Sankalchand Patel University

Innovative Projects
Under

Student Startup & Innovation Policy – 1.0
(Duration: 2019 – 2022)

Prepared By:

Centre for Research & Innovation (CRI)

April 2024

MOTTO

।। अथातो ज्ञानजिज्ञासा ।।

""Curiosity for Knowledge and learning"

QUALITY POLICY

Sankalchand Patel University is committed to provide high quality education through Quality Teaching, Research, Consultancy and Community outreach services. The University is committed to continuous improvement in the academic and administrative processes by fostering Cooperation, Innovation, Professionalism, and Integrity.

VISION

To become a world-class university through philanthropic practices.

MISSION

We serve society to develop and prosper by building human capital.

विद्या ददाति विनयं विनयाद् याति पात्रताम् ।
पात्रत्वात् धनमाप्नोति धनात् धर्म ततः सुखम् ।।

Through learning we get humility, through humility we get eligibility, by eligibility we get wealth, wealth gets religion and religion gets happiness.

OUR INSPIRATION

"વિના સહકાર, નહીં ઉદ્ધાર."

"તું તારા પેટે પાટા બાંધીને પણ
તારા બાળકોને ભણાવજે."

Sankalchand Patel University's history can be traced back to 1952 when Nootan Sarva Vidyalaya Kelavani Mandal (NSVKM) was established by Late Shri. Sankalchand Patel, is a freedom fighter and a social entrepreneur. The objective was to fulfill the educational and socio-cultural needs of the people in North Gujarat. It was the collective vision of the Late Shri. Sankalchand Patel and the Trust which helped Nootan Sarva Vidyalaya Kelavani Mandal (NSVKM) achieve the status of Sankalchand Patel University (SPU). At the university, value-based diversified education was given prominence and delivered to the students in North Gujarat.

Since 2014, under the dynamic leadership of Hon'ble Chairman, Shri. Prakash Patel, the trust has effectively achieved its goal to fulfill educational needs in the area through the Nootan Education cluster of 3 schools and 12 colleges on two separate campuses. The Trust commenced its first educational activity with the setting up of the Nootan High School in Visnagar.

Today, the trust successfully administers educational institutions right from primary schools to graduate and postgraduate colleges and other professional courses including Ph.D. programs. The trust's unswerving efforts towards the growth of education have earned its institutes many merits and a resilient name in the educational campaign of India.

CHIEF PATRON

Shri Prakashbhai Patel
(President, Sankalchand Patel University)
(Chairman, Nootan Sarva Vidyalaya Kelavani Mandal)

PATRON

Prof. (Dr.) Prafulkumar Udani
(Provost, Sankalchand Patel University)

COMPILED BY:
TEAM: CENTRE FOR RESEARCH & INNOVATION

Dr. Ujashkumar A Shah
(Dean, Research & Innovation, CRI, SPU)

Dr. Hiral Parikh
(Associate Dean, Research & Innovation, CRI,SPU)

Dr. Megha Barot
(Research Associate, CRI, SPU)

Mr. Dharm Patel
(Executive – Research & Innovation)

Dr. Santosh G Shah
(Head, CRI, SSIP Coordinator, SPU)

Dr. Pankaj Tripathi
(Associate Dean, Research & Innovation, SPU)

Dr. Ankur Singh
(Research Coordinator, Health Science, CRI, SPU)

Mr. Nand Kishore Singh
(Assistant Registrar- Research & Innovation)

Mr. Hitesh Limbachiya
(Admin Assistant – Research & Innovation)

SSIP COORDINATORS

Dr. Yash Bafna (NPDCH)

Dr. Darshana Pandya (BCA)

Dr. Rajat Prakash(NMCRC)

Dr. Chinmayi Joshi (NSCC)

Dr. Poonamath Chouhan (NACRC)

Ms. Jinal Patel(NCN)

Dr. Shailesh K Patel (SSPC)

Dr. Khushbu Patel (NPC)

Mr. Mehul S. Patel (SPCE)

Dr. Abhilasha Sonware (NHMCH)

Ms. Nisha Mevada (BBA-FDM)

Dr. JayeshThakrar (NCP)

Student Startup & Innovation Policy (SSIP)

Sankalchand Patel University has established the Student Startup & Innovation Policy (SSIP) Cell as per guidelines of Government of Gujarat. The Cell aims to create an integrated, state-wide, university-based innovation ecosystem to support innovations and ideas of young students of Gujarat State and provide a conducive environment for optimum harnessing of their creative zeal.

Objectives of Student Startup & Innovation Policy (SSIP)

1. Developing student centric Innovation and Pre-incubation Ecosystem for Students.
2. Creating an environment to help flourish creativity and an end-to-end support system in educational institutions providing ample support to ideas for better execution.
3. Build internal capacity of educational institutions and key components of the innovation ecosystem to enable deployed processes to make sustainable impact at scale.
4. Create pathways for mind to market by harnessing and handholding projects/research/ innovation/ ideas of students in Gujarat.
5. Creating and facilitating sectoral and regional innovation efforts in the state around educational institutions.
6. Create a common platform to showcase, support and upscale innovations for motivating stakeholders as well as giving opportunity to create value for money and value for many.

Summary of Projects

Fund from SSIP	Fund from SPU	Total Fund	No. of Projects
Rs. 7.55 Lac	Rs. 7.55 Lac	Rs. 15.10 Lac	40

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_36

1. **Institute** : Smt. S.S. Patel Nootan Science And Commerce College
2. **Project title** : Formulation and development of herbal alcohol free-hand sanitizer with moisturizing effect
3. **SSIP Fund Disbursed** : Rs. 86,568
4. **Name of Team leader** : Hardik B Bhatt
5. **Name of Other Students** : --
6. **Name of Mentor** : Dr. Nikunj B Patel
7. **Summary of the project** : The present invention generally relates to a formulation of alcohol free herbal hand sanitizer, even more particularly, the present invention relates to method for the production of formulation. The formulation of alcohol free herbal hand sanitizer contains plant extracts, essential oils and natural surfactant. The formulation imparts good moisturizing effect to skin. The formulation has adequate efficacy on viability of killing organisms.
8. **Photographs of project:**

9. **Achievement:**
   - Products prepared and available at Centre for Research & Innovation
   - Patent Application Number: 202221019423 / Granted Patent Number: 476942

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_38

1. **Institute** : Sankalchand Patel College of Engineering
2. **Project title** : Eco-Friendly Electric Vehicle
3. **SSIP Fund Disbursed** : Rs. 48,750/-
4. **Name of Team leader** : Patel Neel L
5. **Name of Other Students** : (1) Patel Bhargav A. (2) Patel Raj B. (3) Patel Vitt M. (4) Patel Harsh D. (5) Rathod Arjunsinh N. (6) Thakor Rudrasinh (7) Parmar Prakash R.
6. **Name of Mentor** : (1) Prof. Dhaval A Patel (2) Prof. Shreyas A Thakkar
7. **Summary of the project** : **A**dopting one of the clean technology option to add in pollution free campus for the aspirants, the students team has identified and created the "Electric Vehicle", a currently vital segment of Automobile Engineering) to produce the eco friendly electric vehicle to provide mobility inside our Sankalchand Patel University campus to solve the transportation problem from hostel to college for student and faculty members in the form of eco-friendly electric vehicle. With the objective to propose design and produce electric vehicle with robust in design with low cost construction, easy operating with comfort-ability to increase the productivity, we propose the project entitled as" DESIGN AND DEVELOPMENT OF ECO- FRIENDLY ELECTRIC VEHICLE" and vehicle is developed.
8. **Photographs of project:**

