ADD ON COURSE IN AYURBIOLOGY
ACTIVITY REPORT 2019 - 2020

FACULTY: SCIENCE

DEPARTMENT/ COMMITTEE BIOCHEMISTRY

IQAC ACTIVITY No: SVC/ ADD-ON COURSE/ AYURBIOLOGY -03

NAME OF THE ACTIVITY: Add on course in AyurBiology.			
DATE	**FACULTY**	**DEPARTMENT/COMMITTEE**	**COORDINATORS NAME**
August 2019 to December 2019	SCIENCE	Biochemistry	Dr. Anju Kaicker Dr. Nandita Narayanasamy
TIME	**VENUE**	**NUMBER OF PARTICIPANTS**	**NATURE: Outdoor/Indoor**
Saturdays 10:00-12:00	SVC	23	Outdoor/indoor
SUPPORT/ASSISTANCE:	Course fees of 3500/- per student.		

BRIEF INFORMATION ABOUT THE ACTIVITY (**CRITERION NO. -I,II,III and V**):

TOPIC/SUBJECT OF THE ACTIVITY	Though *Ayurveda* is an ancient science, its principles and practices are relevant even today; particularly in the health care sector. The need for a modern scientific evaluation of *Ayurveda* has been recognized. Till date research in *Ayurveda* has however focussed on studies on medicinal herbs and their constituent bioactive compounds for herbal drug development and identification of New Chemical entities. However, it is important now to also explore new educational and research programs in *Ayurveda*, that focus on integrating it with the current understanding of Modern Biology that would enable a more rational approach towards harnessing knowledge of Ayurveda for modern day healthcare.
OBJECTIVES	This course of *Ayurveda Biology* intends • To generate a knowledge interface between *Ayurveda* and life sciences for applications in contemporary healthcare Science.

	• To provide a platform to students of Modern Biology an understanding of the systemic theoretical foundations, principles and practices of *Ayurveda.* • To work towards bridging the understanding of traditional Indian health sciences with *modern Life Science.*
METHODOLOGY	The course is conducted with help from Dr Bhavana Parashar, Sr. Scientist at Trisutra Center , IGIB, Delhi Coordinators sit with Dr Bhavana and formulate the course outline and decide on speakers to be contacted. A time table with speakers is tabulated, speaker are contacted and lectures are mostly scheduled on Saturday morning any time between 10:00 am to 1:00 pm 2 Saturdays were allocated for a field visit to IGIB Trisutra Center, All India Institute of Ayurveda and AIIMS. Students are tested through a. Conducting a survey and filling of 10 questionnaires on Prakrati Assessment. b. A paper review on any publication relating to Ayurbiology c. A course end MCQ based test.
OUTCOMES	Students learn the basic principles of Ayurveda like body composition bases on PanchMahabhutas and Doshas. They learn the concept of prakriti and learn how to assess an individuals' Prakriti. The influence of managing diet, lifestyle, breathing and sleep on balancing of Doshas is taught which makes them understand the importance of a wellness schedule in managing ones' health. They understand the relationship of prakriti to modern Physiology. And learn modern techniques that can help in confirming Prakriti analysis by Questionnaire. The understand the shift from Prakriti to Vikriti that defines the imbalance in prakriti that lead to ill health. They are introduces to Management of health through diet and sleep theraphy Panchakarma treatment, leech treatment and ayur pharmacological methods. The field visits to IGIB and an Ayurvedic hospital gives them a practical exposure to the science of Ayurveda.

