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Memorandum of Understanding

This memorandum of understanding is made at Dehradun on 20th April 2022

BETWEEN

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES, a University established under the University of Petroleum and Energy Studies Act, 2003, (Act No. 15 of 2003 of

For University of Petroleum & Energy Studies

Registrar

Principal
Dolphin (P.G.) Institute of
Bio-Medical & Natural Sciences,
Manduwala, Dehra Dun

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state Government of Uttarakhand), having its main campus at Village Bidholi, via Prem Nagar, Dehradun, Uttarakhand, 248007, through its Registrar **Mr Manish Madaan** (hereinafter called as "**UPES**"), which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and assigns, of the **ONE PART**;

AND

DOLPHIN PG INSTITUTE OF BIOMEDICAL AND NATURAL SCIENCES, Manduwala, Dehradun, Uttarakhand 248007, which is affiliated to H. N. B. Garhwal Central University with NAAC B++ Accreditation, through its authorized signatory, **Prof. Shailja Pant, Principal** (hereinafter called as "**DIBNS**"), which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and assigns, of the **OTHER PART**.

PREAMBLE

Dolphin PG Institute of Biomedical & Natural Sciences (DIBNS), Dehradun and University of Petroleum and Energy Studies (UPES), Dehradun recognize their strengths in research and education in one or more disciplines of science engineering, management and their mutual interest in engaging themselves in academic cooperation. DIBNS and UPES, therefore, agree to establish a programme for academic cooperation in the areas of mutual interest, and in accordance with terms and conditions set forth in this memorandum of understanding (MoU).

A. Objectives

The goal is to foster collaboration, provide opportunity for global experience, and to facilitate advancement of knowledge on the basis of reciprocity, best effort, mutual benefit, and frequent interactions. DIBNS and UPES agree:

- a) to exchange information on research and educational programmes

For University of Petroleum & Energy Studies

Registrar

Principal
Dolphin (P.G.) Institute of
Bio-Medical & Natural Sciences,
Manduwala, Dehra Dun

List of Events/Activities under MOU/Linkage

S. No.	MOU	Title of Event/Activity	Date
1.	UPES	RAC Visit to UPES, Central Instrumentation Facility	25-08-2022
2.		Sample Analysis	05-05-2022 & 25-05-2022
3.		Ph. D Registration with UPES [Suknya Chhetri]	18-01-2023
4.		Participation in International Young Researchers Conclave at UPES	19-01-2023
5.		Summer Internship	9 th January 2023 to 9 th March 2023 [3 Months]
6.		Publication with UPES	NA



Dolphin (PG) Institute of Biomedical & Natural Sciences,

V.P.O.-Manduwala, Chakrata Road, Dehradun – 248 007 (Uttarakhand) India

(Affiliated to H.N.B. Garhwal Central University, Srinagar, Approved by Government of Uttarakhand)

NAAC Accredited 'B++' (2nd Cycle)

Tel No. +91 9568002232

E-mail: mail@dolphininstitute.in Website: www.dolphininstitute.in

Event Report

Title	Publication with UPES
Name of the Activity	MOU-Publication
Dept.By	Department of Pharmaceutical Chemistry and Chemistry
Research Articles	<ol style="list-style-type: none">1. Shefali Arora, Sukanya Chettri, Versha Percha, Deepak Kumar & Mamta Latwal, Artificial intelligence: a virtual chemist for natural product drug discovery, Journal of Biomolecular Structure and Dynamics. https://doi.org/10.1080/07391102.2023.2216295.2. Shefali Arora, Krishna Samanta, Sukanya Chettri, Devendra Rawat, Versha Percha, Deepak Kumar, Ashwagandha: A Flagship Herb of Ayurveda from Past to Present Nano Era, International Journal of Pharmaceutical Investigation, 2023, 13, 3, 393-401.3. Deepak Kumar, Ashwani Sanghi, Shefali Arora, Shobhit Vidyarthi, Antioxidant Potential of different extracts of Xanthium strumarium leaves, Research Journal of Pharmacy and Technology, 2022, 15, 11, 5112-5114.
Research Articles attached.	

