Kenya team of distinction: (L-R) Daniel Main and John Waigwa. Not pictured here but part of the valued care team are: Serafino Gatwiri, Gregory Muruga, and Nancy Kunyiha.



Point-of-care testing (POCT) is growing in popularity and applicability as many health systems seek to implement POCT in general practice, in community settings, and in select departments within the hospital, such as the emergency department. POCT comes with a multitude of benefits including near-patient testing and results, reduced turn-around time and the ability to bring testing to rural or remote areas where traditional core laboratories may not be possible or feasible.

As with any diagnostic and testing program, updates and improvements help to reduce care gaps, mitigate risk and reduce medical errors. Strengthening and improvements to POCT programs often center around education and training, implementation and/or improvement of quality systems, enhanced data management and process improvements. With 33 sites actively utilizing POCT in Nairobi, Kenya, a team led by laboratory medicine pertinently sought to improve standardization of POCT procedures and tests, digitize all POCT and records, and improve equipment performance through a comprehensive quality system.

Article continued on next page

Implementation of this new POCT strategy ultimately and radically changed hospital processes and consequently patient flow and care at the Aga Khan University Hospital. Specifically, there has been a five-fold reduction in total medical errors. This includes a complete elimination of mismatched patient results through electronic point-of-care systems, a 20% reduction in pre-analytic confounders and substantially enhanced compliance to routine quality control (QC).

“Medical errors can have catastrophic effects on patients, resulting in potential medication errors, physical injury, and possibly death” says Majid Twahir, Chief of Staff and Associate Dean of Clinical Affairs at the Aga Khan University Hospital. “With medical errors being 20 times more likely in Africa compared to developed countries, a five-fold reduction has profound impact on the mitigation of preventable adverse outcomes and downstream costs.”

An unintended, but impressive outcome enabled by the enhanced capabilities in data capture were the improved documentation and billing processes, resulting in reduced revenue loss of KES 19,109,800 (177,400.25 US dollars) in only six months, highlighting the multitude of positive effects programs such as these can have for an institution.

These important outcomes have been enabled through a multidisciplinary POCT committee, thus underscoring the importance of ensuring representation across stakeholders, including laboratory medicine, hospital quality department, ICT, nursing, clinical stakeholders, materials management division, biomedical engineering, pharmacy and hospital administration for reducing medical errors and enhancing patient care.

For their leadership, this integrated clinical care team has been awarded a prestigious 2020 UNIVANTS of Healthcare Excellence Award Designation of Distinction. Congratulations to John Waigwa, *Laboratory Quality Coordinator*, Serafino Gatwiri, *Nurse Training Manger*, Gregory Muruga, *ICT Programmer*, Nancy Kunyihya, *Endocrinologist*, Daniel Maina, *Clinical Pathologist and Chair of POCT Committee*.

THREE KEY TAKEAWAYS:

1. Point-of-Care testing is an emerging technology that health systems around the globe are leveraging
2. Continuous improvement programs for POCT, with a strong focus on quality can substantially change patient care and improve flow
3. Cross-functional POCT committees can help ensure strategic buy-in and integration of POC testing for improving care, reducing errors and mitigating lost revenue.

For more details on this best practice and/or other best practices that received recognition by the UNIVANTS of Healthcare Excellence Award program, please visit www.UnivantsHCE.com.





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1. The First Affiliated Hospital of Sun Yat-sen University, 2020. 2. St. Petersburg Hospital Number Two, 2020. 3. Ernst von Bergmann Hospital with the Dialysis Center Potsdam and the Diaverum Kidney Care Center MVZ Potsdam Affiliated with Otto von Guericke University Magdeburg, 2019. 4. Hospital Universitari Sant Joan d'Alacant, 2020. 5. Canterbury District Health Board, 2020. 6. Seirei Hamamatsu HP, 2020. 7. Hospital Clínico San Carlos, 2020. 8. Canterbury District Health Board, 2020.



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Web App “Clinical Laboratory Diagnostics 2020”: free of charge and ads

by Prof. Dr. med. Lothar Thomas

Universitätsklinikum Frankfurt /Germany

Dept. Clinical Chemistry and Laboratory Medicine

Frankfurt - Germany

lothar.thomas@kgu.de

The Web App contains clinical laboratory tests which are a fundamental approach in the diagnostics and monitoring of diseases and provides the opportunity to estimate outcome prediction of the individual patient. With the Web App Clinical Laboratory Diagnostics 2020 it is the intention of the editor and the coauthors to add an excellent resource to physicians and clinical chemists.

Clinical Laboratory Diagnostics 2020 will be updated several times a year and offers a quick and competent support for allocation of pathological test results which are linked to specific diseases.

Since its first publication in 1968, Clinical Laboratory Diagnostics (German title: Labor und Diagnose) has become the best-selling and most renowned reference book for Clinical Chemistry and Laboratory medicine in Europe, the Middle East, and China. So far, it has been published in German, English and Chinese. To respond to requests of our readers and to be in conformity with the spirit of the time we have created a Web App of Clinical Laboratory Diagnostics. Summarized, it represents the most current clinical reference tool for physicians and clinical chemists available in an electronic version. It has been co-authored by more than 60 specialists to encompass the whole spectrum of different disease patterns and laboratory tests. The Web App is available for all electronic devices and free of ads or charge.