CAD Model of Eco Friendly Vehicle

Actual Model

9. **Achievement:**
   - Product prepared and available at Sankalchand Patel College of Engineering

Project ID: SPU_CRI_SSIP1.0_39

1. **Institute** : Sankalchand Patel College of Engineering
2. **Project title** : Solar Powered Battery Charging Station
3. **SSIP Fund Disbursed** : Rs. 45,000/-
4. **Name of Team leader** : Panchal Dhruvil V
5. **Name of Other Students** : (1) Patel Dhruv P. (2) Patel Jay S. (3) Chaudhry Pravin G. (4) Bhatiya Dhruvin V.
6. **Name of Mentor** : (1) Prof. Hiren B Parikh (2) Prof. Shreyas A Thakkar
7. **Summary of the project** : As this project was commissioned at the open parking area there is a need to keep the battery system into the box kind of cabinet so as to keep the batteries and invertor free from the environmental effect like Rain, Sun light and dust, damage, security and also for aesthetic point of view. The idea of housing space or cabinet was introduced. As the housing components are very heavy and fragile there was need to make the cabinet strong enough to withstand the dead load. Initially a square reinforcement frame of mild steel having square pipes was made. Solar charging station generates electricity from solar radiation and it used to charge the electric vehicle which is developed in our campus and it can also be used to provide electricity to the streetlight, also to the other electrical. This station generates 3 Kilo watt of green and clean electricity which is enough to charge the batteries of the electric vehicle for two times. With the developing technology and trends in automobile sector E-vehicles are growing faster and are becoming a very promising choice for the customers. There is constant need of electricity to charge electric vehicles. The promising alternative is to use solar energy to charge electric vehicles at ease.
8. **Photographs of project:**

9. **Achievement:**
   - Product prepared and available at Sankalchand Patel College of Engineering

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_40

1. **Institute** : Sankalchand Patel College of Engineering
2. **Project title** : Innovation Solar Tracking System For Generation of Electricity
3. **SSIP Fund Disbursed** : Rs. 49,000/-
4. **Name of Team leader** : Patel Swetu V
5. **Name of Other Students** : (1) Soni Mrugesh D. (2) Vaghela Hardiksinh S. (3) Patel Darshan D. (4) Darji Gaurav B. (5) Patel Siddhesh J. (6) Sathavara Rutul H.
6. **Name of Mentor** : (1) Dr. Dilip S Patel (2) Prof. Shreyas A Thakkar
7. **Summary of the project** : The SSIP project on Innovative Solar Tracking System for Generation of Electricity was carried out in house at the Mechanical Engineering Department. The Solar tracker has two degree of freedom i.e Horizontal Movement and Vertical Movement. The project was chosen with an aim to have low cost manual movement of solar panel according to the movement of sun to harness maximum solar energy. In tribal area, this type of tracking system may become very cost effective as at least one person can easily set the solar panel during the day at the fixed angle on hourly basis. The Output of the system was measured. There is a slight inconsistency in the reading of the total energy produced due to the cloudy atmosphere during those days.
8. **Photographs of project**

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9. **Achievement:**
   - Product prepared and available at Sankalchand Patel College of Engineering

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_25

1. **Institute** : Swami Sachchidanand Polytechnic College
2. **Project title** : Design and development of 1 KW capacity Hybrid Solar and Wind Turbine
3. **SSIP Fund Disbursed** : Rs. 31,312/-
4. **Name of Team leader** : Patel Ajaykumar Vipulbhai
5. **Name of Other Students** : ------
6. **Name of Mentor** : Dr.Shailesh K. Patel
7. **Summary of the project** : It is related to the utilization of waste wind and solar energy for the charging of battery. Battery will be used further for lightening the highway street light during night hours.

8. **Photographs of project:**

9. **Achievement:**
   - Prototype Prepared and available at Swami Sachchidanand Polytechnic College

Project ID: SPU_CRI_SSIP1.0_26

1. **Institute** : Swami Sachchidanand Polytechnic College
2. **Project title** : Design and development of solar power bicycle without chain drive
3. **SSIP Fund Disbursed** : Rs. 37,500/-
4. **Name of Team leader** : Patel Chandrakant Govindbhai
5. **Name of Other Students** : Patel Nisarg B.
6. **Name of Mentor** : Dr.Shailesh K. Patel
7. **Summary of the project** : Electric bicycle specifications have been decided for 40 kilometers range and for 110 kg load. It is suitable for moving for the local conveyance. It is still under progress
8. **Photographs of project:**

9. **Achievement:**
   - Prototype Prepared and available at Swami Sachchidanand Polytechnic College

Project ID: SPU_CRI_SSIP1.0_07

1. **Institute** : Nootan College Of Physiotherapy
2. **Project title** : Calf stretcher
3. **SSIP Fund Disbursed** : Rs. 30,000/-
4. **Name of Team leader** : Jankiben Alkeshkumar Pandya
5. **Name of Other Students** : (1) Jay K. Patel
6. **Name of Mentor** : Dr. Jayesh Thakarar
7. **Summary of the project** : Calf muscle stretching is done manually by physiotherapist, this equipment is used to facilitate stretching thus helping patients to stretch at ease.
8. **Photographs of project:**

9. **Achievement:** Product is developed and available at Nootan College of Physiotherapy

Project ID: SPU_CRI_SSIP1.0_10

1. **Institute** : Nootan College Of Nursing
2. **Project title** : Stretcho-wheel device
3. **SSIP Fund Disbursed** : Rs. 15000/-
4. **Name of Team leader** : Kadia Chaitali H.
5. **Name of Other Students** : -----
6. **Name of Mentor** : Prof. Priyanka Gurav
7. **Summary of the project** : It is three in one device. (Scoop stretcher, wheeled stretcher and wheelchair) it use for moving to the patient.

