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# Plasma Sarcosine Measured by Gas Chromatography-Mass Spectrometry Distinguishes Prostatic Intraepithelial Neoplasia and Prostate Cancer from Benign Prostate Hyperplasia

Markin, Pavel A <sup>1</sup> ; Brito, Alex <sup>2</sup>

; Moskaleva, Natalia <sup>2</sup> ; Fodor, Miguel <sup>3</sup> ; Lartsova, Ekaterina V <sup>4</sup> ; Shpot, Yevgeny V <sup>5</sup> ; Lerner, Yulia V <sup>6</sup> ; Mikhajlov, Vasily Y <sup>4</sup> ; Potoldykova, Natalia V <sup>5</sup> ; Enikeev, Dimitry V <sup>5</sup> ; Lyundup, Alexey V <sup>7</sup> ;

Appolonova, Svetlana A <sup>2</sup> <sup>1</sup> Laboratory of Pharmacokinetics and Metabolomic Analysis, Institute of Translational Medicine and Biotechnology, I.M. Sechenov First Moscow State Medical University, Moscow, Russia; PhD Program in Nanosciences and Advanced Technologies, University of Verona, Verona, Italy <sup>2</sup> Laboratory of Pharmacokinetics and Metabolomic Analysis, Institute of Translational Medicine and Biotechnology, I.M. Sechenov First Moscow State Medical University, Moscow, Russia <sup>3</sup> Clinical Hospital, University of Chile, Santiago, Chile <sup>4</sup> University Clinical Hospital, I.M. Sechenov First Moscow State Medical University, Moscow, Russia <sup>5</sup> Research Institute of Urology and Reproductive Health, I.M. Sechenov First Moscow State Medical University, Moscow, Russia <sup>6</sup> Department of Pathological Anatomy, I.M. Sechenov First Moscow State Medical University, Moscow, Russia <sup>7</sup> Advanced Cell Technologies Department, Institute for Regenerative Medicine, I.M. Sechenov First Moscow State Medical University, Moscow, Russia

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## ABSTRAK (ENGLISH)

### Objective

Sarcosine was postulated in 2009 as a biomarker for prostate cancer (PCa). Here, we assess plasma sarcosine as a biomarker that is complementary to prostate-specific antigen (PSA).

### Methods

Plasma sarcosine was measured using gas chromatography-mass spectrometry (GC-MS) in adults classified as noncancerous controls (with benign prostate hyperplasia [BPH],  $n = 36$ ), with prostatic intraepithelial neoplasia (PIN,  $n = 16$ ), or with PCa ( $n = 27$ ). Diagnostic accuracy was assessed using receiver operating characteristic curve analysis.

### Results

Plasma sarcosine levels were higher in the PCa ( $2.0 \mu\text{M}$  [ $1.3\text{--}3.3 \mu\text{M}$ ],  $P < .01$ ) and the PIN ( $1.9 \mu\text{M}$  [ $1.2\text{--}6.5 \mu\text{M}$ ],  $P < .001$ ) groups than in the BPH ( $0.9 \mu\text{M}$  [ $0.6\text{--}1.4 \mu\text{M}$ ]) group. Plasma sarcosine had “good” and “very good” discriminative capability to detect PIN (area under the curve [AUC], 0.734) and PCa (AUC, 0.833) versus BPH, respectively. The use of PSA and sarcosine together improved the overall diagnostic accuracy to detect PIN and PCa versus BPH.

## Conclusion

Plasma sarcosine measured by GC-MS had “good” and “very good” classification performance for distinguishing PIN and PCa, respectively, relative to noncancerous patients diagnosed with BPH.

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Dokumen 2 dari 20

# A Rapid and Accurate Detection Approach for Multidrug-Resistant Tuberculosis Based on PCR-ELISA Microplate Hybridization Assay

Ye-Cheng, Zhou <sup>1</sup> ; Shu-Mei, He <sup>2</sup> ; Zi-Lu, Wen <sup>3</sup> ; Jun-Wei, Zhao <sup>4</sup> ; Yan-Zheng, Song <sup>3</sup> ; Zhang, Ying <sup>5</sup> ; Shu-Lin, Zhang <sup>6</sup> <sup>1</sup> Shanghai Public Health Clinical Center, Shanghai, China; Key Laboratory of Biological Resource and Ecological Environment of the Ministry of Education, College of Life Sciences, Sichuan University, Chengdu, China; Department of Immunology and Microbiology, Shanghai Jiao Tong University School of Medicine, Shanghai, China <sup>2</sup> Key Laboratory for Basic Life Science Research of Tibet Autonomous Region, Xianyang, China; Key Laboratory of High Altitude Environment and Gene-Related Disease of Tibet Ministry of Education, School of Medicine, Xizang Minzu University, Xianyang, China <sup>3</sup> Shanghai Public Health Clinical Center, Shanghai, China <sup>4</sup> Clinical Laboratory, First Affiliated Hospital of Zhengzhou University, Zhengzhou, China <sup>5</sup> Department of Molecular Microbiology and Immunology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland <sup>6</sup> Shanghai Public Health Clinical Center, Shanghai, China; Department of Immunology and Microbiology, Shanghai Jiao Tong University School of Medicine, Shanghai, China

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## ABSTRAK (ENGLISH)

Rapid and accurate diagnosis of multidrug-resistant tuberculosis (MDR-TB) is important for timely and appropriate therapy. In this study, a rapid and easy-to-perform molecular test that integrated polymerase chain reaction (PCR) amplification and a specific 96-well microplate hybridization assay, called PCR-ELISA (enzyme-linked immunosorbent assay), were developed for detection of mutations in *rpoB*, *katG*, and *inhA* genes responsible for rifampin (RIF) and isoniazid (INH) resistance and prediction of drug susceptibility in *Mycobacterium tuberculosis* clinical isolates. We evaluated the utility of this method by using 32 multidrug-resistant (MDR) isolates and 22 susceptible isolates; subsequently, we compared the results with data obtained by conventional drug susceptibility testing and DNA sequencing. The sensitivity and specificity of the PCR-ELISA test were 93.7% and 100% for detecting RIF resistance, and 87.5% and 100% for detecting INH resistance, respectively. These results were comparable to those yielded by commercially available molecular tests such as the GenoType MTBDRplus assay. Based on the aforementioned results, we conclude that the PCR-ELISA microplate hybridization assay is a rapid, inexpensive, convenient, and reliable test that will be useful for rapid diagnosis of MDR-TB, for improved clinical care.