V. K. Singh

RAC Chairperson



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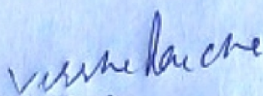
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CIRCULAR

DIBNS/RAC/VISIT/2022-23

Date: 23/08/2022

All RAC members are informed that the visit of Instrumentation Facility, UPES has been scheduled on 25-08-2022, 10:00 AM. It is requested to all members of RAC to present for the same.


Dr. Versha Parcha

RAC, Chair Person

CC to:

1. Chairman office (for kind information please)
2. The Principal Office
3. The Director Office
4. IQAC Coordinator
5. All HODs



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Event Report

Title	RAC Visit to UPES, Central Instrumentation Facility
Name of the Activity	Visit
Date	25 th August 2022
Venue	UPES, Dehradun
Organized By	RAC, DIBNS
Resource Person	-
No. of Participants	03 Faculties
Course Objective	Collaboration for availing Instrumentation Facility.
Course Outcome	Various Instrumentation facilities like XRD, GCMS, HPLC etc required for research purpose can be used.

Photographs



RAC Visit to UPES, Central Instrumentation Facility

Vasudevan

RAC Chairperson



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To,

5/5/2022

Dean Research

University of Petroleum and Energy Sources

Badoli, Dehradun Uttarakhand 248007

Subject: Request for XRD and GC/MS Analysis of Samples

Dear Dean of Research,

I hope this letter finds you in good health and high spirits. My name is Versha Parcha Professor and Chairperson RAC DIBNS, and I am a. I am writing to request your support and assistance in conducting X-ray Diffraction (XRD) and Gas Chromatography/Mass Spectrometry (GC/MS) analyses for a set of samples related to our ongoing research project.

Our research focuses on the data obtained from XRD and GC/MS analyses are crucial for furthering our understanding of the essential oil based nanoparticles. These analyses will provide valuable insights into the composition and structure of the samples, aiding us in drawing meaningful conclusions for our research objectives.

As per MOU between the two institutes We can explore instrumentation facilities available. Therefore I kindly request your permission to utilize the facilities available at the University of Petroleum and Energy Sources for the XRD and GC/MS analyses. Additionally, I would appreciate guidance on the necessary procedures, scheduling, and any associated costs or administrative requirements.

Our research team is committed to adhering to all guidelines and protocols set by the university, ensuring that the equipment is used responsibly and efficiently. We understand the importance of these analyses and assure you that the obtained data will be utilized solely for academic and research purposes.

I am available at your convenience to discuss this request further and address any concerns or queries you may have. Your support in providing access to the XRD and GC/MS facilities will significantly contribute to the success of our research project.

Thank you for considering our request. I look forward to your positive response.

Warm regards,

Versha Parcha

Prof Versha Parcha

Chairperson RAC & Coordinator IPR cell DIBNS

24/5/2022

To,

Chairperson
Research Advisory Committee (RAC)
DIBNS

Subject: Request for Antimicrobial and Antioxidant Studies on Oil Samples

Dear Chairperson,

I hope this letter finds you in good health. My name is Dr Shefali Arora and I am writing to request the assistance of the Research Advisory Committee (RAC) of DIBNS in conducting antimicrobial and antioxidant studies on four oil samples. The samples have been provided by Dr. Shefali Arora, a respected colleague and expert in the field.

Details of the samples:

1. Sample A
2. Sample B
3. Sample C
4. Sample D

Dr. Shefali Arora has identified the potential of these oil samples for their antimicrobial and antioxidant properties, and we believe that a comprehensive study under the guidance of RAC will provide valuable insights into their efficacy and applications.

The proposed studies include:

1. Antimicrobial Assessment: Conducting tests to evaluate the effectiveness of the oil samples against a range of microorganisms.
2. Antioxidant Analysis: Determining the antioxidant capacity of the oil samples to understand their potential in combating oxidative stress.

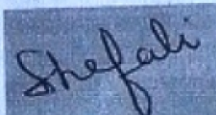
We kindly request the RAC's support in facilitating the necessary approvals, resources, and expertise to carry out these studies. Additionally, any guidance or recommendations from the committee regarding the methodology and scope of the research would be highly appreciated.