It is structured as follows:

- The specific clinical laboratory test in the main menu of the 53 chapters on laboratory tests. The chapters present text, tables, and graphs with information about laboratory findings of the selected diseases or disorders.
- The laboratory tests are structured according to indication, method of determination, specimen, reference interval, clinical assessment, comments and problems, biochemistry and physiology, and references.

The test results are properly interpreted in the context with:

- The presumptive diagnosis. The 53 chapters of clinical laboratory tests are preceded by a chapter containing a broad spectrum of medical decision-making approaches (main menu/chapter 00: Register of diseases).
- In more than 800 tables and graphs of different diseases, the expedient laboratory tests and findings are presented. References provide an evidence-based presentation.
- It is possible for many diseases to select tables and graphs with information about clinical symptoms, laboratory findings, differential diagnosis, and course assessment of the selected disease.

The use of the electronic edition is convenient for the reader because it enables:

- The reading of the chapters and of the different sections, comparable to the text in the print form.
- The selection of tables, graphs and references while reading the text.
- The subject related disease overview of 20 sections of diseases (main menu/chapter 00: Register of diseases) that provides information on clinics and laboratory findings.
- A quite simple index search.

Clinical Laboratory Diagnostics 2020 contains most current scientific, clinical and laboratory diagnostic insights. Latest information from current publications, guidelines and recommendations are included. Especially the selection of the presumptive diagnosis facilitates the assessment and follow-up of disease-specific laboratory findings.

Clinical Laboratory Diagnostics 2020 can be accessed using all electronic media when selecting the link:

<http://www.clinical-laboratory-diagnostics-2020.com>.

Clinical Laboratory Diagnostics 2020 is available for all Laboratory professionals in the IFCC eAcademy at:

<https://eacademy.ifcc.org/events/web-app-clinical-laboratory-diagnostics-2020/>.

D-Dimers ELISA: predictor of gestational complications in women with antiphospholipid syndrome

by Dr. Ana Lena

COLABIOCLI Regional Representative

Treatment with low-molecular-weight heparin (LMWH) and / or low-dose aspirin has been accepted for several years in pregnant women with antiphospholipid syndrome. This treatment has been very successful with a live newborn rate of 80-90%. But between 10 to 20% of these women cannot have a living child, even with such a treatment.

Furthermore, in these patients there is a higher rate of prematurity, low birth weight and preeclampsia than in a normal pregnancy.

Treatment with Enoxaparin 40 mg / day and low-dose aspirin began in the 1990s in Uruguay, controlling patients with Anti Xa in order to maintain its value at 0.3-0.5 IU / ml of plasma.

But it was observed that the level of Anti Xa was not adequate to detect complications but only provided data on the level of heparinemia of the patient. Some patients with levels of Anti Xa mentioned above, presented serious complications that sometimes ended with the loss of pregnancy, abortion or intrauterine fetal death.

It was considered that it was necessary to have information on the patient's coagulation status. That is the reason why D dimers ELISA began to be used as markers of excessive coagulation activation in order to detect complications early and proceed to increase the dose of LMWH.

Because of this, some have abandoned the use of Anti Xa in the follow-up of these pregnant patients with antiphospholipid syndromes treated with LMWH, considering that the level of heparinemia does not predict complications or bleeding at doses used in these patients, and they have preferred to control them with D-dimers ELISA monthly. D-dimers ELISA have been shown to progressively increase in normal pregnancy, reaching a maximum at delivery with a progressive decrease in the puerperium.

In pregnant women with antiphospholipid syndrome treated with LMWH and low-dose aspirin who progress without complications, a progressive increase in ELISA D-dimers is also observed with a slope similar to that of normal pregnant women.

Article continued on next page

Although there are studies defining that D-dimers are very sensitive but not very specific in venous thromboembolic disease, there are no studies on the sensitivity and specificity of this technique in detecting pregnancy complications in women with antiphospholipid syndrome under treatment with LMWH.

In a study carried out in Uruguay, it was demonstrated that abrupt elevation of D-dimers ELISA has a high sensitivity and specificity for detecting pregnancy complications in patients with antiphospholipid syndrome treated with LMWH, with a high positive and negative predictive value.

- Sensitivity 90%
- Specificity 97%
- Accuracy 96%
- Positive predictive value 88%
- Negative predictive value 98%
- Youden Index = (Sensitivity + Specificity) - 1 = 0.87

This allows medical professionals to take action by increasing the dose of LMWH in order to improve placental vitality, stabilizing or reversing complications in a very high percentage of patients who achieve a live newborn by allowing the pregnancy to continue.