8. **Photographs of project:**

9. **Achievement:** Product is developed and available at Nootan College of Nursing

Project ID: SPU_CRI_SSIP1.0_03

1. **Institute** : Sankalchand Patel College of Engineering
2. **Project title** : Pesticides Spraying Drone
3. **SSIP Fund Disbursed** : Rs. 20,000/-
4. **Name of Team leader** : Prajapati Dhruv Amrutlal
5. **Name of Other Students** : (1) Meet P. Panchal (2) Dharatiben S. Patel
6. **Name of Mentor** : Prof. Ankur J. Goswami
7. **Summary of the project** : This project is to mainly overcome the ill-effects of pesticides on human beings and our team is trying hard to diminish the manufacturing cost and provide an affordable price for the device. As our father has a farm, they need to spray pesticides on their own so y that my father got into some dangerous disease so by showing those circumstances we are trying to figure out the problem of the farmers. As a result of the project we have developed the drone for spraying the pesticides in the farms**.**
8. **Photographs of project:**

9. **Achievement:** Prototype model of the Drone is available at Sankalchand Patel College of Engineering

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_11

1. **Institute** : Smt. S.S. Patel Nootan Science And Commerce College
2. **Project title** : Production of low cost bio-degradable sanitary napkins using fibrous husk of coconut
3. **SSIP Fund Disbursed** : Rs. 1,40,000/-
4. **Name of Team leader** : Margi K Prajapati
5. **Name of Other Students** : (1) Krimal M. Saigal (2) Sonal D. Lakhara (3) Janki K. Mehta (4) Maitri B. Prajapati (5) Janvi C. Soni (6) Bhumika D. Patel (7) Digvisha R. Mevada (8) Amit J. Darji
6. **Name of Mentor** : Dr.Hiteshkumar H. Mehta
7. **Summary of the project** : Coconut husk was collected and its fibers were separated, boiled for 30 minutes, dried. The dried husk fibers are arranged in a sheet form and it was pressed by fooder press of capacity 2 tonn. This pressed husk were cut of size about 9cm x 30cm. 5 Layers were made in manner bottom husk layer, cotton layer, husk layer, cotton layer and top husk layer. This sheets were packed in a cotton cloth of same dimension by stitching all sides, which will be nowonward called as a absorbent material. This absorbent material was then packed in another cotton cloth having wings on both the sides. This sanitary napkin was validated by 100 individual users with no side effects and good absorbent capacity. A patent was filed for the absorbent material; whose second examination is under process. Cellulase enzyme was synthesized by isolating cellulose degrading fungi from the soil. Currently, Cellulase Enzyme immobilization work is under progress.
8. **Photographs of project:**




9. **Achievement:** Patent Published & Granted

Patent No: 202021027392A,
Biodegradable Absorbent Article and Method of Making Thereof,
Dr. Hitesh Mehta
Date of filing: 28/06/2020, Date of Publication: 06-08-2021, Date of Grant: 15/03/2024

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_09

1. **Institute** : Smt. S.S. Patel Nootan Science And Commerce College
2. **Project title** : Synthesis of New Anti-Cancer Drugs
3. **SSIP Fund Disbursed** : Rs. 2,00,000/-
4. **Name of Team leader** : Sohilkhan Dolatkhan Chauhan
5. **Name of Other Students** : -----
6. **Name of Mentor** : Dr.Santosh Kumar
7. **Summary of the project** : Synthesized 2 new Thiosemicarbazone ligands and ten transition metal complexes. Characterized two ligands and their transition metal Complexes of Ni, Co, Zn, Cu, including bidentate base (2, 2-bipyridyl , 1,10 phenanthroline). The UV–vis, IR and 1H NMR and Mass spectra confirmed the synthesis of HL1, H2L2& [Ni(HL2)2] , [Co(HL2)2], [Zn(HL2)2], [Cu(HL2)(phen)]. The structure of ligand HL1 and H2L2 and its respective metal complexes are optimised using density functional theory (DFT. In the lab the MTT Assay method was used. The cytotoxicity of all the newly synthesized compounds were screened in vitro against the human cancer cell line (MCF-7) and monkey normal kidney cells lines (VERO). DNA fragmentation studies of novel compounds were performed to understand the mode of action of the drug. Doxorubicin is taken as control (reference) in the MTT Assay and DNA fragmentation studies. In another embodiment, Cytotoxicity studies shows that Nickel complex is 4.75-fold more potent than Doxorubicin. Additionally, Nickel complex is more selective towards MCF-7 cell lines as compared to compounds 2, 3, 4 and Doxorubicin. Nickel complex is safer for normal VERO cell lines as compared to Doxorubicin.
8. **Photographs of project:**

9. **Achievement:** Patent Application Number: 202321055711, A thiosemicarbazone compound with anticancer activity Chauhan Sohilkhan Dolatkhan, Dr. Santosh Kumar, Chauhan Sohilkhan Dolatkhan, Dr. Santosh Kumar, Dr. Vipul P Patel, Date of Filing: 20/08/2023, Date of Publish: 11/10/2023

Project ID: SPU_CRI_SSIP1.0_01

1. **Institute** : Sankalchand Patel College of Engineering
2. **Project title** : Cerebrum (Brain computer interface)
3. **SSIP Fund Disbursed** : Rs. 25,000/-
4. **Name of Team leader** : Patel Parth Sanjaykumar
5. **Name of Other Students :** (1) Bharat D. Chaudhari (2) Dhruv D. Patel (3) Het A. Raval (4) Yatrik M. Patel
6. **Name of Mentor** : Prof. Dishant R. Soni
7. **Summary of the project** : The MindWave Mobile 2: Brainwave Starter Kit is an innovative project offering an accessible entry point into the world of Brain-Computer Interface (BCI) technology. It introduces users to the MindWave Mobile 2 EEG headset, providing an affordable solution to explore brainwaves, enhance meditation practices, and develop custom applications. This wireless headset incorporates a BT/BLE dual-mode module and offers compatibility across iOS, Android, PC, and Mac platforms, making it versatile and convenient for users across various devices.

   Continuous Improvement: Ongoing advancements in algorithms and software development promise to enhance the functionality and capabilities of the Brainwave Starter Kit, offering users improved features and performance.

   Expansion of Applications: As understanding of brainwave patterns evolves, the potential applications of EEG technology are expected to expand, opening new avenues for innovation and discovery in areas such as mental health, gaming, and beyond.

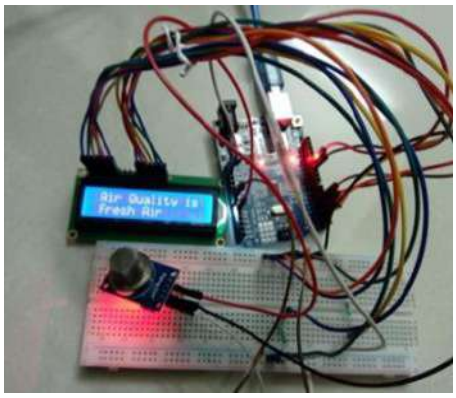
8. **Photographs of project:**

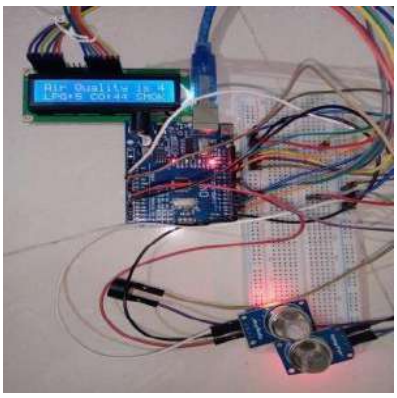
9. **Achievement:** Instrumental facility created and available at Sankalchand Patel College of Engineering