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Dokumen 3 dari 20

# COVID-19 Pandemic Once Again Exposes the Weakest Link in Laboratory Services: Specimen Delivery

Lapić, Ivana <sup>1</sup> ; Komljenović, Sven <sup>1</sup> ; Knežević, Josip <sup>1</sup> ; Rogić, Dunja <sup>1</sup> <sup>1</sup> Department of Laboratory Diagnostics, University Hospital Center Zagreb, Zagreb, Croatia

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## ABSTRAK (ENGLISH)

### Objective

Reorganization of the emergency department (ED) during the COVID-19 pandemic implied closure of the ED-dedicated laboratory and manual transport of all specimens to the dislocated central laboratory. The impact of such reorganization on laboratory turnaround time (TAT) was examined.

### Methods

The TAT from blood sampling to specimen reception (TAT1), from specimen reception to test reporting (TAT2), and from sampling to test reporting (TAT3) were compared between the pandemic peak month in 2020 and the same month in 2019. We evaluated whether TAT2 fulfills the recommended 60-minute criteria.

### Results

A statistically significant difference was observed for all comparisons ( $P < .001$ ), with TAT1 prominently contributing to TAT3 prolongation (from 48 minutes to 108 minutes) and exceeding the recommended 60-minute criteria. The TAT2 was extended from 33 minutes to 49 minutes.

### Conclusion

An ED reorganization compromised the usual laboratory services for patients in the ED, with manual specimen delivery being the main cause for TAT prolongation.

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Dokumen 4 dari 20

## Comparison of Turbidimetric Inhibition Immunoassay, High-Performance Liquid Chromatography, and Capillary Electrophoresis Methods for Glycated Hemoglobin Determination

Gilani, Mehwish <sup>1</sup> ; Mohammad Aamir <sup>1</sup> ; Ammad Akram <sup>2</sup> ; Zujaja Hina Haroon <sup>1</sup> ; Ijaz, Aamir <sup>3</sup> ; Muhammad Tahir Khadim <sup>1</sup> <sup>1</sup> Armed Forces Institute of Pathology, Rawalpindi, Pakistan <sup>2</sup> Pak Emirates Military Hospital, Rawalpindi, Pakistan <sup>3</sup> Rehman Medical Institute, Peshawar, Pakistan

## ABSTRAK (ENGLISH)

### Objective

The purpose of this study was to compare the performances of and evaluate the agreement among glycosylated hemoglobin values analyzed by using National Glycohemoglobin Standardization Program-certified and International Federation of Clinical Chemistry-standardized analyzers.

### This cross-sectional study was conducted at the

Armed Forces Institute of Pathology, Department of Chemical Pathology from March 2019 to May 2019.

### Methods

Glycosylated hemoglobin (HbA<sub>1c</sub>) was measured in the blood specimens from 100 patients on an ADVIA 1800 by a turbidimetric inhibitory immunoassay (TINIA), Sebia instrument by electrophoresis, and Bio-Rad Variant II Turbo system by high-performance liquid chromatography (HPLC). Quantitative variables were calculated as the mean  $\pm$  standard deviation (SD). Precision and method comparisons were carried out according to Clinical and Laboratory Standards Institute recommendations. The results obtained from each analyzer were compared by correlation analysis. Method comparison was done by linear regression and Bland-Altman plots using the SPSS software version 24.

### Results

The mean  $\pm$  SD HbA<sub>1c</sub> values from TINIA, electrophoresis, and HPLC were 7.188%  $\pm$  1.89%, 7.164%  $\pm$  1.866%, and 7.160%  $\pm$  1.85%, respectively. The between-run coefficients of variation for TINIA, electrophoresis, and HPLC were 0.64%, 0.61%, and 0.60%, respectively. All 3 showed good correlation (TINIA,  $R^2 = .994$ ,  $P = .00$ ; electrophoresis,  $R^2 = .992$ ,  $P = 0.00$ ; and HPLC,  $R^2 = .994$ ,  $P = 0.00$ ).

### Conclusion

The good clinical agreements of HbA<sub>1c</sub> and strong correlations between analyzers indicate that these analyzers can be used interchangeably.

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Dokumen 5 dari 20

# Unexpected Cholera Bacteremia in a 91 Year Old Caucasian Male Patient

Thwe, Phyu M<sup>1</sup>

; Schilling, Matthew<sup>2</sup>; Reynoso, David<sup>2</sup>; Ren, Ping<sup>1</sup> <sup>1</sup> Departments of Pathology, Galveston, Texas  
<sup>2</sup> Departments of Internal Medicine–Infectious Diseases, University of Texas Medical Branch, Galveston, Texas

## ABSTRAK (ENGLISH)

Cholera is an illness caused by *Vibrio cholerae*; its main symptom is acute watery diarrhea. Some infections are asymptomatic or result in patients presenting with mild diarrhea, but complications, such as bacteremia, can be fatal. Being endemic in Africa, Southeast Asia, and Haiti, *V. cholerae* infection cases in the United States are primarily considered travel-related. Herein, we report a case of a 91 year old Caucasian man, a Texas Gulf Coast resident, who developed bacteremia due to *V. cholerae* despite having no international travel history. Culture workup by mass spectrometry, automated biochemical system, and 16S ribosomal RNA (rRNA) gene sequencing confirmed *V. cholerae*. This case conveys an important reminder to clinicians and laboratory professionals regarding potentially serious cholera illnesses due to the domestic prevalence of *V. cholerae* in the coastal regions of the United States.