NEWS FROM REGIONAL FEDERATIONS AND MEMBER SOCIETIES



The monograph Scientific Foundation “Professor Ivan Berkeš”

Published by the Society of Medical Biochemists of Serbia



Book cover of the monograph
Scientific Foundation “Professor Ivan Berkeš”

by Dr. Snežana Jovičić

Liaison Member of the IFCC eNewsletter Working Group

In 2020, the year of the global pandemic the activities of the Society of Medical Biochemists of Serbia (SMBS) were suspended. Planned activities, like the national congress and the Belgrade Symposium for Balkan region were postponed, and the annual scientific conference “Professor Ivan Berkeš” did not take place. However, the year 2020 was also the year of the 110th anniversary of the birth of Professor Ivan Berkeš. On this occasion, SMBS published a monograph dedicated to professor Berkeš’s life and work, to the review of the previous scientific conferences organized to honour his legacy, also to the Foundation “Professor Ivan Berkeš”, and to the laureates of its annual award. The authors of the monograph are Professor Nada Majkić-Singh, the founder of the Foundation and its *spiritus movens*, and Snežana Jovičić, who, as the IFCC eNewsletter liaison member, has been writing a series of articles covering the conference over the past years.

Article continued on next page

Professor Ivan Berkeš established medical biochemistry as a modern scientific and diagnostic discipline of medicine and pharmacy in Yugoslavia and Serbia. Under his guidance generations of medical biochemists were educated at the Faculty of Pharmacy of the University of Belgrade.

But not only that. As a versatile individual (he was passionate in music, art, history, and philosophy, and spoke five languages) he inspired his students with his charismatic personality. Professor Berkeš graduated and completed his PhD thesis in Zagreb, Croatia.

He worked at several universities in former Yugoslavia - at the Faculty of Medicine in Zagreb, Faculty of Medicine in Skopje (North Macedonia), and Faculty of Pharmacy in Belgrade (Serbia), where he was elected Senior Professor in medical biochemistry and was a long-term director of the Institute of Biochemistry until his retirement.



Professor Berkeš with his collaborators and specialists at the Faculty of Pharmacy, University of Belgrade, 1970

For nearly 20 years, professor Ivan Berkeš invested all his efforts into the methodological research in clinical biochemistry, general and clinical enzymology. This work resulted in numerous specialists, master, and doctoral theses.

During his working years, professor Berkeš published several books and over 200 scientific papers in renowned journals in Yugoslavia and worldwide. He was actively engaged in the Federal Committee for Medical Biochemistry and the Section of Medical Biochemistry of the Pharmaceutical Society of Serbia.

Appreciating the work of their teacher and a renowned expert, Professor Ivan Berkeš, upon the proposal of Professor Nada Majkić-Singh, in 1997 the Society of Medical Biochemists of Yugoslavia at the time, now the Society of Medical Biochemists of Serbia, and the Faculty of Pharmacy,

University of Belgrade, established the Scientific Foundation and the Annual Scientific Conference „Professor Ivan Berkeš“. Beginning in 1998, Scientific Conferences have been presenting masters and doctoral theses in medical biochemistry and related disciplines defended during the previous academic year. Also, the best graduate students in pharmacy and medical biochemistry of the Faculty of Pharmacy in the previous academic year have been awarded the monetary awards of the Scientific Foundation.

The monograph reviews all the twenty-one scientific conferences that took place so far, concluded with the last one, held in December 2019. Also, it presents the biographies of all the forty-eight laureates of the Scientific Foundation, informing us briefly about their careers in pharmacy and medical biochemistry, in Serbia and worldwide. The 2020 Scientific Conference could not take place because of the restrictions imposed by the global pandemic that prevented us from gathering. However, the Foundation did not miss to hand the well-deserved awards to the best students of the Faculty of Pharmacy in 2020, Milena Simić (Master of Pharmacy-medical biochemist) and Milan Beljkaš (Master of Pharmacy). SMBS congratulate them on their first success, wishing them fruitful careers in pharmacy and medical biochemistry, like the ones their predecessors have. We hope that the 2020 would be the only year in which the Scientific Conference did not take place, and that the memory of Professor Ivan Berkeš will be alive for many years to come through the activities of Scientific Foundation, annual Scientific Conference, and many young laureates of the Foundation award.



Professor Nada Majkić-Singh and the laureate of the Foundation award for the year 2020, Milena Simić



Professor Nada Majkić-Singh and the laureate of the Foundation award for the year 2020, Milan Beljkaš



News from the Japan Society of Clinical Chemistry (JSCC)

2020 JSCC Outstanding Young Investigator Award

The Japan Society of Clinical Chemistry (JSCC) Outstanding Young Investigator Award is given to persons who has made outstanding academic research in clinical chemistry. In 2020, Hidetsugu Fujigaki, PhD and Masayoshi Tasaki PhD were the winners of the Article Award. The award presentation was held at the 60th Annual Meeting of JSCC in Tokyo, Japan held from October 30 - November 1, 2020 by livestreaming. At the award presentation, award winners Dr. Fujigaki and Dr. Tasaki were congratulated by Dr. Masato Maekawa, president of JSCC for their outstanding work in clinical chemistry.

In this issue, we would like to introduce the winners of 2020 JSCC Outstanding Young Investigator Award to distribute their outstanding work.

*by Dr. Hideo Sakamoto
International Exchange Committee of JSCC*

Hidetsugu Fujigaki, PhD (Department of Disease Control and Prevention, Fujita Health University Graduate School of Health Sciences) is the winner of the 2020 JSCC Outstanding Young Investigator Award, entitled with “Imbalances of tryptophan-kynurenine pathway metabolism in neuropsychiatric disorders”

The essential amino acid L-tryptophan (Trp) is metabolized via kynurenine pathway which is recognized as a major route of Trp degradation in mammals. Dysregulation of the kynurenine pathway metabolism is involved in the pathophysiology of several neuropsychiatric disorders. Several clinical studies and experimental models have shown that the kynurenine pathway metabolites in body fluids have potential to be used as biomarkers for neuropsychiatric diseases.

