

CLINICAL CHEMISTRY AND LABORATORY MEDICINE

Published in Association with the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM)

EFLM
EUROPEAN FEDERATION OF CLINICAL CHEMISTRY
AND LABORATORY MEDICINE



CCLM is the official journal of the Association of Clinical Biochemists in Ireland (ACBI), the Austrian Society of Laboratory Medicine and Clinical Chemistry (ÖGLMKC), the German Society for Clinical Chemistry and Laboratory Medicine (DGKL), the Hungarian Society of Laboratory Medicine (MLDT), the Royal Belgian Society of Laboratory Medicine (RBSLM), the Italian Society of Clinical Biochemistry and Clinical Molecular Biology (SIBioC), the Portuguese Society of Clinical Chemistry, Genetics and Laboratory Medicine (SPML), the Slovenian Association for Clinical Chemistry and Laboratory Medicine (SZKKLM) and the Spanish Society of Laboratory Medicine (SEQC). *CCLM* is affiliated with the Australasian Association of Clinical Biochemists (AACB) and Société Française de Biologie Clinique (SFBC).

EDITOR-IN-CHIEF

Mario Plebani
Padova, Italy

ASSOCIATE EDITORS

Giuseppe Lippi
Reviews Editor
Verona, Italy
Philippe Gillery
Reims, France
Ronda Greaves
Melbourne, Australia
Karl J. Lackner
Mainz, Germany
Bohuslav Melichar
Olomouc, Czech Republic
Peter Schlattmann
Jena, Germany
Pan Shiyang
Nanjing, P.R. China

EDITORIAL BOARD

Ivan Brandslund
Odense, Denmark
Christoph Buchta
Vienna, Austria
Janne Cadamuro
Salzburg, Austria

DE GRUYTER

Etienne Cavalier
Liege, Belgium
Wei Cui
Beijing, P.R. China
Vincent De Guire
Montreal, Canada
Vincent Delatour
Paris, France
Emmanuel Favaloro
Westmead, Australia
Julien Favresse
Brussels, Belgium
Pilar Fernandez-Calle
Madrid, Spain
João Tiago Guimarães
Porto, Portugal
Liam Heaney
Loughborough, UK
Brandon M. Henry
Cincinnati, OH, USA
Markus Herrmann
Graz, Austria
Martin Hersberger
Zurich, Switzerland
Johannes J.M.L. Hoffmann
Nuenen, Netherlands
Zhi-De Hu
Hohhot, P.R. China
Aamir Ijaz
Mirpur, Pakistan

Berend Isermann
Leipzig, Germany
Joannes F.M. Jacobs
Nijmegen, Netherlands
Petr Jarolim
Boston, MA, USA
Graham Jones
Darlinghurst, NSW, Australia
János Kappelmayer
Debrecen, Hungary
Peter Kavsak
Toronto, Canada
Magdalena Krintus
Bydgoszcz, Poland
Vathany Kulasingam
Toronto, ON, Canada
Leslie Charles Lai
Kuala Lumpur, Malaysia
Ivana Lapić
Zagreb, Croatia
Michael Laposata
Galveston, TX, USA
Nicholas E. Larkey
Charlottesville, VA, USA
Tze Ping Lo
Singapore
Konstantinos Makris
Athens, Greece

David Meyre
Hamilton, Canada
Yesim Ozarda
Bursa, Turkey
Tomris Özben
Antalya, Turkey
Andrea Padoan
Padova, Italy
Vladimir Palicka
Hradec Králové,
Czech Republic
Geraldo Picheth
Curitiba, Brazil
Ted E. Schutzbank
San Diego, CA, USA
Cord Spreckelsen
Jena, Germany
Grazyna Sypniewska
Bydgoszcz, Poland
Michael Vogeser
Munich, Germany
Maria Alice V. Willrich
Rochester, MN, USA
Annalise E. Zemlin
Cape Town, South Africa

