

RJPT COVER

<https://rjptonline.org/>





Research Journal of Pharmacy and Technology

About Journal

Research Journal of Pharmacy and Technology (RJPT) is an international, peer-reviewed, multidisciplinary journal, devoted to pharmaceutical sciences. The aim of RJPT is to increase the impact of pharmaceutical research both in academia and industry, with strong emphasis on quality and originality. RJPT publishes Original Research Articles, Short Communications, Review Articles in all areas of pharmaceutical sciences from the discovery of a drug up to clinical evaluation. Topics covered are: Pharmaceutics and Pharmacokinetics; Pharmaceutical chemistry including medicinal and analytical chemistry; Pharmacognosy including herbal products standardization and Phytochemistry; Pharmacology: Allied sciences including drug regulatory affairs, Pharmaceutical Marketing, Pharmaceutical Microbiology, Pharmaceutical biochemistry, Pharmaceutical Education and Hospital Pharmacy. Research Journal of Pharmacy and Technology (RJPT) is published every year in last week of January, February, March, April, May, June, July, August, September, October, November and December from Raipur.

Abstracting and Indexing Information

The journal is indexed/listed with Scopus, Pro Quest Central, CAB:Abstract, CAS: Chemical Abstracts Service (CAS), CAS: Indian Citation Index, ISA: Indian Science Abstracts, Google Scholar, Gale Group Inc. USA.

Claims

Missing numbers will not be supplied if claims are received more than six months after the date of issue or if loss was due to failure to give notice of change of address. The Publisher and Printer cannot accept responsibly for foreign delivery when records indicate posting



Research Journal of Pharmacy and Technology (RJPT) is an international, peer-reviewed, multidisciplinary journal... [Read more >>>](#)

RNI: CHHENG00387/33/1/2008-TC

DOI: 10.5958/0974-360X

0.38

2018 CiteScore

56th percentile

Powered by Scopus

Research Journal of Pharmacy and Technology

Q3

Pharmacology (medical)

best quartile



(Home.aspx)

Research Journal of Pharmacy and Technology

(Home.aspx)

ISSN

0974-360X (Online)

0974-3618 (Print)

HOME (HOME.ASPX) PAST ISSUES (PASTISSUES.ASPX) EDITORIAL BOARD (EDITORIALBOARD.ASPX) FOR AUTHORS (FORAUTHORS.ASPX) MORE (MORE.ASPX)

NEWS (NEWS.ASPX) Submit Article (SubmitArticle.aspx) search

EDITOR IN CHIEF



DR. MRS. MONIKA S. DAHARWAL ()

Editor In Chief

A & V Publications, RJPT House, Lokmanya GrihNirman Society, Rohanipuram, In-front of Sector- 1, Pt. Deendayal Upadhyay Nagar, Raipur

492 010, (CG) India

Email: editor.rjpt@gmail.com

[Home Page](#)

ASSOCIATE EDITOR



MARWAN MAHMOOD SALEH ()

Associate Editor

Anbar-Ramadi- Habbaniya- 4-4-17

Email: bio.marwan72@gmail.com

[Home Page](#)



DHANANJAY BABANRAO DESHMUKH ()

Associate Editor

Ashvin college of pharmacy manchi hill ashvi Bk sangamner Ahmednagar

Email: dhananjaydeshmukh777@gmail.com

[Home Page](#)



DR KARTEEK ESWARA ()

Associate Editor

T2.staff quarters, ksr Institutions, ksr kalvi nagar, Tiruchengode-637215, Tamilnadu

Email: karteeswara@gmail.com

[Home Page](#)



DR. CHUKWUEBUKA EMMANUEL UMEYO ()

Associate Editor

Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Awka,

Anambra State, Nigeria

Email: ec.umeyor@unizik.edu.ng

[Home Page](#)



DR. PRANAV KUMAR PRABHAKAR ()

Associate Editor

Department of Transdisciplinary Research, Division of Research & Development, Lovely Professional University, Phagwara, Punjab, India-

144402

Email: prabhakar.litm@gmail.com

[Home Page](#)



DR. BISWAJIT BASU ()

Associate Editor

Dr. Biswajit Basu, Associate Professor, Department of Pharmaceutics, Bengal School of Technology, Sugandha, Delhi Road, Hooghly - 712

102, West Bengal India.

Email: bbosu.pharma@gmail.com

[Home Page](#)



DR. GURJEET KAUR ()

Associate Editor

Amity Institute of Biotechnology Amity University Uttar Pradesh Lucknow India

Email: g.kaur@ko.amity.edu

[Home Page](#)



DR. SUBRAT KUMAR PATTANAYAK ()

Associate Editor

Department of Chemistry NIT Raipur -492010, India

Email: skpilltbs@gmail.com

[Home Page](#)



DR. UPENDRA PRASAD TRIPATHY ()

Associate Editor

JAYKAPUR(PAPRI), RAYAGADA, ODISHA

Email: uptri@pathy@gmail.com

[Home Page](#)



DR.RER.NAT ARLI ADITYA PARIKES ()

Associate Editor

Department of Bioinformatics School of Life Sciences Indonesia International Institute for Life Sciences Jl. Pulomas Barat Kav.88 Jakarta

13210

Email: arli.parikesi@i3l.ac.id

[Home Page](#)



DR G KUMARASWAMY ()

Associate Editor

Dr.Kumara Swamy, Gandia Prof.& HeadDept.of Pharmaceutical AnalysisCare College of Pharmacy, Warangal, Telangana.Mobile:

+91-900973789

Email: kumaraswamy.gandia@gmail.com

[Home Page](#)



HARDIK PATHAK ()

Associate Editor

222 pashupatinath nagar, jaipur

Email: hardikaeshu@gmail.com

[Home Page](#)



MARIA SHANAIDA ()

Associate Editor

46001, Ternopil, Vohi Str., 1, Ukraine

Email: shanayda-mi@ukr.net

[Home Page](#)



DR. G. MANIKANDAN ()

Associate Editor

Dr.G.Manikandan Assistant Professor Department of Botany Sri Kaliswari College (Autonomous) Sivakasi - 626130 Tamil Nadu India

Email: rgmani.19@gmail.com

[Home Page](#)



DR.S.MOHANASUNDARAM ()

Associate Editor

Department of Biochemistry, Sri Sankara Arts and Science College (Autonomous), Kanchipuram - 631561, Tamilnadu, India

Email: sbmohar2007@gmail.com

[Home Page](#)



DR SHAESTA K. BHAVIKATTI ()

Associate Editor

College of Dentistry, King Khalid University, Abha, Saudi Arabia

Email: drshaeesta@gmail.com

[Home Page](#)



SONAM BHATIA ()

Associate Editor

Dept. of Pharmaceutical Sciences, Faculty of Health Science, Sam Higginbottom University of Agriculture, Technology and Sciences,

Prayagraj, India

Email: sonamperbhatia@gmail.com

[Home Page](#)



HUSSEIN O.M. AL-DAHMOSHI ()

Associate Editor

Iraq, Babylon Province Hillia City

Email: dr.dahmishi83@gmail.com

[Home Page](#)



BIMESH KUMAR ()

Associate Editor

BLOCK-4B, ROOM NO 203, SCHOOL OF PHARMACEUTICAL SCIENCES, LOVELY PROFESSIONAL UNIVERSITY, PHAGWARA, PUNJAB,

144411

Email: bimlesh1pharm@gmail.com

[Home Page](#)



DR.BELLAMKONDA RAMESH ()

Associate Editor

Department of Food Technology, Vikrama Simhapuri University, Nellore, Andhra Pradesh, India-524320

Email: rammygp@gmail.com

[Home Page](#)



K. MAHALINGAN ()
Associate Editor
RR College of Pharmacy, RR Nagar, Chickabanawara, Bangalore- 560090
Email: kmahalingan@gmail.com
🏠 Home Page ()



DR. RUPESH K. GAUTAM ()
Associate Editor
MM School of Pharmacy, MM University, Ambala-Chandigarh Highway, Sadopur-Ambala (India) -134007
Email: drrupeshgautam@gmail.com
🏠 Home Page ()



DR LINU MOHAN P ()
Associate Editor
Professor, Department of Pharmacy Practice Al Shifa College of Pharmacy Perinthalmanna- Kerala- India
Email: linumohanp@alshifacollegeofpharmacy.ac.in
🏠 Home Page ()



SHANKAR BALU KALBHARE ()
Associate Editor
YSPM'S Yashoda Technical Campus, Satara 415003
Email: kiranka1786@gmail.com
🏠 Home Page ()



R.SUNDARALINGAM ()
Associate Editor
Assistant Professor, Department of Microbiology, Madras Christian College (Autonomous), Tambaram, Chennai - 600059, Tamilnadu
Email: sundaralingam@mcc.edu.in
🏠 Home Page ()



DR ANUPAM KR SACHAN ()
Associate Editor
Dayanand Dinanath College, Institute of Pharmacy, Kanpur Nagar, Uttar Pradesh-208027
Email: anupamkrsachan@gmail.com
🏠 Home Page ()



MANIKANDAN K ()
Associate Editor
SRM College of Pharmacy SRM Institute of Science and Technology Kattankulathur, Kancheepuram
Email: gurumani12@gmail.com
🏠 Home Page ()



PROF. DR. NAGHAM MAHMOOD ALJAM ()
Associate Editor
Professor, Ph.D. Organic Chemistry, Iraq dr.naghamsmj@yahoo.com
Email: dr.naghamsmj@yahoo.com
🏠 Home Page ()



ARIF NUR MUHAMMAD ANSORI ()
Associate Editor
Universitas Air Langga, Surabaya, Indonesia.
Email: arif.nma-17@fkh.unair.ac.id
🏠 Home Page ()



DR.K.B.BHASKAR ()
Associate Editor
33B, Kanmalhasan street, new balaji nagar, selaiyur, chennai.
Email: jaihbhaskar15@gmail.com
🏠 Home Page ()



DIMPLE NAGPAL ()
Associate Editor
Chitkara University, Punjab
Email: dimplenagpal009@gmail.com
🏠 Home Page ()



DR VINAYAKUMAR KADIBAGIL ()
Associate Editor
BELUR ROAD, 2ND CROSS ABHI Building
Email: DRVINAYAKADIBAGIL@GMAIL.COM
🏠 Home Page ()



DR. ATUL KABRA ()
Associate Editor
University Institute of Pharma Sciences Chandigarh University Mohali, Punjab
Email: atul.kbr@gmail.com
🏠 Home Page ()



MOHD IBRAHIM ALARAJ ()
Associate Editor
Airport St. Amman, Jordan
Email: ibrahim_naseem@yahoo.com
🏠 Home Page ()



DR. PAVAN KUMAR ()
Associate Editor
Koneru Lakshmaiah Education Foundation KLEF
Email: pavankmahs@gmail.com
🏠 Home Page ()



ASHESH SINGH ()
Associate Editor
M-303, Swastik city near Pooja park, Lambha turning Narol-Ahemdabad-382405
Email: ashesh_parihar@yahoo.com
🏠 Home Page ()



SWARNIMA PANDEY ()
Associate Editor
GoeI Institute of Pharmacy & Sciences, Faizabad road lucknow 226028
Email: yesgodi@gmail.com
🏠 Home Page ()



DR. PARUL JOHRI ()
Associate Editor
C-1/167 Indra nagar kanpur
Email: pjohri@lko.amity.edu
🏠 Home Page ()



MORTEZA SAKI ()
Associate Editor
Department of Microbiology, Faculty of Medicine Ahvaz Jundishapur University of Medical Sciences Ahvaz
Email: mortezasaki1981@gmail.com
🏠 Home Page ()



DUMPALA LAKSHMIPRASUNA RAJESH ()
Associate Editor
Sumandeep Pharmacy college AT & PO: PIPARIA,WAGHODIA ROAD, TA: WAGHODIA, VADODARA- 391760
Email: mlakshmiprasuna2015@gmail.com
🏠 Home Page ()



DR. S. BALASUBRAMANIAN ()
Associate Editor
National Centre for Coastal Research Chennai.
Email: sskthivelbala.s@gmail.com
🏠 Home Page ()



RAVINANDAN A P ()
Associate Editor
Mr. Ravinandan A.P. M. Pharm, MBA, FSASS, (Ph.D.) Assistant Professor, Clinical Pharmacist and Research Scholar Department of Pharmacy Practice Sree Siddaganga College of Pharmacy In Collaboration with Siddaganga Hospital and Research Centre BH Road, Tumkur, Karnataka, India
Email: rzvinandanap@gmail.com
🏠 Home Page ()



DR. PUTTA RAJESH KUMAR ()
Associate Editor
Dr. Putta Rajesh Kumar, C/o: Amdapur X Road, Yenkapally, Moinabad, Ranga Reddy, Hyderabad, Telangana 500075 INDIA Mobile: 0-949-072-1376
Email: prkbp@gmail.com
🏠 Home Page ()



DR. SRIKANTH JEYABALAN ()
Associate Editor
Department of Pharmacology Sri Ramachandra Faculty of Pharmacy Sri Ramachandra Institute of Higher Education & Research (DU) Porur, Chennai, Tamil Nadu - 600 116
Email: srikanthj@sriramachandra.edu.in
🏠 Home Page ()



PROF.B.RAMYA KUBER ()
Associate Editor
Prof.B.Ramya Kuber, Professor of Pharmacognosy Institute of Pharmaceutical Technology, Sri Padmavati Mahila Viswavidyalayam(Women's University), Tirupati-517502, Andhra Pradesh, India.
Email: rkuberpharma@yahoo.com
🏠 Home Page ()



DR GOVINDH BODDIETI ()
Associate Editor
Door Number: 1-1-33/A, New Venkojipalem
Email: govindhdt@gmail.com
🏠 Home Page ()



DR DURGESH RANJAN KAR ()
Associate Editor
BENGAL SCHOOL OF TECHNOLOGY A COLLEGE OF PHARMACY SUGHANDHA CHUCHURA DIST- HOOGHLY WEST BENGAL INDIA
Email: durgesh176@gmail.com
🏠 Home Page ()



MORTHA LAKSHMI PRASANNA ()

Associate Editor
VJ'S COLLEGE OF PHARMACY Diwancheruvu Rajahmundry, andhra pradesh Pin 533296
Email: luckympharma09@gmail.com
🏠 Home Page ()



DR. GARIMA MISHRA ()

Associate Editor
Department of Pharmacy, College of Health Sciences, Debre Tabor University, Ethiopia
Email: gp_nmr2002@yahoo.co.in
🏠 Home Page ()



DR. PRADEEP SINGH ()

Associate Editor
Department of Pharmacy, College of Health Sciences, Debre Tabor University, Ethiopia
Email: pradeep_2682@yahoo.co.in
🏠 Home Page ()



DR. DAVID PAUL ()

Associate Editor
St.James College of Pharmaceutical Sciences St.James Medical Academy River Bank, Chalakudy Kerala, India- 680307
Email: davidpaulred@gmail.com
🏠 Home Page ()



DR.S.SASIKALA ()

Associate Editor
Head and Associate professor Department of Computer Science with Cognitive Systems Hindusthan College of Arts and Science, Coimbatore - 641028, Tamilnadu, India.
Email: iamssasikalamoht@gmail.com
🏠 Home Page ()



DR. A.K. JHA ()

Associate Editor
Principal, Shri Shakaracharya College of Pharma. Sciences, Bhilai CG India
Email: jhaak@rediffmail.com
🏠 Home Page ()