We assure you that the results of these studies will contribute to the scientific knowledge in the field and may have practical applications in various industries, including healthcare and nutrition.

We are committed to complying with all ethical guidelines and standards in conducting this research, and we will provide regular updates and a final report upon completion.

Thank you for considering our request. We look forward to your positive response and collaboration in advancing this important research.

Sincerely,



Dr Shefali arora

Energy Acres: Bijnor Via Prem Nagar, Dehradun - 248 007 (Uttarakhand), India, T: +91 135 2770137, 2776053/54/91, 2776201, M: 9997799474, F: +91 135 2776090/95
Knowledge Acres: Prem Nagar, Dehradun - 248 007 (Uttarakhand), India, M: +91 8171979021/2/3, 7060111775



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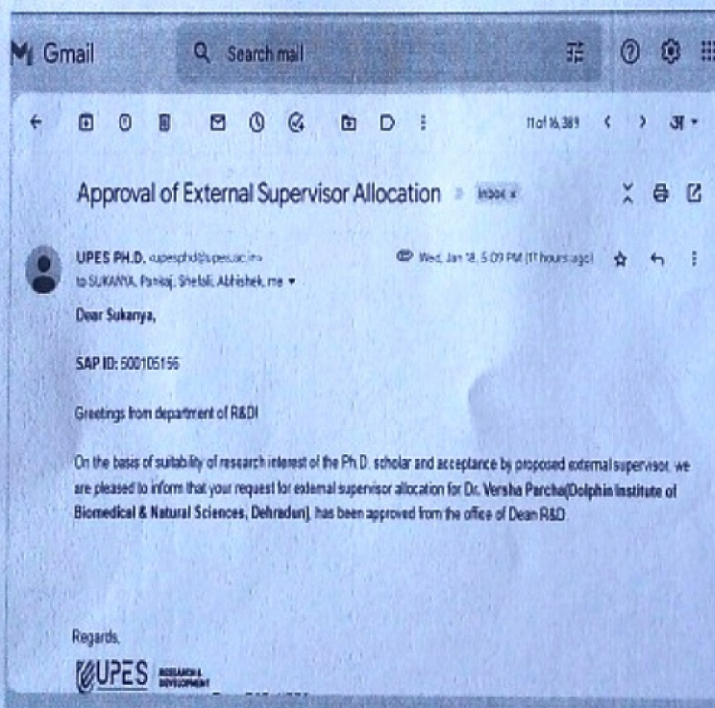
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Event Report

Title	Ph. D Registration with UPES
Name of the Activity	MOU- Ph. D Registration
Date	18-January-2023
Venue	UPES, Dehradun
Resource Person	Dr. Versha Parcha (Supervisor)
No. of Participants	1. Suknya Chhetri

Photographs



Ph. D Registration Letter: Suknya Chhetri

Versha Parcha
Supervisor

[Signature]
HEAD OF DEPARTMENT



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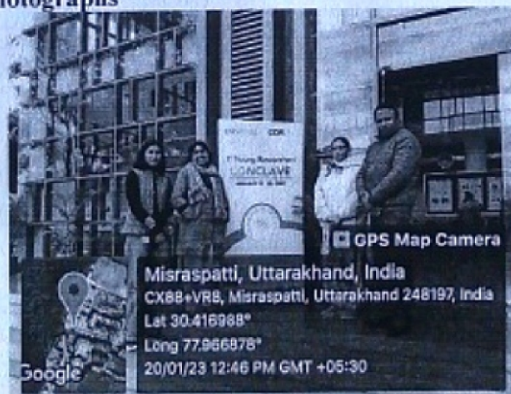
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Event Report

Title	Participation in International Young Researchers Conclave at UPES
Name of the Activity	Conclave
Date	19 th Jan 2023
Venue	UPES
Organized By	UPES
No. of Participants	02 Students (Mr. Pankaj Bhandari, Suknya Chhhetri, Research Scholar) 02 Faculties (Dr. Versha Parcha & Dr. Deepak Kumar)
Course Objective	Participation international youth conclave
Course Outcome	Exhibited poster & essential oil samples and formulation in an exhibition stall international youth conclave