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Dokumen 6 dari 20

# Unexpected Short-Tandem-Repeat Patterns in Posttransplant Chimerism Testing: Investigation of 3 Cases with Help from Forensic Science

Gvozdjan, Kristina<sup>1</sup>; Casey, Heather<sup>1</sup>; Mowery, Carrie<sup>1</sup>; Kumer, Lorie<sup>1</sup>; Fisher, Carolyn<sup>1</sup>; Tyler, Jennifer<sup>1</sup>; Bayerl, Mike G<sup>1</sup>; Malysz, Jozef<sup>1</sup>; Naik, Seema<sup>2</sup>; Rybka, Witold<sup>2</sup>; Ehmann, Christopher<sup>2</sup>; Claxton, David<sup>2</sup>; Shin Mineishi<sup>2</sup>; Baker, Maria<sup>2</sup>; Zheng, Hong<sup>2</sup>; Shike, Hiroko<sup>1</sup>

<sup>1</sup> Department of Pathology, Penn State Milton S. Hershey Medical Center, Hershey, PA <sup>2</sup> Department of Hematology Oncology, Penn State Milton S. Hershey Medical Center, Hershey, PA

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## ABSTRAK (ENGLISH)

Chimerism testing by short tandem repeats (STRs) is used to monitor engraftment after allogeneic hematopoietic stem cell transplantation (HSCT). Generally, STR alleles are stable and transferred from parent to child or from donor to recipient. However, 3 cases did not follow this norm. Additional work-up with help from forensic literature solved these mysteries.

In case 1, the patient received HSCT from his son. The son shared STR alleles in 22/23 loci except Penta E, which was explained by repeat expansion in the son.

In case 2, the patient had been in remission for 14 years after HSCT for lymphoma and developed repeat expansion in CSF1PO in granulocytes.

In case 3, a pre-HSCT patient demonstrated 3 alleles, with 2 peaks taller than the third, in the FGA locus (chromosome 4). A combination of a triallelic variant and leukemia-associated trisomy 4 explained the finding. STR number variants are rare and clinically inconsequential but can overlap malignancy-associated, clinically significant changes.

## About the Journal

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## T-Cell Molecular Modulation Responses in Atherosclerosis Anergy

Pakzad, Bahram <sup>1</sup> ; Rajae, Elham <sup>2</sup> ; Shahrabi, Saeid <sup>3</sup> ; Mansournezhad, Somayeh <sup>4</sup> ; Davari, Nader <sup>4</sup> ; Azizidoost, Shirin <sup>4</sup> ; Najmaldin Saki <sup>4</sup>

<sup>1</sup> Internal Medicine Department, Isfahan University of Medical Sciences, Isfahan, Iran <sup>2</sup> Department of Rheumatology, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran <sup>3</sup> -Department of Biochemistry and Hematology, Faculty of Medicine, Semnan University of Medical Sciences, Semnan, Iran <sup>4</sup> Thalassemia and Hemoglobinopathy Research Center, Research Institute of Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

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### ABSTRAK (ENGLISH)

Atherosclerosis continues to be a major cause of death in patients with cardiovascular diseases. The cooperative role of immunity has been recently considered in atherosclerotic plaque inflammation, especially adaptive immune response by T cells. In this review, we examine the possible role of T cells in atherosclerosis-mediated inflammation and conceivable therapeutic strategies that can ameliorate complications of atherosclerosis. The cytokines secreted by T-lymphocyte subsets, different pathophysiological profiles of microRNAs (miRs), and the growth factor/receptor axis have diverse effects on the inflammatory cycle of atherosclerosis. Manipulation of miRNA expression and prominent growth factor receptors involved in inflammatory cytokine secretion in atherosclerosis can be considered diagnostic biomarkers in the induction of anergy and blockade of atherosclerotic development. This manuscript reviews immunomodulation of T cells responses in atherosclerosis anergy.

## Soluble CD14 Subtype in Peripheral Blood is a Biomarker for Early Diagnosis of Sepsis

Zhou, Wuqiong <sup>1</sup> ; Rao, Heping <sup>2</sup> ; Ding, Qiuming <sup>1</sup> ; Xiang, Lou <sup>1</sup> ; Shen, Jianjiang <sup>1</sup> ; Ye, Bin <sup>3</sup> ; Xiang, Caixia <sup>4</sup> <sup>1</sup> Department of Diagnosis, Shengzhou People's Hospital (the First Affiliated Hospital of Zhejiang University Shengzhou Branch), Shaoxing, Zhejiang, China <sup>2</sup> Department of Nursing, School of Medicine, Quzhou College of Technology, Quzhou, Zhejiang, China <sup>3</sup> Intensive Care Unit, Shaoxing, Zhejiang,



China<sup>4</sup> Department of Pediatrics, Shengzhou People's Hospital (the First Affiliated Hospital of Zhejiang University Shengzhou Branch), Shaoxing, Zhejiang, China

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## ABSTRAK (ENGLISH)

### Objective

To study the value of serum soluble CD14 subtype (sCD14-ST) in early diagnosis of sepsis.

### Methods

Seventy-two patients were diagnosed with systemic inflammatory response syndrome, sepsis, or septic shock. Peripheral blood was collected at 0, 12, 24, and 48 hours after admission to the hospital. Levels of sCD14-ST, procalcitonin (PCT), hypersensitive C-reactive protein (CRP), and white blood cells (WBC) were determined.

### Results

Levels of sCD14-ST in the patients with septic shock were higher than those in the other patients ( $P < .01$ ) and peaked at 48 h. PCT and CRP levels were similar in the patients at admission but increased by 5 times to 10 times in the next 48 h, especially in the patients with septic shock. WBC levels remained high and did not change dramatically. Receiver operating characteristic analysis revealed that the area under the curve, sensitivity, and specificity values of sCD14-ST to diagnose sepsis were much higher than those of the other markers.

### Conclusion

Compared with PCT, CRP, and WBC, sCD14-ST is a better biomarker for the early diagnosis of sepsis.

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Dokumen 10 dari 20

## Detection of Circulating Antibodies to p16 Protein-Derived Peptides in Hepatocellular Carcinoma

Xu, Yangchun<sup>1</sup>; Gu, Litong<sup>2</sup>; Wang, Jiabin<sup>1</sup>; Wang, Zhenqi<sup>3</sup>; Zhang, Ping<sup>4</sup>; Zhang, Xuan<sup>1</sup>

<sup>1</sup> Second Hospital of Jilin University, Changchun, China <sup>2</sup> Department of Hepatobiliary & Pancreatic Surgery, Jilin Province People's Hospital, Changchun, China <sup>3</sup> School of Public Health, Jilin University, Changchun, China <sup>4</sup> Department of Hepatobiliary & Pancreatic Surgery, First Hospital of Jilin University, Changchun, China

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## ABSTRAK (ENGLISH)

### Objective

This study aimed at confirming the alteration of circulating anti-p16 immunoglobulin G (IgG) levels in hepatocellular carcinoma (HCC).