DR. NAGHAM MAHMOOD ALJAMALI ()

Associate Editor
college Education ,department , IRAQ.
Email: drnagham_m@yahoo.com
🏠 Home Page ()



DR. DEEPANSH SHARMA ()

Associate Editor
Block 28, Room No. 202 Department of Biosciences, Lovely Professional University
Email: deepanshsharma@gmail.com
🏠 Home Page ()



DR. S. SARAF ()

Associate Editor
Professor, University Institute of Pharmacy , PT.Ravishankar Shukla University, Raipur-492010 CG India Vice- President, Pharmacy Council of India, New Delhi
Email: shailendrasarf@rediffmail.com
🏠 Home Page ()



DR. DEEPENDRA SINGH ()

Associate Editor
University Institute of Pharmacy Pt. Ravishankar Shukla University Raipur(C.G.)
Email: deependraop@gmail.com
🏠 Home Page ()



DR S RAJESHKUMAR ()

Associate Editor
Nanotherapy Lab School of Biosciences and Technology, VIT, Vellore
Email: ssrajeshkumar@hotmail.com
🏠 Home Page ()



VASUNDHRA KASHYAP PHD, MBA, MS ()

Associate Editor
66 Lowden Avenue, Somerville, MA 02144 USA
Email: vk76@cornell.edu
🏠 Home Page ()



ROMAN LYSLUK ()

Associate Editor
Department of Pharmacognosy and Botany, Danylo Halytsky Lviv National Medical University, Pekarska,69., Lviv, Ukraine, 79010
Email: pharmacognosy.org.ua@ukr.net
🏠 Home Page ()



BEHZAD FOROUTAN ()

Associate Editor
Department of Pharmacology, School of Medicine, Shahrood University of Medical Sciences, Shahrood, Iran
Email: behzad_foroutan@hotmail.com
🏠 Home Page ()



DR. R. B. KAKAIDE ()

Associate Editor
Professor, Uni. Dept. of Pharmaceutical Sci., RTM Nagpur University, Nagpur India
Email: drkakaide@yahoo.com
🏠 Home Page ()



WISSAM ZAM ()

Associate Editor
Al-Andalus University of Medical Sciences/Faculty of Pharmacy-Tarous, Syria
Email: wzam@au.edu.sy
🏠 Home Page ()



DR. VIBHA YADAV ()

Associate Editor
Covington, LA, USA
Email: editor.vibha@gmail.com
🏠 Home Page ()



DR. S. ASHUTOSH KUMAR ()

Associate Editor
Department of Pharmacy, Tripura University (A Central University) Suryamaninagar, West Tripura, Tripura- 799022.
Email: ashu.mpharm2007@gmail.com
🏠 Home Page ()



DR. U. S. MAHADEVA RAO ()

Associate Editor
Kuala Terengganu, Malaysia
Email: raousm@gmail.com
🏠 Home Page ()



CHANDRASEKARAN V M ()

Associate Editor
A24 Technology Tower VIT University Vellore 632014 (TN)
Email: vmcsi@yahoo.com
🏠 Home Page ()



NAEEM HASAN KHAN ()

Associate Editor
Faculty of Pharmacy, AIMST University, 08100 Bedong, Kedah D.A., Malaysia.
Email: naemhshirazi@hotmail.com
🏠 Home Page ()

ACADAMIC EDITOR



DR. BHARTI AHIRWAR ()

Associate Professor, SLT Institute of Pharm. Sciences, Guru Ghasidas University, Bilaspur CG India
Email: bh_bharti@yahoo.com
🏠 Home Page ()



SUDHISH A. RAI ()

RJPT House, Lokmanya GrihNirman Society, Rohanipuram, In-front of Sector- 1, Pt. Deendayal Upadhyay Nagar, Raipur 492 010. (CG) India
Email: sudhishrai7337@gmail.com
🏠 Home Page ()



DR. ASHOK A. HAJARE ()

Professor and Head, Department of Pharm. Tech., Bharati Vidyapeeth College of Pharmacy, Kolhapur (M. S.), India Pin - 416013
Email: ashok.hajare@bharativedyapeeth.edu
🏠 Home Page ()



SANYAM GANDHI ()

International Regulatory Strategy Lead Takeda Pharmaceutical Company Ltd., 1 Kingdon St., Paddinton, London, W2 6BD England
Email: askforsanyam@gmail.com
🏠 Home Page ()



DR. AJAY KUMAR MEENA ()

Captain Srinivasa Murthy Regional Ayurveda Drug Development Institute, Arumbakkam, Chennai - 600 106
Email: ajaysheera@gmail.com
🏠 Home Page ()

EDITORS



DR AVINASH B DAREKAR ()

KVNSNSP, Institute of Pharmaceutical Education and Research, Canada Corner, Nashik, Maharashtra-422002.
Email: avibldarekar@gmail.com
🏠 Home Page ()



PRAVEEN KUMAR SHARMA ()

Department of Chemistry, Lovely Professional University, Phagwara, Punjab, India-144411
Email: pk_pandit1982@yahoo.com
🏠 Home Page ()



DR SUDIP KUMAR MANDAL ()

Dr. B. C. Roy College of Pharmacy & Allied Health Sciences, Durgapur, West Bengal, India
Email: gotosudip79@gmail.com
🏠 Home Page ()



DR K MANIKANDAN ()

Dr. K. Manikandan, M. Pharm., Ph.D., Associate Professor, SRM College of Pharmacy, SRM University, Kattankulathur, Kancheepuram - 603203 Mobile Number - 0 9444708710
Email: manikank2@srmist.edu.in
🏠 Home Page ()



DR SHAIK HARUN RASHEED ()

professor & Head Srikrupa Institute of Pharmaceutical Sciences Velikatta, siddipet - 502277 Telangana.
Email: shaikharunrasheed@gmail.com
🏠 Home Page ()



DR. ASHISH KUMAR ()

Professor and HOD, Department of Chemistry, Lovely Professional University, Jalandhar road Phagwara
Email: drashishchemlpu@gmail.com
🏠 Home Page ()



DR. SHAKTA MANI SATYAM ()

Department of Pharmacology, Melaka Manipal Medical College (Manipal Campus), Manipal Academy of Higher Education, Manipal- 576104, District- Udipi, State- Karnataka (India)
Email: smsatyam21@gmail.com
🏠 Home Page ()



ABDULRAHMAN R. MAHMOOD ()

*Department of Chemistry, College of Education for Pure Sciences/(Ibn-Al-Haitham), University of Baghdad, Baghdad, Iraq.
Email: abdoaljumaily@gmail.com
🏠 Home Page ()



DR. SUSHIL KUMAR MIDDHA ()

Maharani Lakshmi Ammanni College For Women, 18th Cross, Malleswaram, Bangalore- 12
Email: drsushilmiddha@gmail.com
🏠 Home Page ()



MUNIM R. ALI ()

Al-Mustansiriyah University Biology depart./college of Science Iraq/Baghdad
Email: mnumbio77@yahoo.com
🏠 Home Page ()



DR. GAURAV TIWARI ()

G- 23, Department of Pharmacy, PSIT, NH-2, Kalpi Road, Bhaunti Kanpur 209305
Email: dr.gauravtiwari@psit.in
🏠 Home Page ()



DR.ZEYAD KADHIM OLEWI ()

najaf-iraq
Email: zeyadkadhim@alkafeel.edu.iq
🏠 Home Page ()



ASSIST. PROF. DR. AMAL TALIB A ()

Dept. Clinical Laboratory Sciences/ Faculty of Pharmacy/ University of Babylon, Iraq.
Email: amal.athyah@yahoo.com
🏠 Home Page ()



YAHIA MOHAMMAD MOUALLA ()

Alsham private university, Latakia
Email: Yahiamoualla@hotmail.com
🏠 Home Page ()



MOHANAD MOUSA KAREEM ()

Babylon University
Email: mohanad_1972@yahoo.com
🏠 Home Page ()



ADAWIYA FADHIL ABBAS ALZUBAIDI ()

Iraq / Diyala / Baqubah Diyala university / education college / pure science
Email: adwa_22000@YAHOO.COM
🏠 Home Page ()



MOUSHIRA ZAKI ()

El Bhouth ST.
Email: moushiraz@yahoo.com
🏠 Home Page ()



DR. AMIT KUMAR CHATURVEDI ()

Department Of Chemistry, J.S.University, Shikohabad (U.P.)
Email: achaturvedi794@gmail.com
🏠 Home Page ()



DR. MANOJ KUMAR JENA ()

Department of Biotechnology, School of Bioengineering and Biosciences, Lovely Professional University, Phagwara-144411, Punjab, India
Email: manoj.20283@lpu.co.in
🏠 Home Page ()



AVINASH BABURAO THALKARI ()

Vasant Pharmacy College Kaji Affiliated by MSBTE Mumbai
Email: avinashthalkari@rediffmail.com
🏠 Home Page ()



RAJESH L. DUMPALA ()

Alembic Pharma Campus, Alembic Rd, Subhanpura, Vadodara, Gujarat 390003
Email: rdumpala64@gmail.com
🏠 Home Page ()



ABDULRAHMAN R. MAHMOOD ()

*Department of Chemistry, College of Education for Pure Sciences/(Ibn-Al-Haitham), University of Baghdad, Baghdad, Iraq.
Email: abdulrahman.r.m@hcoedu.uobaghdad.edu.iq
🏠 Home Page ()



DR.T.C.VENKATESWARULU ()

Department of Bio-Technology, Vignani's Foundation for Science, Technology & Research, Vadamudi-522213, Andhra Pradesh
Email: venki_biotech1327@yahoo.com
🏠 Home Page ()



DR PRASHANT L. PINGALE ()

Associate Professor of Pharmaceutics, GES's Sir Dr. M. S. Gosavi College of Pharmaceutical Education and Research, Nashik-422005, Maharashtra, India
Email: prashantpingale@gmail.com
🏠 Home Page ()



DR GURVINDER SINGH ()

School of Pharmaceutical Sciences, Lovely Professional University, Phagwara, Punjab
Email: guri_ph@yahoo.co.in
🏠 Home Page ()



DR.SUSHANT KUMAR ()

UTTAR PRADESH UNIVERSITY OF MEDICAL SCIENCES, SAIFAI, ETWAH, UTTAR PRADESH
Email: KSUSHANT75@GMAIL.COM
🏠 Home Page ()



MR. PARESH ASHOK PATIL ()

Jay ambe Nivas, Gujar gali, Shahada Dist-Nandurbar
Email: rcp.pareshatil@gmail.com
🏠 Home Page ()



VAMSIKRISHAN BIRUPANENI ()

4401 manchester avenue, Apt#53, CA, 95207.
Email: vamsikrishan99@gmail.com
🏠 Home Page ()



DR. SUNIL KUMAR ()

122 Ground Floor Research Block A Post Graduate Institute of Medical education and Research
Email: drsunilkumarjasswal@gmail.com
🏠 Home Page ()



SANDEEP PODDAR ()

Lincoln University College, Wisma Lincoln, No. 12-18, Off Jalan Perbandaran, SS6/12 Kelana Jaya, Selangor D. E., Malaysia
Email: sandeepoddar@lincoln.edu.my
🏠 Home Page ()



DR ZAKIR HUSSAIN ()

Dr Zakir Hussain S/o MD UNUS Rtd Express mail guard SCRLY Near mohammadia masjid, Satyanarayana pet GUNTAKAL-515801 ANANTAPUR DIST ANDHRA PRADESH-INDIA
Email: zakirhussain765@gmail.com
🏠 Home Page ()



BASIL A. ABBAS ()



University of Basrah, Basrah, Iraq
Email: basilabbas@uobasrah.edu.iq
Home Page ()



DR V. PALANISINGH ()
Putuvadi, Ulagamattai post Sivagangai Dist, Tamil Nadu PIN 630410
Email: vpalanisingh@gmail.com
Home Page ()



NASIR MUWFAQ YOUNIS ()
University of Mosul ,College of Nursing
Email: nasirmuwaq@uomosul.edu.iq
Home Page ()



SANDIP SEN ()
SRIRUPPA INSTITUTE OF PHARMACEUTICAL SCIENCES, VELUKATTA, KONDAPKKA, SIDDIPET-502277
Email: sandipssen2010@gmail.com
Home Page ()



DR. BISWA MOHAN SAHOO ()
Roland Institute of Pharmaceutical Sciences (Biju Patnaik University of Technology Nodal Centre of Research) Berhampur-760010, Odisha, India
Email: drbiswamohansahoo@gmail.com
Home Page ()



DR.MATADEEN BHARTI ()
Department of Fluorosis Chief Medical and Health Office Dhar District Dhar MP India pin code 454001
Email: drmdbharti@gmail.com
Home Page ()



DR PRASENJIT MONDAL ()
Vaageswari Institute of Pharmaceutical Sciences, Ramakrishna colony, Karimnagar, Telangana, India
Email: prajenjitmyname@gmail.com
Home Page ()



SOURAVH BAIS ()
474 VIP PARASPAR NAGAR
Email: souravh2008.123@rediffmail.com
Home Page (<https://sageuniversity.in/pharmadetail/faculty>)



DR. D.S.JAYALAKSHMI ()
Satyabama Institute of Science and Technology (deemed to be University), Rajiv Gandhi Salai, OMR
Email: jayasanand10@gmail.com
Home Page (<https://www.sathyabama.ac.in/>)



DR. PARTHA NIYOGI ()
SCHOOL OF PHARMACY THE NEOTIA UNIVERSITY SARISHA, DIAMOND HARBOUR WEST BENGAL- 743 368
Email: parthaninyogi@tnu.in
Home Page (https://www.tnu.in/our_faculty/dr-partha-niyogi/)



DR. RAJIV DUTTA ()
Shobhit Institute of Engineering & Technology (Deemed-to-be-University) NH-58, Modipuram Meerut, UP-250110, India
Email: director.sbt@gmail.com
Home Page (rdutta.50megs.com)



PRAVEEN KUMAR UPPALA ()
LIG 163 Alakananda colony, Vizianagaram, Andhra Pradesh
Email: praveen.chintu32@gmail.com
Home Page (<http://www.ipc.gov.in/>)



RAMAKRISHNA REDDY H ()
#32, Shiva shakti, 4th Cross, KBL Elite layout, JPNagar 8th Phase, Bangalore-560108, Karnataka state, India.
Email: rkrreddy_h@yahoo.co.in
Home Page (<https://www.apotex.com/in/contact-us>)



DR. PRAVIN KUMAR SHARMA ()
Acropolis Institute of Pharmaceutical Education and Research, Indore
Email: praveensharma910@gmail.com
Home Page (<https://aipcr.ac.in/>)



DR. FORAT YASIR ALJABERI ()
Chemical Engineering Department, College of Engineering, Al-Muthanna University, Samarra, Iraq



DR ANJU THAWARE ()
Associate professor, Dept of samhita Siddhant ,MGACRCH,salod wardha ,(DMIMSU,wardha) Maharashtra ,India
Email: anjusamhita@dmimsu.edu.in
Home Page (<https://mgachrc.org/departments>)



DR. NITIN SHARMA ()
Department of Biotechnology Chandigarh Group of Colleges, Landran, Mohali- 140307
Email: nitin.3994@gcg.edu.in
Home Page (<https://www.cgc.edu.in/chandigarh-college-of-technology>)



PROF. GALLA RAJITHA ()
Prof. G. Rajitha, Professor, Institute of PharmaceuticalTechnology, Sri Padmavati Mahila Visvavidyalayam, Tirupati - 517502, Andhra Pradesh, India
Email: rajitha.galla@gmail.com
Home Page (<http://www.spmv.ac.in/>)