PROOFS & DOCUMENTS ATTACHED (Tick mark the proofs attached):

Notice & Letters	**Student list of participation**	**Activity report**	**Photos**	Feedback form

	√	√	√	
Feedback analysis	News clip with details	Certificate √	Any other	

IQAC Document No:	Criterion No:	Metric No:
Departmental file no	IQAC file No;	

NAME OF TEACHER	NAME OF HEAD/ COMMITTEE INCHARGE	IQAC COORDINATOR (SEAL & SIGNATURE)
Dr. Anju Kaicker Dr. Nandita Narayanasamy	Dr. Anju Kaicker Dr. Nandita Narayanasamy	N. Latha Dr. N. Latha Coordinator, IQAC Coordinator, IQAC Sri Venkateswara College (University of Delhi) Dhaula Kuan, New Delhi-110021

For Reference

Criterion I	Curricular Aspects (planning & Implementation)		Criterion V	Student Support & Progression
Criterion II	Teaching Learning & Evaluation		Criterion VI	Governance
Criterion III	Research, Innovations & Extension		Criterion VII	Institutional Values & Best Practices
Criterion IV	Learning Resources and Infrastructure			

Add On Course
2019-20

AyurBiology: Bridging our understanding of Ayurveda and Modern Medicine

Sri Venkateswara college

Course coordinators:
Dr. Anju Kaicker
Dr. Nandita Narayanasamy
Dr. Bhavana Parasher

Introduction: Ayurveda Vs AyurBiology: An insight.

Ayurveda, meaning Ayu = Life and Veda = knowledge; is a 5,000-year-old system of holistic (whole body) and natural healing. It is traces its origins in the Vedic culture of India and is considered to be one of the oldest healing sciences. Ayurvedic medicine is based on the belief that health and well-being depends on the delicate balance between internal and external influences and on the energies that modulate the functioning of both; mind and body.

Ayurveda focusses on health management through holistic principles wherein ill health is viewed as a disruption of energy flow in the entire body and does not specifically target any particular organ or organ system. The premise is that that there are three doshas : Vata, Pitta and Kapha and that disease and illness originate from an imbalance in these three energies. Every individual according to Ayurveda has a specific balance of the 3 energies that constitute his/her *Prakriti*. The *Prakriti* of an individual determines their response to stimuli (Internal and External) as well as their susceptibility to disease. The interventions practised in Ayurveda to cure ill-health aim at correcting the specific imbalance in an individual's *Prakriti* and hence is highly personalized. The primary goal of Ayurvedic medicine is to help people live long, healthy and balanced lives without the need for invasive therapies.

Aim of the course:

Though *Ayurveda* is an ancient science and its principles and practices are relevant even today, particularly in the area of public health and Disease control management; it is not widely accepted as a scientific practise of medical treatment. To change this perception, of late, the need for a scientific evaluation of *Ayurvedic practices* has been recognized. Till date however, research in *Ayurveda* has been focussed on studies on medicinal herbs and their constituent bioactive compounds for herbal drug development and identification of New Chemical entities. However, it is now important to explore new educational and research programs in *Ayurveda*, that focus on integrating this holistic science with the current understanding of Modern Biology.

This Add on course is focused on the theme of *AyurBiology*, and intends to generate a knowledge interface between *Ayurveda* and Modern Biology for applications in contemporary Healthcare Sciences. The program aims at providing a platform to students of Modern Biology an understanding of the systemic theoretical foundations, principles and practices of *Ayurveda*. Thus, it works towards bridging together the understanding of traditional Indian health sciences with *Modern LifeScience*.

Detailed lectures are held on the concept of prakriti and influence of diet, environment, seasons, life style and age on prakriti. Molecular basis of prakriti and dosha are taught using relevant examples and emphasis is put on integrating the trisutra concept with modern medicine. Clinical examination methods used in ayurveda for personalized management of health & disease are discussed at length and culminated with a visit to an ayurvedic clinic. The students are also taken to Ayurveda Institutes to expose them to the working environment of an ayurvedic hospital. They saw a rich collection of our indigenous herbs and formulation of medicines from these plants. Mechanism of action and benefits of panchkarma and leech therapy were discussed. The students were assessed on the basis of assignments that are given to them periodically and an end term examination consisting of multiple choice questions.

Outline of Course Content:

Unit 1: Introduction- week 1 : 2hr.