Photographs



Participation in International Young Researchers Conclave at UPES

Versha Parcha
RAC Chairperson



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Event Report

Title	Rational Design, Synthesis and Biological evaluation of novel substituted benz[d]imidazo[2,1-b]thiazole derivative as antimycobacterial agents targeting the mycobacterial oxidative phosphorylation pathway.
Name of the Activity	Summer Internship
Date	9 th January 2023 to 9 th March 2023 [3 Months]
Venue	UPES
Organized By	Department of Biochemistry, DIBNS & School of Health Sciences & Technology, UPES.
No. of Participants	01 [Moni Kumari, M. Sc Biochemistry-21-23 Batch]
Photographs	

Venki Pachke
RAC Chairperson

Gyanendra Awasthi
HEAD OF DEPARTMENT

Ref: UPES/R & D/DDN/2023

Dated : 10th Jan 2023

Sub: Letter for Summer Internship

Dear Ms Moni Kumari

We are pleased to offer you "Summer Internship" under the following research project sanctioned by the DST-SERB.

Project Title: Rational design, synthesis and biological evaluation of novel substituted benzo[d]imidazo[2,1-b]thiazole derivatives as antimycobacterial agents targeting the mycobacterial oxidative phosphorylation pathway.

You will primarily be reporting to PI of the Project – Dr. Kuldeep Kumar Roy, Associate Professor, School of Health Sciences and Technology, UPES, Dehradun

You will be paid remuneration of INR. 5000 per month

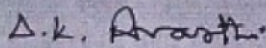
Your association with us will be for a period from 9th Jan 2023 till 9th March 2023.

You will follow the specified working hours of the Bidholi Campus, Dehradun fulfilling your commitment as per the "Terms of Association" (Annexure I).

We request you to join duties at the University on 9th Jan 2023 at our Bidholi Campus, Dehradun

Kindly sign the duplicate copy of this letter as token of your acceptance.

With best regards,
Yours sincerely,



Dr. DK Avasthi
Dean R & D
UPES, Dehradun

.....
Received the letter in original, I accept the offer as per the terms and conditions specified above.

Date:.....

Signature:.....

ANNEXURE-I

Duties & Responsibilities of Moni Kumari as a Summer Intern

Under the contract, Summer Intern shall carry out the following assignment:

- a) Report to the Principal Investigator of the Sanctioned Research Project i.e. Dr. Kuldeep Kumar Roy
- b) Carry out research work of the research project on "Rational design, synthesis and biological evaluation of novel substituted benzo[d]imidazo[2,1-b]thiazole derivatives as antimycobacterial agents targeting the mycobacterial oxidative phosphorylation pathway" as directed by the PI of the project.
- c) Keep and maintain the record of the results in presentable form (Soft as well as hard copy).
- d) To present the research work in the National/International conferences, workshops, seminars.
- e) Keep a track of contingencies/consumables required for the work.
- f) Assist the PI in preparation of various reports related to the project work.
- g) Carryout any other departmental work as directed by the PI.



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Event Report

Title	Publication with UPES
Name of the Activity	MOU-Publication
Dept.By	Department of Pharmaceutical Chemistry and Chemistry
Research Articles	<ol style="list-style-type: none">1. Shefali Arora, Sukanya Chettri, Versha Percha, Deepak Kumar & Mamta Latwal, Artificial intelligence: a virtual chemist for natural product drug discovery, Journal of Biomolecular Structure and Dynamics. https://doi.org/10.1080/07391102.2023.2216295.2. Shefali Arora, Krishna Samanta, Sukanya Chettri, Devendra Rawat, Versha Percha, Deepak Kumar, Ashwagandha: A Flagship Herb of Ayurveda from Past to Present Nano Era, International Journal of Pharmaceutical Investigation, 2023, 13, 3, 393-401.3. Deepak Kumar, Ashwani Sanghi, Shefali Arora, Shobhit Vidyarthi, Antioxidant Potential of different extracts of Xanthium strumarium leaves, Research Journal of Pharmacy and Technology, 2022, 15, 11, 5112-5114.
Research Articles attached.	