Article continued on next page



Dr. Hidetsugu Fujigaki

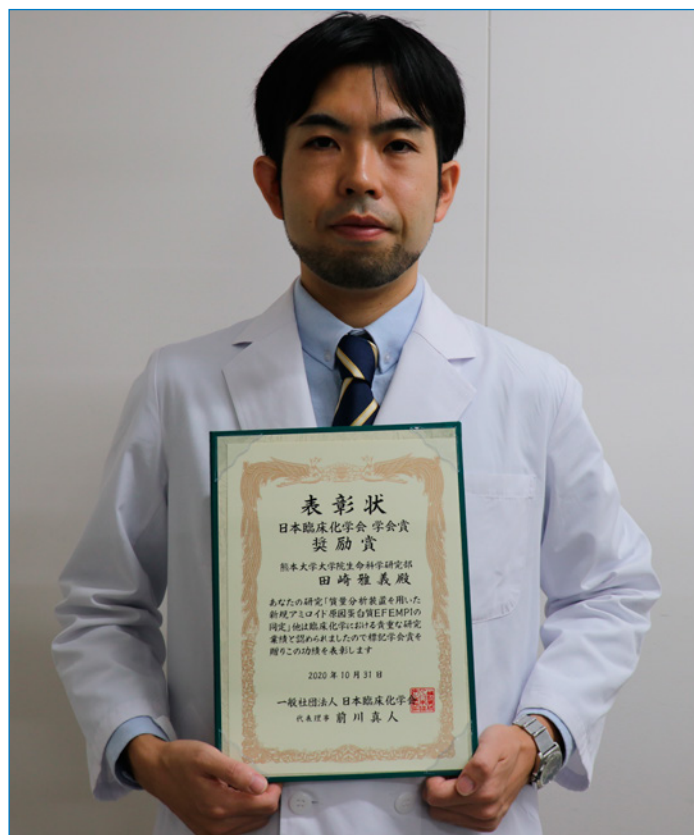
Also, enzymes in kynurenine pathway can serve as drug targets for neuropsychiatric disorders.

His group found that the kynurenine pathway was involved in depressive symptoms occurring as a side effect of interferon therapy in hepatitis C viral (HCV) patients. They showed that increases in serum kynurenine pathway metabolites, such as kynurenine and 3-hydroxykynurenine, were much higher in depressive HCV patients receiving interferon therapy. In addition, they found that murine interferon over-expressing mice showed depression-like behavior and serum kynurenine and 3-hydroxykynurenine levels were significantly increased. These results suggest that levels of serum kynurenine pathway metabolites can be used as a biomarker for depressive symptoms in interferon-treated patients.

Dr. Fujigaki also conducts research on developing therapeutic agents for neuropsychiatric disorders that target enzymes in the kynurenine pathway. Elevated brain levels of one of the kynurenine pathway metabolites, kynurenic acid, have been demonstrated in the brain tissue of patients with schizophrenia. These

elevated levels of kynurenic acid could contribute cognitive deficits and negative symptoms associated with schizophrenia. Kynurenine aminotransferase II (KAT II) is considered to be responsible for most brain kynurenic acid synthesis, therefore, inhibition of KAT II activity could be a potential therapeutic target of the symptoms of schizophrenia. His group developed a high-throughput screening assay to identify novel inhibitors for KAT II. They screened approximately 13,000 molecules in compound libraries by this screening assay and discovered that glycyrrhizic acid and its derivatives were selective and potent inhibitors of KAT II. Since glycyrrhizic acid is the component of kampo medicine and is also an approved drug in many countries, glycyrrhizic acid may be an excellent candidate for drug repositioning in the treatment of schizophrenia.

Masayoshi Tasaki, PhD (Department of Morphological and Physiological Sciences, Graduate School of Health Sciences, Kumamoto University) **is the winner of the 2020 JSCC Outstanding Young Investigator Award, entitled with “EFEMP1 is a novel amyloid precursor protein identified by mass spectrometry”.**



Dr. Masayoshi Tasaki

Amyloidosis is a group of disorders characterized by amyloid deposits in systemic organs. Although more than 36 amyloid precursor proteins, such as amyloid beta peptide, immunoglobulin light chain and transthyretin have been reported (Benson et al., Amyloid 2018), amyloid of unknown origin still exists. By using laser microdissection and LC-MS/MS, he newly identified EGF-containing fibulin-like extracellular matrix protein 1(EFEMP1) as an amyloid precursor protein from amyloid deposits of GI tract in patient with GI bleeding (Tasaki et al., J Pathol 2019). Immunohistochemical staining with monoclonal anti-EFEMP1 antibody showed that EFEMP1 specifically colocalized in amyloid deposits of GI tract from patient. In addition, his histopathological studies showed that

the frequency of EFEMP1 amyloid deposits increased with age in lung, stomach, small intestine, large intestine and bladder. EFEMP1 amyloid was weakly visualized by Congo Red staining. He has also reported EFEMP amyloid incidentally found in surgically resected specimens of colon cancer (Tasaki et al., Amyloid 2020).

