

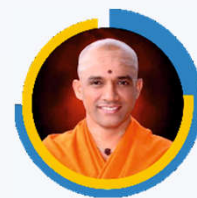


II Jai Sri Gurudev II

ADICHUNCHANAGIRI UNIVERSITY

Estd. under ACU Act, 2012 (Karnataka Act No. 18 of 2013)

B.G. Nagara – 571448, Karnataka, India.



The **11th International Conference on Materials for Advanced Technology (ICMAT-2023)** was held in Suntec City, Singapore, during 26-30 June 2023. The Conference was inaugurated by a **Nobel Laureate - Prof. Stanley Whittingham**, from USA.

Over 2340 delegates from 39 different countries across the world participated. ICMAT Series are the biggest Materials Science Conferences in the world attracting usually around 4000 delegates from over 70 countries, and at least 4 Nobel Laureates will take part each time. ICMAT-2023 is relatively a smaller conference compared to the earlier series due to the fact that it is the first conference in the Post-COVID period. This latest ICMAT - 2023 had 35 different Symposia on current frontier topics of Science and Technology. Out of which three Symposia were considered as the most popular ones attracting a large number of delegates from all over the world. Prof.K. Byrappa is associated with ICMAT Series of Conferences from 2005, organizing Symposium on the important areas of Solution Processing of Advanced Materials, because of the fact that he is considered as a World Authority in the field of Hydrothermal Technology - a very important technique in Solution Processing Technology.



Prof. Stanley Whittingham, USA
Nobel Laureate speaking at ICMAT-2023



Prof. K. Byrappa, ACU, India
delivering Keynote talk at ICMAT 2023

During 2009, the Symposium organized by Prof. Byrappa was the biggest one in ICMAT-2009 attracting delegates from more than 42 countries. This time also the Symposium organized by Prof.K. Byrappa is one of the best among 35 Symposia held in ICMAT-2023. This Symposium organized by Prof.K. Byrappa, had his Co-Chairs from Singapore, USA, Germany and Australia. It attracted delegates from over 25 countries, which is the highest compared to other symposia.

The areas covered in this Symposium were highly attractive and very relevant to the current developments in Science and Technology. The Symposium Organized by Prof.K. Byrappa, with Adichunchanagiri University affiliation, had speakers like President of the International Union of Materials Research Societies (Prof. Osvaldo Novais De Oliveira, Brazil).



Prof. Osvaldo Novais De Oliveira,
President, IUMRS.





Prof. C. Jagadish, Australia

President of the Australian National Academy of Sciences, and also the Winner of Australian Highest Civilian Award, attended all our sessions organized by Prof.K. Byrappa throughout the Conference.

General Secretary of the International Union of Materials Research Societies; and President, American Ceramic Society, USA (Prof.S. Mathur, Germany), The Winner of Highest Civilian Award of Japan – The Rising Sun Award (Prof. Tadafumi Adschiri, Japan), President of the International Association of Zeolites (Prof. Martin Hartman, Germany), Winner of Highest Civilian Award of Australia, and President of the Australian National Academy of Sciences (Prof.C. Jagadish, Australia). President of the International Solvothermal and Hydrothermal Association – ISHA (Prof. Edward Lester, England), etc. made this Symposium as one of the best ones.



Prof. S. Mathur, Germany

General Secretary of the International Union of Materials Research Societies; and President, American Ceramic Society, USA, delivering a Keynote talk.

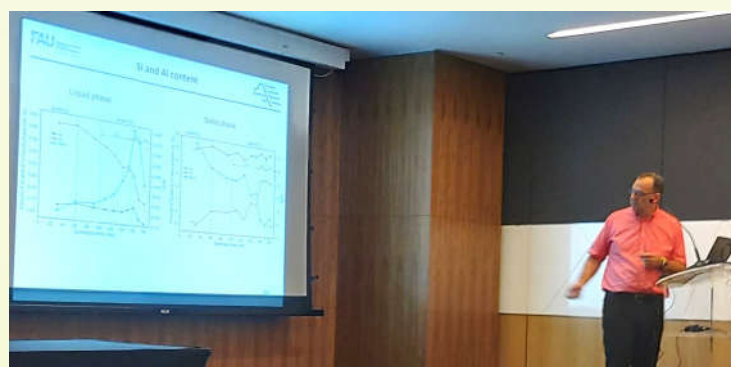


Prof. Tadafumi Adschiri, Japan
Winner of Highest Civilian Award of Japan – The Rising Sun Award, delivering a Keynote talk.