The contemporary relevance of Ayurveda in modern times: Basic tenets of holistic and personalised medicine- examples of relevance in Drug discovery, Non-pharmacological LS interventions, disease biology

- History of Ayurveda and Vedic culture:
- Ethics and regulations in Ayurvedic Practices
- Methodology and experimentation used in for validation of an ayurvedic medication or therapy.

Awareness Questionnaire Distribution / collection

Unit 2: Title: Dosha- Prakriti- environment and phenotypes: Principles of Ayurveda.

Weeks 2; 2hr lecture and Week 3 : 4hr practical session at IGIB

- Trisutra Ayurveda: Basic tenets of holistic and personalised medicine-
- Understanding the concept of dosha & body constitution.
- The concept of Prakriti
- Phenotypic Assessment methods using modern physiological and anthropometric parameters

Assignment 1. Prakriti assessment by questionnaire

Correlating Prakriti methods with other phenotyping methods

***Unit 3: Title: Anagatbadhapratishedha*: Personalised preventive diet and lifestyle regimen. Weeks 4 and 5 : 2hrs lectures each week**

Ayurvedic concept of Nutrition; Seasonal & daily regimen including diet management for health maintenance: Influences of diet, environment, seasons, life style, age on Prakriti

- Medicine v/s health supplement; spices v/s medicine

- Diet & nutrition according to your body constitution, place and time as well as Dosha Concept of Agni (digestive fire) & Ama (biological toxins)
- Ayurvedic dietetics & nutrition.
- Imbalance (to keep away from common health issues
- Yogic diet-Satavic, Rajasic & tamasic food.
- Importance of physical activity and Sleep in health and disease

Effects of Yoga on physiological parameters such as Autonomic functions

Assignment 2: Self-assessment of Lifestyle through Questionnaire.

Understanding of variability in health with respect to ones *Prakriti;*How to make best of their Prakriti and maintain it

Unit 4: **Title: Ayurgenomics for exploring concepts of Ayur Biology. Weeks 6 and 7**

- The need for and methods used to Bridging the gap between Modern Biology, genomics and Ayurveda
- Understanding the molecular basis of Prakriti and Tridosha Biology.
- Research avenues in AyurBiology/ Ayurgenomics

Week 8: 4hrs 4hrs lec-dem practical session, Visit to lab AIIMS

Unit 5: Title: *Roga Samprapti- Dosha- Dushya Sammurchhana.* Week 8

- Health to disease transitions: Prakriti to Vikriti transitions.
- Concept of Dushyas viz; *Dhatu, srotas, Agni* (digestive fire) mala & *Ama* (biological toxins)

Unit 6: Title: *Roga rogi pariksha:* Diagnosis in Ayurveda*.* Week 9

- Clinical examination methods described in Ayurveda for personalised management of health & Disease.
- Relation to modern diagnostic methods.

Unit 6: *Vyadhihara Chikitsa*: Therapeutic treatment modalities described in Ayurveda.

Week 10 : 4 hrs; Visit to AIIA

- Internal Medication Stratergies: Shodhana: Detoxification (*panchakarma*) and Shamana: Medication for rejuvenation (*Rasayana*) etc.
- External Medication Stratergies: Massage (*Abhyangam*), *shirodhara* and other local therapied with herbal formulations.
- Ayurvedic Drug formulations and prescriptions according to Prakriti assessments**.**
- Nanoparticle vis- a-vis- Bhasma; Metals in modern medicine

Assignment 3: Discussion and presentations of Modern scientific evidence of some of the Therapeutic practices:

Week 12: Final Assessment MCQ based paper and Assignment 4:

Correlation of Ayurveda and its applicability with Modern Medicine: a paper review.