ASHISH GUPTA ()
Flat no.E113,Nariman Point, Mahalaxmi Nagar Indore MP
Email: ashishgupta@acropolis.edu.in
Home Page (www.acropolis.in)



HUSAM AL-HRAISHAWI ()
195 Little Albany St,
Email: hra10@scarletmail.rutgers.edu
Home Page (<https://uomisn.edu.iq/ar/>)



TUHIN SARKAR ()
Jakir Hossain Institute of Pharmacy, Vill. & PO- Miapur, Dist.- Murshidabad, Pin: 742225, West Bengal.
Email: gantuhin@gmail.com
Home Page (<http://www.jhip-india.co/>)



BHUPENDRA G. PRAJAPATI ()
Ganpat Vidyanagar, Mahesna 384012
Email: bhupen27@gmail.com
Home Page (<https://skpcper.guni.ac.in/about/pharmaceutics-and-pharmaceutical-technology/>)



DR K RAJYALAKSHMI ()
Department of Pharmaceutical Chemistry, Vignan Pharmacy College, Vadlamudi, Guntur, A.P.
Email: drkri3579@gmail.com
Home Page (<http://www.vignanpharmacycollege.in>)



Email: furatyasir@nu.edu.iq
Home Page (<https://www.rjptonline.org/Editorial/Board.aspx>)



DR. L. NANDHAKUMAR ()
Kastooribha gandhi Pharmacy college Namakkal, Rasipuram
Email: drndkumar12@gmail.com
Home Page (<https://kgpc.edu.in/kgpc/index.php>)



PROF. DR. RAJIV DUTTA ()
SHOBHIT UNIVERSITY, GANGOH
Email: director.sbt@gmail.com
Home Page (rdutta.50megs.com)



AHMED ALI MHAWESH ()
Baghdad/Iraq Al-Ghadeer Quarter
Email: alshammariaahmed.a.m@gmail.com
Home Page (<https://cunahrainuniv.edu.iq/ar/view/464>)



DR JAGDISH KAKADIYA ()
Department of Pharmacology, Parul Institute of Pharmacy and Research, Parul University, Vadodra, Gujarat, India
Email: jagdishkakadiya@gmail.com
Home Page (paruluniversity.ac.in/faculty/faculty-of-pharmacy/faculty-members)




MAJIDA HAMEED KHAZAAL ()
Kufa University
Email: majidahameed9@yahoo.com
Home Page (<http://staff.uokufa.edu.iq/profile.html?majidah.alkhazaali>)




DR. SHOBHIT KUMAR ()
Dr. Shobhit Kumar, Associate Professor, Department of Pharmaceutical Technology, Meerut Institute of Engineering and Technology (MIET), NH-58, Delhi-Roorkee Highway, Meerut-250005, Uttar Pradesh, India. Tel: +91 9675598375 E-mail: shobhitkmr87@gmail.com
shobhitkumar@miet.ac.in
Email: shobhit.kumar@miet.ac.in
Home Page (<https://www.miet.ac.in/pharmacy>)




DR. P. DWARAKANADHA REDDY ()
Annamacharya College of Pharmacy, Rajampet-516126, Andhra Pradesh, India
Email: dwarakanadharedyperam@gmail.com
Home Page (<https://scholar.google.co.in/citations?user=OvgwYmKUAJ&hl=en>)

**PROF. MATOLE VINOD KALIDAS ()**
Shivai Charitable trust's College of Pharmacy, Koregaonwadi Tal. Omerga Dist. Dharashiv Maharashtra India
Email: matole7414@gmail.com
🏠 Home Page (<https://prsu.ac.in/site/facultydetails?id=484>)

**SANKARGANESH ()**
3/478, Ajith nagar, Sathanuppam, Kelambakkam-603103, Chennai, TN
Email: bilisankar@gmail.com
🏠 Home Page (<https://hindustanuniv.ac.in/>)

**ALAA HUSSEIN AL-DARRAJI ()**
Iraq-Misan
Email: alaa.hussein@uomisan.edu.iq
🏠 Home Page (<https://www.researchgate.net/profile/Alaa-Al-Darraj/stats/report/weekly/2022-06-12>)

**MANISH KUMAR ()**
SD College, Barnala-148101, Punjab, India.
Email: manish@sdcollegeinstitutions.org
🏠 Home Page (<http://sdcollegeinstitutions.org/SD.%20College/index.php>)

**DR. DINANATH TUKARAM GAIKWAD ()**
223, Shamrao Kumbhar Nagar, Nanapati Nagar, Kolhapur, Maharashtra, India
Email: gdinanath@gmail.com
🏠 Home Page (<http://copkolhapurbharatividyapeeth.edu/>)

**BEHZAD FOROUTAN ()**
Department of Pharmacology School of Medicine Shahrood University of Medical Sciences Shahrood, IRAN
Email: behzad_foroutan@hotmail.com
🏠 Home Page ()

**DR. AMIT ROY ()**
Principal, Columbia Institute of Pharmacy, Raipur CG India
Email: wokerstuni@gmail.com
🏠 Home Page ()


**DR. JAYASHREE SEN ()**
J.N.M.C.&A.V.B.R.H.Sawangi,Wardha,Maharashtra 442007
Email: jayashree_sen@rediffmail.com
🏠 Home Page ()


**IMAD ()**
University of Babylon
Email: imad_dna@yahoo.com
🏠 Home Page ()


**RIM M. HARFOUCH ()**
Al Andalus university, Qadmus, Tartous, Syria
Email: rimharfouch@au.edu.sy
🏠 Home Page ()

**MOHAMMAD JAWAD AL-JASSANI ()**
Department of Microbiology, College of Science, Al-Karkh University of Science, Iraq.
Email: pcr2000@yahoo.com
🏠 Home Page ()

REVIEWERS


**DR. SUBHASHIS DEBNATH ()**
Seven Hills College of Pharmacy Venkatramapuram, Tirupati- 517561
Email: subhashis.ooty@gmail.com
🏠 Home Page ()


**GAURAV KUMAR ()**
Department of Microbiology School of Bioengineering and Biosciences Lovely Professional University Phagwara, 144411, Punjab, India
Email: gau_ravkr@yahoo.com
🏠 Home Page ()

**RUCHI VERMA ()**
manipal college of pharmaceutical sciences, manipal university, karnataka, India.
Email: ruchi.verma@manipal.edu
🏠 Home Page ()

**P. PARTHIBAN ()**
Centre for R&D, PRIST University, Thanjavur-613403, India
Email: parthivam@yahoo.co.in
🏠 Home Page ()


**PROF. D. K. TRIPATHI ()**
Principal, Rungta Institute of Pharmaceutical Sci. and Research, Bhillai CG India
Email: editor.rpt@gmail.com
🏠 Home Page ()


**DR. P. KUMARAVEL ()**
Assistant Professor, Department of Biotechnology, Vysya College, Masinaickenpatty, Salem- 636103, Tamil Nadu, India.
Email: kumaravelbiotech@gmail.com
🏠 Home Page ()


**DR GIRISH PAI K ()**
Faculty - Dept of Pharmaceutics Manipal college of pharmaceutical sciences Manipal University, Madhav Nagar Manipal - 576104, Karnataka State, India
Email: girishpai@manipal.edu
🏠 Home Page ()

**DR. AJAY V. PATHAK ()**
House No.33 Ravindra nagar Nagpur-440022 Maharashtra, INDIA
Email: a.pathak4@gmail.com
🏠 Home Page ()


**AYUSH DOGRA ()**
department of electronics and communications, panjab university chandigarh
Email: ayush123456789@gmail.com
🏠 Home Page ()


**DR. PRATIBHA VYAS ()**
Department of Microbiology, College of Basic Sciences and Humanities, Punjab Agricultural University, Ludhiana- 141004, Punjab, India.
Email: pratibha.19044@pu.co.in
🏠 Home Page ()


**IHSAN HABIB DAKHLIL ()**
Engineering College, Al-Muthanna University, Iraq
Email: ihsaneshahiri@yahoo.com
🏠 Home Page ()


**DR. KETAN VINODLAL SHAH ()**
201, Rudrax Apartment, Gururasad Society, Nehind Telephone exchange, Krishnanagar Main road, Rajkot
Email: ketan421981@gmail.com
🏠 Home Page ()


**K SUJANA ()**
university college of pharmaceutical sciences Acharya Nagarjuna university
Email: sujana_36@yahoo.co.in
🏠 Home Page ()

**DR.PBRINDHA DEVI ()**
Vels University, Velan Nagar, PV Vaitthiyalingam Road, Pallavaram
Email: pbrindhadevi@gmail.com
🏠 Home Page ()

**DR VAMSHI KRISHNA TIPPVAJHALA ()**
Assistant Professor- Senior Scale Department of Pharmaceutics Manipal College of Pharmaceutical Sciences Manipal University Manipal, Karnataka, India
Email: krissrcm@gmail.com
🏠 Home Page ()

**ZAIN BAAITY ()**
Syria, Latakia
Email: zain_syria@hotmail.com
🏠 Home Page ()

**LAITH AHMED NAJAM ()**
Mosul University, College of Science, Physics Dept., Mosul
Email: Prof.laith2014@gmail.com
🏠 Home Page ()

**VEEREN DEWOOLKAR ()**
4824 Washienaw Ave, Apt C1, Ann Arbor, MI 48108
Email: veerenrv@gmail.com
🏠 Home Page ()

**NEERAN OBIED JASIM ()**
University of AL-Qadisiyah college of Pharmacy Iraq
Email: neran.jasim@qu.edu.iq
🏠 Home Page ()



MAHMOUD NAJIM ABID ()
Mustansiriyah University, College of Science, Department of Chemistry
Email: mahmoudajbouri@gmail.com
🏠 Home Page ()



NILESH PATEL ()
B/103,SnehKunj Elegance,Behind Shivalay Parisar Kudasan,Gandhinagar-382421,Gujarat
Email: nilesh33.emcure@gmail.com
🏠 Home Page ()



NEERAN OBIED JASIM ()
university of AL-Qadisiyah -college of science-Iraq
Email: neran.jasim@qu.edu.iq
🏠 Home Page ()



MARWAN MAHMOOD SALEH ()
Anbar-Ramadi- Habbaniya- 4-4-17
Email: ah.marwan_bio@uoanbar.edu.iq
🏠 Home Page ()



PALLAVI LAXMAN PHALKE ()
Parul University, Limda, Waghodiya, Vadodara-391760, Gujarat India.
Email: falkepallavi@gmail.com
🏠 Home Page ()



DR. ANUP S. HENDRE ()
Biochemistry Department Krishna Institute of Medical Sciences, Malkapur Karad, Dist-Satara.
Email: anupviews@gmail.com
🏠 Home Page ()



SURENDRA KUMAR GAUTAM ()
Kamla Nehru Institute of Management & Technology, NH96 Faizabad Bypass Road Faridpur Campus
Email: surendra_bkt95@yahoo.in
🏠 Home Page ()



DR U R RAKSHITH ()
Dr U R Rakshith Lecturer JSS College of Pharmacy, JSS Academy of Higher Education and Research Shivarathreeswara Nagar, Mysuru-



YAHIA M. MOUALLA ()
Faculty of pharmacy, Tishreen university, Latakia, Syria
Email: yahia.moualla@tishreen.edu.sy
🏠 Home Page ()



SUHAS SURESH AWATI ()
Assistant Professor, Dr. Shivajirao Kadam College of Pharmacy, Kasabe Digrji, Bagarvat, Tal- Miraj, Dist- Sangli, Maharashtra. 416301
Email: awatis@gmail.com
🏠 Home Page ()



SHAIK FIROZ ()
Assistant Professor, Department of Pharmaceutics, Sree Vidyanikethan College of Pharmacy, Sree Sainath Nagar, A.Rangampet-517102.
Email: firoz.kallur@gmail.com
🏠 Home Page ()



DR NASEEF PP ()
Vice Principal, Mouana College of Pharmacy, Near Angadippuram Railway Station, Malappuram, Kerala, India 679321
Email: drnaseefpp@gmail.com
🏠 Home Page ()



DR. ARINDAM CHATTERJEE ()
School of Pharmaceutical Sciences Jaipur National University (SADTM Campus) Near RTO Office, Jaipur Agra Bypass Jagatpura, Jaipur, Rajasthan India-302017
Email: chatterjee.arindam@hotmail.com
🏠 Home Page ()



S RAJARAJAN ()
Department of Pharmaceutics, Karnataka College of Pharmacy 33/2, Thirumena Halli, Hegde Nagar Main Road,Bangalore-560064
Email: pharmking@gmail.com
🏠 Home Page ()



DR. RAHUL RADHAKRISHNAN ()
Manasam, Edavattom, Chirakkara (PO), Kollam, Kerala
Email: drrahulpharmd@gmail.com
🏠 Home Page ()



RIM M. HARFOUCH ()
0624 Albaath street, Latakia, Syria
Email: rimharf@yahoo.com
🏠 Home Page ()

570015 Karnataka , India
Email: urrakshith@jssuni.edu.in
🏠 Home Page ()



RAMU SAMINENI ()
H.NO-1-123-A: C/O SIVARAMAKRISHNA SAMINENI MANDEPUDI, AMARAWATHI
Email: saminenramu@gmail.com
🏠 Home Page ()



DHAVAL PATEL ()
A-104, Maruti Aamrakunj, Sargasan, Gandhinagar-382421
Email: dhaval.nine@gmail.com
🏠 Home Page ()



AKHIL NAGAR ()
R C PATEL INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH
Email: akhilpharma23@gmail.com
🏠 Home Page ()



SUNANDAR IHSAN ()
Kampus Hijau Bumi Tridharma Universitas Halu Oleo Fakultas Farmasi, Jl. H.E.A.Mokodompit Anduonuhu, Kendari, Indonesia
Email: sunandarihsan@uho.ac.id
🏠 Home Page ()



ANAS TARIQ NAFEI ()
Baghdad, Qadisiyah Express way
Email: anasalhamdany@yahoo.com
🏠 Home Page ()



DR. KUMARASWAMY GULLAPELLE ()
STREET NUMBER 4 , BHAVANI NAGAR , NACHARAM, HYDERABAD NACHARAM, Hyderabad, Telangana, pincode: 500076
Email: kumargullapelli001@gmail.com
🏠 Home Page ()



RADHWAN AL-ZIDAN ()
Almothana district, Mosul, Iraq
Email: radhwan.alzidan@uomosul.edu.iq
🏠 Home Page ()



ARUN A ()
3/31 periyar street, ramapuram chennai 600089
Email: arunarticle2016@gmail.com
🏠 Home Page ()



ABDUL SALEEM MOHAMMAD ()
Department of Pharmaceutical Analysis and Quality Assurance, Nizam Institute of Pharmacy, Deshmukhi (V), Pochampally (M), Behind Mount Opera, Nalgonda (Dist)- 508284, Telangana, India.
Email: mohdsaleempharma@gmail.com
🏠 Home Page ()



KARTHIKEYAN T ()
registrar nimhans
Email: karthik_77m@yahoo.co.in
🏠 Home Page ()



DR. PUTTA RAJESH KUMAR ()
Amdapur X Road, Yenkapally, Moinsabad, Ranga Reddy, Hyderabad, Telangana 500075 INDIA
Email: prkbp@gmail.com
🏠 Home Page ()