The Symposium organized by Prof.K. Byrappa was well appreciated by all the delegates and complimented him for the excellent speakers and carefully chosen topics on which they spoke. It also branded the Adichunchanagiri University, as the Organizing Committee Member, and also Chair of the major Symposium. Many delegates were searching in Google for the location of the Adichunchanagiri University, and a few International delegates, and also some Professors from IIT and IISc., India have expressed their wish to visit our University, and also to collaborate.



Prof. Edward Lester, UK
President of International Solvothermal and Hydrothermal Association - (ISHA) delivering a talk.



Prof. Martin Hartman, Germany
President of International Zeolite Association, delivering a Keynote talk.





**Prof. Sanjay Mathur, Germany;
Prof. Lan Xiang, China and Prof.
K. Byrappa, India, with Nobel
Laureate Prof. Stanley
Whittingham in the back at
ICMAT-2023 exhibition**

Prof.K. Byrappa delivered a Keynote Talk on 29th June, and it was very well received. The talk ignited long scientific discussion with the delegates. Last but not the least, one of our University Research Scholars Mr.S. Manjunath, from ACU-CRI received the Best Poster Award with Cash Prize in ICMAT-2023, the name of the Adichunchanagiri University was announced in the Closing Ceremony.



**Mr. S. Manjunath, Res. Scholar. ACU, India
was honored with a cash prize and certificate
for receiving the Best Poster Award.**

The presented paper was entitled “Biohydrothermal Synthesis and Characterization of Chitosan conjugated Zinc Oxide nanoparticles for various Biomedical Applications” authored by Manjunath, S., Devamani, M., Pandareesh, M.D., Madhusudhan, K.N., and Byrappa, K.

The Award was given based on the excellent topic and contents of the Poster presentation. The selection of the Best Posters was done by judges from almost all the participating countries.

Therefore, this visit of Prof.K. Byrappa, along with TWO Research Scholars from Adichunchanagiri University was the most successful one and the University received the recognition from many international dignitaries.

The help and encouragement rendered by; Pooja Sri Sri Sri Dr. Nirmalanandanatha Mahaswamiji, Chancellor, Adichunchanagiri University; Prof.Dr. M.A. Shekar, Vice Chancellor, Adichunchanagiri University; and Prof.Dr. C.K Subbaraya, Registrar, Adichunchanagiri University are highly acknowledged.



ABSTRACT ID: A-2896
Processing of Biodegradable Advanced Packaging Materials Using ZnO Nanoparticles of Biohydrothermal Origin and Poly (lactic acid)
Bindu Malini, M.T.*Prashantha Kalappa, Madhusudan, K.N.¹ and Byrappa, K
 Center for Research and Innovation, BGSIT, Adichunchanagiri University-571 448, Karnataka, India.
¹Central Sericultural Research and Training Institute, Central Silk Board, Government of India, Mysore- 570008, Karnataka, India.
 *Corresponding Author: padmasri.mtm@gmail.com

ABSTRACT
 Hydrothermal technique is one of the most environmentally benign techniques of processing Nanomaterials with tailor-made properties. Zinc oxide nanoparticles are one of the most popularly used materials in various applications. The recent trend is the use of zinc oxide nanoparticles prepared under Biohydrothermal conditions with almost zero toxicity as filler material in the biodegradable polymer matrix. This has yielded novel advanced packaging materials showing enhanced shelf life, food quality, retention and all other such parameters required for the packaging applications. The present work discusses the processing of such an advanced packaging material in the form of thin films with all the characteristics suitable for the packaging applications. A systematic characterization of this novel biopolymer nanocomposite has been carried out using several analytical techniques and the suitability of the product has been discussed in detail.