Resource Persons:

1. **Dr. Bhavana Prasher: CSIR – TRISUTRA AyurGenomics Unit, IGIB, New Delhi**
2. **Dr. Mitali Mukerji: CSIR – TRISUTRA AyurGenomics Unit, IGIB, New Delhi**
3. **Dr. Sudhir Kumar: Professor, CBPACS**
4. **Dr. Bharat Krushna Kuntia: Project Scientist, AIIMS**
5. **Dr. Anurag Agrawal, CSIR- IGIB**
6. **Dr. Rama Jayasundar, Department of NMR & MRI Facility, AIIMS**
7. **Dr. R. M. Acharya, Swami Vivekananda Yoga Anusandhana Samsthanam, Delhi**
8. **Dr. K.K. Deepak, Department of Physiology, AIIM**

Trips organized for hands on training as part of the course

Practical session at IGIB

The students were divided into small groups and were shown various methods used by the institute to analyze baseline Phenotypes of individuals, namely: Anthropometry, Skin measurement, Heart rate variability, Lung function test and Pulse Wave Velocity.

Anthropometry is the study of the measurement of the human body in terms of the dimensions of bone, muscle, and adipose tissue. The various aspects measured

include body weight; height vertex; wrist, waist, hip and bicep girth; and skin fold. The students were explained the cumulative factors that affected these parameters. For instance, people who are taller than a certain reference standard may indicate high socio-economic status (well nourished), Vata-Pita dominant Prakriti, dry and arid climate in residence or male as gender. Another example is skin fold: a thicker skin fold can indicate an Asian or African ethnicity, Kapha prakriti or belonging to the middle aged group.

The students were shown several devices used for skin measurements and their role in indicating diseases. One of the devices, Mexameter MX 18 is used to measure melanin and haemoglobin (erythema), mainly responsible for the colour of the skin by reflectance. Factors affecting measurement include season, age, gender (higher levels in males) and diseases (like COPD). The Sebumeter is used to **accurately determine the sebum level of the skin surface, as well as on scalp and hair. Factors affecting sebum levels include: skin microbiome, gender (males have higher levels due to testosterone) and conditions like PCOD (higher testosterone).**Other devices shown were: cutometer (measures skin elasticity by suction), vapometer (measures transepidermal water loss, an indicator of the skin's barrier function) and Skin glossymeter (measures gloss on skin, lips and hair).

Heart rate variability (HRV) is the physiological phenomenon of the variation in the time interval between consecutive heartbeats in milliseconds. It is a simple, non-invasive method to evaluate the sympathovagal balance at the sinoatrial level. Different physiological factors may influence HRV such as gender, age, circadian rhythm, respiration and body position. **Pulse Wave Velocity** (PWV) is a measure of arterial stiffness, or the rate at which pressure waves move down the vessel. First, the Pulse Wave Distance and Pulse Transit Time (PTT) are determined. Then PWV is calculated by dividing the distance by the transit time providing a measure of cardiovascular health.

To measure lung function, students were shown the use of a Spirometer (type shown: Pneumotachometer), a device used to measure lung capacity and lung volume. The students were explained the various parameters mentioned and were also explained differences observed in various spirograms due to conditions like COPD and asthma.

The students were amused to see the Zebrafishes used as an experimental model organism by the institute! They were explained the multiple advantages of using the system: it serves as a vertebrate model, is easily cultured and early development processes are similar to humans. Zebrafish embryos are nearly transparent which allows researchers to easily examine the development of internal structures. In fact, 84% of genes associated with human disease have a zebrafish counterpart.

The students thoroughly enjoyed the session, which concluded with a delicious lunch at the IGIB canteen!