AAMINAH NAJMUS SAHAR ()
H.no: 121,Pension lane, New Bowenpally Secunderabad- 500011
Email: aaminahnajmus@yahoo.in
🏠 Home Page ()



ZAINAB HATHAM FATHI ()
College of Pharmacy, University of Mosul
Email: zainabh@uomosul.edu.iq
🏠 Home Page ()



DR. OM PRAKASH RANJAN ()
Faculty of Pharmacy, Sachchidanad Sinha College, Aurangabad, Bihar.
Email: omprakashranjan@gmail.com
🏠 Home Page ()



SHASHIKANT SUDARSHAN UPADHYE ()



Annasaheb Dange College of B.Pharmacy, Ashta Tal:Walwa, Dist: Sangli 416301, Maharashtra, India
 Email: ssupadhye7@gmail.com
[Home Page \(\)](#)



VISHAL KUMAR BISWKARMA ()
 KSCP, Subharti University, Meerut, Uttar Pradesh, India
 Email: vishalkumarbiswkarma@gmail.com
[Home Page \(\)](#)



DR. C. JANANI ()
 Dr. C. Janani, Srimad Andavan Arts and Science College, Nelson Road, TV Kovil, Trichy-05
 Email: janabio.net@gmail.com
[Home Page \(\)](#)



RANJAN KUMAR SINGH ()
 g d memorial college of pharmacy, kbhb, jodhpur.342005
 Email: rxsingh@gmail.com
[Home Page \(\)](#)



BIMESH KUMAR ()
 BLOCK 4, ROOM NO 203, SCHOOL OF PHARMACEUTICAL SCIENCES, LOVELY PROFESSIONAL UNIVERSITY, PHAGWARA, PUNJAB, 144411.
 Email: bimlesh3pham@gmail.com
[Home Page \(\)](#)



DR. BISWARANJAN RAY ()
 Associate prof. Dept. of Pharmacology, College of Pharmaceutical Sciences, Puri, Odisha
 Email: crabiswa@gmail.com
[Home Page \(\)](#)



ANAR J PATEL ()
 Sal Institute of Pharmacy, Ahmedabad
 Email: anarpatel@sal.edu.in
[Home Page \(\)](#)



MATOLE VINOD KALIDAS ()
 AT POST AURAD TAL.OMERGA DIST. OSMANABAD
 Email: vinodmatole57@gmail.com
[Home Page \(\)](#)



NIRMAL THAKKER ()
 B-602, Tinapali Ashrutli Greenz, Behind Nirma University, S.G. Highway, Ahmedabad-382481, Gujarat, India
 Email: nirmalthakker117@yahoo.com
[Home Page \(\)](#)



JASWANTH GOWDA B.H. ()
 Yenepeya (Deemed to be University), Deralakatte, Mangalore, India-575018.
 Email: jaswanth_14601@yenepeya.edu.in
[Home Page \(\)](#)



ZEINA ABDULMUNIM ALTHANOON ()
 Albaladyat Quarter Mosul Iraq
 Email: ph.zeinaalthanoon@gmail.com
[Home Page \(\)](#)



SHIVAVEERAKUMAR ()
 Department of Microbiology, Davangere University, Davanagere - 577002, Karnataka
 Email: shiv_math1984@rediffmail.com
[Home Page \(\)](#)



DR. V.K. EVANJELENE ()
 16, Anbu Nagar, gorimedu, Salem - 636 008
 Email: evankutty@gmail.com
[Home Page \(\)](#)



ASHISH TALE ()
 MJPS College of Pharmacy, Degaon, Ta, Risod, Dist. Washim-444506 (M.S) India
 Email: ashishitale93@gmail.com
[Home Page \(\)](#)



GANESH BARKADE ()
 Dr. Vitthalrao Vikhe Patil Foundation's College of Pharmacy, Ahmednagar, MH, India-414111 Vikhe Patil Foundation
 Email: ganeshbarkade7@gmail.com
[Home Page \(\)](#)



DR. VEDAMURTHY JOSHI ()
 Associate professor, Sri Adichunchanagiri College of Pharmacy, BG Nagara Nagamangala Tq Mandya dist Karnataka
 Email: vedamurthyjoshi@gmail.com
[Home Page \(\)](#)



AVINASH BABURAO THALKARI ()
 Kanadi Road Kaj Vasant Pharmacy College Kaj Kanadi Road Kaj
 Email: avinashthalkari@gmail.com
[Home Page \(\)](#)



DR. P. PRAVEEN REDDY ()
 Vivekananda Degree and PG College, Karimnagar- 505001, Telangana
 Email: microppr@gmail.com
[Home Page \(\)](#)



MUTHUKUMAR S ()
 45, U.K. Thevar Street, Sular, Coimbatore-641402
 Email: pharmmuthu@gmail.com
[Home Page \(\)](#)



D CHANDRA SEKHAR NAIK ()
 KVSr Siddhartha college of pharmaceutical sciences poly clinical road Vijayawada-10
 Email: chandrudsavath@gmail.com
[Home Page \(\)](#)



BHARAT MISHRA ()
 Nirmala college of pharmacy, Nirmala Hills, Muvattupuzha, Ernakulam, Kerala, India
 Email: bharatekarsh@gmail.com
[Home Page \(\)](#)



DR. C. JANANI ()
 Srimad Andavan Arts and Science College, Nelson Road, TV Kovil TV kovil
 Email: janabio.net@gmail.com
[Home Page \(\)](#)



PRATHEEP THANGARAJ ()
 Department of Biotechnology, PRIST Deemed to be University, Thanjavur-613403, India.
 Email: pratheeptp@gmail.com
[Home Page \(\)](#)



SHAIMAA AHMAD HASSAN ()
 AlKarkh University of science / Baghdad / Iraq
 Email: dr.shaimaa_altaee@kus.edu.iq
[Home Page \(\)](#)



DR ANUP NAHA ()
 Manipal College of Pharmaceutical Sciences, MAHE, Manipal, Karnataka- 576104
 Email: anupnaha@gmail.com
[Home Page \(\)](#)



EIMAN SHAHROUR ()
 Iattakia- syria
 Email: eimanm.shahrour@gmail.com
[Home Page \(\)](#)



DR. DEVAKUMAR DINESH ()
 Department of Zoology, Bharathiar University Coimbatore-641046 Tamilnadu India
 Email: devadinesh4041@gmail.com
[Home Page \(\)](#)



AUDUMBAR DIGAMBAR MALI ()
 At, Po. Andhalgaon, Tal-mangalwedha, Dist- Solapur, Pin Code:- 413305, Maharashtra, India.
 Email: maliandud42@gmail.com
[Home Page \(\)](#)



DR. MITTAL MAHESHWARI ()
A- One Pharmacy College, Ahmedabad
Email: mittalmaheshwari@gmail.com
🏠 Home Page ()



ABDUL AZEEM ()
Research Scholar, Electrical Engineering Department Jamia Millia Islamia-New Delhi
Email: azeemth@gmail.com
🏠 Home Page ()



DR. V. VADIVEL ()
PG & Research Department of Botany, V.O. Chidambaram College, Tuticorin- 628008 Tamil Nadu, India
Email: drvvadivel@gmail.com
🏠 Home Page ()



PROF.(DR.) KUMARASWAMY GANDLA ()
Dr.Kumara Swamy Gandla Associate Editor of RIPT (Research Journal of Pharmacy and Technology Chaitanya Deemed to be University, Hanamkonda, Warangal-Urban (Dist.), Telangana 506001-India. Mobile: +91-9000973789 / +91-7801022789
Email: drkumaraswamygandla@gmail.com
🏠 Home Page ()



MR. PATIL AMOL MANIK ()
ATI, P- KASEGAON TAL- WALWA DIST- SANGLI PIN CODE- 415404 MAHARASHTRA
Email: ampd389@gmail.com
🏠 Home Page ()



MOH MIRZA NURVADY ()
Blok HC No. 14, Jl. Intan 2, Perum GPA, Ngijo, Kec. Karangploso, Kabupaten Malang, East Java
Email: mirzanurvady@umm.ac.id
🏠 Home Page ()



SHAIMAA AHMAD HASSAN ()
College of Remote Sensing & Geophysics, Al Karkh University of Science, Baghdad, Iraq
Email: dr.shaimaa_ahaaee@kus.edu.iq
🏠 Home Page ()



MAUSAMI VAGHELA ()
New College Wadi-3, B/H Punjab Honda, Opp. sitvan Flat, Kalawad Road, Rajkot.
Email: mausami_2123@yahoo.com
🏠 Home Page ()



NAZIYA IQBAL KHAN ()
38 Sahyadri nagar Isbavi Pandharpur 413307 Solapur Maharashtra
Email: naziya.aara@gmail.com
🏠 Home Page (<https://sahyadripharmacy.org/wp-content/uploads/2021/08/teaching-staff-converted.pdf>)



DR GYANENDRA KUMAR SHARMA ()
Anand College of Pharmacy, Agra
Email: gyanendrasharma.acp@gei.org
🏠 Home Page (<https://acp.edu.in/teacher/prof-dr-gyanendra-kumar-sharma/>)



MISS.MALI SUNAYANA MALLAPPA ()
A/P Andhalgaon, Pin No.- 413 305 Tal- Mangalwedha, Dist-Solapur, Maharashtra, India
Email: sunayanamali01@gmail.com
🏠 Home Page (sunayanamali01@gmail.com)



DR. ARUNACHALAM MUTHURAMAN ()
Dr. Arunachalam Muthuraman, M. Pharm., Ph.D. Associate Professor, Pharmacology Unit, Faculty of Pharmacy, AIMST University, Semeling, 08100 Bedong, Kedah Darul Aman, Malaysia. E-mail: arunachalammu@gmail.com Phone No: +60-1136293386 (Malaysia); +91-9988040886 (India) Malaysia Office: +60-44298000 (Extn. 1281 / 1284);
Email: arunachalammu@gmail.com
🏠 Home Page (https://www.aimst.edu.my/staff/_dr-arunachalam-muthuraman-2/)



MUKUL SHARMA ()
Faculty of Pharmacy, Medi-Caps University, Indore
Email: mukulsharma@medicaps.ac.in
🏠 Home Page (<https://www.medicaps.ac.in/index.php?action=sf-staffdetails&staffid=1228>)



PROF. DR. NAGHAM MAHMOOD ALJAM ()
Professor , Department of Chemistry ,Synthetic Field, Iraq,
Email: dr.nagham_mj@yahoo.com
🏠 Home Page (https://scholar.google.com/citations?user=DwqLj18AAAAJ&hl=ar&gmla=AJSN-F5GvOO0KkyAAsEKvwgNKZCgs8Q95yQZLQSWL50IE5AtDpE_LPbIC790EmRTK5DM4cQdmVvSD-LcEL5w6G5S92_DCoafRGY6-Q0AQ7XC-nTz0CkwK5m_3U1LDawTxfjKEACIS58pEUsz2xW441HtHqm493TuZz2idUgNF0x&scid=803455237925191217&gmla=AJSN-F56AvWRBBLUJv5xB-N2NQZLjvVjMhZUjNFPURUwosXtdvOdTgP2H-NR061du5-BOPRrYppq3umxyjAwMnAX_DBYNYUfH5AwS0UyyOKdWUC9fDkFjwW9CJltnjL95BplpOPuJoTwxYpLJ6nNNKWKIC91FjtLdNQmcpJwktUptsq2416&scid=4058147899730636809)



PRASHANT PANDEY ()
Department of Pharmaceutical Sciences, Babasaheb Bhimrao Ambedkar University, Lucknow
Email: mrpandeyprashant@gmail.com
🏠 Home Page (<https://www.bbau.ac.in/>)



KOTESHWARA MUDIGONDA ()
Suven Life Sciences Limited, Hyderabad, India
Email: koteshwara_mudigonda@yahoo.com
🏠 Home Page ()



DR. SWAMY C T ()
51, Anna Arch Rd, NSK Nagar, Anna Nagar, AA Hospital Campus
Email: swamyc23@gmail.com
🏠 Home Page ()



KHUDHAIR ABBAS KAREEM AL-RUDAI ()
Iraq, Baghdad
Email: khudhair-2010@yahoo.com
🏠 Home Page ()



BALJEET YADAV ()
1202 H. Coralwood Sector 84, Gurugram INDIA
Email: baljeetyadav@rggu.org
🏠 Home Page ()



DR NILIMA ABHJEET THOMBRE ()
MET's Institute Of Pharmacy, Bhubal Knowledge City, Adgaon, Nasik-422003, Maharashtra, India. nilimat_top@bkc.met.edu 09422284082, 09960646693
Email: nilimat_top@bkc.met.edu
🏠 Home Page ()



SNIGDHO DAS ()
Flat No.6,Ira Apartments-2,Jadunath Ukil Road, Kudghat
Email: snigdho1991@gmail.com
🏠 Home Page ()



DR SUDARSAN BISWAL ()
O/o the Asst. Drugs Controller, Bhubaneswar Circle II, Bhubaneswar, Khordha, Odisha, India
Email: dsbiswad@rediffmail.com
🏠 Home Page ()



NAZIYA IQBAL KHAN ()



PATHAN HUJEB AFSAR KHAN ()
Shreyash Institute of Pharmaceutical Education and Research Aurangabad, Maharashtra, India.
Email: pathanhujeb@gmail.com
🏠 Home Page (<https://www.syppharmacy.org/>)



DR. SHIKHA MAHESHWARI ()
Pushpanjali Enclave Ptlampur Delhi
Email: shikhamaheshwarimohs@gmail.com
🏠 Home Page (<https://staff.cuchd.in/StaffHome.aspx>)



DR V N MEENA DEVI ()
Noorul Islam Centre for Higher Education Kumaracoll, Kanyakumari Dist. Tamilnadu 629180 India.
Email: meenadevi@niuiv.com
🏠 Home Page (<http://www.niuiv.com/>)



PRASHANT PANDEY ()
Department of Pharmaceutical Sciences, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, Uttar Pradesh, India
Email: dr.pandeyprashant@outlook.com
🏠 Home Page (<https://www.bbau.ac.in/index.aspx>)



MR. TUSHAR PRADIP DUKRE ()
At- Malwadi, Post- Bota.
Email: tusharpd23@gmail.com
🏠 Home Page (www.shrisiioip.in)



DR. DATTATRAYA MANOHAR SHINKA ()
Rajiv Nagar Nashik-Vaibhav Colony
Email: dattashinkar@gmail.com
🏠 Home Page (<https://msgpharma.org/>)



PROF. SACHIN NAMDEO KOTHAWADE ()
Sitabai Thite College of Pharmacy, Pune-Nagar Bypass, Behind Hudco Colony, Shirur, Tal - Shirur, Dist - Pune, Pin - 412210
Email: sachin.kothawade23@gmail.com
🏠 Home Page (<https://stcopshirur.com/faculties/>)

DR. SIVARAMAN DHANASEKARAN ()
 Pandit Deendayal Energy University, Gandhinagar, Gujarat
 Email: sivaramand83@gmail.com
 Home Page (<https://pdpu.ac.in/>)

ALI MAHMOOD RAYSHAN ()
 Iraq, Karbala, City Center
 Email: alireshashan@alzah.edu.iq
 Home Page (<https://alzahu.edu.iq/en>)

DUKRE TUSHAR PRADIP ()
 At: Satral, Post- Songaon, Tal- Rahuri, District-Ahmednagar, 413711
 Email: tusharpd23@gmail.com
 Home Page (www.shrissoip.in)