INTRODUCTION
 Development of biodegradable advanced packaging materials has been influenced by the growing environmental awareness and demand for sustainable packaging solutions. One such strategy involves adding Biohydrothermal-derived ZnO nanoparticles to Poly(lactic acid), a biodegradable polymer made from renewable resources. As a biodegradable substitute for traditional polymers derived from petroleum, poly(lactic acid) (PLA) has attracted a lot of attention. It has many benefits, including biocompatibility, renewability, and strong mechanical qualities. The bio-hydrothermal method is one way to make nanoparticles (NPs) smaller and unagglomerated. Nanostructured ZnO has outstanding mechanical properties resulting from the anisotropic crystalline structure, a large volume-to-surface area ratio, superior thermal conductivity, and a low coefficient of thermal expansion, which makes ZnO highly suitable as amplifying fillers in polymer blends. A fully biodegradable and adaptable polymer, PLA, is created from lactic acid, which is produced during the fermentation of renewable agricultural raw materials. ZnO nanoparticles in food packaging improves the barrier and mechanical properties of food packaging as well as the physicochemical properties and quality of food (moisture content, flavour, colour, weight, bioavailability, and texture) and increases the antimicrobial activity.



Fig 3: Graphical representation of fabrication of ZnO:PLA film by solution casting method

Materials: Ajwain seeds (*Trachyspermum ammi*) was purchased from Mohan Bander stone, Mysore, India. Analytical grade chemicals were used in this work. NaOH (99%, Sigma-Aldrich, India), ethanol (99%, Alfa Aesar, India), Zn(NO₃)₂·6H₂O (99%, Alfa Aesar, India), poly(lactic acid) (PLA) (Sigma-Aldrich, India), acetic acid glacial (Rankem, India), and chloroform (Sigma, India) were procured.

Table 1: Phytochemical extraction from Reflex method

Sample	Weight (g)	Yield(g)
1. Cinnamon (<i>Cinnamomum verum</i>)	30	6.47
2. Pineapple flower (<i>Ananas comosus</i>)	20	4.32
3. Marac mango (<i>Ceiba pentandra</i>)	20	4.51
4. Tulsi (<i>Ocimum tenuiflorum</i>)	33.4	12.6
5. Ajwain (<i>Trachyspermum ammi</i>)	30	6.37
6. Jeera (<i>Cuminum cyminum</i>)	30	5.44

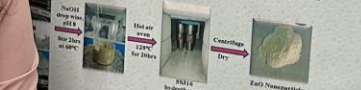


Fig 2: Graphical representation of synthesis of ZnO Nanoparticles by Biohydrothermal method

CONCLUSIONS
 Biodegradable packaging material for food packing has been successfully developed (Fig.3). The hydrothermal technique was employed to synthesize non-toxic ZnO Nanoparticles (Fig.3). The casting method was used to prepare ZnO Poly (lactic acid) Nanocomposites (Fig.2). The prepared films show a good quality with uniform distribution of ZnO Nanoparticles in the PLA matrix (Fig.7). The films on the food packaging material for its shelf life, food quality, retention is under

ACKNOWLEDGMENT
 The authors are grateful to the financial support and also the authors are grateful to CSIR-CRRI for giving opportunity to attend the international conference

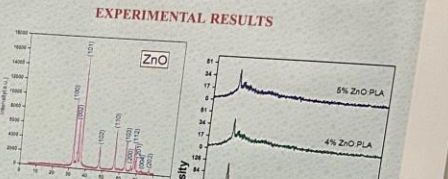


Fig 4: XRD pattern of Biohydrothermal ZnO Nanoparticles synthesized using Ajwain Seed (*Trachyspermum ammi*) extract