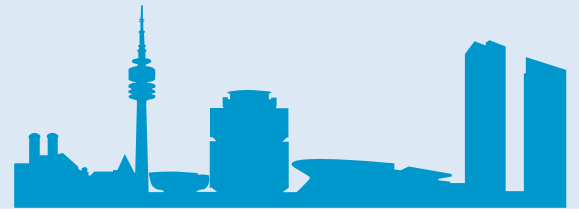
These data suggest that EFEMP1 amyloid has been overlooked due to low affinity with Congo Red, and might be a common type of age-related amyloid. Recently, EFEMP1 has been approved as a novel amyloid precursor protein by the International Society of Amyloidosis (ISA) nomenclature committee. (Benson et al., Amyloid 2020). His work shed a light on understanding of amyloidosis.

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PRELIMINARY PROGRAMME



EUROMEDLAB
2021 MUNICH

Biological Variation of Cardiac Troponins in Health and Disease: A Systematic Review and Meta-analysis

Diaz-Garzon J., Fernandez-Calle P., Sandberg S., Özcürümez M., Bartlett W.A., Coskun A., Carobene A., Perich C., Simon M., Marques F., Boned B., Gonzalez-Lao E., Braga F., Aarsand A.K., on behalf of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) Working Group on Biological Variation and Task Group for the Biological Variation Database

Clin Chem 2020;

Available from:

<https://doi.org/10.1093/clinchem/hvaa261>.

Reported by Lejla Alić, member of the EFLM WG-Promotion & Publications

In this study, the authors evaluated available biological variation (BV) studies on cardiac-specific troponin I and T (cTnI, cTnT) in regard to The Biological Variation Data Critical Appraisal Checklist (BIVAC) compliance. Additionally, authors perform a meta-analysis of essential BV estimates from BIVAC-compliant studies in different states of health (healthy vs non-healthy), sampling intervals (short-term vs long term) and assays used (contemporary vs high-sensitivity assays). Data for BV estimates from 14 and 15 BIVAC-compliant studies for cTnI and cTnT, respectively, were included in the first stage meta-analysis, while in the second stage meta-analysis included 10 and 12 studies for cTnI and cTnT BV estimates. The latter included only studies that reported results above the limit of detection (LoD).

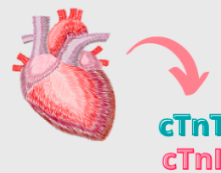
Interestingly, the study shows that the biological variation estimates in non-healthy individuals were like estimates in healthy individuals for all settings. The study offers important cTnI and cTnT estimates such as reference change value (RCV) which should be included in standard clinical protocols for diagnosing, treating, and monitoring patients with cardiac diseases and a range of different chronic diseases.

BIOLOGICAL VARIATION OF CARDIAC TROPONINS IN HEALTH AND DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS



Diaz-Garzon, et al. *Clin Chem.* 2020

<https://doi.org/10.1093/clinchem/hvaa261>



AIM OF THE STUDY

- to identify published studies on cTn that are BIVAC compliant
- to perform a meta-analysis of BV estimates for cTnI and cTnT in different states of health and sampling intervals

RESULTS

PubMed, studies performed until April 15, 2020

BV estimates for:

healthy vs. non-healthy

cTnT vs. cTnI

short-term vs. long-term sampling.

	24hr	24hr	24hr	24hr	
cTnT	CV _i (%)	5.3	11.3	3.1	8.4
	CV _b (%)	34.9	26.8	60.7	68.3
	RCV (%)	-26.2 - 35.6	-37.8 - 60.6	-23.6 - 30.8	-29.1 - 41.1
	CV _{APS} (%)	2.7	5.7	1.6	4.2
	B _{APS} (%)	8.8	7.3	15.2	17.2
cTnI	CV _i (%)	4.3	15.1	5.0	14.1
	CV _b (%)	36.7	34.6	156.0	63.8
	RCV (%)	-25.6 - 34.4	-38.0 - 61.4	-25.5 - 34.1	-33.2 - 49.6
	CV _∞ (%)	2.1	7.6	2.5	7.1
	B _∞ (%)	9.2	9.4	39.0	16.3

Abbreviations: cTn (T, I) - cardiac-specific troponins T and I; BIVAC - Biological Variation Data Critical Appraisal Checklist; BV - biological variation; CV_i - within-subject BV; CV_b - between-subject BV; RCV - reference change value; CV_{APS} - analytical performance specification for imprecision; B_{APS} - analytical performance specification for bias

INFOGRAPHIC BY LEJLA ALIĆ (EFLM-CC)

Critical appraisal and meta-analysis of biological variation estimates for kidney related analytes

Jonker N., Aslan B., Boned B., Marqués-García F., Ricós C., Alvarez V., Bartlett W., Braga F., Coskun A., Diaz-Garzón J., Fernández-Calle P., Gonzalez-Lao E., Minchinela J., Perich C., Simón M., Sandberg S., Aarsand A.K.

Clin Chem Lab Med 2020;

Available from:

<https://doi.org/10.1515/cclm-2020-1168>.