MANAGING EDITOR

Heike Jahnke
Berlin, Germany

ABSTRACTED/INDEXED IN Analytical Abstracts · Baidu Scholar · Cabells Journalytics · CABI (over 50 subsections) · Chemical Abstracts Service (CAS): CAPlus; SciFinder · CNKI Scholar (China National Knowledge Infrastructure) · CNPIEC: cnpLINKer · Dimensions · EBSCO (relevant databases) · EBSCO Discovery Service · EMBASE · Genamics JournalSeek · Google Scholar · ICAP Alcohol Information Databases · Japan Science and Technology Agency (JST) · J-Gate · Journal Citation Reports/Science Edition · JournalGuide · JournalTOCs · KESLI-NDSL (Korean National Discovery for Science Leaders) · Medline · MyScienceWork · Naver Academic · Naviga (Softweco) · Norwegian Register for Scientific Journals, Series and Publishers · Pathway Studio · Primo Central (ExLibris) · ProQuest (relevant databases) · Publons · PubMed · PubsHub · QOAM (Quality Open Access Market) · ReadCube · Reaxys · Scilit · SCImago (SJR) · SCOPUS · Semantic Scholar · Sherpa/RoMEO · Summon (ProQuest) · TDNet · TEMA Technik und Management · Text Mining · Ulrich's Periodicals Directory/ulrichsweb · WanFang Data · Web of Science: Biological Abstracts; BIOSIS Previews; Current Contents/Life Sciences; Prous Science Integrity; Science Citation Index; Science Citation Index Expanded · WorldCat (OCLC) · X-MOL · Yewno Discover

CCLM is the official journal of the Association of Clinical Biochemists in Ireland (ACBI), the Austrian Society of Laboratory Medicine and Clinical Chemistry (ÖGLMKC), the German Society for Clinical Chemistry and Laboratory Medicine (DGKL), the Hungarian Society of Laboratory Medicine (MLDT), the Royal Belgian Society of Laboratory Medicine (RBSLM), the Italian Society of Clinical Biochemistry and Clinical Molecular Biology (SIBioC), the Portuguese Society of Clinical Chemistry, Genetics and Laboratory Medicine (SPML), the Slovenian Association for Clinical Chemistry and Laboratory Medicine (SZKKLM) and the Spanish Society of Laboratory Medicine (SEQC). *CCLM* is affiliated with the Australasian Association of Clinical Biochemists (AACB) and Société Française de Biologie Clinique (SFBC).

The publisher, together with the authors and editors, has taken great pains to ensure that all information presented in this work (programs, applications, amounts, dosages, etc.) reflects the standard of knowledge at the time of publication. Despite careful manuscript preparation and proof correction, errors can nevertheless occur. Authors, editors and publisher disclaim all responsibility for any errors or omissions or liability for the results obtained from use of the information, or parts thereof, contained in this work.

The citation of registered names, trade names, trademarks, etc. in this work does not imply, even in the absence of a specific statement, that such names are exempt from laws and regulations protecting trademarks etc. and therefore free for general use.

ISSN 1434-6621 · e-ISSN 1437-4331 · CODEN CCLMFV

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at www.degruyter.com/cclm.

RESPONSIBLE EDITOR(S) Prof. Dr. Mario Plebani, Università di Padova, Dipartimento di Medicina di Laboratorio, Azienda Ospedaliera di Padova, Via Nicolò Giustiniani 2, 35131 Padova, Italy. Tel.: +390 (0)49 821 2792, Fax: +390 (0)49 663 240, e-mail: mario.plebani@unipd.it

PUBLISHER Walter de Gruyter GmbH, Berlin/Boston, Genthiner Str. 13, 10785 Berlin, Germany

JOURNAL COORDINATOR Heike Jahnke, De Gruyter, Genthiner Str. 13, 10785 Berlin, Germany, Tel.: +49 (0)30 260 05 – 220, Fax: +49 (0)30 260 05 – 325, e-mail: heike.jahnke@degruyter.com

ADVERTISEMENTS e-mail: anzeigen@degruyter.com

© 2024 Walter de Gruyter GmbH, Berlin/Boston, Germany

TYPESETTING TNQ Tech Private Limited, Chennai, India

PRINTING Franz X. Stücker Druck und Verlag e.K., Ettenheim

COVER ILLUSTRATION Research lab © Eisenhans. Permission to use the image on the cover granted by Fotolia LLC.