V. K. Lachne

RAC Chairperson

RESEARCH ARTICLE

Antioxidant Potential of different extracts of *Xanthium strumarium* leaves

Deepak Kumar^{1*}, Ashwani Sanghi², Shefali Arora³, Shobhit Vidyarthi¹

¹Department of Pharmaceutical Chemistry, Dolphin PG Institute of Biomedical and Natural Sciences, Dehradun, Uttarakhand, India.

²Department of Biochemistry, Dolphin PG Institute of Biomedical and Natural Sciences, Dehradun, Uttarakhand, India.

³Department of Chemistry, University of Petroleum and Energy Studies, Dehradun, Uttarakhand, India.

*Corresponding Author E-mail: deepsingh2304@gmail.com

ABSTRACT:

The use of herbal medicine for the treatment of diseases from centuries in all over the world because of safety, efficacy, cultural acceptability and lesser side effects. In comparison of herbal medicine, synthetic medicines have side and toxic effects. That is why herbal medicines have huge demand and popularity in world market. In the present study different extracts of leaves of *Xanthium strumarium* were prepared and evaluated their antioxidant potential. Evaluation of antioxidant activity is done by DPPH method. All extract were tested for presence of phytoconstituents i.e., alkaloid, carbohydrate, sterols, proteins, amino acids, saponin, and phenolic compounds in different extracts. From the results, we foundout that acetone and methanol extracts were the richest extract for phytoconstituents. Acetone extract showed maximum antioxidant potential (54.01±1.09%).

KEYWORDS: Antioxidants, *Xanthium strumarium*, DPPH, Ascorbic acid.

INTRODUCTION:

Many chronic and degenerative diseases including attherosclerosis, ischemic heart disease, ageing, diabetes, cancer, immunosuppression, neurosuppression, neurodegenerative diseases are due to oxidative stress¹. The imbalance between oxidants and antioxidants that causes damage of biomolecules which refers as oxidative stress². In living system, free radicals are produced by oxidation of food³. Antioxidant defence mechanism is the effective path of eliminate the action of free radicals which cause the oxidative stress. Antioxidants have the properties to breaks the free radicals chain reactions. Recently search of medicinal plants with antioxidant potential has been increased⁴. *Xanthium strumarium* L. is also known as cocklebur belongs to asteraceae family and widely destributed throughout tropical part of India⁵. The whole plant is upto 1m in height and used as a medicine. In ayurveda, the medicinal properties like antipyretic, anthelmintic, cooling, fattening, complexation and memory and fattening has been reported⁵.

Various parts of plant has been used for treatment of various like leaves possesses antirheumatic, diuretic, antisyphilitic, appetiser, emollient, laxative and sedative activities. The fruits possesses antibacterial, cytotoxic, antifungal, antirheumatic antimalarial, hypoglycaemic, antispasmodic and stomachic activities⁶. The research has been done on many medicinal properties like antitumor⁶, diuretic⁷, antifungal⁸, antioxidant⁹, antitussive¹⁰, antiplasmodial¹¹, antimitotic¹², antinociceptive¹³, insecticidal¹⁴, antibacterial and antifungal¹⁵, anti-inflammatory¹³ and anticancer¹⁶. Hence the present study was aimed to evaluate antioxidant activity of different extracts of leaves of *Xanthium strumarium*.

Experimental:

Collection and Identification of leaves of *Xanthium strumarium*:

Leaves of *Xanthium strumarium* were collected from locality of Dehradun (India). Plant material was authenticated by S. K. Srivastava (Scientist D/110D), in Botanical Survey of India, Northern regional centre, Dehradun (BSI). Authenticated specimen no is - 114541.