DR. SK. ARIFA BEGUM ()
 Dr. Sk. Arifa Begum, Assistant Professor, KVSRR Siddhartha College of Pharmaceutical Sciences, Siddhartha Nagar, Vijayawada - 520 010, Andhra Pradesh, India.
 Email: arifashaik2007@gmail.com
 Home Page (<https://kvsrsiddharthapharma.edu.in/>)

RUPALI NIRMAL ()
 Sahajanandnagar
 Email: rupalinirmalcpn@gmail.com
 Home Page (<https://sanjivaniopharm.org.in/>)

RISHU YADAV ()
 352/1 n.c. Kidwai Nagar Kanpur
 Email: rishuyadav789@gmail.com
 Home Page (<https://mau.ac.in/school-of-pharmacy.php>)

DR. YASMIN HAMID MOMIN ()
 Annasaheb Dange College of B.Pharmacy, Ashta 416301
 Email: mullays413@gmail.com
 Home Page (<https://www.adcbp.in/b-pharm-staff>)

PRAVEEN KUMAR UPPALA ()
 LIG 163, Alakananda Colony, Vizianagaram, Andhra Pradesh
 Email: praveen.chintu32@gmail.com
 Home Page (<http://www.ipc.gov.in/>)

Research Journal of Pharmacy and Technology

Pharmacology (medical)

Q3 best quartile

SJR 2021 0.23

powered by scimagojr.com

(<https://www.scimagojr.com/journalsearch.php?q=21100197160&tip=sid&sexact=no>)

QUICK LINKS

- SUBMIT ARTICLE (SUBMITARTICLE.ASPX)
- AUTHOR'S GUIDELINES (DOWNLOADS/INSTRUCTIONS_TO_AUTHOR.PDF)
- PAPER TEMPLATE (DOWNLOADS/PAPER_TEMPLATE.DOC)
- COPYRIGHT FORM (DOWNLOADS/COPYRIGHT_TRANSFER_FORM.DOCX)
- CERT. OF CONFLICT OF INTEREST (DOWNLOADS/CERTIFICATE OF CONFLICT OF INTEREST.PDF)
- PROCESSING CHARGES (CHARGESDETAILS.ASPX)
- INDEXING INFORMATION (INDEXED_IN.ASPX)

LATEST ISSUES

DR. EKA INDRASETYAWAN ()
 Department of Pharmacy Udayana University
 Email: ekaindrasetyawan@unud.ac.id
 Home Page (<https://farmasi.unud.ac.id/>)

DR. MOHAN GANDHI BONTHU ()
 V. V. Institute of Pharmaceutical Sciences, Guttlavalleru, Krishna District 521356.
 Email: bmgandhiopharma@gmail.com
 Home Page (<https://vviips.guttlavalleru.ac.in/>)

SWATI GOKUL TALELE ()
 Sandip Institute of Pharmaceutical Sciences, Nashik
 Email: swatitalele77@gmail.com
 Home Page (<https://sips.sandipfoundation.org/faculties/>)

Research Journal of Pharmacy and Technology

RJPT

Research Journal of Pharmacy and Technology (RJPT) is an international, peer-reviewed, multidisciplinary journal...

Read more >>> ([AboutJournal.aspx](#))

RNI: CHHENG00387/33/1/2009-TC
 DOI: 10.5958/0974-360X

0.38
 50th percentile

2018 CiteScore
 Powered by Scopus

(https://www.scopus.com/sourceid/21100197160?dgcid=sc_widget_citescore)

- AUGUST 2022 (82) (ISSUES.ASPX?VID=15&IID=8)
- JULY 2022 (80) (ISSUES.ASPX?VID=15&IID=7)
- JUNE 2022 (82) (ISSUES.ASPX?VID=15&IID=6)
- MAY 2022 (78) (ISSUES.ASPX?VID=15&IID=5)
- APRIL 2022 (83) (ISSUES.ASPX?VID=15&IID=4)
- MARCH 2022 (77) (ISSUES.ASPX?VID=15&IID=3)
- FEBRUARY 2022 (77) (ISSUES.ASPX?VID=15&IID=2)
- JANUARY 2022 (80) (ISSUES.ASPX?VID=15&IID=1)

POPULAR ARTICLES

- (AbstractView.aspx?PID=2017-10-9-42)
Detection of Food Adulterants in Chili, Turmeric and Coriander Powders by Physical and Chemical Methods
 (AbstractView.aspx?PID=2017-10-9-42)
- (AbstractView.aspx?PID=2020-13-1-43)
Formulation and Evaluation of Herbal Face Cream
 (AbstractView.aspx?PID=2020-13-1-43)
- (AbstractView.aspx?PID=2013-6-2-15)
Medicinal Plants from Solanaceae Family
 (AbstractView.aspx?PID=2013-6-2-15)
- (AbstractView.aspx?PID=2019-12-1-69)
Recent Advances in Preventive Resin Restoration (PRR)
 (AbstractView.aspx?PID=2019-12-1-69)
- (AbstractView.aspx?PID=2018-11-2-70)
Recent Advancements in Laminates and Veneers in Dentistry
 (AbstractView.aspx?PID=2018-11-2-70)
- (AbstractView.aspx?PID=2017-10-12-61)
Mathematical Models in Drug Discovery, Development and Treatment of Various Diseases - A Case Study
 (AbstractView.aspx?PID=2017-10-12-61)
- (AbstractView.aspx?PID=2020-13-4-16)
Formulation and Evaluation of Herbal Lipsticks
 (AbstractView.aspx?PID=2020-13-4-16)
- (AbstractView.aspx?PID=2014-7-9-14)
The Use of Neem in Oral Health
 (AbstractView.aspx?PID=2014-7-9-14)
- (AbstractView.aspx?PID=2010-3-3-60)
Evaluation of Ayurvedic Marketed Formulations Asava's and Arista's.
 (AbstractView.aspx?PID=2010-3-3-60)
- (AbstractView.aspx?PID=2019-12-11-80)
Dental Waxes - A Review
 (AbstractView.aspx?PID=2019-12-11-80)

(AbstractView.aspx?PID=2012-5-5-5)

A comparative, Bioequivalence study to evaluate the safety and pharmacokinetic profile of single dose Ivabradine 7.5mg Tablets in healthy, adult, human subjects under fasting condition.

(AbstractView.aspx?PID=2012-5-5-5)

(AbstractView.aspx?PID=2020-13-7-74)

Pharmaceutical Incompatibilities: Causes, Types and Major ways of Overcoming in Extemporaneous Medicinal forms

(AbstractView.aspx?PID=2020-13-7-74)

(AbstractView.aspx?PID=2014-7-9-16)

Project Writing for Retail Pharmacy Practical Training: A Proforma

(AbstractView.aspx?PID=2014-7-9-16)

(AbstractView.aspx?PID=2015-8-12-24)

Screening Methods for Hepatoprotective Agents in Experimental Animals

(AbstractView.aspx?PID=2015-8-12-24)

(AbstractView.aspx?PID=2016-9-9-50)

A review on MBT system in orthodontics

(AbstractView.aspx?PID=2016-9-9-50)

Recent Articles

Tags

Not Available

ABOUT JOURNAL

Research Journal of Pharmacy and Technology (RJPT) is an international, peer-reviewed, multidisciplinary journal, devoted to pharmaceutical sciences. The aim of RJPT is to increase the impact of pharmaceutical research both in academia and industry, with strong emphasis on quality and originality. RJPT publishes Original Research Articles, Short Communications, Review Articles in all areas of pharmaceutical sciences from the discovery of a drug up to clinical evaluation. Topics covered are: Pharmaceutics and Pharmacokinetics; Pharmaceutical chemistry including medicinal and analytical chemistry; Pharmacognosy including herbal products standardization and Phytochemistry; Pharmacology; Allied sciences including drug regulatory affairs, Pharmaceutical Marketing, Pharmaceutical Microbiology, Pharmaceutical biochemistry, Pharmaceutical Education and Hospital Pharmacy.
Read More >>> (AboutJournal.aspx)

VISITORS




Today: 14535

Yesterday: 22787

Total: 16624440

[HOME \(HOME.ASPX\)](#) | [ABOUT JOURNAL \(ABOUTJOURNAL.ASPX\)](#) | [EDITORIAL BOARD \(EDITORIALBOARD.ASPX\)](#) | [SITEMAP \(SITEMAP.XML\)](#)

Designed and Developed by:
 [\(https://tlabsolutions.com/\)](https://tlabsolutions.com/)
T-Labs Solutions (<https://tlabsolutions.com/>)

CONTENT

- **QbD Stressed Development and Validation of Stability-Indicating RP- HPLC Method for the Simultaneous Estimation of Linagliptin and Metformin HCl in Pharmaceutical Dosage Form**
Khushbu Patel, Ujashkumar A. Shah, Hirak V. Joshi, Jayvadan K. Patel, Chhaganbhai N. Patel..... 1917
- **Attributes for Discrete Choice Experiment on Pharmacy-based Alcohol Brief Intervention Service in Thailand**
Sukunta Muadthong, Nusaraporn Kessomboon..... 1924
- **Brucellar spondylitis: An update on the Diagnosis by the involvement of Essential/Toxic Elements**
Muzahem Mohialdeen Taha, Ekhlash M. Taha, Israa Fadhil Ascar, Saleh M. Rahim..... 1933
- **RP-HPLC Method development and Validation for Rapid estimation of Diazepam in Bulk and Pharmaceutical Dosage Form**
Monika Maheshwari, Parul Soni..... 1938
- **Phytochemical Analysis and *In Vitro* Anticancer Activity of *Enteromorpha compressa* against Ovarian Cancer**
J. Mariya Jothi, A. Jayaprakash..... 1943
- **Insilico Study, and Analysis Antibacterial Activity of Beta-glucan against Beta-Lactamase and Protein Binding Penicillin-2A**
Mokhamad Fahmi Rizki Syaban, Nabila Erina Erwan, Muhammad Rafif Raihan Syamsuddin, Fatimah Az Zahra, Faradilah Lukmana Sabila..... 1948
- **Isolation, Identification and Analysis of Novel Metabolites from Soil Samples (Microbial Co Culture) of Cardamom Plantations Western Ghats, India**
Padmini V. Sekar, V. Deepa Parvathi, R. Sumitha..... 1953
- **A Study of Potential drug-drug interactions in HIV positive individuals with Co-morbidities**
Sayan Kumar Das, Smita Shenoy, Muralidhar Varma, R Rajesh, Ravi Shankar, Sadhana Holla, Kavitha Saravu..... 1960
- **Development and Validation of *In-vitro* dissolution test using RP-HPLC Analysis for simultaneous estimation of Azelnidipine and Telmisartan in a Fixed-dose Combination**
Manish Kumar, Umesh Chandra, Arun Garg, Pankaj Gupta..... 1967
- **Strategic archetype of Herbal Medicine Product (HMP) in Regulated and Emerging Market**
Swagat Tripathy, PN Murthy, BP Patra, Vikram, Sumit Sanduria, Harish Dureja..... 1973
- **New stability indicating RP-UFLC method for the quantification of Efavirenz in pharmaceutical dosage forms**
Sai Gnaneswari Aluri, Mukthinuthalapati Mathrusri Annapurna..... 1981
- **Antibiotic Sensitivity Pattern of Clinically Isolated *Klebsiella* Species in C. U. Shah Hospital, Surendranagar**
Vaibhavi Patel, Priya Mehta, Kunjan Kikani, Girish K. Goswami..... 1989
- **Production and Characterization of Micro-Collagen from Carp Scales Waste (*Cyprinus carpio*)**
Rasmi Zakiah Oktarlina, Syaiful Bahri, Andi Nafisah Tendri Adjeng..... 1995
- **Effect of combination of some Polymers with Carbopol 940 on Pregabalin Release Rate from Emulgels**
Nawar Haddad, Jameela Hasian..... 2003
- **The effect of Adrenaline on the contractility of the Right Ventricular Myocardium in rat pups with altered Serotonin concentration in Ontogenesis**
Akhmetova M., Nigmatullina R., Mindubayeva F., Tykezhanova G. 2010

- **Development and validation of a new stability indicating RP-HPLC method for the quantification of Budesonide in pharmaceutical dosage forms in presence of an internal standard**
Bandaru Sai Pavan Kumar, Mukthinuthalapati Mathrusri Annapurna..... 2103
- **Evaluation of the Antibacterial and Antioxidant properties of the Methanolic extracts of four Medicinal plants selected from Wadi Al-Karak, Jordan related to their Phenolic contents**
Ibrahim Alfarrayeh, Khaled Tarawneh, Dima Almajali, Wajdy Al-Awaida..... 2110
- **Phytochemical Screening, GC-MS Analysis, Molecular Docking Study and Evaluation of Antioxidant and Antimicrobial Activity of *Sapindus emarginatus* Seed Kernel**
Ali Alrabie, Arwa Al-Dhrai, Inas Al-Qadsi, Vidya Pradhan, Mazahar Farooqui..... 2117
- **Antibacterial Screening of Urine Culture using Urine Antibacterial Substance Assay (UABA)**
S. Subalakshmi, S. S. M. Umamageswari, M. Kalyani..... 2122
- **Development and Validation of Quality by Design based RP-HPLC Method for determination of Tenofovir Alafenamide Fumarate from Bulk drug and Pharmaceutical dosage form and its application to Forced Degradation Studies**
Aakanksha J. Wankhade, Purnima D. Hamrapurkar..... 2127
- **Effect of Oleic acid Incorporation on delivery of Carteolol from commercial Silicone contact lenses**
Hala Rayya, Lama Al haushey..... 2135
- **Radical Scavenger and Anti-diabetic Potencies of *Etilingera elatior* Fruits growing in South East Sulawesi-Indonesia**
Imran, Wahyuni, Adryan Fristiohady, Mesi Leorita, M. Hajrul Malaka, Muhammad Ilyas Y, Musadar, Nur Syifa Rahmatika, Ahmad Darmawan, Sofa Fajriah, Agung W. Mahatva Yodha, Sahidin I..... 2141
- **Development and Validation of Stability Indicating Related Substances Method for Dolutegravir/Lamivudine/Tenofovir Disoproxil Fumarate (DLT) Tablets using High Performance Liquid Chromatography**
Saravanan. R, Somanathan. T, Gavaskar. D, Sriraman. V, Tamilvanan. M, Sasieekhumar. A. R..... 2147
- **Detection of Cytomegalovirus in Urine Specimen of Cholestatic Infants by Polymerase Chain Reaction**
Gondo Mastutik, Nila Kurniasari, Alphania Rahniayuw, Anny Setijo Rahaju, S. Eriaty N. Ruslan, Khafidhotul Ilmiah, Bagus Setyoboedi, Erna Sulistyani..... 2151
- **Potential role of Niacin as Adjuvant to Sevelamer on Serum levels of Inorganic phosphorus, Calcium and Calcium-phosphorus product in Hemodialysis patients with Hyperphosphatemia**
Rana Baha Mohammed, Mohammed Mahmood Mohammed..... 2158
- **Effect of head covering on Phototherapy Induced Hypocalcemia in Jaundiced term neonates**
Laxmipati G H, Shreedhara Avabratha K, Bhagyalakshmi K..... 2163
- **Role of Ksharsutra in Management of Shataponak Bhagandar with respect to multiple Fistula in ano**
Kiran Pundlikrao Mendhekar, Sanjay C. Babar..... 2168
- **The Synergistic effect of Oral Antibiotic Therapy on C- Reactive Protein and Lipid profile in Chronic Periodontitis patients**
Dhivya K, Umavparvathy S, Jayaraj R R, Selva Priya M..... 2172
- **Synthesis, Characterisation and Antimicrobial Activity of Novel 2-Methyl-3-(2-(substituted ylidene)hydrazinyl)quinazolin-4(3H)-ones**
Gopal Muthu Boopathi, Shanmugarajan T. S...... 2176

RESEARCH ARTICLE

Detection of Cytomegalovirus in Urine Specimen of Cholestatic Infants by Polymerase Chain Reaction

Gondo Mastutik^{1*}, Nila Kurniasari^{1,2}, Alphania Rahniayu^{1,2}, Anny Setijo Rahaju^{1,2}, S. Eriaty N. Ruslan³, Khafidhotul Ilmiah¹, Bagus Setyoboedi^{4,5}, Erna Sulistyani⁶

¹Department of Anatomic Pathology, Faculty of Medicine, Universitas Airlangga, Surabaya - 60132, Indonesia.