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_02

1. **Institute** : Sankalchand Patel College of Engineering
2. **Project title** : An Iot based Air Pollution Monitoring System
3. **SSIP Fund Disbursed** : Rs. 22,000/-
4. **Name of Team leader** : Patel Aniketkumar Narendrabhai
5. **Name of Other Students** : (1) Kathan R. Patel (2) Rachit V. Patel
6. **Name of Mentor** : Prof. Ankur J. Goswami
7. **Summary of the project** : Where pollution has become a major problem around the world, air pollution is the most dangerous, shocking and severe pollution among other pollutions e.g. water pollution, soil pollution, noise pollution, light pollution, thermal pollution etc. Air pollution is the major cause of diseases like asthma, cancer, bronchitis, birth defects and immune system like diseases. This system implements the combination of an android app, server, gas sensors (CO2, CO, LPG, and CH4) to sense the air quality of the environment and shows the real condition of air. Solving the draw backs of existing air quality sensors this device can be used to monitor various gasses at a time. The most demanding thing would be this system will give the real time data and will show the quality of the air based on the standard air quality. The system will give the user the indication of the air quality and based on given parameters it will let the user know how much the environmental air is polluted or safe. This system will do everything on behalf of human in such a way that for a smart city when people will have less time for spending and there will be more industry and air will be more polluted this device will let people know how safe the air is. The goal is to make the system as reasonable as possible so that people from every society background can use this and if some research organization wants to do further research then if some nominal amount of money is invested then it would be a great solution to install a weather station thus air quality monitoring system. This project provides a combination of process of sensing several gas levels in the air and also the ambient temperature and humidity, thus sensing the quality of the air. The levels of the gases and the temperature is displayed in a LCD display panel, which continuously shows the real time output values of the gas sensors, temperature and humidity sensor.
8. **Photographs of project:**





9. **Achievement:** Instrumental facility created and available at Sankalchand Patel College of Engineering

Project ID: SPU_CRI_SSIP1.0_04

1. **Institute** : Narsinhbhai Patel Dental College and Hospital
2. **Project title** : Designing of new V-shaped plate and use it in surgical fixation of mandibular fracture
3. **SSIP Fund Disbursed** : Rs. 55,000/-
4. **Name of Team leader** : Dr. Rahulkumar Khimjibhai Badgha
5. **Name of Other Students** : ----
6. **Name of Mentor** : (1) Dr.Anil Managutti (2) Dr.Nirav Patel
7. **Summary of the project** : We designed V-shape plate for mandibular fracture and used it in 8 patients in our institute. This newly designed V-plate involve both lines of osteosynthesis within a single plate, favorable for application of load on both the incisors and molars in fracture of symphysis and parasymphysis, easier to negotiate the mental nerve so that postoperatively also impart 2-dimensional stability. The duration of surgery and fixation of fracture also reduced.

8. **Photographs of project:**

9. **Achievement:** Prototype is developed and available at Narsinhbhai Patel Dental College and Hospital

Project ID: SPU_CRI_SSIP1.0_05

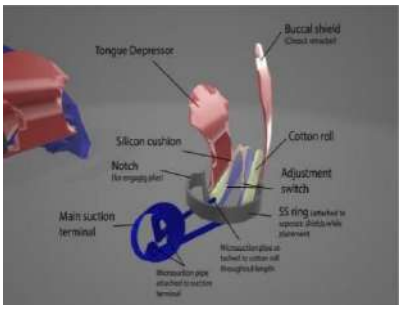
1. **Institute** : Narsinhbhai Patel Dental College and Hospital
2. **Project title** : Herbal toothpaste-gum care
3. **SSIP Fund Disbursed** : Rs. 6,500/-
4. **Name of Team leader** : Chandni Thakar
5. **Name of Other Students** : (1) Maitri Patel (2) Jal Shah
6. **Name of Mentor** : Dr.Dhaval Mehta
7. **Summary of the project** : Toothpaste created but was little abrasive and no foaming. Testing was done from pharmacy lab.

8. **Photographs of project:**

9. **Achievement:** Product is developed and available at Narsinhbhai Patel Dental College and Hospital

Project ID: SPU_CRI_SSIP1.0_20

1. **Institute** : Narsinhbhai Patel Dental college And Hospital
2. **Project title** : Auto adaptive matrices
3. **SSIP Fund Disbursed** : Rs. 20,000/-
4. **Name of Team leader** : Dhruvi Patel
5. **Name of Other Students** : -----
6. **Name of Mentor** : Dr. kailash Attur
7. **Summary of the project** : Multipurpose Matrix retainer with tongue depressor, buccal shield, cotton roll placement, suction terminal. Easy to use device. Addition of silicon cushion so that it does not impinge the soft tissues. Tongue depressor is added so that there is restricted movement of the tongue. Buccal shield is added to retract the buccal mucosa. A slot for suction terminal is added for placement of suction tube.
8. **Photographs of project:**



9. **Achievement:**
   - Prototype Prepared and available at Narsinhbhai Patel Dental College & Hospital
   - Patent Application Number: 202121019638 - MULTIPURPOSE INTRAORAL DEVICE

Project ID: SPU_CRI_SSIP1.0_21

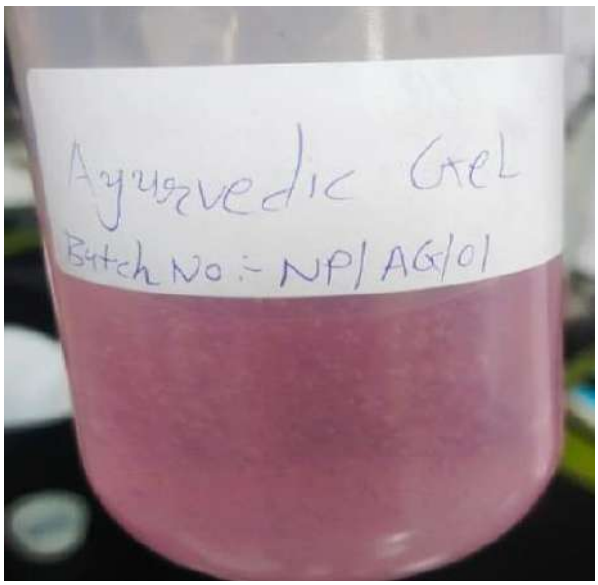
1. **Institute** : Narsinhbhai Patel Dental college And Hospital
2. **Project title** : To design, develop and evaluation of resorbable cone for primary teeth root canal filling
3. **SSIP Fund Disbursed** : Rs.6,250/-
4. **Name of Team leader** : Dr. Matangi Joshi
5. **Name of Other Students** : (1) Dr. Rutu Patel (2) Dr. Charmi Patel
6. **Name of Mentor** : (1) Dr. Yash Bafna (2) Dr.Shoba Fernandes
7. **Summary of the project** : The fabrication of cone was not possible using Endoflas and Zinc oxide eugenol due to consistency and hardness of the material. Another shortcoming was the failure of fabrication of die for narrow canals.
8. **Photographs of project:**

9. **Achievement:**
   - Prototype Prepared and available at Narsinhbhai Patel Dental College & Hospital