Reported by Aleksei Tikhonov, member young scientist of the EFLM WG-Promotion & Publications

In this meta-analysis authors reviewed available biological variation (BV) data and provided updated BV estimates for the following kidney markers in serum and plasma: albumin, creatinine, cystatin C, chloride, potassium, sodium, and urea. Retrieved publications for the meta-analysis were appraised by the Biological Variation Data Critical Appraisal Checklist (BIVAC). Meta-analyses of BIVAC compliant studies with similar design were performed to deliver global estimates of within-subject (CVI) and between-subject (CVG) BV estimates.

Out of the 61 identified papers, three received a BIVAC grade A, four grade B, 48 grade C, five grade D and one paper was not appraised as it did not report numerical BV estimates. Most of the studies were identified for creatinine (n=48). BV estimates derived from the meta-analysis were in general lower than previously reported estimates for all analytes except urea. For some measurands, BV estimates may be influenced by age or states of health, but further data are required.

CRITICAL APPRAISAL AND META-ANALYSIS OF BIOLOGICAL VARIATION ESTIMATES FOR KIDNEY RELATED ANALYTES

Niels Jonker et al, on behalf of the EFLM Working Group on Biological Variation and Task Group for the Biological Variation Database

DOI: <https://doi.org/10.1515/cclm-2020-1168>



1 SUMMARY

The review provides updated global BV estimates for kidney-related measurands. For all measurands except for urea, these estimates were lower than previously reported.



2 METHODS

Meta-analyses of BIVAC compliant studies with a similar design were performed to deliver global estimates of within-subject (CVI) and between-subject (CVG) biological variation (BV) estimates. Out of the 61 identified papers grade A, B, C and D received 3, 4, 48, and 5 papers, respectively. One paper was not appraised.

3 RESULTS

ANALYTE	No OF STUDIES	CVI (95% CI)	CVG (95% CI)
ALBUMIN	10	2.6 (2.2-3.9)	5.1 (2.2-6.3)
CHLORIDE	7	1.1 (0.9-2.1)	1.3 (0.8-1.4)
CREATININE	11	4.5 (4.4-5.7)	14.2 (7.0-17.4)
CYSTATIN C	3	4.0 (3.9-8.6)	12.1 (12.0-15.1)
POTASSIUM	7	4.1 (3.1-5.4)	4.1 (4.1-7.7)
SODIUM	7	0.5 (0.2-1.4)	1.2 (0.5-1.4)
UREA	9	13.9 (9.5-14.4)	19.0 (1.1-22.5)

INFOGRAPHIC BY ALEKSEI TIKHONOV (EFLM-CC)

Biological variation of serum insulin: updated estimates from the European Biological Variation Study (EuBIVAS) and meta-analysis

Carobene A., Gonzalez Lao E., Simon M., Locatelli M., Coşkun A., Díaz-Garzón J., Fernandez-Calle P., Sandberg S., Aarsand A.K., on behalf of the European Federation of Clinical Chemistry and Laboratory Medicine Working Group on Biological Variation

Clin Chem Lab Med 2020;

Available from:

<https://doi.org/10.1515/cclm-2020-1490>.

Reported by Tara Rolić, member of the EFLM WG-Promotion & Publications

The within-subject (CVI) and the between-subject (CVG) biological variation (BV) components have several clinical implications. On behalf of the Working Group on Biological Variation of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM), BV of serum insulin and meta-analysis were performed. Meta-analysis included seven studies with reported BV estimates for insulin in serum/plasma samples from the EFLM BV Database (EFLM BVD). Three of them have fulfilled the inclusion criteria to deliver global BV estimates. Additionally, the European Biological Variation Study (EuBIVAS) involved six European laboratories from Italy, Norway, Spain, the Netherlands, and Turkey. Fasting blood samples from 91 healthy volunteers were drawn weekly in morning hours, for ten consecutive weeks. All samples were analyzed in duplicate by the electrochemiluminescence immunoassay (ECLIA, Roche Diagnostics). The CVI estimate derived from all subjects was 25.3% (95% CI; 24.0–26.6). No significant differences in insulin concentrations and CVG between subgroups were observed. Finally, the meta-analysis derived CVI estimate decreased from 28.5% (95% CI; 21.1–37.1) to 25.4% (95% CI; 21.1–37.1) after inclusion of the EuBIVAS data. Result of the multinational cohort study is that obtained CVI estimates were homogeneously distributed and lower than previously published. Authors emphasized how obtained results highlight the applicability of the EuBIVAS BV estimates and impact the meta-analysis results with implications for the delivery of correct diagnosis and monitoring.