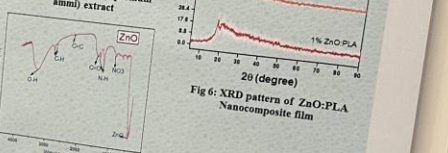


Fig 5: FTIR spectrum of Biohydrothermal ZnO Nanoparticles synthesized using Ajwain Seed (*Trachyspermum ammi*) extract

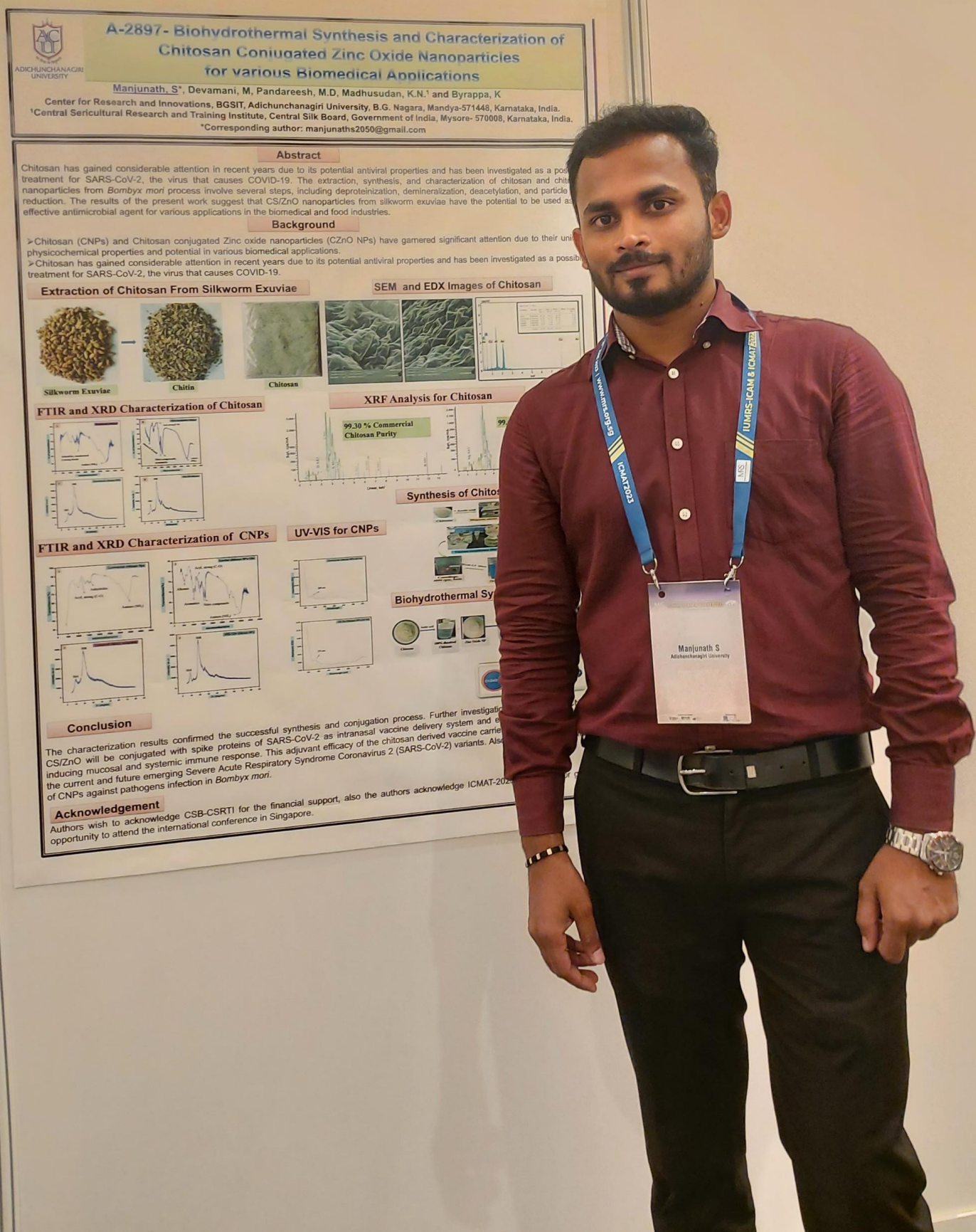


Fig 6: XRD pattern of ZnO:PLA Nanocomposite film



Fig 7: SEM images of Biohydrothermal ZnO Nanoparticles:Poly (lactic acid) Nanocomposites