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_35

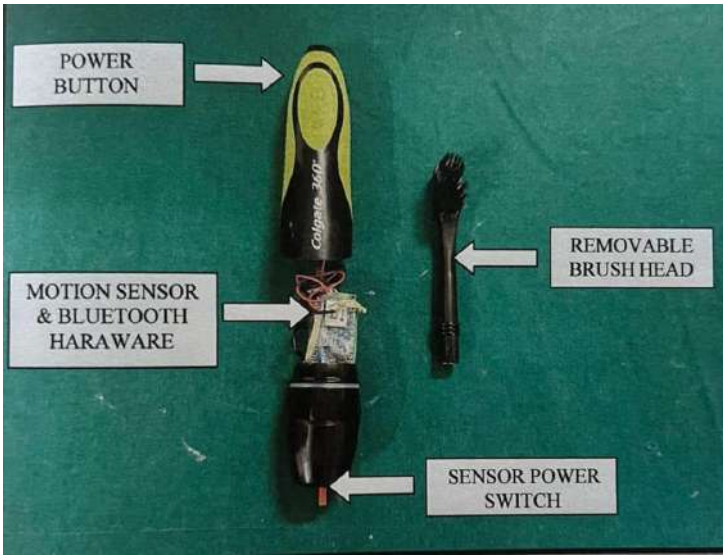
1. **Institute** : Smt. S.S. Patel Nootan Science And Commerce College
2. **Project title** : Formulation and Development of ayurvedic moisturizing gel with antimicrobial activity
3. **SSIP Fund Disbursed** : Rs. 94,278/-
4. **Name of Team leader** : Nayankumar D Prajapati
5. **Name of Other Students** : (1) Patel Richaben N. (2) Rabadi Mohsinali M. (3) Patel Seema V. (4) Joshi Vatsal H. (5) Kalasariya Haresh S.
6. **Name of Mentor** : Dr. Nikunj B Patel
7. **Summary of the project** : As coronavirus continues its spread, what ingredients in these alcohol-based sanitizers and synthetic hand sanitizers, and how effective they are? Nowadays, great interest has been shown by consumers in natural sources, instead of synthetic ingredients and alcohol-based sanitizer. The new thing is, the formulation will not be prepared by using any toxic ingredients and alcohol (which have many side effects). It contains only and only naturally obtained ingredients with antimicrobial and with good moisturizing effect. These Natural ingredients improve skin health as well as very effective against microbes. Cost-effective formulation develops without alcohol and synthetic ingredients. It can be used on whole body for moisturization and also with antimicrobial activity.
8. **Photographs of project:**



9. **Achievement:**
   - Products prepared and available at Centre for Research & Innovation

Project ID: SPU_CRI_SSIP1.0_37

1. **Institute** : Narsinhbhai Patel Dental college And Hospital
2. **Project title** : Smart Toothbrush: an application of Bluetooth hardware and sensors on tooth brush
3. **SSIP Fund Disbursed** : Rs. 50,000/-
4. **Name of Team leader** : Vijay Yogi
5. **Name of Other Students** : Solanki Jigar
6. **Name of Mentor** : (1) Dr. Ajay Kubavat (2) Dr. Shrish Charan (3) Dr. Ankur Singh (4) Dr. D. J. Shah (5) Prof. Mehul Patel
7. **Summary of the project** : This study aimed to assess the effectiveness of plaque removal using manual and powered toothbrushes in orthodontic patients. The objectives included quantifying plaque formation at various assessment points, comparing efficacy between the two groups, and evaluating specific care areas. The in-vivo study involved 60 adolescents with fixed orthodontic appliances, randomly assigned to either a powered or manual toothbrush. Plaque removal was measured using the Tursky Modification of the Quigley-Hein Plaque Index (TMQHPI) and Modified Quigley-Hein Index (MQH) at 2 and 6 weeks. Results indicated a statistically significant reduction in plaque scores for both groups, with the powered toothbrush group showing a higher efficacy than the manual toothbrush group. The conclusion suggests that powered toothbrushes are more effective in plaque removal.
8. **Photographs of project:**

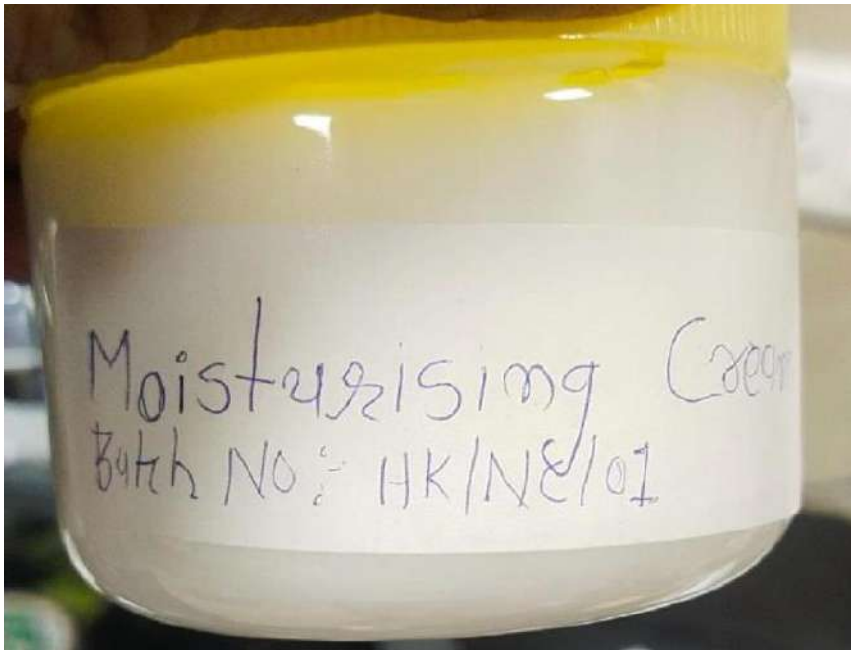


9. **Achievement:**
   - Product prepared and available at Narsinhbhai Patel Dental college

Project ID: SPU_CRI_SSIP1.0_30

1. **Institute** : Smt. S.S. Patel Nootan Science And Commerce College
2. **Project title** : Marine Algae in Skin Cosmetics: An Alternative Way
3. **SSIP Fund Disbursed** : Rs. 1,00,000/-
4. **Name of Team leader** : Haresh S. Kalasariya
5. **Name of Other Students** : -------
6. **Name of Mentor** : Dr. Nikunj B. Patel
7. **Summary of the project** : It contains an extract of the brown alga, Iyengaria stellata which was not previously used in multipurpose skin cosmetic formulations. The product provides multipurpose benefits and is safer to use. It contains natural preservatives and emulsifiers. The product is natural, economical, and cost-effective. The product reveals its natural purity.

8. **Photographs of project:**



9. **Achievement:**

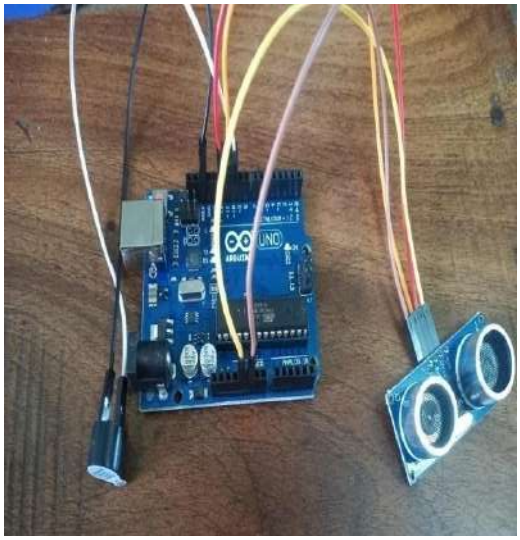
- Products prepared and available at Centre for Research & Innovation