BIOLOGICAL VARIATION OF SERUM INSULIN: UPDATED ESTIMATES FROM THE EUROPEAN BIOLOGICAL VARIATION STUDY (EUBIVAS) AND META-ANALYSIS

CAROBENE A, GONZALEZ LAO E, SIMON M ET AL.,
EFLM WG-BV
CCLM 2020

[HTTPS://DOI.ORG/10.1515/CCLM-2020-1490](https://doi.org/10.1515/cclm-2020-1490)



ABBREVIATIONS



CVI = within-subject biological variation
 CVG = between-subject biological variation
 RCV = reference change value
 APS = analytical performance specifications (CVAPS=0.5CVI)
 II = index of individuality (II=CVI/CVG)
 BV = biological variation
 CI = confidence interval

	Number of individuals	Mean concentration $\mu\text{U/mL}$ (95% CI)	CVI% (95% CI)	CVG% (95% CI)	CVs% (95% CI)	II	CVaps %	RCV%
All subjects	90	7.65 (7.47-7.83)	3.1 (3.0-3.2)	25.3 (24.0-26.6)	33.4 (28.1-39.5)	0.76	12.7	-37.4 / 59.7
Males	38	7.53 (7.24-7.83)		25.0 (23.2-27.1)	31.9 (24.6-42.7)	0.78		
Females	52	7.72 (7.50-7.95)		25.3 (23.7-27.0)	34.8 (28.3-43.9)	0.73		

META-ANALYSIS

7 studies with report of the BV estimates of insulin in serum/plasma
 3/7 fulfill the inclusion criteria



EUBIVAS STUDY

- six EU laboratories from Italy, Norway, Spain the Netherlands and Turkey
- 91 healthy volunteers (age 21-69 years)
- fasting blood samples drawn weekly for 10 consecutive weeks
- samples analyzed in duplicate by electrochemiluminescence immunoassay method



- multinational cohort study
- meta-analysis derived CVI estimate decreased from 28.5% to 25.4%
- applicability of the EuBIVAS and impact on the results for the delivery of correct diagnosis and monitoring



INFOGRAPHIC BY TARA ROLIĆ, EFLM CC

A proposed common training framework for specialists in laboratory medicine under EU directive 2013/55/EC (The recognition of professional qualifications)

Wieringa G., Queraltó J., Homšak* E., Jassam N., Cavalier E., Svinarov D., Krleža J.L., Christou S., Pikner R., Rennebod Larsen T., Tomberg K., Linko-Parvinen A., Sapin V., Baum H., Kroupis C., Bagoly Z., Costelloe S., Sciacovelli L., Stasulans J., Vitkus D., Meunier D., Solnica B., Reguengo H., Mambet C., Kovac G., Krhin B., Ohlson M., Buhagiar G. and Simundic A.M.

Clin Chem Lab Med 2020;
Available from:
<https://doi.org/10.1515/cclm-2020-1504>.

Reported by Serkan Bolat, corresponding member of the EFLM WG-Promotion & Publications

Representatives of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) and national laboratory science societies have proposed Common Training Framework for non-medical Specialists in Laboratory Medicine. The qualifications of specialists trained in accordance with this syllabus will be automatically recognised in the European Union (EU). The common training framework is essential for the recognition of the competences of scientific and pharmacy-trained staff, who make up to 60% of the total laboratory specialists in the EU. It is built on three core components which including an equivalence of practice standards, expected base of knowledge, skills, competences, and professional conduct.

The framework includes common goals similar to the Directive 2013/55/EC (The Recognition of Professional qualifications) which aims to increase professional mobility, enhance patient safety by harmonising the education and training, ensure equitable distribution of skills/expertise across the EU. Finally, it should be noted that the template syllabus proposed by the EFLM was accepted by 19 EU member states and it could replace the national program only by EU member state decision.

A proposed common training framework for specialists in laboratory medicine under EU directive 2013/55/EC (The recognition of professional qualifications)
Wieringa et al. Clin Chem Lab Med 2020
doi.org/10.1515/cclm-2020-1504

SCENE Pharmacists and scientists (non-medical specialists) are the majority of specialists in 15 of 26 EU Member States.

GOALS

- Increasing professional mobility
- Harmonising the education and training
- Ensuring equitable distribution of skills/expertise

SCOPE

- Equivalence of standards of practice
- Expected base of knowledge, skills, competences
- An expected code of conduct

FRAMEWORK

- No need to replace national programmes
- Template for education and training
- Supported by more than 1/3 of professional organisations in EU Member States

Infographic by Serkan Bolat
EFLM-CC

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Website: www.szyhlo.com.

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Website: www.technogenetics.it/en.

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Instrumentation Laboratory

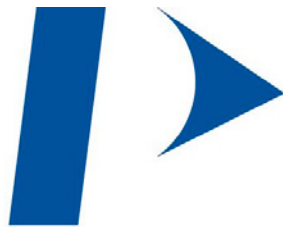
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IFCC'S CALENDAR OF CONGRESSES, CONFERENCES & EVENTS

We advise readers to keep up-to-date about the evolving situation and possible rescheduled dates.
Contact organizing secretariats for updates on upcoming events.