Poster Paper Presentation by Ms. M.T. Bindumalini at ICMAT-2023, Suntec City, Singapore during 26-30, June 2023. The title of the paper “Processing of Biodegradable Advanced Packaging Materials Using ZnO Nanoparticles of Biohydrothermal Origin and Poly(lactic acid)”. Authors: Ms. Bindu Malini M.T. Prashantha Kalappa, Madhusudan K.N, and Byrappa, K.



Poster Paper Presentation by Mr. Manjunath, S at ICMAT-2023, Suntec City, Singapore during 26-30, June 2023. The title of the paper “Biohydrothermal Synthesis And Characterization of Chitosan Conjugated ZnO Nanoparticles For Various Biomedical Applications”. Authors: Mr. Manjunath, S, Devamani, M, Pandareesh M.D, Madhusudan K.N, and Byrappa, K.

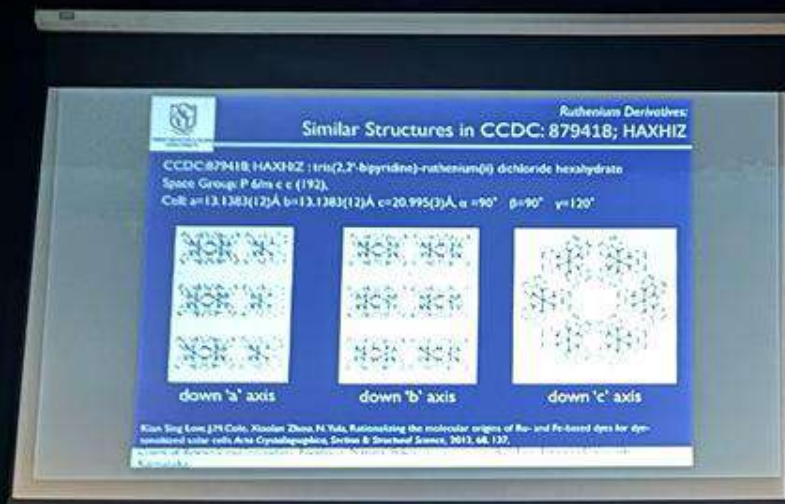
This Poster Won Best Poster Award of ICMAT-2023, Singapore, and also a Cash Prize.



PLENARY LECTURE entitled, ‘Crystal Growth Design of Advanced Functional Metal Oxides’, delivered by Prof. Dr. K. Byrappa, Adichunchanagiri University at “49th National Seminar on Crystallography during November 28-30, 2022 held at University of Jammu organized in Association with Indian Crystallography Association (ICA), INDIA



INVITED SEMINAR entitled,
“**Crystallographic studies and Biological
evaluation of Ruthenium polypyridyl
derivatives: Implications in Photodynamic
Therapeutics**” delivered by **Prof.Dr.Babu A
Manjasetty** at, “**49th National Seminar on
Crystallography**”, during **November 28-30,
2022** held at **University of Jammu** organized
in Association with **Indian Crystallography
Association (ICA), INDIA**





49TH NATIONAL SEMINAR ON CRYSTALLOGRAPHY (49TH - NSC) (November 28-30, 2022)



Organized by

UNIVERSITY OF JAMMU IN ASSOCIATION WITH INDIAN CRYSTALLOGRAPHIC ASSOCIATION (ICA)
AND NATIONAL COMMITTEE OF INSA FOR INTERNATIONAL UNION OF CRYSTALLOGRAPHY (INSA-IUCr)





S.No. 009

Certificate

Pleased to state that Mr./Ms./Dr. Babu A. Manjaletty
has participated in the 49th National Seminar on Crystallography (49th NSC) during November 28-30, 2022,
organized by Chemical Crystallography Laboratory, Department of Physics, University of Jammu, Jammu.