Patent Application Number: 202221019422 : NATURAL SKIN CARE FORMULATION

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_32

1. **Institute** : Sankalchand Patel College of Engineering
2. **Project title** : Smart Social Distancing Gadget
3. **SSIP Fund Disbursed** : Rs. 6,500/-
4. **Name of Team leader** : Patel Akshita A.
5. **Name of Other Students** : Barad Komalkunvarba D.
6. **Name of Mentor** : Prof. Hiral M Patel
7. **Summary of the project** : The main aim of the shoes is to make sure a proper distance is maintained among individuals so that community spread of virus can be diminished. Here ultrasonic sensors are installed on four sides of the shoes so it that measure the minimum distance to be maintained by the individual in 360 degrees. Also a buzzer is installed which alerts the individual by giving a buzzer upon not maintaining a minimum distance.
   A light signal is also installed for example, if an object is 6 feet far away from sensor green light will be on that means we are in a safe zone. If an object is 4 feet far away from sensor orange light will be on that define danger zone and if an object is 2 feet far away from sensor red light will be on that define most danger zone and buzzer will be ringing. So, a person can change their position immediately.
   In future maybe we replace buzzer with vibration motor and if we will find any sensor damage issues then we will replace simple sensor into waterproof ultrasonic sensor.
8. **Photographs of project:**

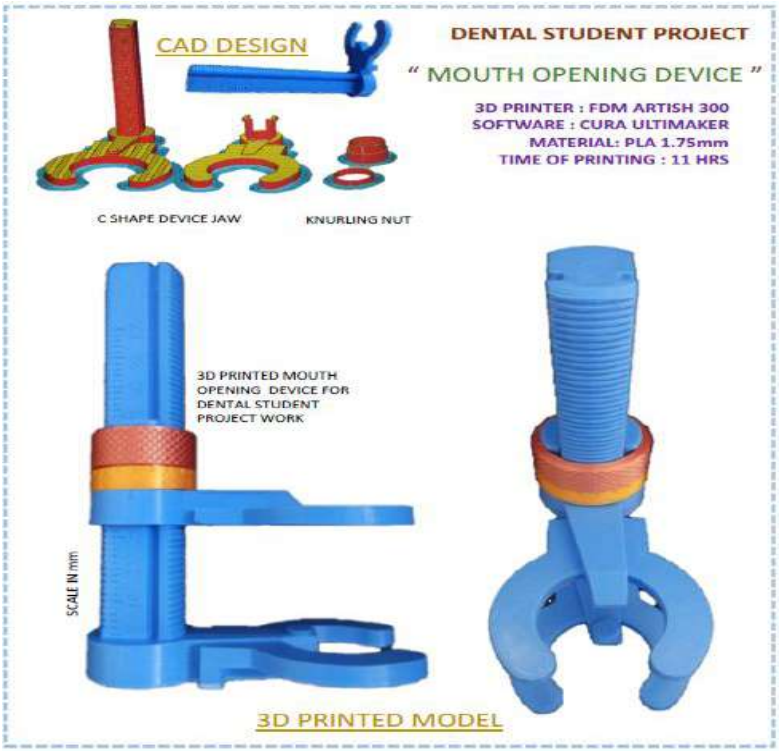



9. **Achievement:**

- Products prepared and available at Centre for Research & Innovation

Project ID: SPU_CRI_SSIP1.0_23

1. **Institute** : Narsinhbhai Patel Dental college And Hospital
2. **Project title** : Digitally calibrated mouth opening device
3. **SSIP Fund Disbursed** : Rs. 12,500
4. **Name of Team leader** : Dr. Riddhi Goswami
5. **Name of Other Students** : Dr. Raksha Chavada
6. **Name of Mentor** : Dr. Dhaval Mehta
7. **Summary of the project** : Oral submucous fibrosis (OSMF) is a chronic, progressive disease that affects the oral cavity, particularly the mucosa and submucosa of the oral cavity. Initially, individuals may experience burning sensations in the mouth, difficulty in opening the mouth, and a sensation of a fibrous band when the cheek is stretched. It is primarily associated with betel quid, a combination of areca nut, slaked lime, catechu, and other ingredients. Betel quid is commonly chewed in various forms in many parts of Asia. This project aims to develop a digitally calibrated mouth-opening device instrument to measure and increase mouth opening. 3d design tried**.** But better design we are trying for.
8. **Photographs of project:**



9. **Achievement:**
   - Prototype Prepared and available at Narsinhbhai Patel Dental College & Hospital

Project ID: SPU_CRI_SSIP1.0_24

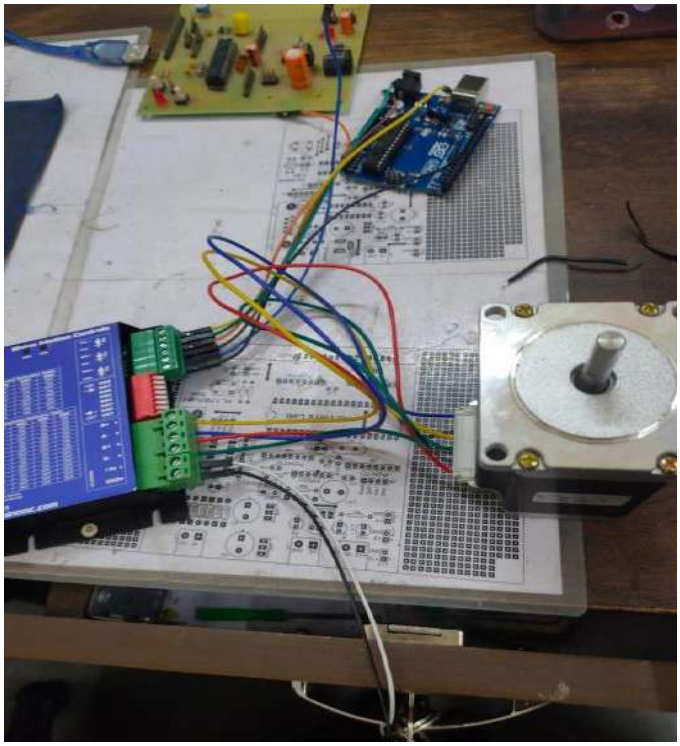
1. **Institute** : Nootan college of Nursing
2. **Project title** : Mobile Toilet Chair
3. **SSIP Fund Disbursed** : Rs. 15,000/-
4. **Name of Team leader** : Ashutosh Dineshkumar Vaishnav
5. **Name of Other Students** : Seema Chaudhary
6. **Name of Mentor** : Prof. Divya Rohit
7. **Summary of the project** : Mobile Toilet Chair are use when it is difficult to travel to the toilet and support over the toilet. It is very comfortable chair with water tank and water sprayer, and also available stool collection bag. It is one time use and throw bag. Hand rest supporters are available in chair. It is use in travel, hospital and home.
8. **Photographs of project:**