²Department of Anatomic Pathology, Dr. Soetomo General Academic Hospital, Surabaya - 60132, Indonesia.

³Institute of Tropical Diseases, Universitas Airlangga, Surabaya - 60132, Indonesia.

⁴Department of Child Health of Pediatric, Faculty of Medicine, Universitas Airlangga, Surabaya - 60132, Indonesia.

⁵Department of Child Health of Pediatric, Dr. Soetomo General Academic Hospital, Surabaya - 60132, Indonesia.

⁶Department of Oral Medicine, Faculty Dentistry, Jember University, Jember- 68121, Indonesia.

*Corresponding Author E-mail: gondomastutik@fk.unair.ac.id, gondomastutik@gmail.com

ABSTRACT:

Cholestatic infants are associated with congenital abnormalities or viral infections, such as cytomegalovirus (CMV) infection. CMV can be detected by polymerase chain reaction (PCR) in body fluids, including urine which can be obtained easily and is non-invasive. The objective was to detect CMV in urine specimens of cholestasis infants and to analyze its correlation with serological status. This was a descriptive observational study with the cross-sectional approach, used urine from 39 cholestatic infants who meet the inclusion and exclusion criteria and have been approved by Ethics Committee. The nested-PCR was performed from extracted urine and unextracted direct urine. Serological data of immunoglobulin (Ig) M and IgG data were collected. Data were analyzed by Chi-square. Detection of CMV from extracted urine by PCR showed positive in 87.2% patients and from unextracted urine was positive in 48.7% patients. Serological status showed that IgM was positive in 41.0% patients and IgG was positive in 89.7% patients. The acute infection (IgM+ IgG+) was found in 41.0% patients, past infection (IgM-IgG+) was 48.7% patients, and not infected (IgM-IgG-) was in 10.3% patients. The acute infection (IgM+ IgG+), past infection (IgM-IgG+) and not infected (IgM-IgG-) was found in 41.0%, 48.7%, and 10.3% patients, respectively. The correlation between PCR CMV from extracted urine with serological CMV was moderate, while the unextracted urine was low. It indicates that to detect the infection of CMV, PCR technique is more accurate than serological testing, and the extracted urine is more appropriate specimen as PCR template than direct urine.

KEYWORDS: Infant mortality, Infectious disease, Cytomegalovirus, Polymerase chain reaction.

INTRODUCTION:

Cholestasis is an important cause of morbidity and mortality in infants and children¹⁻⁶. Cholestasis is defined as decreased bile flow due to failure of secretion by hepatocytes or obstruction of bile flow to the intra or extra hepatic bile ducts.

The diagnosis of cholestasis is performed based on the examination of conjugated bilirubin levels, namely direct or conjugated bilirubin levels greater than 2 mg/dL if total bilirubin is less than 5 mg/dL, or more than 20% of total bilirubin if the bilirubin level is more than 5 mg/dL^{1-4,7}. The inability to detect and monitor the progression of liver damage will interfere the management of disease with cholestasis. The bile acids accumulation has an impact on hepatotoxicity so that it is an underlying cause of abnormalities in the liver⁸⁻¹⁰. If the cholestatic condition is not detected in early or not received the proper therapy, it will cause serious abnormalities that lead to death.

Received on 22.05.2021

Modified on 09.07.2021

Accepted on 19.08.2021

© RJPT All right reserved

Research J. Pharm. and Tech. 2022; 15(5):2151-2157.

DOI: 10.52711/0974-360X.2022.00357

The incidence of cholestasis in infancy is associated with congenital abnormalities or viral infection. The most common cause of infection is cytomegalovirus (CMV) infection¹¹ with symptoms of jaundice (62%), petechiae (58%), and hepatosplenomegaly (50%)¹². Diagnosis of CMV infection in infants is carried out by isolating the virus from urine with culture techniques, blood serology by checking the detection of anti-CMV IgM and IgG, detection of CMV antigen by antigenemia assay on blood samples, detecting CMV DNA using polymerase chain reaction (PCR) techniques¹³ and in situ hybridization in tissues¹⁴. Viral culture is the gold standard for the diagnosis of CMV. The virus was inoculated on fibroblast cells and observations were made from 2 to 21 days after virus inoculation¹⁵. In addition, false-negative results are often obtained when viral load is low. Currently in Indonesia, the most common diagnosis of CMV infection is by serological examination of CMV IgM and IgG from blood samples. IgM is formed 2-4 weeks after infection and IgG is produced following it¹⁶. However, in newborns, the ability to produce IgM and IgG is still weak. IgG for newborns is obtained maternally from the mother, while IgM is still in the learning process to synthesize slowly¹⁷, so that the serological examination of IgM and IgG anti-CMV in infants in the first week is still not able to reflect the condition of CMV infection in infants¹⁵.

The replication process of the virus initiated with the immediate-early (IE) gene expression in 2-4 hours after infection, then virions have been produced and spread throughout body fluids within 48-72 hours post-infection^{18,19}. CMV DNA can be isolated from body tissues and body fluids such as tears, salivary glands, breast milk, urine, feces, semen, cervical secretions, amniotic fluid, blood, and organ transplants^{20,21}.

The CMV detection in the most conserve target areas, namely the major immediate early (MIE) gene and the late antigen (L) gene, have high specificity for detecting CMV DNA. Based on this, it is possible to detect CMV DNA from urine from the second- or third-day post-infection. The early and properly diagnosis will enable the patient to receive appropriate treatment so that it can reduce the mortality due to cholestasis.

Urine is a body fluid that is easy to obtain and non-invasive in newborns. The virus is excreted into the urine and mixes with cell debris along the urinary tract. For diagnostic purposes, it is necessary to consider whether the extracted or unextracted procedure of urine specimens is required to perform CMV PCR because eliminating one step means reducing costs and minimizing the time required. The objective of this study was to detect CMV in urine by PCR and to analyze the correlation between PCR CMV from extracted or

unextracted urine (direct urine) specimens with the serological status anti-CMV in infants with cholestasis.

MATERIAL AND METHODS:

Sample Collection:

This study was a descriptive observational study with a cross-sectional approach. Samples were urine specimens from 39 infants with cholestasis in the Inpatient Unit of Children's Health at Dr. Soetomo General Academic Hospital Surabaya. Ethical study was approved by Ethics Commission, number 729/Panke.KKE /XII/2017. Subjects have been willing to participate in this study and have obtained consent from their parents or guardians by signing a written consent letter after receiving an informed consent explanation.

Inclusion criteria were 1-12 months infants with cholestasis who showed symptoms of jaundice in the following conditions: if total bilirubin is $\geq 5\text{mg/dL}$, conjugated bilirubin level is 20% of total bilirubin levels, and if total bilirubin is $< 5\text{mg/dL}$, the direct bilirubin level is $> 2\text{mg/dL}$. Exclusion criteria were patients who had received antiviral therapy, malnourished patients, miliary tuberculosis patients, HIV patients, history of using immunosuppressive drugs such as corticosteroids and cytostatic, platelets $< 80,000\text{mg/dL}$, ascites, and prolonged physiological hemostasis.

Serological Data collection:

The IgM and IgG anti-CMV were obtained by measuring IgM and IgG level using The VIDAS CMV IgM and IgG Assay (Biomérieux). IgM interpretation is the IgM index unit < 0.7 negative, $< 0.7 - 0.9$ equivocal, > 0.9 positive. IgG interpretation is the IgG index unit < 4 negative, $> 4 - < 6$ equivocal, > 6 positive. This data were the secondary data from patient medical records.

PCR Data Collection:

The urine sample was divided into two parts, one part was directly used PCR without being extracted and the other part was extracted then using as PCR template. A total of 200 μl of urine was used for CMV DNA extraction using the QIAamp DNA Mini Kit (Qiagen), the CMV DNA extraction procedure was carried out according to the protocol in the kit. The urine used by PCR was 4 μl .

CMV DNA detection was performed by nested PCR technique using MIE4/MIE5 primers in the first round, then followed by IE1/IE2 primers in the second round. The MIE4 sequences were 5'-CCAAGC GGCCTC TGATAA CCAAGCC-3' and MIE5 sequences were 5'-CAGCAC CATCCT CCTCTT CCTCTGG-3' which produced 435 base pairs (bp). The IE1 sequences were 5'-CCACCC GTGGTG CCAGCTCC-3' and IE2 were 5'CCCGCT CCTCCT GAGGACCC-3' which produced

161 bp¹¹. PCR was performed using Go Taq Green Master Mix (Promega). The first PCR was conducted for the β -globin gene using PCO3+ and PCO4+ primers, subsequently proceed with PCR for CMV. The master mix reaction in the first round was 10 μ l master mix, 1 μ l forward MIE4 10 pmol primer, 1 μ l 10 pmol MIE5 reverse primer, 4 μ l ddH₂O, and 4 μ l template DNA (extracted or unextracted urine). The PCR conditions were pre-denaturation of 94°C for 5 minutes, denaturation of 94°C for 30 seconds, annealing 55°C for 30 seconds, extension at 72°C for 45 seconds, and PCR was performed for 40 cycles. Final extension 72°C was for 7 minutes. The master mix reaction and conditions for second round PCR were the same as the first round PCR, but the template was 1 μ l of product from the first round PCR and used IE1 / IE2 primers. PCR results were electrophoretic on 2% acrylamide gel.

Statistical Analysis:

The correlation between the PCR of CMV DNA from the extracted and unextracted urine with serological anti-CMV in infants with cholestasis was performed by Chi-square. If significantly different, the strength of the relationship is known from the contingency coefficient.

RESULTS:

This study involved 39 infants with cholestasis consisting of 17 male infants and 22 female infants, aged 1-12 months (mean \pm SD= 3.44 \pm 2.326). Patients consisted of 32 patients aged 2 over 5 months. The level of direct/conjugated bilirubin (D Bil) was 8.1221 \pm 4.15911 (mean \pm SD) and total bilirubin (T Bil) was 11.1603 \pm 5.54247 (mean \pm SD) (Table 1).

Table 1. Characteristics of infants with cholestasis

| Characteristics | |
|-----------------------------------|-----------------------|
| Age (mean \pm SD) | 3,44 \pm 2,326 |
| Age (N / %) | |
| 1-2 month | 18 (46.1 %) |
| 3-4 month | 14 (35.9%) |
| 5-6 month | 3 (7.7%) |
| >6 month | 4 (10.3%) |
| Sex (N / %) | |
| Male | 22 (56.4%) |
| Female | 17 (43.6%) |
| Bilirubin index (mean \pm SD) | |
| Direct Bilirubin | 8.1221 \pm 4.15911 |
| Total Bilirubin | 11.1603 \pm 5.54247 |
| Type Cholestasis N (%) | |
| Intrahepatic | 23 (59%) |
| Extrahepatic | 16 (41%) |
| SD: Standard Deviation; N: Number | |

The results of serological data showed that 16/39 (41.0%) patients were IgM positive and 35/39 (89.7%) patients were IgG positive. The results of serological examinations showed acute CMV infection indicated by IgM+ IgG+ was 16/39 (41.0%), had been infected CMV indicated by IgM- IgG+ was 19/39 (48.7%), and not

infected CMV indicated by the IgM- IgG- was 4/39 (10.3%) (Table 2).

Table 2. Detection of CMV infection based on serology and PCR from urine

| Examination type | | Number | Percentage |
|-----------------------|------------|--------|------------|
| PCR extracted urine | Positive | 34 | 87,2% |
| | Negative | 5 | 12,8% |
| PCR unextracted urine | Positive | 19 | 48,7% |
| | Negative | 20 | 51,3% |
| Serological | IgM+ | 16 | 41.0% |
| | IgG+ | 35 | 89.7% |
| | IgM+, IgG+ | 16 | 41.0% |
| | IgM-, IgG+ | 19 | 48.7% |
| | IgM-, IgG- | 4 | 10.3% |

Detection of CMV infection using conventional PCR techniques from extracted urine showed 34 (87.2%) patients were positive and 5 (12.8%) were negative, and from unextracted urine showed 19 (48.7%) patients were positive and 20 (51.3%) patients were negative (Figure 1, Table 2).

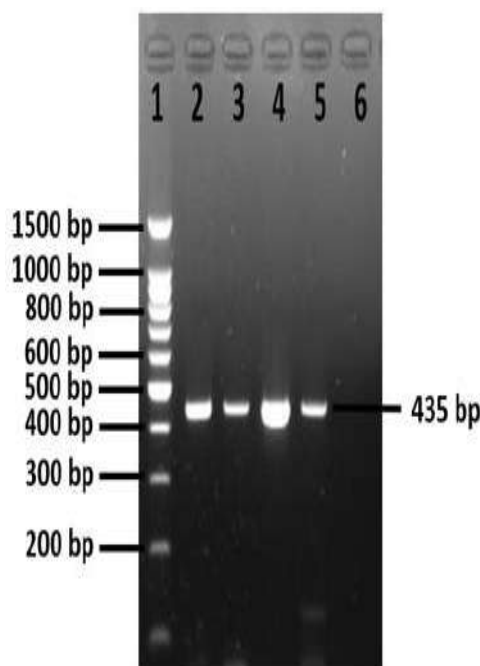


Figure 1. Detection of CMV infection by polymerase chain reaction (PCR) using MIE4/MIE5 primers from urine specimens. Lane 1= Marker 100 base pair, lane 2, 3, 4, 5 = specimens showed positive (\pm 435 base pair), lane 6 = negative control.

There was no difference between PCR CMV from the extracted and unextracted urine (p=0.064). However, these data suggest that the PCR of unextracted urine with positive results, also showed the same positive results with the PCR of extracted urine. In addition, the PCR of unextracted urine with negative results, showed 75% positive and 25% negative in the PCR of extracted urine (Table 3).

Table 3. The PCR results from the extracted and unextracted urine in infants with cholestasis

| The PCR from unextracted urine | The PCR from extracted urine | | Total | P value |
|--------------------------------|------------------------------|-----------|-----------|---------|
| | Positive | Negative | | |
| Positive | 19 (100%) | 0 (0%) | 19 (100%) | 0,064 |
| Negative | 15 (75%) | 5 (25%) | 20 (100%) | |
| Total | 34 (87.2%) | 5 (12.8%) | 39 (100%) | |

There was a correlation between anti-CMV serological examination and PCR examination of extracted urine with p value = 0.028 (p <0.05). Contingency coefficient was significantly different with a value of 0.4 (p = 0.024) and showed moderate correlation strength (Table 4). All infants with cholestasis who presented the IgM+ IgG+ had positive for CMV PCR results. When IgM and IgG were negative, but the urine PCR results were positive.