Calendar of IFCC Congresses/Conferences and Regional Federations' Congresses

May 27 - 29, 2021	 <p>ARAB FEDERATION OF CLINICAL BIOLOGY AFCB</p>	<i>AFCB Congress 2021</i>	Beirut, LB
Sep 23 - 25, 2021	 <p>African Federation of Clinical Chemistry</p>	<i>AFCC Congress 2021</i>	Lusaka, ZM
Nov 28 - Dec 2, 2021	 <p>EUROMEDLAB 2021 MUNICH</p>	<i>XXIV IFCC - EFLM EuroMedLab Munich 2021</i>	Munich, DE
Dec 6 - 7, 2021	 <p>IFCC International Federation of Clinical Chemistry and Laboratory Medicine</p>	<i>IFCC-ICHCLR Workshop on overcoming challenges to global standardization of clinical laboratory testing: reference materials and regulations</i>	Paris, FR
Mar 30 - Apr 2, 2022	 <p>COLABIOCLI</p>	<i>XXV COLABIOCLI Congress</i>	Leon, MX

Calendar continued on next page

June 26 - 30, 2022		<i>XXIV IFCC WorldLab Seoul 2022</i>	Seoul, KR
Oct 15 - 18, 2022		<i>XVI APFCB Congress 2022</i>	Sydney, AU
May 21 - 25, 2023		<i>XXV IFCC - EFLM WorldLab EuroMedLab - Rome 2023</i>	Rome, IT
<i>New date TBA</i>		<i>International Congress of Pediatric Laboratory Medicine</i>	TBA
<i>New date TBA</i>		<i>IFCC Forum for Young Scientists</i>	TBA



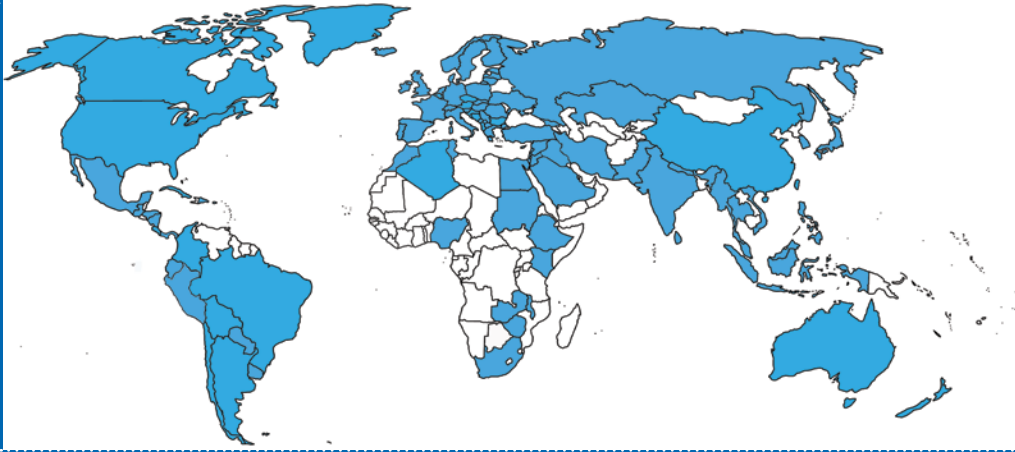
Other events with IFCC auspices

We advise readers to keep up-to-date about the evolving situation and possible rescheduled dates. Contact organizing secretariats for updates on upcoming events.

Jan 15 - Apr 10, 2021	<i>Lab Accreditation in Pathology Department</i>	Pakistan Online event
Mar 3 - Dec 3, 2021	<i>Virtual Diploma in Clinical Biochemistry program</i>	Mexico Online event
May 24 - 27, 2021	<i>10th Santorini Conference "Systems medicine and personalized health and therapy" – "The odyssey from hope to practice: Patient first – Keeps Ithaca always in your mind"</i>	Santorini, GR
May 27 - 29, 2021	<i>II National Meeting Conquilab and Technological</i>	Mazatlan, MX
Jun 10 - 11, 2021	<i>8th International Symposium on Critical Care Testing and Blood Gases</i>	Biarritz, FR
Sep 6- 7, 2021	<i>POCT: Making the point</i>	Rome, IT
Oct 5 - 10, 2021	<i>FEBS Advanced Course: 360-degree Lysosome; from structure to genomics, from function to disease-update</i>	Izmir, TR
Oct 6 - 8, 2021	<i>4èmes Journées Francophone de Biologie Médicale</i>	Rennes, FR
Oct 8 - 11, 2021	<i>46th ISOBM Congress</i>	Bled, SI
Feb 10 - 11, 2022	<i>International Congress on Quality in Laboratory Medicine</i>	Helsinki, FI
<i>New date TBA</i>	<i>6th Serbian Biomarker Symposium (SERBIS): Lipid Metabolism in Health and Disease</i>	Belgrade, SRB

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 African Federation of Clinical Chemistry (AFCC)
 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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Publisher

**Communications and Publications
Division (CPD) of the IFCC**

The Communications and Publications Division publishes ten editions of the e-News per year, including two double issues.

Editor

Katherina Psarra, MSc, PhD
Department of Immunology - Histocompatibility
Evangelismos Hospital, Athens, Greece
E-mail: enews@ifcc.org

Design & Production:

**Insoft Digital**

epub@insoftdigital.com

Circulation

The eNews is distributed to all IFCC members registered on-line to receive it and to all IFCC sponsors.

Deadlines for submissions to the eNews

N° 1/2 – January/February: *by mid January*

N° 3 – March: *by mid February*

N° 4 – April: *by mid March*

N° 5 – May: *by mid April*

N° 6 – June: *by mid May*

N° 7/8 – July/August: *by mid June*

N° 9 – September: *by mid August*

N° 10 – October: *by mid September*

N° 11 – November: *by mid October*

N° 12 – December: *by mid November*

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Katherina Psarra, Editor, IFCC eNews
E-mail: enews@ifcc.org

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