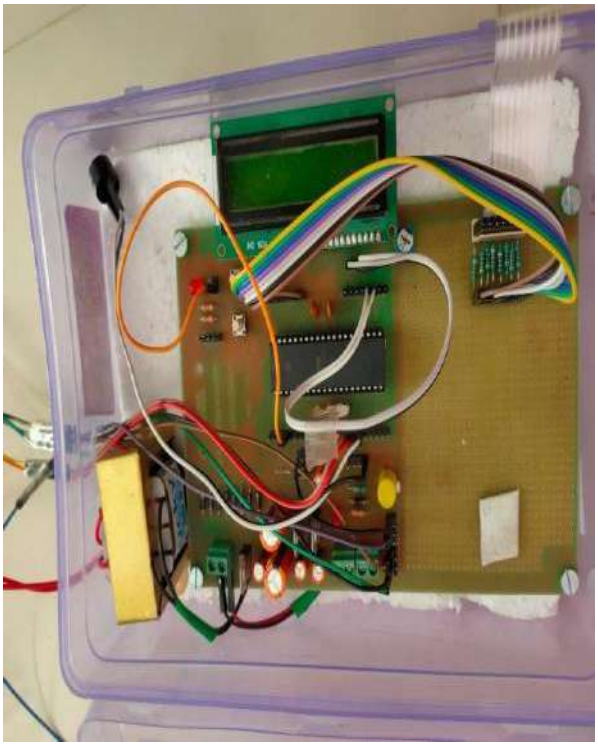
9. **Achievement:**
   - Prototype Prepared and available at Nootan College of Nursing

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_27

1. **Institute** : Nootan College of Physiotherapy
2. **Project title** : Equipment of bridging exercise
3. **SSIP Fund Disbursed** : Rs. 6,250/-
4. **Name of Team leader** : Patel Rajna M
5. **Name of Other Students** : ------
6. **Name of Mentor** : Dr. Sakshi Thakrar
7. **Summary of the project** : This equipment will be used to strengthen the pelvic floor muscles and support the muscles.
8. **Photographs of project:**





9. **Achievement:**
   - Prototype Prepared and available at Nootan College of Physiotherapy

Project ID: SPU_CRI_SSIP1.0_28

1. **Institute** : Smt. S.B. Patel Institute of Business Management
2. **Project title** : Handmade eco-friendly jewellery
3. **SSIP Fund Disbursed** : Rs. 6,250/-
4. **Name of Team leader** : Patel Agnaya Amarkumar
5. **Name of Other Students** : Ani V. Patel
6. **Name of Mentor** : Prof. Twinkal J. Parmar
7. **Summary of the project** : Quilling is the process of coiling paper & forming the coils in to different designs. Quilling is a fun, easy way to create earing designs. There are many different ways to make quilling earrings. We can form the quilling in to domes & cons, level the paper quelling coils flat to make interesting designs, or create a combination of the two types of quilling designs.

8. **Photographs of project:**



9. **Achievement:**

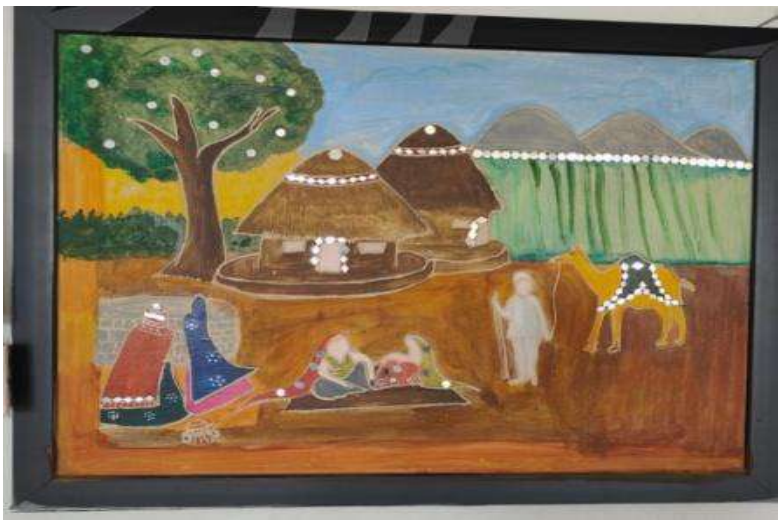
- Prototype Prepared and available at Nootan Institute of Design & Communication

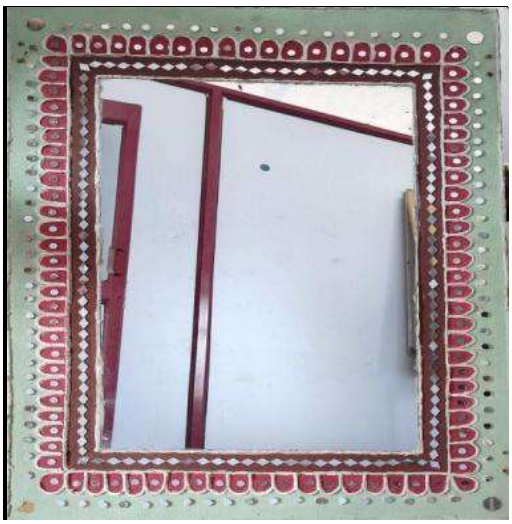
Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_29

1. **Institute** : Smt. S.B. Patel Institute of Business Management
2. **Project title** : Mud and mirror work represent on plywood
3. **SSIP Fund Disbursed** : Rs. 10,000/-
4. **Name of Team leader** : Patel Sweety Kaushikbhai
5. **Name of Other Students** : Jigna S. Patel
6. **Name of Mentor** : Prof. Twinkal J. Parmar
7. **Summary of the project** : This type of work made under ethical working condition. All people & Community are easily Showy & Aristocratic Knowledge of our traditional craft.

8. **Photographs of project:**



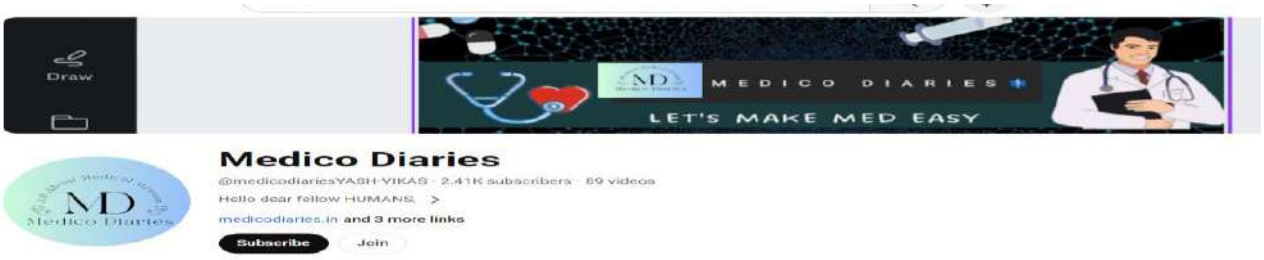


9. **Achievement:**
   - Products prepared and available at Centre for Research & Innovation and Nootan Institute of Design & Communication

Project ID: SPU_CRI_SSIP1.0_31

1. **Institute** : Nootan Medical College and Research Centre
2. **Project title** : One Touch Platform For MBBS Aspirants
3. **SSIP Fund Disbursed** : Rs. 90,000/-
4. **Name of Team leader** : Yash K Mehta
5. **Name of Other Students** : (1) Chaniyara Herit N. (2) Mehta Foram P. (3) Patel Anchal K.
6. **Name of Mentor** : Dr.Neha Vijay Jain
7. **Summary of the project** : Here, this channel is related to MEDICAL STREAM. We are here not JUST sharing the handmade notes, guidance for study, ppts, diagrams, tables, timetables, explanation of topics BUT ALSO we are sharing our handhold experience of NEET, 1ST MBBS and STRUGGLE OF MEDICAL STREAM. So, tighten your seat belts and off we go..... - Total NEET GUIDANCE, timetable for studies, notes, journey from a mediocre to a Medico, How to get into MBBS all at one platform. - Admission guidance, what is best for you, information and answer to Your questions. - All about MBBS. - Handmade notes, easy to reproduce diagrams, practical tips, all the necessary information to pass 1st university professional exam. - Not just study related talks, but also other tips and tricks to excel and enjoy your college life. -Always available for you, mail us any time of the day and you'll get your answer about anything, I repeat ANYTHING related to MEDICAL.