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Artificial intelligence: a virtual chemist for natural product drug discovery

Shefali Arora^a, Sukanya Chettri^a, Versha Percha^b, Deepak Kumar^b and Mamta Latwal^a

^aDepartment of Chemistry, University of Petroleum and Energy Studies, Dehradun, Uttarakhand, India; ^bDepartment of Pharmaceutical Chemistry, Dolphin(PG) Institute of Biomedical and Natural Sciences, Dehradun, Uttarakhand, India

Communicated by Ramaswamy H. Sarma

ABSTRACT

Nature is full of a bundle of medicinal substances and its product perceived as a prerogative structure to collaborate with protein drug targets. The natural product's (NPs) structure heterogeneity and eccentric characteristics inspired scientists to work on natural product-inspired medicine. To gear NP drug-finding artificial intelligence (AI) to confront and excavate unexplored opportunities. Natural product-inspired drug discoveries based on AI to act as an innovative tool for molecular design and lead discovery. Various models of machine learning produce quickly synthesizable mimetics of the natural products templates. The invention of novel natural products mimetics by computer-assisted technology provides a feasible strategy to get the natural product with defined bio-activities. AI's hit rate makes its high importance by improving trail patterns such as dose selection, trail life span, efficacy parameters, and biomarkers. Along these lines, AI methods can be a successful tool in a targeted way to formulate advanced medicinal applications for natural products. 'Prediction of future of natural product based drug discovery is not magic, actually its artificial intelligence'

ARTICLE HISTORY

Received 16 January 2023
Accepted 12 May 2023

KEYWORDS

Data mining; bioactivity data; molecular interaction attribute; encoding natural product

Introduction

Nature has a huge store of medicinal compounds. It has inspired 50% of all drugs of today and only a few of them utilize as potential drugs derived from natural products. A new emerging technology namely 'Artificial intelligence (AI)' is very helpful to find the targeted way to get the novel pharmaceutical applications for natural products. This method provides a cheap and easy platform for manufacturing natural products with the same effects. Many natural products with potential active ingredients are selected by evolutionary mechanisms. By the time of the mid-1970s, natural products find as the fount of a pharmaceutical drugs for new human therapy. In the period between the 1980s and the 2010s, 2/3 of the drug was discovered from unaltered NPs, and NP analogs and contained NP pharmacophores 5%, 28%, 35% respectively (Newman and Cragg, 2020). Many researchers adopted many computational methods for the discovery and structure determination of bioactive natural products and the use of molecular patterns for target selectivity and combinatorial design (Giordanetto and Kihlberg, 2014; Johnston et al., 2015; Merk et al., 2018; Nugroho and Morita, 2019; Rodrigues, 2017). Many artificial intelligence-based engineers first look for predictable target molecules of natural products especially proteins to get information about the pharmacologically applicable compounds. AI technology is a meaningful method to identify the target protein and a pairs of active ingredients in natural compounds in a comparison to conventional screening. Limited research has been reported about the interaction of

natural compounds with the different proteins present in the human body to produce remarkable effects. A bacterial molecule namely marinopyrrole A (a natural substance with a complicated structure) have different biological activity such as anti-inflammatory, antibiotics, and anti-cancer activity, and many AI researchers derived an algorithm to get possible target proteins of marinopyrrole A. By implementing the different AI and machine learning models, the developed algorithm analyzed the pharmacologically active parts of marinopyrrole A with the comparable patterns of already discovered new drugs for which the target proteins to which they attach the familiar. During drug discovery, as the pattern matches, the scientists were capable to identify eight human receptors and enzymes which can be the binding site of bacterial molecules. The above discovered enzymes and receptors are involved in the immune system, pain process, and inflammation. Many experiments performed in the lab proved that marinopyrrole A can generate considerable interaction with most of the predicted protein. AI method is the reliable method to narrow down the protein targets of natural products by more than 50% and shorten the research of novel pharmaceutically active agents. The synthesis of marinopyrrole A is a very expensive and time-consuming process, so finding an alternative way as AI makes it possible to find the target proteins of marinopyrrole A which is needed for getting better results in the future. AI algorithms can be used more simply to design active ingredients with life effects as natural structures and are useful not only to prepare new drugs but on the verge of possible fundamental switch in medical-chemical research. In the future AI is

Ashwagandha: A Flagship Herb of Ayurveda from Past to Present Nano Era

Shefali Arora^{1,*}, Krishna Samanta¹, Sukanya Chettri¹, Devendra Rawat¹, Versha Percha², Deepak Kumar²

¹Department of Chemistry, University of Petroleum and Energy Studies, Dehradun, Uttarakhand, INDIA.