## Methods

An in-house-developed enzyme-linked immunosorbent assay was used for determining plasma IgG antibodies against p16-derived antigens in 122 HCC patients and 134 healthy controls.

## Results

Plasma anti-p16 IgG levels were significantly higher in HCC patients than in the controls ( $Z = 3.51$ ,  $P = 0.0004$ ), with no difference between males and females. A trend of increasing plasma anti-p16 IgG levels was associated with increasing HCC stage, with group 3 patients having the highest anti-p16 IgG levels ( $Z = 3.38$ ,  $P = 0.0008$ ). Group 3 exhibited the best sensitivity (19.6%) and specificity (95%) for plasma anti-p16 IgG detection, with an area under the receiver operating characteristic curve of 0.659 (95% confidence interval, 0.564–0.754).

## Conclusion

Circulating IgG antibody to p16 protein might be a useful biomarker for HCC prognosis assessment rather than for early malignancy diagnosis.

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Dokumen 11 dari 20

# Clinical Laboratory Employees' Attitudes Toward Artificial Intelligence

Ardon, Orly<sup>1</sup>; Schmidt, Robert L<sup>1</sup>

<sup>1</sup> University of Utah Department of Pathology and ARUP Laboratories, Salt Lake City, UT

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## ABSTRAK (ENGLISH)

### Objective

The objective of this study was to determine the attitudes of laboratory personnel toward the application of artificial intelligence (AI) in the laboratory.

### Methods

We surveyed laboratory employees who covered a range of work roles, work environments, and educational levels.

### Results

The survey response rate was 42%. Most respondents (79%) indicated that they were at least somewhat familiar with AI. Very few (4%) classified themselves as experts. Contact with AI varied by educational level ( $P = .005$ ). Respondents believed that AI could help them perform their work by reducing errors (24%) and saving time (16%). The most common concern (27%) was job security (being replaced by AI). The majority (64%) of the respondents

expressed support for the development of AI projects in the organization.

## Conclusions

Laboratory employees see the potential for AI and generally support the adoption of AI tools but have concerns regarding job security and quality of AI performance.

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Dokumen 12 dari 20

# Scientific Evidence, Medical Practice, and the Insidious Danger of Anecdotal Reports

Bertholf, Roger L

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Dokumen 13 dari 20

# Phenotypes Associated with 16p11.2 Copy Number Gains and Losses at a Single Institution

Chu, Caleb <sup>1</sup> ; Wu, Haotian <sup>2</sup> ; Xu, Fangling <sup>2</sup> ; Ray, Joseph W <sup>3</sup> ; Britt, Allison <sup>3</sup> ; Robinson, Sally S <sup>3</sup> ; Lupo, Pamela J <sup>3</sup> ; Murphy, Christine R C <sup>3</sup> ; Dreyer, Charles F <sup>3</sup> ; Lee, Phillip D K <sup>3</sup> ; Hu, Peter C <sup>1</sup> ; Dong, Jianli <sup>2</sup> <sup>1</sup> School of Health Professions, University of Texas MD Anderson Cancer Center, Houston, Texas <sup>2</sup> Department of Pathology, University of Texas Medical Branch, Galveston, Texas <sup>3</sup> Department of Pediatrics, University of Texas Medical Branch, Galveston, Texas

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## ABSTRAK (ENGLISH)

Chromosome 16p11.2 is one of the susceptible sites for recurrent copy number variations (CNVs) due to flanking near-identical segmental duplications. Five segmental duplications, named breakpoints 1 to 5 (BP1–BP5), have been defined as recombination hotspots within 16p11.2. Common CNVs on 16p11.2 include a proximal ~593 kb between BP4 and BP5, and a distal ~220 kb between BP2 and BP3. We performed a search for patients carrying 16p11.2 CNVs, as detected using chromosome microarray (CMA), in the Molecular Diagnostic Laboratory at the University of Texas Medical Branch (UTMB), in Galveston. From March 2013 through April 2018, a total of 1200 CMA results were generated for germline testing, and 14 patients tested positive for 16p11.2 CNVs, of whom 7 had proximal deletion, 2 had distal deletion, 4 had proximal duplication, and 1 had distal duplication. Herein, we provide detailed phenotype data for these patients. Our study results show that developmental delay, abnormal body weight, behavioral problems, and hypotonia are common phenotypes associated with 16p11.2 CNVs.

# Presepsin and Midregional Proadrenomedullin in Pediatric Oncologic Patients with Febrile Neutropenia

Agnello, Luisa <sup>1</sup> ; Bivona, Giulia <sup>1</sup> ; Parisi, Elisa <sup>2</sup> ; Giuseppe Dejan Lucido <sup>3</sup> ; Iacona, Alessandro <sup>4</sup> ; Ciaccio, Anna Maria <sup>5</sup> ; Giglio, Rosaria Vincenza <sup>4</sup> ; Ziino, Ottavio <sup>2</sup> ; Ciaccio, Marcello <sup>6</sup>

<sup>1</sup> Department of Biomedicine, Neurosciences and Advanced Diagnostics, Institute of Clinical Biochemistry, Clinical Molecular Medicine and Laboratory Medicine, University of Palermo, Palermo, Italy <sup>2</sup> Pediatric Hematology and Oncology, ARNAS Civico Hospital, Palermo, Italy <sup>3</sup> Department of Earth and Sea Sciences, Palermo, Italy <sup>4</sup> Department of Laboratory Medicine, Palermo, Italy <sup>5</sup> University of Palermo, Palermo, Italy <sup>6</sup> Department of Biomedicine, Neurosciences and Advanced Diagnostics, Institute of Clinical Biochemistry, Clinical Molecular Medicine and Laboratory Medicine, University of Palermo, Palermo, Italy; Department of Laboratory Medicine, Palermo, Italy

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## ABSTRAK (ENGLISH)

### Objective

In this study, we investigated the roles of presepsin (PSP) and midregional proadrenomedullin (mr-proADM) in children with febrile neutropenia (FN) due to chemotherapy.