Visit to AIIMS

The students were first given a lecture on “Physiological variability” by Dr. KK

Deepak, HOD of the Physiology department in the teaching block. The students were then taken to various research labs in the Convergence block. In the Respiratory research lab, the students were shown the working of an impulse oscillometer, a non-invasive device used to measure pulmonary resistance and reactance. At the Electrophysiology sleep and research laboratory, an overview of Polysomnography (PSG) was given to the students, explaining how it monitors brain activity (EEG), eye movements (EOG), muscle activity or skeletal muscle activation (EMG), and heart rhythm (ECG), during sleep. The various stages of sleep and the corresponding brain waves recorded by EEG were also explained. Next up, the students were shown a Lower body negative pressure device (LBNPD) in the Space and Environment Research facility. Since exposure to zero gravity in space leads to a condition called space deconditioning (characterized by a reduction in heart size and blood volume, impaired balance control, changes in nervous system sensitivity, decreases in bone and muscle mass, and weakening of the immune system), the LBNPD has been created to overcome this problem. It is a sealed device in which a seal near the waist allows a vacuum to be applied to the chamber, creating lower relative pressure on the legs which helps pull bodily fluids toward the feet. They were also shown a Transcranial Doppler (TCD) ultrasound device, which provides rapid, noninvasive, real-time measures of cerebrovascular function. Towards the end, the students were shown and explained a 128 electrode EEG in the Stress and Cognitive Electro-imaging lab. The Electroencephalogram is used for commonly used in diagnosing epilepsy and sleep disorders. The students were fascinated by the various techniques explained and enjoyed the interactive sessions.

Visit to AIIA (All India Institute of Ayurveda)

The students were given a brief introduction about AIIA. The All India Institute of Ayurveda aims at bringing a synergy between Traditional Wisdom of Ayurveda and Modern tools and technology. The Institute has 25 Specialty Departments and 12 clinics with 8 inter-disciplinary research laboratories wherein several scholars have access for PG & Ph.D programs every year. AIIA's mission includes undertaking interdisciplinary research focused on validation of Ancient Wisdom of Ayurveda using modern tools and technology.

The students were first shown the Yoga therapy room, where a discussion with the yoga instructors were held on the benefits of various asanas. The students also visited the library, which had several books on Ayurveda like the Charaka Samhita (in different languages) as well as journals.

The students were also shown the place where Ayurvedic drugs are formulated in the institute. They were explained how drugs are classified on the basis of the form in which they are taken (some examples include *leh, churan, swaras, kwaat*). The students were also enlightened about the 50 *Mahakashayas* (a *Mahakashaya* refers to a group of 10 herbs) in Ayurveda. They were amazed to see several of these *Mahakashyas* placed in containers in a systematic manner. The extraction of these herbs has been very specifically described in the Ayurveda texts, with details

like the type and position of the leaf to be chosen, the season and the time of the day to extract the herb, and so on mentioned. The students were also shown how these formulations are tested for purity using modern techniques like TLC (Thin Layer Chromatography), which are used to detect compounds like flavonoids and alkaloids. They were also informed about the various API (*Ayurvedic* Pharmacopoeia of India) guidelines the institutes have to follow to maintain formulation standards. Next up, the students were shown the Rasashastra Practical lab, where they were shown various raw materials, *Yantras* and crucibles used to make formulations.

As students entered the Pediatrics unit, they entered a room where some children were being massaged by a team of doctors. They were informed the different oils used and how this method was being used to treat patients with diseases like cerebral palsy and Guillain-Barré syndrome. The students were also shown the Diagnostics unit of the hospital, and were shown CBC devices and an Immunoassay analyzer.

The students were then taken to the Panchkarma unit. Panchkarma is a special treatment consisting of medicated oil massage and herbal remedies. The students were shown all five natural methods (**Vamanam, Virechanam, Aasthaapana/Niruham, Anuvaasan and Nasyam**) of purgation or elimination, which intensively detoxifies the body, while balancing the three doshas: Vata, Pitta and Kapha.

AIIA has over 282 medicinal plants, and towards the end, students were given a tour of the beautiful area where these plants are nurtured. They were also given a brief overview of the medicinal properties of a variety of plants.