There was a correlation between anti-CMV serological examination and PCR examination of unextracted urine (p = 0.035). The contingency coefficient was 0.383, which was significantly different (p = 0.035) and showed low association strength (Table 4). These results suggested that in patients who are serologically negative for IgM and IgG, CMV DNA is also absent in the urine specimen.

Table 4. Correlation between anti-CMV serology and PCR of extracted and unextracted urine in infants with cholestasis

| Serological anti-CMV | The PCR from extracted urine | | Total | P-Value |
|--|--------------------------------|------------|-------------|---------|
| | Positive | Negative | | |
| IgM+, IgG+ | 16 (100.0%) | 0 | 16 (100.0%) | 0.028* |
| IgM-, IgG+ | 16 (84.2%) | 3 (15.8%) | 19 (100.0%) | |
| IgM-, IgG- | 2 (50.0%) | 2 (50.0%) | 4 (100.0%) | |
| Total | 34 (87.2%) | 5 (12.8%) | 39 (100.0%) | |
| Coefficient contingency of the PCR from extracted urine were 0.4 (p = 0.024) | | | | |
| | The PCR from unextracted urine | | Total | P-Value |
| | Positive | Negative | | |
| IgM+, IgG+ | 11 (68.8%) | 5 (31.3%) | 16 (100.0%) | 0.035* |
| IgM-, IgG+ | 8 (42.1%) | 11 (57.9%) | 19 (100.0%) | |
| IgM-, IgG- | 0 (0%) | 4 (100.0%) | 4 (100.0%) | |
| Total | 19 (48.7%) | 20 (51.3%) | 39 (100.0%) | |
| Coefficient contingency of the PCR from unextracted urine were 0.383 (p = 0.035) | | | | |

DISCUSSION:

Cholestasis can be classified into extrahepatic cholestasis which is a mechanical obstruction of the extrahepatic bile duct and intrahepatic cholestasis caused by intrahepatic bile duct obstruction and the presence of hepatocyte abnormalities²². Symptoms of cholestasis are jaundice, pale stools, dark urine, enlarged liver, sometimes splenomegaly^{23,24}. Infants with CMV infection will receive antiviral or immunomodulatory

treatment²⁵. Infants with cholestasis who do not receive proper treatment, usually their condition will get worse and cause death. Based on this, a quick diagnosis of CMV infection will be useful for reducing the mortality rate due to cholestasis.

Currently, the most widely used method to diagnose CMV infection is serological anti-CMV. This method can detect the presence of specific anti-CMV IgM and IgG antibodies in the circulation among infants with cholestasis¹¹ and among pregnant women²⁶. In addition, the detection of IgM and IgG is also useful in determining whether the patient has CMV infection acutely or has CMV infection in the past. The indication of acute or recent infection is positive for IgM and positive or negative for IgG, while the past infection is positive for IgG and negative for IgM¹⁵. Based on serological CMV, it showed that 41.0% of infants with cholestasis were in acute CMV infection and 48.7% of infants had been infected with CMV. Furthermore, 10.3% infants were negative for CMV infection based on serological examination.

CMV is an important viral infection in neonatal cholestasis^{27,28} and the reason of congenital infection²⁹. This study demonstrated that antibodies to CMV were high, whereas CMV IgM was 41% and CMV IgG was 89.7%. Other studies showed that CMV IgM in neonatal cholestasis was 30-40% and 80-90% had IgG (and/or IgM) CMV in serum^{27,30}. The infants age who positive for IgM aged 2, 3, 4, and 5 months, and who positive for IgG aged 1-2 months were 15 infants and 29 infants were more than 2 months. Seropositivity of CMV IgM or IgG in this study cannot confirm whether CMV infection is congenital or peri-natal or post-natal. In addition, seropositivity of CMV IgG also cannot be determined whether obtained from maternal or not. Because congenital infection of CMV can be determined and distinguished from acquired infection in perinatal or post-natal infection certainly before third week of life¹⁵. In this study, identification CMV was performed in infants after 4 weeks ages, therefore it is not possible to confirm the congenital infection.

PCR examination is a method to detect DNA that is useful in diagnosing viral diseases because of the ability to detect viral DNA even though the viral load is low^{31,32}. This is a sensitive technique for detecting CMV based on the viral nucleic acid amplification reaction. CMV can be detected from urine, blood, or saliva within

the first 3 weeks of life by viral culture or PCR³³. Detection DNA CMV by PCR from urine specimens can increased sensitivity compared to viral culture from urine¹⁵. Viral culture was observed for 2 to 21 days to ensure the results were negative. It is expensive and laborious. PCR is being used more frequently for diagnosis of viral infections because of its enhanced sensitivity and rapid turn-around¹⁵. In addition, it can reduce the examination time from 3 weeks to a day, save costs, and be rapid.

This study demonstrated that CMV DNA in urine specimens of cholestatic infants was very high (87.2%). This study was in accordance with others that testing CMV by PCR using blood specimens from cholestasis infants that showed 74% positive³⁰. This suggested that the infection of CMV is the most common of infection that causes cholestasis in infants¹¹, as reported in another study that showed CMV infection can play a role in the pathogenesis and progression of extrahepatic biliary atresia³⁴.

This study detected CMV DNA in two ways, namely by extracting DNA from urine and directly using urine as PCR template without DNA extraction step. The results showed that no difference in PCR results between using the extracted urine and unextracted urine as PCR template, but it seems that the extracted urine showed a better indication than the unextracted urine. It was 87.2% positive for the extracted urine and 48.7% for the unextracted urine. Moreover, all positive PCR results from the unextracted urine, also showed positive PCR results from the extracted urine. Meanwhile, the negative PCR results from unextracted urine, some of them still showed positive PCR results from the extracted urine. It is probably because the DNA molecule is bound to the silica-gel membrane during the DNA extraction process, while the protein and other contaminants molecules have dissolved in washing step. Therefore, PCR primers were annealed to the target genes properly, the amplification process could be maximized and showed positive PCR results.

This study found a moderate association between CMV serology and CMV PCR from the extracted urine specimens and a low association with the unextracted urine specimens in infants with cholestasis. It indicates that if the serologic result is positive then the possibility of a positive PCR result from the extracted urine is moderate. This can be seen in the results, if IgM+ IgG+, so all PCR results are positive, while IgM- IgG+ and IgM- IgG-, then the PCR results can be positive and can be negative. Furthermore, in PCR results from the unextracted urine, if the serologic result is positive, then the possibility of positive PCR results is low. This can be seen in the results, the IgM+ IgG+, IgM- IgG+, or IgM-

IgG-, so the PCR results can be positive and can be negative.

IgM antibodies were produced immediately after viral exposure, accompanied by an increase of DNA CMV excretion and a gradual production of IgG antibodies. IgM to CMV appeared for 2 to 3 weeks post-infection and gradually decreased in post-acute infection, while IgG to CMV appeared 2 to 3 weeks primary infection and persist for life^{16,30,35,36}. Cleansing of CMV DNA is correlated with clearance of IgM antibodies³⁷. We found that the infants were IgM negative and IgG positive, while CMV DNA was positive. Infants aged 1-2 months were 9 infants, 3-4 months were 3 infants, and more than 4 months were 4 infants. The possible explanation is that the infants in this study could be post-acute infection, but still in the active period to produce CMV DNA, and IgG is still elevated and produced during life. In addition, we also found the infant with IgM was negative, IgG was positive, and DNA CMV was negative. There were 3 infants aged 2, 3 and 5 months. The possible explanation is that the IgG was from persistent maternal antibodies or maybe the infants have been already infected by CMV, so IgM must be no longer be produced, CMV DNA is cleared, and IgG still persists for long life^{30,35,36}.

Interestingly, we found infants who serologically IgM and IgG were negative but DNA CMV in urine was positive. The infants were 2 and 4 months. The explanation may be because CMV infection is still in its early stages so that IgM and IgG have not been appeared, and viral DNA has already been excreted. It can be an early onset of infection or the early time after incubation period so that IgM and IgG has not been produced. Infection of CMV is initiated by inoculation of the virus onto a mucosal site by hand contact or intimate contact. The incubation period is around one months. In primary infection, the viremia is present, and the virus is shed from multiple sites, including saliva, urine, cervicovaginal secretion, and semen. IgM and IgG appear in serum immediately after onset of viral shedding³⁸.

Infants who were serologically negative for IgM and IgG, viral DNA CMV was not found in the urine. The data showed that infants were 2 months. Infection of CMV is not always only factor causing cholestasis in infants. The most common causes of cholestasis in infants are idiopathic neonatal cholestasis, alpha-1 antitrypsin deficiency, infections, and biliary atresia^{22,39}. In the early stages of infection, the virus was excreted in very small amounts or IgM has not been formed, so it was not detected in serum and in urine. Overall, if the serological examination shows negative but the patient shows symptom of cholestasis in clinically appearance, it is suggested to confirm the diagnosis by PCR of the extracted urine.

In conclusion, this study found a moderate association between serological and PCR testing to detect CMV infection in infants with cholestasis from extracted urine and a low association from unextracted urine. It indicates that the PCR technique for detecting CMV infection is more accurate than serological testing to CMV, and the extracted urine is more appropriate specimen as a PCR template than direct urine.

CONFLICT OF INTEREST:

The authors declare no conflict of interest.

ACKNOWLEDGEMENT:

We thank to all patients who participate in this research and to the Government of the Republic of Indonesia, the Ministry of Research, Technology and Higher Education, especially the Faculty of Medicine, Universitas Airlangga who have provided financial support.

REFERENCES:

1. Feldman AG, Sokol RJ. Neonatal Cholestasis. *Neoreviews*. 2013; 14(2): e63-73. <https://doi.org/10.1542/neo.14-2-e63>
2. Davis AR, Rosenthal P, Escobar GJ, Newman TB. Interpreting conjugated bilirubin levels in newborns. *The Journal of Pediatrics*. 2011; 158(4): 562-5. <https://doi.org/10.1016/j.jpeds.2010.09.061>
3. Rashed YK, Saber MA, Tawfik M, Mourad WS. Histopathological features and accuracy for diagnosing biliary atresia by prelaparotomy liver biopsy in Egypt. *Egyptian Pediatric Association Gazette*. 2013; 61(1): 42-5. <https://doi.org/10.1016/j.epag.2013.05.001>
4. Suchy FJ. Neonatal cholestasis. *Pediatrics in Review*. 2004; 25(11): 388-96. <https://doi.org/10.1542/pir.25-11-388>
5. Oommen A. Neonatal Health Care Services in India. *Asian Journal of Nursing Education and Research*. 2015; 5(4): 545-52. <https://doi.org/10.5958/2349-2996.2015.00112.3>
6. Rani U, Lewis LE, Akhtar N, Chawla K. Prevention of Neonatal healthcare-associated infections: Current update. *Research Journal of Pharmacy and Technology*. 2020; 13(6): 2771-6. <https://doi.org/10.5958/0974-360X.2020.00492.8>
7. Harsha L, Priya J, Shah KK, Reshmi B. Systemic Approach to Management of Neonatal Jaundice and Prevention of Kernicterus. *Research Journal of Pharmacy and Technology*. 2015;8(6):1087-92. <https://doi.org/10.5958/0974-360X.2015.00189.4>
8. Pereira TN, Walsh MJ, Lewindon PJ, Ramm GA. Pediatric cholestatic liver disease: Diagnosis, assessment of disease progression and mechanisms of fibrogenesis. *World Journal of Gastrointestinal Pathophysiology*. 2010; 1(2): 69-84. <https://doi.org/10.4291/wjgp.v1.i2.69>
9. Ramm GA, Nair VG, Bridle KR, Shepherd RW, Crawford DH. Contribution of hepatic parenchymal and nonparenchymal cells to hepatic fibrogenesis in biliary atresia. *The American Journal of Pathology*. 1998; 153(2): 527-35. [https://doi.org/10.1016/S0002-9440\(10\)65595-2](https://doi.org/10.1016/S0002-9440(10)65595-2)
10. Bhargava O, Sutrakar SK, Ghanghoriya P, Verma A. Incidence of thrombocytopenia in hyperbilirubinemic neonates following Phototherapy. *Asian Journal of Research in Chemistry*. 2015; 8(4): 221-30. <https://doi.org/10.5958/0974-4150.2015.00039.5>
11. Oliviera NL, Kanawaty FR, Costa S, Hessel G. Infection by cytomegalovirus in patients with neonatal cholestasis. *Arquivos de Gastroenterologia*. 2002; 39(2): 132-6. <https://doi.org/10.1590/s0004-28032002000200012>
12. Leung AK, Sauve RS, Davies HD. Congenital cytomegalovirus infection. *Journal of the National Medical Association*. 2003; 95(3): 213-8. PMID: 12749681

13. Bhatia P, Narang A, Minz RW. Neonatal cytomegalovirus infection: diagnostic modalities available for early disease detection. *The Indian Journal of Pediatrics*. 2010; 77(1): 77-9. <https://doi.org/10.1007/s12098-009-0255-2>
14. Ali SHM, Al-Mahbobi TF, AL-Bayaa YJ, Al-Alwany SHM. Impact of Human Cytomegalovirus Infection associated with the expressed protein of mutated BRCA1 gene in breast tissues from a group of Iraqi Female Patients with Breast Carcinoma. *Research Journal of Pharmacy and Technology*. 2018; 11(4): 1505-12. <https://doi.org/10.5958/0974-360X.2018.00280.9>
15. Ross SA, Novak Z, Pati S, Boppana SB. Diagnosis of Cytomegalovirus Infections. *Infectious Disorders Drug Targets*. 2011; 11(5): 466-74. <https://doi.org/10.2174/187152611797636703>
16. De Tommaso MA, Andrade PD, Costa SC, Escanhoela CA, Hessel G. High frequency of Human Cytomegalovirus DNA in the Liver of Infants with Extrahepatic Neonatal Cholestasis. *BMC Infectious Disease*. 2005; 5(108). <https://doi.org/10.1186/1471-2334-5-108>
17. Mack CL. What causes biliary atresia? Unique aspects of the neonatal immune system provide clues to disease pathogenesis. *Cellular Molecular Gastroenterology and Hepatology*. 2015; 1(3):267-74. <https://doi.org/10.1016/j.jcmgh.2015.04.001>
18. Crough T, Khanna R. Immunobiology of human cytomegalovirus: from bench to bedside. *Clinical Microbiology Reviews*. 2009; 22(1): 76-98. <https://doi.org/10.1128/CMR.00034-08>
19. Fehr AR, Yu D. Human Cytomegalovirus Early Protein pUL21a Promotes Efficient Viral DNA Synthesis and the Late Accumulation of Immediate-Early Transcripts. *Journal of Virology*. 2011; 85(2): 663-74. <https://doi.org/10.1128/JVI.01599-10>
20. Stehel EK, Sánchez PJ. Cytomegalovirus infection in the fetus and neonate. *NeoReviews*. 2005; 6(1): e38-45. <https://doi.org/10.1542/neo.6-1-e38>
21. Sareen A, Tandon S, Ramachandran A, Srimathi R. Saliva as A Diagnostic Tool for Detection of the Viruses: A Review. *Research Journal of Pharmacy and Technology*. 2018; 11(10): 4739-43. <https://doi.org/10.5958/0974-360X.2018.00863.6>
22. Fischler B, Lamireau T. Cholestasis in the newborn and infant. *Clinics and Research in Hepatology and Gastroenterology*. 2014; 38(3): 263-7. <https://doi.org/10.1016/j.clinre.2014.03.010>
23. Girard M, Lacaille F. Diagnosis of neonatal cholestasis. *Annales Nestlé*. 2008; 66:109-20. <https://doi.org/10.1159/000147408>
24. Chandrasekhar M, Vishakantamurthy DG, Sheela Willaims. A Study to Assess the Knowledge Regarding Neonatal Jaundice and its Management among staff Nurses in selected Hospital at Mysuru. *International Journal of Nursing Education and Research*. 2017; 5(3): 327-30. <https://doi.org/10.5958/2454-2660.2017.00067.9>
25. Swanson EC, Schleiss MR. Congenital cytomegalovirus infection: new prospects for prevention and therapy. *Pediatric Clinics of North America*. 2013; 60(2): 335-49. <https://doi.org/10.1016/j.pcl.2012.12.008>
26. Ali MK, Shia JS, Al-Marsome H. Detection of HSV and CMV in Pregnant and Miscarriage women by ELISA and real time PCR Assay. *Research Journal of Pharmacy and Technology*. 2019; 12(9):4090-4. <https://doi.org/10.5958/0974-360X.2019.00704.2>
27. Fischler B, Ehrnst A, Forsgren M, Orvell C, Nemeth A. The viral association of neonatal cholestasis in Sweden: a possible link between cytomegalovirus infection and extrahepatic biliary atresia. *Journal of Pediatric Gastroenterology and Nutrition*. 1998; 27(1): 57-64. <https://doi.org/10.1097/00005176-199807000-00010>
28. Gomathi S, Theresa PL. Case Report on Torch Syndrome with Multiple Anomalies in Neonate. *International Journal of Nursing Education and Research*. 2018; 6(1): 12-14. <https://doi.org/10.5958/2454-2660.2018.00003.0>
29. Aldabagh MAH. Immune Profile in Iraqi women with Recurrent Spontaneous Abortion (RSA) Proved with Cytomegalovirus Infection (CMV). *Research Journal of Pharmacy and Technology*. 2018; 11(2):599-603. <https://doi.org/10.5958/0974-360X.2018.00110.5>