### Methods

We assessed 36 FN episodes in 26 children. Patients were classified into bacteremia (B) and fever of unknown origin (FUO) groups. We evaluated PSP and mr-proADM at admission (T0), after 24/48 h (T1), and after 5 days (T2).

### Results

PSP and mr-proADM levels were elevated at T0 and significantly decreased at T2. mr-proADM levels did not significantly differ between the B and FUO groups. PSP levels significantly differed between the B and FUO groups only at T1. Both PSP and mr-proADM levels at T0 were a predictor of length of hospital stay but not of the duration of fever. Finally, receiver operating characteristic curve analysis showed that PSP and mr-proADM had low diagnostic accuracy for blood culture positivity.

### Conclusion

PSP and mr-proADM display poor clinical usefulness for FN in oncologic children.

# Molecular Epidemiology of Carbapenem-Resistant Enterobacterales Strains Isolated from Blood Cultures in Antalya, Turkey

Su, Harun Reşid <sup>1</sup> ; Turhan, Özge <sup>2</sup>

; Cemile Aylin Erman Daloğlu <sup>3</sup> ; Ögünç, Meral Dilara <sup>3</sup>

; Özhak, Betil <sup>3</sup> ; Öngüt, Gözde <sup>3</sup> ; Mert Ahmet Kuşkucu <sup>4</sup> ; Midilli, Kenan <sup>4</sup> ; Mamıkoğlu, Latife <sup>2 1</sup>

Tokat Hospital, Tokat, Turkey <sup>2</sup> Department of Infectious Disease and Clinical Microbiology, University School of Medicine, Akdeniz University, Antalya, Turkey <sup>3</sup> Department of Medical Microbiology, University School of Medicine, Akdeniz University, Antalya, Turkey <sup>4</sup> Department of Medical Microbiology, University Cerrahpaşa School of Medicine, Istanbul University, Istanbul, Turkey

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## ABSTRAK (ENGLISH)

### Objective

The aim of this study was to investigate the prevalence of carbapenemase and CTX-M genes among 330 blood culture isolates of Enterobacterales with reduced susceptibility to at least 1 carbapenem, between 2010 and 2015.

### Methods

BD Max CRE assay and in-house PCR were used to detect carbapenemase and CTX-M genes.

### Results

At least 1 carbapenemase gene was detected among 113 (74.3%) of the 152 carbapenem resistant isolates. The OXA-48 (69.7%) was the most common carbapenemase followed by VIM, NDM and IMP, whereas no tested isolates were KPC-positive. Eighty-six isolates (56.6%) had CTX-M and 65 had both OXA-48 and CTX-M. Carbapenemase production in Enterobacterales was significantly increased in years ( $P < .05$ ).

### Conclusion

Our study indicates that there is ongoing endemic circulation of the OXA-48 producing organism in our facility. It is noteworthy that more than half of the OXA-48 producing strains also produced CTX-M enzyme.

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Dokumen 16 dari 20

# Quantification by Ultrafiltration and Immunofixation Electrophoresis Testing for Monoclonal Serum Free Light Chains

Singh, Gurmukh <sup>1</sup>

; Bollag, Roni <sup>1</sup> <sup>1</sup> Department of Pathology Medical College of Georgia at Augusta University, Augusta, GA

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## ABSTRAK (ENGLISH)

### Objective

Measurement of monoclonal immunoglobulins is a reliable estimate of the plasma cell tumor mass. About 15% of plasma cell myelomas secrete light chains only. The concentration of serum free light chains is insufficient evidence of the monoclonal light chain burden. A sensitive quantitative estimate of serum free monoclonal light chains could be useful for monitoring patients with light chain myeloma. We describe such an assay that does not require mass-spectrometry equipment or expertise.

### Methods

Serum specimens from patients with known light chain myelomas and controls were subjected to ultrafiltration through a membrane with pore size of 50 kDa. The filtrate was concentrated and tested by immunofixation electrophoresis. The relative area under the monoclonal peak, compared to that of the total involved light chain composition, was estimated by densitometric scanning of immunofixation gels. The proportion of the area occupied by the monoclonal peak in representative densitometric scans was used to arrive at the total serum concentration of the monoclonal serum free light chains.

### Results

Using an ultracentrifugation and concentration process, monoclonal serum free light chains were detectable, along with polyclonal light chains, in all 10 patients with active light chain myelomas. Monoclonal light chains were identified in serum specimens that did not reveal monoclonal light chains by conventional immunofixation electrophoresis. The limit of detection by this method was 1.0 mg/L of monoclonal serum free light chains.

### Conclusion

The method described here is simple enough to be implemented in academic medical center clinical laboratories and does not require special reagents, equipment, or expertise. Even though urine examination is the preferred method for the diagnosis of light chain plasma cell myelomas, measurement of the concentration of serum free light chains provides a convenient, albeit inadequate, way to monitor the course of disease. The method described here allows effective electrophoretic differentiation of monoclonal serum free light chain from polyclonal serum free light chains and provides a quantitation of the monoclonal serum free light chains in monitoring light chain monoclonal gammopathies.

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Dokumen 17 dari 20

# Verification of 20 Mathematical Formulas for Discriminating Between Iron Deficiency Anemia and

# Thalassemia Trait in Microcytic Anemia

Johannes J M L Hoffmann <sup>1</sup>

; Urrechaga, Eloísa <sup>2</sup> <sup>1</sup> H3L Consult, Nuenen, The Netherlands <sup>2</sup> CORE Laboratory, Hospital Galdakao—Usansolo, Galdakao, Spain

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## ABSTRAK (ENGLISH)

### Background

Currently, more than 45 mathematical formulas based on simple red blood cell (RBC) parameters have been proposed for differentiating between iron deficiency and thalassemia in microcytic anemia, of which 20 are relatively new and have not been thoroughly independently verified. The study goal was to verify these 20 new formulas and to identify which RBC parameters have a decisive impact on the performance of those formulas.

### Methods

A database containing laboratory and diagnostic data from 2788 subject individuals with microcytic anemia was used for assessing performance by receiver operating characteristic (ROC) analysis.

### Results

The new Index26 had excellent performance, equivalent to the Green and King, Jayabose, and Janel formulas previously identified in the literature. The discriminant power of nearly all newer formulas was lower in our study than that claimed by the original authors. We discovered that a well-performing formula requires mean cell volume (MCV), RBC distribution width (RDW), and RBC measurements, whereas hemoglobin measurements appeared not to be essential.