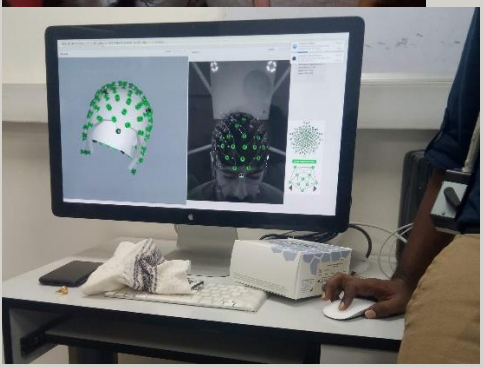
The visit was extremely enlightening to the students and they thoroughly enjoyed seeing the aspects and techniques of Ayurveda which they had previously only read about.

List of students enrolled and contact details (August 2019)

NAME	CONTACT NUMBER	EMAIL ADDRESS
Kriti Gupta	9695991541	kritigupta12348@gmail.com
Divyanshi Verma	8527132167	dvdivyanshiverma2@gmail.com
Mayank Bansal	9953322469	mayankborn2000@gmail.com
Aastha Puri	9136734700	aasthapuri07@gmail.com
Neha Guliya	9311994444	neha.guliya2014@gmail.com

Kousheen Brar	9414020110	kousheenbrar110@gmail.com
Vaishali	9540938528	Vaishaligautam2798@gmail.com
Vidushi Sharma	9625335687	vidushi289@gmail.com
Saruby Sharma	9899001569	saruby.sharma@gmail.com
Ayushi Kumari	9304042915	ayushikumari.25899@gmail.com
Manjulika Bharti	7289955564	manjulika2000@gmail.com
Muskan Gupta	9910530489	Muskanggupta1407@gmail.com
Sandeep Chatterjee	7290986681	sandeepchatterjee66@gmail.com
Khushboo Arora	9319161911	khushbooarora8888@gmail.com
T. Akanksha	8929599050	akankshatimmasarthi@gmail.com
Hrithik Kumar	93184121139	mrkihtirh123@gmail.com
Sujata Balasubramanian	9953028272	sujata412000@gmail.com
Anish Vashisht	9773958202	anishvashisht360@gmail.com
Bani Satsangi	9319722867	Satsangi.bani@gmail.com
Rajshree Laishram	8826647616	rajlkuku@gmail.com
Shriya Mehta	8941831539	shriyamehta2000@gmail.com
Palak Taneja	9871668803	tanejapalak18@gmail.com

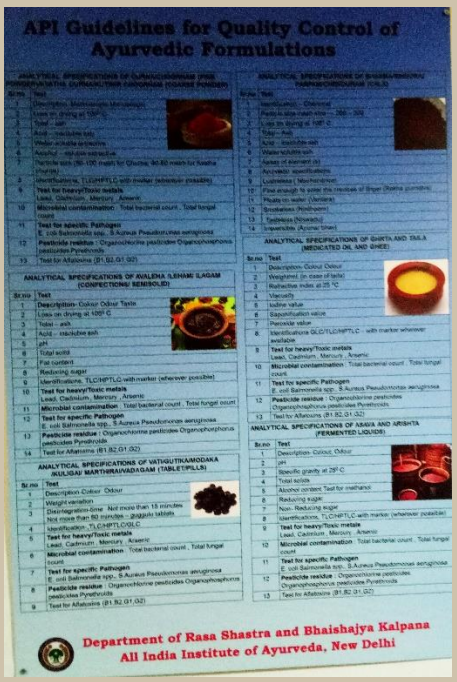
Students being demonstrated noninvasive physiological tests like EEG , PFT, Sonography and ECG that are now used to substantiate Prakriti analysis