Contents

Editorial

Connie M. Arthur, Richard D. Cummings and Sean R. Stowell

Unraveling the mystery of blood groups and COVID-19 — 371

Refers to article on p 396

Reviews

Ruchi Sharma, Weidan Zhao, Yousaf Zafar, Arvind R. Murali and Kyle E. Brown

Serum hepcidin levels in chronic liver disease: a systematic review and meta-analysis — 373

Daniela Ligi, Chiara Della Franca, Kin Israel Notarte, Nathaniel Goldrich, David Kavteladze, Brandon Michael Henry and Ferdinando Mannello

Platelet distribution width (PDW) as a significant correlate of COVID-19 infection severity and mortality — 385

Mini Reviews

Massimo Franchini, Fabrizio Maggi and Daniele Focosi

ABO blood group-related mechanism of infection of SARS-CoV-2: an overview of systematic reviews — 396

Opinion Paper

Abdurrahman Coskun and Giuseppe Lippi

Personalized laboratory medicine in the digital health era: recent developments and future challenges — 402

Guidelines and Recommendations

Zsuzsanna Hevessy, Gabor Toth, Peter Antal-Szalmas, Margit Tokes-Fuzesi, Janos Kappelmayer, Bettina Karai and Eva Ajzner, on behalf of the Working Group on Guidelines and Algorithms of the Hungarian Society of Laboratory Medicine
Algorithm of differential diagnosis of anemia involving laboratory medicine specialists to advance diagnostic excellence — 410

General Clinical Chemistry and Laboratory Medicine

Ulf Nyman, Jonas Björk, Pierre Delanaye, Alexandre Lahens, Hans Pottel, Emmanuelle Vidal-Petiot and Martin Flamant
Rescaling creatinine makes GFR estimation equations generally applicable across populations – validation results for the Lund-Malmö equation in a French cohort of sub-Saharan ancestry — 421

Leonor Guiñón, Francisco J. Illana, Biel Cuevas, Marina Canyelles, Cecília Martínez-Bru and Álvaro García-Osuna

Periodic verification of results' comparability between several analyzers: experience in the application of the EP31-A-IR guideline — 428

Ana Turčič, Andrija Štajduhar, Željka Vogrinc, Ljiljana Zaninović and Dunja Rogić

Machine learning to optimize cerebrospinal fluid dilution for analysis of MRZH reaction — 436

Triin Paabo, Piret Mihkelson, Jelena Beljantseva, Ain Rähni, Signe Tækker, Rando Porosk, Kalle Kilk and Katrin Reimand

Diagnostic performance of automated red cell parameters in predicting bone marrow iron stores — 442

Surada Satthakarn, Kesorn Panyasai, Amphai Phasit and Sittichai Panyasai

Reliability of hemoglobin A₂ value as measured by the Premier Resolution system for screening of β -thalassemia carriers — 453

Rivka Goldis, Batia Kaplan, Michael Arad, Angela Dispenzieri, Surendra Dasari, Olga Lesya Kukuy, Amos J. Simon, Amir Dori, Efrat Shavit-Stein, Tamar Ziv, David Murray, Taxiarchis Kourelis, Morie A. Gertz, Dan Dominissini, Hila Magen and Eli Muchtar

Amino acid sequence homology of monoclonal serum free light chain dimers and tissue deposited light chains in AL amyloidosis: a pilot study — 464

Yuelin Wang, Siqi Zhang, Weixing Zhong, Huan Chen, Yiming Zhao, Hang Song, Tien Yin Wong, Youxin Chen, Yanchun Zhang and Chan Zhao

Development of high-performance point-of-care aqueous VEGF detection system and proof-of-concept validation in RVO patients — 472

Ievgen Motorykin, Jianying Mu, Bradley S. Miller, Allison Li, Nigel J. Clarke, Michael J. McPhaul and Zengru Wu

Detection rate of IGF-1 variants and their implication to protein binding: study of over 240,000 patients — 484

Sonia Pajares-García, José Manuel González de Aledo-Castillo, José Eduardo Flores-Jiménez, Tatiana Collado, Judit Pérez, Abraham José Paredes-Fuentes, Ana Argudo-Ramírez, Rosa María López-Galera, Blanca Prats and Judit García-Villoria

Analysis of a second-tier test panel in dried blood spot samples using liquid chromatography–tandem mass spectrometry in Catalonia's newborn screening programme — 493

Yongbin Zeng, Li Zhang, Zhiyi Zheng, Jingyi Su, Ya Fu, Tianbin Chen, Kun Lin, Can Liu, Huanhuan Huang, Qishui Ou and Yongjun Zeng