### Conclusions

Only the new Index26 performed at a level comparable to the very strongest established formulas. All other new formulas had lower performance than was claimed in the original publications, underscoring that independent verification of new formulas is indispensable.

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Dokumen 18 dari 20

# Incident Command in the Time of COVID-19

Cook, Jim <sup>1</sup>

<sup>1</sup> Laboratory Services, Houston Methodist, Houston, Texas, USA

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## ABSTRAK (ENGLISH)

The SARS-CoV-2 virus was initially contained in China but rapidly spread across the globe. The grave threat was not apparent until it was already in our midst. Our organization implemented an Incident Command System (ICS), based on previous experience, to respond to the COVID-19 pandemic in a comprehensive and effective manner. This well-known management and response framework is used by many specialties and organizations in disasters of different complexity and size. Our ICS was able to assemble the appropriate people, assess the situation, and develop and implement plans to deal with the COVID-19 crisis. The effectiveness of the ICS structure and its execution was instrumental in getting in front of the virus and managing regional activities. The ICS is an effective tool to improve safety and mitigate risk when dealing with large-scale disasters and should be implemented and practiced before the need arises.

Our organization implemented a formal Incident Command System (ICS) very early as a response to the COVID-19 pandemic. Although it recently disbanded, we are maintaining its core functionality and communication as we continue to deal with COVID-19 into the future. The author has observed the ICS being used at hospitals through hurricanes, blizzards, and riots but never saw it work as well as it did during the initial weeks of the pandemic. This group deftly navigated through uncharted waters by leveraging the spirit and structure of Incident Command.

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Dokumen 19 dari 20

# Serum and Saliva Levels of Cancer Antigen 15-3, Carcinoembryonic Antigen, Estradiol, Vaspin, and Obestatin as Biomarkers for the Diagnosis of Breast Cancer in Postmenopausal Women

Farahani, Hyder <sup>1</sup> ; Amri, Jamal <sup>2</sup> ; Alaei, Mona <sup>2</sup> ; Mohaghegh, Fathollah <sup>3</sup> ; Rafiee, Mohammad <sup>4</sup> <sup>1</sup>

Department of Clinical Biochemistry and Genetic, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran <sup>2</sup> Department of Clinical Biochemistry and Genetic, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran; Traditional and Complementary Medicine Research Center, Arak University of Medical Sciences, Arak, Iran <sup>3</sup> Department of Radiotherapy Oncology, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran <sup>4</sup> Department of Biostatistics and Epidemiology, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran

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## ABSTRAK (ENGLISH)

### Objective

To find suitable biomarkers for diagnosis of Breast cancer in serum and saliva; also, to examine the correlation between salivary and serum concentrations of suitable biomarkers.

### Methods

This case-control study included 30 women with breast cancer as a case group and 30 healthy women as a matched control group. Blood and saliva specimens were collected from all participants. We evaluated serum and



salivary cancer antigen 15-3 (CA15-3), carcinoembryonic antigen (CEA), estradiol, vaspin, and obestatin concentrations. Mann-Whitney *U* testing and Spearman correlation coefficients were used for statistical analysis.

## Results

Serum and salivary concentrations of estradiol were significantly higher in patients with breast cancer (BC) than in healthy women ( $P < .05$ ). Also, serum CEA and salivary obestatin concentrations were significantly higher in BC patients than in the control group ( $P < .05$ ). However, there was no significant difference between other parameters in patients with BC and controls. We observed a positive correlation between serum and salivary concentrations of CA15-3, as well as a negative correlation between serum and salivary concentrations of vaspin and obestatin.

## Conclusion

The results of this study demonstrated that concentrations of CEA and estradiol in serum, obestatin in serum and saliva, and estradiol in saliva were significantly different between the 2 groups.

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Dokumen 20 dari 20

# Intraosseous Specimens Submitted to the Laboratory: A Case Report and Review

Song, Linda <sup>1</sup> ; Koka, Rima <sup>1</sup> ; Reese, Erika <sup>2</sup> ; Mullins, Kristin <sup>1</sup> ; Murphy, Colin <sup>1</sup>

<sup>1</sup> Department of Pathology, University of Maryland School of Medicine, Baltimore, MD <sup>2</sup> Division of Transfusion Medicine, University of Maryland Medical Center, Baltimore, MD

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## ABSTRAK (ENGLISH)

Intraosseous (IO) devices are used for vascular access in settings where venous access is initially unobtainable, such as prehospital trauma care or cardiac arrest. While IO devices are effective for infusion of blood, fluids, and medications, there is limited data on the analytical equivalence of specimens taken out of IO devices and peripheral venous blood. Despite this, IO device manufacturers and clinical resources state that IO specimens can be submitted for laboratory analysis. As reported in this case, IO specimens may be drawn and labeled as 'peripheral blood'. IO specimens are not always caught by automated sample quality testing and may proceed through analysis without any warning signal to the laboratory. There are potential regulatory risks in accepting IO samples for analysis without validation. IO infusion is a valuable technique for vascular access in critically ill patients, but clinical laboratories will need to determine their own policies for identifying and handling IO specimens.

## Daftar Pustaka

Citation style: APA 6th - Annotated with Abstracts - American Psychological Association, 6th Edition

Markin, P. A., Brito, A., Moskaleva, N., Fodor, M., Lartsova, E. V., Shpot, Y. V., . . . Appolonova, S. A. (2020). Plasma sarcosine measured by gas chromatography-mass spectrometry distinguishes prostatic intraepithelial neoplasia and prostate cancer from benign prostate hyperplasia. *Labmedicine*, 51(6), 566-573. doi:<https://doi.org/10.1093/labmed/lmaa008>

**Objective** Sarcosine was postulated in 2009 as a biomarker for prostate cancer (PCa). Here, we assess plasma sarcosine as a biomarker that is complementary to prostate-specific antigen (PSA). **Methods** Plasma sarcosine was measured using gas chromatography-mass spectrometry (GC-MS) in adults classified as noncancerous controls (with benign prostate hyperplasia BPH], n = 36), with prostatic intraepithelial neoplasia (PIN, n = 16), or with PCa (n = 27). Diagnostic accuracy was assessed using receiver operating characteristic curve analysis. **Results** Plasma sarcosine levels were higher in the PCa (2.0  $\mu$ M 1.3–3.3  $\mu$ M], P <.01) and the PIN (1.9  $\mu$ M 1.2–6.5  $\mu$ M], P <.001) groups than in the BPH (0.9  $\mu$ M 0.6–1.4  $\mu$ M]) group. Plasma sarcosine had “good” and “very good” discriminative capability to detect PIN (area under the curve AUC], 0.734) and PCa (AUC, 0.833) versus BPH, respectively. The use of PSA and sarcosine together improved the overall diagnostic accuracy to detect PIN and PCa versus BPH. **Conclusion** Plasma sarcosine measured by GC-MS had “good” and “very good” classification performance for distinguishing PIN and PCa, respectively, relative to noncancerous patients diagnosed with BPH.