- He/She has made an Invited / ~~Oral~~ / ~~Poster~~ presentation on the topic ".....Crystallographic.....
-----Therapeutics-----"
- He/She has Chaired a Technical Session.


Dr. Sandeep Arya
Org. Secretary (49th-NSC)


Prof. Arun Bharti
H.O.D. Physics


Professor Rajni Kant
Convener & Chairman, 49th NSC

Chemical Crystallography Laboratory, Department of Physics, University of Jammu, Jammu – 180006 (J&K)



BEST PRESENTATION AWARD: Paper entitled, “Walnuts and Alzheimer’s Disease Progression:An Emerging Therapeutic Interventions” presented at “International Conference on Innovation and Advances in Pharmaceutical Sciences - Current Scenario and Future Perspective”, during 10-11 February 2023 organized by Adichunchanagiri College of Pharmacy, Adichunchanagiri University, INDIA.



BEST POSTER AWARD : Poster entitled, “Biohydrothermal Synthesis and Characterization of Chitosan Conjugated Zinc Oxide Nanoparticles for Various Biomedical Applications “, at 11th International Conference on Materials for Advanced Technology (ICMAT 2023) held at Suntec City, Sangaapore, during 26-30 June 2023, Singapore.

Bajaj College of Science, Wardha (Autonomous)
Fergusson College, Pune (Autonomous)
Indian Association of Physics Teachers (IAPT)



APPRECIATION CERTIFICATE

This is to certify that Mr/Miss BABU A. MANJASETTY from Department Of Physics, Faculty Of Natural Sciences, Centre For Research And Innovation has participated in the National Photo Essay Competition In Physics organized on the occasion of National Science Day 2023.

Dr. Sanjay. H. Bagade
Head, Dept. of Physics
Bajaj College of Science, Wardha.

Prof. P. K. Ahluwalia
President, IAPT

Dr. Nandkumar Mandlik
Head, Dept. of Physics
Fergusson College, Pune.

Participated in the National Photo essay competition in Physics entitled, “Symmetry Observed in Protein Structures”, on the occasion of National Science Day – 2023 with the theme entitled, “World of Art and Physics” organized by Fergusson College, Pune; Bajaj College of Science, Wardha in association with Indian Association of Physics Teachers (IAPT), India

INTERNATIONAL
CONFERENCE



Sri Adichunchanagiri
College of Pharmacy

Certificate

— of Oral Presentation —



International Conference on Innovation and Advances in Pharmaceutical Sciences

- Current Scenario and Future Perspectives

10th & 11th February 2023 | Karnataka, India

This is to certify that Mr/Ms/Mrs/Dr. ✓ BABU. A. MANJASETTY
of Adichunchanagiri University, India presented his/her worthy Oral
Presentation titled Automated Technologies and Novel Techniques in Protein
X-ray Crystallography for Structure based Drug Discovery in the
"International Conference on Innovation and Advances in Pharmaceutical Sciences - Current Scenario and Future Perspectives"
Organized by Sri Adichunchanagiri College of Pharmacy, Adichunchanagiri University & Association of Pharmaceutical Research
(APR) held on 10th & 11th February 2023.


Dr. B. Ramesh
Dean and Principal

Sri Adichunchanagiri College of Pharmacy
Adichunchanagiri University
B.G.Nagara, Karnataka, India


Dr. Prakash Goudanavar
Professor and Head

Dept. of Pharmaceutics & Regulatory Affairs
Sri Adichunchanagiri College of Pharmacy
Adichunchanagiri University
B.G.Nagara, Karnataka, India




Mr. Rudra Bhanu Satpathy
CEO & Founder
Association of Pharmaceutical
Research (APR)
Technoarete Group