Targeted quantitative lipidomic uncovers lipid biomarkers for predicting the presence of compensated cirrhosis and discriminating decompensated cirrhosis from compensated cirrhosis — 506

Reference Values and Biological Variations

Anwar Borai, Kiyoshi Ichihara, Waleed Tamimi, Abdulaziz Masaud and Samia Sobki

Establishment of reference intervals for free light chains and immunoglobulins in Saudi population — 522

Cancer Diagnostics

Daniel Martin Klotz, Theresa Link, Pauline Wimberger and Jan Dominik Kuhlmann

A predictive and prognostic model for surgical outcome and prognosis in ovarian cancer computed by clinico-pathological and serological parameters (CA125, HE4, mesothelin) — 530

Charissa Wijnands, Pieter Langerhorst, Somayya Noori, Jenneke Keizer-Garritsen, Hans J.C.T. Wessels, Jolein Gloerich, Vincent Bonifay, Hélène Caillon, Theo M. Luider, Alain J. van Gool, Thomas Dejoie, Martijn M. VanDuijn and Joannes F.M. Jacobs

M-protein diagnostics in multiple myeloma patients using ultra-sensitive targeted mass spectrometry and an off-the-shelf calibrator — 540

Cardiovascular Diseases

Maïke Schaefer, Andreas Stein, Bettina Ruf, Gunter Balling, Jonas Palm, Andreas Simmelbauer, Julie Cleuziou, Michaela Sander, Josef Auer, Kristina Borgmann, Joachim Struck, Oliver Hartmann, Janin Schulte, Jürgen Hörer, Peter Tassani-Prell, Peter Ewert, Stefan Holdenrieder and Cordula M. Wolf

Bioactive adrenomedullin (bio-ADM) is associated with endothelial dysfunction in infants and children with complex congenital heart disease undergoing open-heart surgery on cardiopulmonary bypass — 551

Infectious Diseases

Yin Liu, Ruizhi Wang, Shihua Zhong, Liu Qian and Dong Wang

Monocyte distribution width as an early predictor of short-term outcome in adult patients with sepsis — 562

Andrea Padoan, Ilaria Talli, Chiara Cosma, Stefania Moz, Giulia Furlan, Filippo Navaglia, Lucio Marchioro, Martina Zaninotto, Daniela Basso and Mario Plebani

Analytical and clinical evaluations of SNIBE Maglumi chemiluminescent immunoassay for the detection of SARS-CoV-2 antigen in salivary samples — 572

Online Only Content

<https://www.degruyter.com/view/j/cclm.2024.62.issue-3/issue-files/cclm.2024.62.issue-3.xml>

Letters to the Editor

Steeff Kurstjens, Anoeska Schipper, Johannes Krabbe and Ron Kusters

Predicting hemoglobinopathies using ChatGPT — e59

Tony Badrick and Jean-Marc Giannoli

Managing the Quality Control of multiple instruments — e62

Matthijs Oyaert, Sander De Bruyne, Christel Van Camp, Inge Van de Caveye and Joris Delanghe

Lipid droplets may interfere with urinary red blood cell and crystal counts by urinary flow cytometry — e65

Luc Thouault, Cyril Leven, Jean-Richard Eveillard, Hélène Kerspern, Emmanuelle Plée-Gautier, Jean-Christophe Ianotto, Jean-Luc Carre and Clément Capaldo

Assessment of the lipemia index determined by the Atellica CH 930 analyzer for the detection of monoclonal immunoglobulins — e68

Eva Rabing Brix Petersen, Morten Pedersen, Helle Tanderup Kristensen, Lise Pedersen, Marianne Benn, Ole Winther Rasmussen and Ivan Brandslund

Concerning quality demands of arterial partial pressure of oxygen — e72

Julien Cabo and Julien Favresse

Navigating between perpendicular drop and tangent skimming methods for M-protein quantification: a call for clarification of guidelines — e74

Hamza Bensaoud, Fabrizio Buttafuoco, Salah Lali and Charles Chevalier

Early detection of peripheral invasive candidiasis further to cytographic interferences in Sysmex XN-9000 hematology analyzer — e78

Congress Abstracts

Annual meeting of the Royal Belgian Society of Laboratory Medicine: “Symphony of the Heart”

Area 42, Rue des Palais 46, 1030 Brussels –
November 17th, 2023 — A1