Ye-Cheng, Z., Shu-Mei, H., Zi-Lu, W., Jun-Wei, Z., Yan-Zheng, S., Zhang, Y., & Shu-Lin, Z. (2020). A rapid and accurate detection approach for multidrug-resistant tuberculosis based on PCR-ELISA microplate hybridization assay. *Labmedicine*, 51(6), 606-613. doi:<https://doi.org/10.1093/labmed/lmaa016>

Rapid and accurate diagnosis of multidrug-resistant tuberculosis (MDR-TB) is important for timely and appropriate therapy. In this study, a rapid and easy-to-perform molecular test that integrated polymerase chain reaction (PCR) amplification and a specific 96-well microplate hybridization assay, called PCR-ELISA (enzyme-linked immunosorbent assay), were developed for detection of mutations in *rpoB*, *katG*, and *inhA* genes responsible for rifampin (RIF) and isoniazid (INH) resistance and prediction of drug susceptibility in *Mycobacterium tuberculosis* clinical isolates. We evaluated the utility of this method by using 32 multidrug-resistant (MDR) isolates and 22 susceptible isolates; subsequently, we compared the results with data obtained by conventional drug susceptibility testing and DNA sequencing. The sensitivity and specificity of the PCR-ELISA test were 93.7% and 100% for detecting RIF resistance, and 87.5% and 100% for detecting INH resistance, respectively. These results were comparable to those yielded by commercially available molecular tests such as the GenoType MTBDRplus assay. Based on the aforementioned results, we conclude that the PCR-ELISA microplate hybridization assay is a rapid, inexpensive, convenient, and reliable test that will be useful for rapid diagnosis of MDR-TB, for improved clinical care.

Lapić, I., Komljenović, S., Knežević, J., & Rogić, D. (2020). COVID-19 pandemic once again exposes the weakest link in laboratory services: Specimen delivery. *Labmedicine*, 51(6), e83-e86. doi:<https://doi.org/10.1093/labmed/lmaa081>

**Objective** Reorganization of the emergency department (ED) during the COVID-19 pandemic implied closure of the ED-dedicated laboratory and manual transport of all specimens to the dislocated central laboratory. The impact of such reorganization on laboratory turnaround time (TAT) was examined. **Methods** The TAT from blood sampling to specimen reception (TAT1), from specimen reception to test reporting (TAT2), and from sampling to test reporting (TAT3) were compared between the pandemic peak month in 2020 and the same month in 2019. We evaluated whether TAT2 fulfills the recommended 60-minute criteria. **Results** A statistically significant difference was observed for all comparisons (P <.001), with TAT1 prominently contributing to TAT3 prolongation (from 48 minutes to 108 minutes) and exceeding the recommended 60-minute criteria. The TAT2 was extended from 33 minutes to 49 minutes. **Conclusion** An ED reorganization compromised the usual laboratory services for patients in the ED, with manual specimen delivery being the main cause for TAT prolongation.

Gilani, M., Aamir, M., Akram, A., Zujaja, H. H., Ijaz, A., & Muhammad, T. K. (2020). Comparison of turbidimetric inhibition immunoassay, high-performance liquid chromatography, and capillary electrophoresis methods for glycosylated hemoglobin determination. *Labmedicine*, 51(6), 579-584. doi:<https://doi.org/10.1093/labmed/lmaa010>

**Objective** The purpose of this study was to compare the performances of and evaluate the agreement among glycosylated hemoglobin values analyzed by using National Glycohemoglobin Standardization Program-certified and International Federation of Clinical Chemistry-standardized analyzers. This cross-sectional study was conducted at the Armed Forces Institute of Pathology, Department of Chemical Pathology from March 2019 to May 2019.

**Methods** Glycosylated hemoglobin (HbA1c) was measured in the blood specimens from 100 patients on an ADVIA 1800 by a turbidimetric inhibitory immunoassay (TINIA), Sebia instrument by electrophoresis, and Bio-Rad Variant II Turbo system by high-performance liquid chromatography (HPLC). Quantitative variables were calculated as the mean  $\pm$  standard deviation (SD). Precision and method comparisons were carried out according to Clinical and Laboratory Standards Institute recommendations. The results obtained from each analyzer were compared by correlation analysis. Method comparison was done by linear regression and Bland-Altman plots using the SPSS software version 24. **Results** The mean  $\pm$  SD HbA1c values from TINIA, electrophoresis, and HPLC were 7.188%  $\pm$  1.89%, 7.164%  $\pm$  1.866%, and 7.160%  $\pm$  1.85%, respectively. The between-run coefficients of variation for TINIA, electrophoresis, and HPLC were 0.64%, 0.61%, and 0.60%, respectively. All 3 showed good correlation (TINIA,  $R^2 = .994$ ,  $P = .00$ ; electrophoresis,  $R^2 = .992$ ,  $P = 0.00$ ; and HPLC,  $R^2 = .994$ ,  $P = 0.00$ ). **Conclusion** The good clinical agreements of HbA1c and strong correlations between analyzers indicate that these analyzers can be used interchangeably.