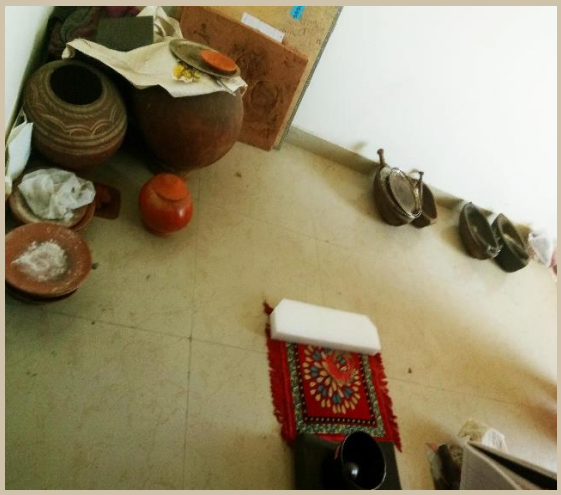


Students of 2019 batch with AIIA resource persons and course coordinators Dr Anju Kaicker and Dr. Nandita Narayanasamy at the entrance of AIIA after a 4 hr Lec- Dem interaction .

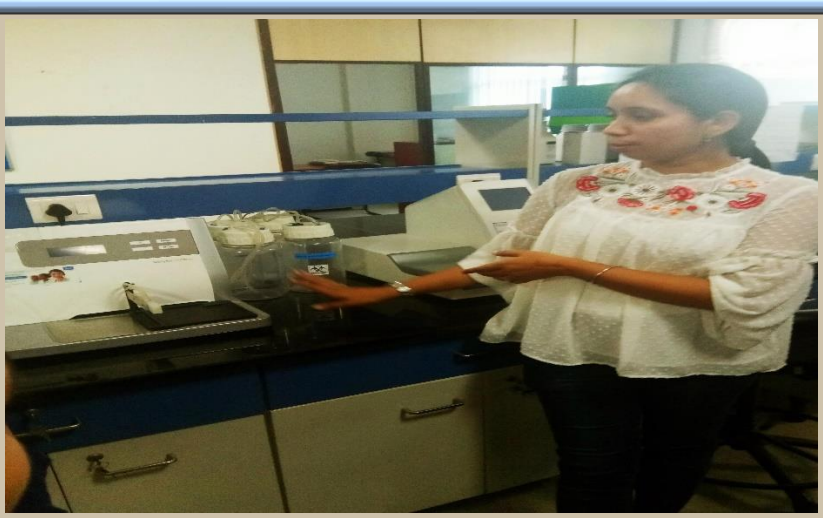
Panch karma technique in progress. Consent based demonstrations for students of SVC Ayurbio program

Students being shown the stored medicinal plant parts that are used in ayurvedic formulations. Plants are sourced from the Medicinal plant garden (photo adjacent) or most are sourced from scred groves and other forest nurseries across the country





Ayur- Pharma: The poster above the stringent API guidelines that ensure quality in ayurvedic formulations. The picture adjacent shows traditional crucibles, pots and other apparatus that are used in the preparation of an ayurvedic formulations



Resource Persons

1. **Dr. Bhavana Prasher:CSIR – TRISUTRA AyurGenomics Unit, IGIB, New Delhi**
2. **Dr. Mitali Mukerji:CSIR TRISUTRA AyurGenomics Unit, IGIB,New Delhi**
3. **Prof. Sudhir Kumar: CBPACS**
4. **Dr. Bharat Krushna Kuntia: Project Scientist, AIIMS**
5. **Prof. Rama Jayasunder, Department of NMR and MRI facility,AIIMS**
6. **Dr R.M Acharya, Swami Vivekananda Yoga Anusandhana Sansthanam, Delhi**
7. **Dr. K.K. Deepak, Department of Physiology, AIIMS.**

SRI VENKATESWARA COLLEGE

(UNIVERSITY OF DELHI)

CERTIFICATE OF COMPLETION

This to certify that Mr./ Ms. Ayushi Kumari has successfully completed the add-on course in Ayur Biology, held from 19th August to 25th November, 2019.

Dr. Nandita Narayansamy
(CO-ORDINATOR)

Dr. Anju Kaicker
(CO-ORDINATOR)

Dr. P. Hemalatha Reddy
(PRINCIPAL)