30. Goel A, Chaudhari S, Sutar J, Bhonde G, Bhatnagar S, Patel V, Bhor V, Shah I. Detection of Cytomegalovirus in Liver Tissue by Polymerase Chain Reaction in Infants with Neonatal Cholestasis. *Pediatric Infectious Disease Journal*. 2018; 37(7): 632-6. <https://doi.org/10.1097/INF.0000000000001889>
31. Soetens O, Fellous CV, Foulun I. Evaluation of different cytomegalovirus (CMV) DNA PCR protocols for analysis of dried blood spots from consecutive cases of neonates with congenital CMV infections. *Journal of Clinical Microbiology*. 2008; 46(3): 943-6. <https://doi.org/10.1128/JCM.01391-07>
32. Goegebuer T, Mensel BV, Beuselinck K. Clinical predictive value of real-time PCR quantification of human cytomegalovirus DNA in amniotic fluid samples. *Journal of Clinical Microbiology*. 2009; 47(3): 660-5. <https://doi.org/10.1128/JCM.01576-08>
33. Plosa EJ, Esbenshade JC, Fuller MP, Weitkamp JH. Cytomegalovirus infection. *Pediatrics in Review*. 2012; 33(4): 156-63. <https://doi.org/10.1542/pir.33-4-156>
34. Soomro GB, Abbas Z, Hassan M, Luck N, Memon Y, Khan AW. Is there any association of extra hepatic biliary atresia with cytomegalovirus or other infections? *Journal of Pakistan Medical Association*. 2011; 61(3): 281-3. PMID: 21465946
35. Gerna G, Lilleri D, Fornara C, Bruno F, Gabanti E, Cane I, Furione M, Revello MG. Differential kinetics of human cytomegalovirus load and antibody responses in primary infection of the immunocompetent and immunocompromised host. *Journal of General Virology*. 2015; 96(Pt 2): 360-9. <https://doi.org/10.1099/vir.0.070441-0>
36. Prince HE. Clinical Applications of Cytomegalovirus IgG Avidity Testing. *Clinical Microbiology Newsletter*. 2019; 41(24): 213-8. <https://doi.org/10.1016/j.clinmicnews.2019.12.001>
37. Ziemann M, Unmack A, Steppat D, Juhl D, Görg S, Hennig H. The natural course of primary cytomegalovirus infection in blood donors. *Vox Sanguinis*. 2010; 99(1):24-33. <https://doi.org/10.1111/j.1423-0410.2009.01306.x>
38. Johnson J, Anderson B, Pass RF. Prevention of maternal and congenital cytomegalovirus infection. *Clinical Obstetrics and Gynecology*. 2012 Jun;55(2):521-530. <https://doi.org/10.1097/GRF.0b013e3182510b7b>
39. Gunaydin M, Bozkurter Cil AT. Progressive familial intrahepatic cholestasis: diagnosis, management, and treatment. *Hepatic Medicine*. 2018; 10: 95-104. <https://doi.org/10.2147/HMER.S137209>



Source details

Research Journal of Pharmacy and Technology

Scopus coverage years: 1997, 2005, from 2011 to Present

Publisher: A and V Publication

ISSN: 0974-3618 E-ISSN: 0974-360X

Subject area: Pharmacology, Toxicology and Pharmaceutics: Pharmacology, Toxicology and Pharmaceutics (miscellaneous)
Medicine: Pharmacology (medical)

Source type: Journal

CiteScore 2021
1.3



SJR 2021
0.234



SNIP 2021
0.618



[View all documents >](#) [Set document alert](#) [Save to source list](#)

[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

i Improved CiteScore methodology ✕

CiteScore 2021 counts the citations received in 2018-2021 to articles, reviews, conference papers, book chapters and data papers published in 2018-2021, and divides this by the number of publications published in 2018-2021. [Learn more >](#)

CiteScore 2021 ▼

$$1.3 = \frac{4,996 \text{ Citations } 2018 - 2021}{3,865 \text{ Documents } 2018 - 2021}$$

Calculated on 05 May, 2022

CiteScoreTracker 2022 ⓘ

$$1.1 = \frac{3,487 \text{ Citations to date}}{3,308 \text{ Documents to date}}$$

Last updated on 05 September, 2022 • Updated monthly

CiteScore rank 2021 ⓘ

| Category | Rank | Percentile |
|--|----------|------------|
| Pharmacology, Toxicology and Pharmaceutics | #13/30 | 58th |
| Pharmacology, Toxicology and Pharmaceutics (miscellaneous) | | |
| Medicine | | |
| Pharmacology | #180/255 | 29th |

[View CiteScore methodology >](#) [CiteScore FAQ >](#) [Add CiteScore to your site](#)

Ads by Google

Stop seeing this ad | Why this ad? ⓘ

Research Journal of Pharmacy and Technology

| COUNTRY | SUBJECT AREA AND CATEGORY | PUBLISHER | H-INDEX |
|--|--|-------------------------------------|--|
| India  | Medicine Pharmacology (medical) Pharmacology, Toxicology and Pharmaceutics Pharmacology, Toxicology and Pharmaceutics (miscellaneous) | A and V Publication | 47 |
| PUBLICATION TYPE | ISSN | COVERAGE | INFORMATION |
| Journals | 0974360X, 09743618 | 1997, 2005, 2011-2021 | Homepage How to publish in this journal editor.rjpt@gmail.com |

SCOPE

Research Journal of Pharmacy and Technology (RJPT) is an international, peer-reviewed, multidisciplinary journal, devoted to pharmaceutical sciences. The aim of RJPT is to increase the impact of pharmaceutical research both in academia and industry, with strong emphasis on quality and originality. RJPT publishes Original Research Articles, Short Communications, Review Articles in all areas of pharmaceutical sciences from the discovery of a drug up to clinical evaluation. Topics covered are: Pharmaceutics and Pharmacokinetics; Pharmaceutical chemistry including medicinal and analytical chemistry; Pharmacognosy including herbal products standardization and Phytochemistry; Pharmacology: Allied sciences including drug regulatory affairs, Pharmaceutical Marketing, Pharmaceutical Microbiology, Pharmaceutical biochemistry, Pharmaceutical Education and Hospital Pharmacy.

 Join the conversation about this journal

Quartiles

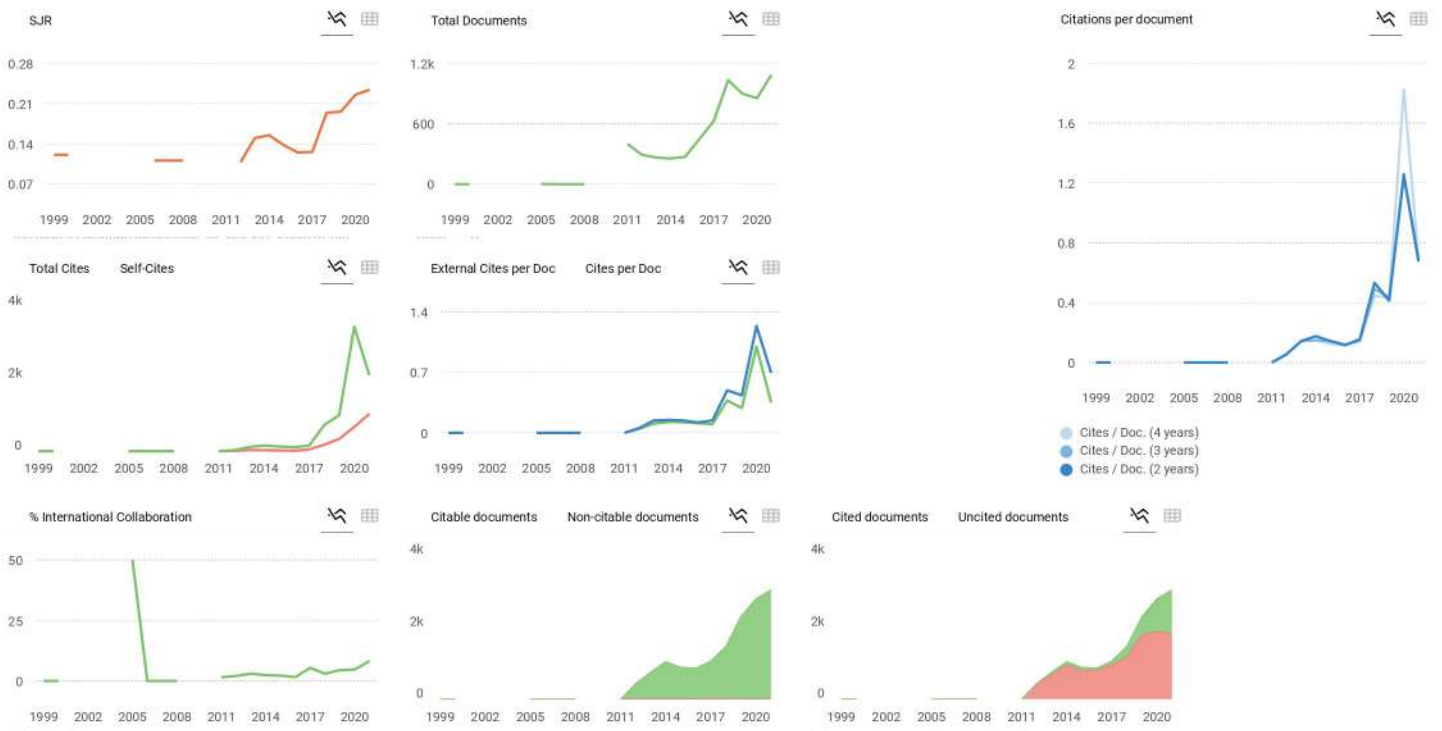
FIND SIMILAR JOURNALS

options ⋮

| | | | | |
|---|---|---|--|--|
| <p>1</p> <p>International Journal of Research in Pharmaceutical</p> <p>IND</p> <p style="font-size: 1.5em; font-weight: bold; color: green;">47%</p> <p>similarity</p> | <p>2</p> <p>Journal of Applied Pharmaceutical Science</p> <p>IND</p> <p style="font-size: 1.5em; font-weight: bold; color: green;">44%</p> <p>similarity</p> | <p>3</p> <p>Indian Journal of Pharmaceutical Sciences</p> <p>IND</p> <p style="font-size: 1.5em; font-weight: bold; color: green;">43%</p> <p>similarity</p> | <p>4</p> <p>Brazilian Journal of Pharmaceutical Sciences</p> <p>BRA</p> <p style="font-size: 1.5em; font-weight: bold; color: green;">41%</p> <p>similarity</p> | <p>5</p> <p>Turkish Journal of Pharmaceutical Sciences</p> <p>TUR</p> <p style="font-size: 1.5em; font-weight: bold; color: green;">40%</p> <p>similarity</p> |
|---|---|---|--|--|

Ads by Google

Stop seeing this ad | Why this ad? ⓘ



Research Journal of Pharmacy and Technology

Q3 Pharmacology (medical) best quartile

SJR 2021 0.23

powered by scimagojr.com

Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimagojr.com" style="display: inline-block; width: 100px; height: 15px; background-color: #f0f0f0; border: 1px solid #ccc;">
```

SCImago Graphica

Explore, visually communicate and make sense of data with our new data visualization tool.

Metrics based on Scopus® data as of April 2022

A Andi Nafisah 8 months ago

Is this Journal still in coverage by Scopus in 2022?

reply

H Hawraa Hamid 11 months ago

I am a researcher I would publish in this journal

reply

Melanie Ortiz 11 months ago

SCImago Team

Dear Hawraa, thank you very much for your comment, we suggest you look for the author's instructions/submission guidelines in the journal's website. Best Regards, SCImago Team

F Fatma Bassyouni 11 months ago

please the journal indexed scopus and Q3

please reply me as soon as possible

best regards
Dr Fatma Bassyouni

reply



RUMAH SAKIT UMUM DAERAH
Dr. SOETOMO

**KOMITE ETIK PENELITIAN KESEHATAN
RSUD Dr. SOETOMO SURABAYA**

**KETERANGAN KELAIKAN ETIK
(" ETHICAL CLEARANCE ")**

729 / Panke.KKE / XII / 2017

KOMITE ETIK RSUD Dr. SOETOMO SURABAYA TELAH MEMPELAJARI SECARA SEKSAMA RANCANGAN PENELITIAN YANG DIUSULKAN, MAKA DENGAN INI MENYATAKAN BAHWA PENELITIAN DENGAN JUDUL :

" Kesesuaian Pemeriksaan Serologi CMV dan PCR CMV Jaringan Hati pada Kolestasis Bayi "

PENELITI UTAMA : Dr. Bagus Setyo boedi, dr., Sp.A (K)

PENELITI LAIN : 1. Sjamsul Arief, dr., Sp.A (K), MARS

2. Dwiyanti Puspitasari, dr., DTM&H, MCTM (TP), Sp.A (K)

3. Dr. Hari Basuki N, dr., M.Kes

4. Dr. Gondo Mastutik, drh., M.Kes

5. Reny Widayanti, dr

UNIT / LEMBAGA / TEMPAT PENELITIAN : RSUD Dr. Soetomo Surabaya

DINYATAKAN LAIK ETIK

Berlaku dari : 19 DEC 2017 s.d 19 DEC 2018

SURABAYA, 19 DEC 2017



KETUA

(Dr. Elizeus Hanindito, dr., Sp.An, KIC,KAP)

NIP. 19511007 197903 1 002