Thwe, P. M., Schilling, M., Reynoso, D., & Ren, P. (2020). Unexpected cholera bacteremia in a 91 year old caucasian male patient. *Labmedicine*, 51(6), e71-e74. doi:<https://doi.org/10.1093/labmed/lmaa028>

Cholera is an illness caused by *Vibrio cholerae*; its main symptom is acute watery diarrhea. Some infections are asymptomatic or result in patients presenting with mild diarrhea, but complications, such as bacteremia, can be fatal. Being endemic in Africa, Southeast Asia, and Haiti, *V. cholerae* infection cases in the United States are primarily considered travel-related. Herein, we report a case of a 91 year old Caucasian man, a Texas Gulf Coast resident, who developed bacteremia due to *V. cholerae* despite having no international travel history. Culture workup by mass spectrometry, automated biochemical system, and 16S ribosomal RNA (rRNA) gene sequencing confirmed *V. cholerae*. This case conveys an important reminder to clinicians and laboratory professionals regarding potentially serious cholera illnesses due to the domestic prevalence of *V. cholerae* in the coastal regions of the United States.

Gvozdjan, K., Casey, H., Mowery, C., Kumer, L., Fisher, C., Tyler, J., . . . Shike, H. (2020). Unexpected short-tandem-repeat patterns in posttransplant chimerism testing: Investigation of 3 cases with help from forensic science. *Labmedicine*, 51(6), 635-641. doi:<https://doi.org/10.1093/labmed/lmaa022>

Chimerism testing by short tandem repeats (STRs) is used to monitor engraftment after allogeneic hematopoietic stem cell transplantation (HSCT). Generally, STR alleles are stable and transferred from parent to child or from donor to recipient. However, 3 cases did not follow this norm. Additional work-up with help from forensic literature solved these mysteries. In case 1, the patient received HSCT from his son. The son shared STR alleles in 22/23 loci except Penta E, which was explained by repeat expansion in the son. In case 2, the patient had been in remission for 14 years after HSCT for lymphoma and developed repeat expansion in CSF1PO in granulocytes. In case 3, a pre-HSCT patient demonstrated 3 alleles, with 2 peaks taller than the third, in the FGA locus (chromosome 4). A combination of a triallelic variant and leukemia-associated trisomy 4 explained the finding. STR number variants are rare and clinically inconsequential but can overlap malignancy-associated, clinically significant changes.

About the journal. (2020). *Labmedicine*, 51(6), 553. doi:<https://doi.org/10.1093/labmed/lmaa090>

Pakzad, B., Rajae, E., Shahrabi, S., Mansournezhad, S., Davari, N., Azizidoost, S., & Saki, N. (2020). T-cell molecular modulation responses in atherosclerosis anergy. *Labmedicine*, 51(6), 557-565. doi:<https://doi.org/10.1093/labmed/lmaa003>

Atherosclerosis continues to be a major cause of death in patients with cardiovascular diseases. The cooperative role of immunity has been recently considered in atherosclerotic plaque inflammation, especially adaptive immune response by T cells. In this review, we examine the possible role of T cells in atherosclerosis-mediated inflammation and conceivable therapeutic strategies that can ameliorate complications of atherosclerosis. The cytokines secreted by T-lymphocyte subsets, different pathophysiological profiles of microRNAs (miRs), and the growth factor/receptor axis have diverse effects on the inflammatory cycle of atherosclerosis. Manipulation of miRNA expression and prominent growth factor receptors involved in inflammatory cytokine secretion in atherosclerosis can be considered diagnostic biomarkers in the induction of energy and blockade of atherosclerotic development. This manuscript reviews immunomodulation of T cells responses in atherosclerosis energy.

Zhou, W., Rao, H., Ding, Q., Xiang, L., Shen, J., Ye, B., & Xiang, C. (2020). Soluble CD14 subtype in peripheral blood is a biomarker for early diagnosis of sepsis. *Labmedicine*, 51(6), 614-619. doi:<https://doi.org/10.1093/labmed/lmaa015>

**Objective** To study the value of serum soluble CD14 subtype (sCD14-ST) in early diagnosis of sepsis. **Methods** Seventy-two patients were diagnosed with systemic inflammatory response syndrome, sepsis, or septic shock. Peripheral blood was collected at 0, 12, 24, and 48 hours after admission to the hospital. Levels of sCD14-ST, procalcitonin (PCT), hypersensitive C-reactive protein (CRP), and white blood cells (WBC) were determined. **Results** Levels of sCD14-ST in the patients with septic shock were higher than those in the other patients ( $P < .01$ ) and peaked at 48 h. PCT and CRP levels were similar in the patients at admission but increased by 5 times to 10 times in the next 48 h, especially in the patients with septic shock. WBC levels remained high and did not change dramatically. Receiver operating characteristic analysis revealed that the area under the curve, sensitivity, and specificity values of sCD14-ST to diagnose sepsis were much higher than those of the other markers. **Conclusion** Compared with PCT, CRP, and WBC, sCD14-ST is a better biomarker for the early diagnosis of sepsis.

Xu, Y., Gu, L., Wang, J., Wang, Z., Zhang, P., & Zhang, X. (2020). Detection of circulating antibodies to p16 protein-derived peptides in hepatocellular carcinoma. *Labmedicine*, 51(6), 574-578. doi:<https://doi.org/10.1093/labmed/lmaa006>

**Objective** This study aimed at confirming the alteration of circulating anti-p16 immunoglobulin G (IgG) levels in hepatocellular carcinoma (HCC). **Methods** An in-house-developed enzyme-linked immunosorbent assay was used for determining plasma IgG antibodies against p16-derived antigens in 122 HCC patients and 134 healthy controls. **Results** Plasma anti-p16 IgG levels were significantly higher in HCC patients than in the controls ( $Z = 3.51$ ,  $P = 0.0004$ ), with no difference between males and females. A trend of increasing plasma anti-p16 IgG levels was associated with increasing HCC stage, with group 3 patients having the highest anti-p16 IgG levels ( $Z = 3.38$ ,  $P = 0.0008$ ). Group 3 exhibited the best sensitivity (19.6%) and specificity (95%) for plasma anti-p16 IgG detection, with an area under the receiver operating characteristic curve of 0.659 (95% confidence interval, 0.564–0.754). **Conclusion** Circulating IgG antibody to p16 protein might be a useful biomarker for HCC prognosis assessment rather than for early malignancy diagnosis.

Ardon, O., & Schmidt, R. L. (2020). Clinical laboratory employees' attitudes toward artificial intelligence. *Labmedicine*, 51(6), 649-654. doi:<https://doi.org/10.1093/labmed/lmaa023>

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