²Department of Pharmaceutical Chemistry, Dolphin (PG) Institute of Biomedical and Natural Sciences, Dehradun, Uttarakhand, INDIA.

ABSTRACT

Plants are considered excellent resources for the generation of greener biomaterials. Plant extract are renewable in nature. Various metabolites present in plant extract are normally used in redox reaction for the formation of eco-friendly nano-particles. It is also considered as the main factory for the green synthesis of metal nano-particles. The plant-based nano-particles is very necessary for absolute harmony connection between plant science and nanotechnology. Ashwagandha is the non-toxic herb which used to treat a range of conditions and its life changing benefits runs over a long time. Its numerous medicinal values make this plant so popular. It is a stress buster which works for all "SUPERHERB". This super herb rejuvenates our body and brain from the inside out. Present review depicts the variety of assistance of Ashwagandha plant with or without nanoparticles, from the past to the present time of corona.

Keywords: Ashwagandha, Plant extract, Nanoparticles, COVID-19, Natural inhibitor.

Correspondence:

Shefali Arora
Energy Acres, PO Bidholi, Wa Prem Nagar,
Dehradun-248007, Uttarakhand, INDIA.
Email: shefali.arora@ddn.upes.ac.in

Received: 09-01-2023;

Revised: 28-02-2023;

Accepted: 05-05-2023.

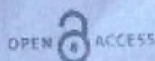
INTRODUCTION

Treatment of Ayurveda always gives side benefits not side effects. Ashwagandha is an evergreen shrub which is found in India, Africa and many parts of the Middle East. It is known as Rasayana for more than 6000 years.¹ Its botanical name is *Withania somnifera* and commonly known as winter cherry or poison gooseberry which is the annual evergreen shrub from the family Solanaceae. The name of family Solanaceae means "dream carrier" with reference to restful sleep. This family plants supported sleep and use to provide daytime energy and stress. Sometime this herb is called "Indian Ginseng" although it is unrelated to the Ginseng species as Ginseng support energy and stamina and Ashwagandha gives calming and nourishing stress support.² The root of Ashwagandha smells (gandha) like horse (in Sanskrit *Ashwa* means horse), that's why the plant name is Ashwagandha.³ The plant requires the dry stony soil with sun to partial requirement of shade. In most of the countries this herb is sold as dietary supplement. The various part of Ashwagandha works as anthelmintic, astringent, diuretics, narcotics, thermogenic and as tonic. Its powder is given to the children with milk and works as tonic and able to gives the power of horse. This herb is used against nervous breakdown, insomnia, vitiated conditions of vata, rheumatism, constipation, leukoderma

etc.⁴ In Tanzania, the root of Ashwagandha is used to promote uterine constriction and sexual stimulant.^{5,6} The plant is works as rejuvenative for men, strengthen muscles, bone marrow, muscle and semen. It also promotes longevity and youthful vitality.⁷ The whole plant itself have medicinal importance (Figure 1). The leaves of plants are rich in iron and can be taken as herbal tea. The plant leaves are helpful during heavy periods and anemia. Its leaves are useful in painful swellings and fever. Its leaves also consume as energy sources and decreases fever and pain during swelling. The flower parts having diuretics, depurative, astringent and aphrodisiac property. The seeds are known for anthelmintic activity and used to treat memory loss, anxiety, hysteria, syncope etc. Drug-free and non-habit-forming herb of Ashwagandha contain melatonin, a hormone which is naturally produced in the brain and help for sound cycle asleep naturally. A Russian scientist N.V. Lazarez described the plant as adaptogen as it satisfied the criteria of non-toxic, benefit of overall well-being and reduce and regulate stress by helping the body adapt.

ASHWAGANDHA AS A SUPPLEMENT

Ashwagandha is considered as "Real Potent Regenerative Tonic or Rasayana of Ayurveda". Because of the nature of adaptogen, the Ashwagandha is used for many states of stress which may be physical and mental. Ashwagandha extract is the best form to take in. Various forms of it are available in the market such as capsules, gummies, liquid drops and powders which can be mix in to drinks (Figure 2). Its two branded extract is KSM66 and Sensoril are very popular. Both brands are fully standardized,



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