8. **Photographs of project:**



9. **Achievement:**

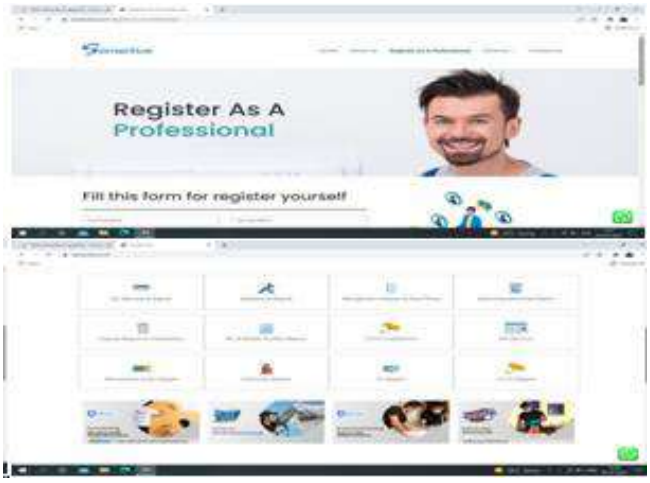
	Website of Medico Diaries: medicodiaries.in
	Instagram acc.instagram.com/p/CCYHfnpAdaM/?igshid=l75swxc4cmw6
	Telegram acc.t.me/medicodiaries1
	Facebook pagefacebook.com/groups/975128272938872/?ref=share
	www.youtube.com/@medicodiariesYASH-VIKAS, 2.41K subscribers, 89 videos, 261,042 views

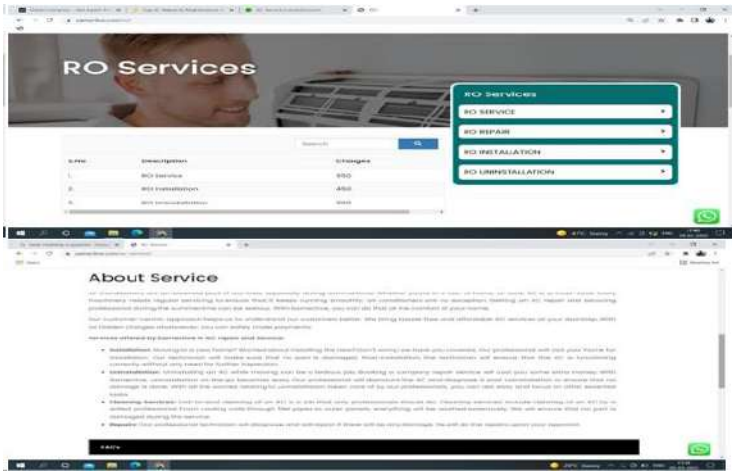
Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_33

1. **Institute** : Sankalchand Patel College of Engineering
2. **Project title** : Electronic Services
3. **SSIP Fund Disbursed** : Rs. 50,000/-
4. **Name of Team leader** : Sagar D Rokad
5. **Name of Other Students** : Raval Meet S.
6. **Name of Mentor** : Prof. Mehul S Patel
7. **Summary of the project** : Nowadays People don't get Electronics services easily and if they have to repair any Electronics items they have to carry that item to the shop to repair that thing. It wastes lots of Customer Valuable time and also if the Items are heavy Weighted they have to face lots of other difficulties too. So by our Website people can easily contact us and according to Customer Problem We provide quick Services at their Home and People can find all types of services and Repairing at one place.

8. **Photographs of project:**





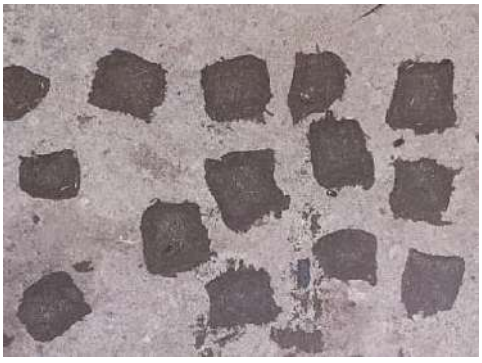
9. **Achievement:** Developed website: www.samective.com

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_34

1. **Institute** : Smt. S.S. Patel Nootan Science And Commerce College
2. **Project title** : Formulation of Nutritablet for plant growth Development
3. **SSIP Fund Disbursed** : Rs. 40,000/-
4. **Name of Team leader** : Patel Lensi N
5. **Name of Other Students** : (1) Patel Khushi D. (2) Sathvara Smit D. (3) Darji Meet S. (4) Patel Foram J. (5) Modi Prince J. (6) Kalasariya Haresh S.
6. **Name of Mentor** : Dr. Nikunj B Patel
7. **Summary of the project** : The new thing is Nutritablet helpful to supply water with nutrients without wasting a bulk of water as well as fertilizer. And plant growth-promoting components are totally from natural source marine algae.
8. **Photographs of project:**



9. **Achievement:**
   - Products developed and available at Centre for Research & Innovation

Project ID: SPU_CRI_SSIP1.0_06

1. **Institute** : Narsinhbhai Patel Dental college And Hospital
2. **Project title** : Use of Curry leaf in antimicrobial mouthwash
3. **SSIP Fund Disbursed** : Rs. 6,500/-
4. **Name of Team leader** : Shelvi Vachhani
5. **Name of Other Students** : (1) Anjali Trivedi (2) Ritika Trivedi (3) Aarohi Shah
6. **Name of Mentor** : (1) Dr.Charu Agrawal (2) Dr.Hiral Parikh
7. **Summary of the project** : The project was started to prepare a herbal mouthwash using widely available curry leaves. Preparation was done and primary testing was done at the Nootan Pharmacy College, and more improvements were to be made. Later, the product was planned to be tested on the patients for its efficacy and acceptance. But, as the students passed out of the BDS program and the principal mentor also left the institute, the project has been paused since then. Currently, no final preparation of mouthwash has been done.

8. **Photographs of project:**

9. **Achievement:** Product is developed and available at Narsinhbhai Patel Dental College and Hospital

Project ID: SPU_CRI_SSIP1.0_08

1. **Institute** : Nootan College of Physiotherapy
2. **Project title** : Accupuncture-Accupressure Combo modality
3. **SSIP Fund Disbursed** : Rs. 5000/-
4. **Name of Team leader** : Patel Vanipkumar Satishbhai
5. **Name of Other Students** : ----
6. **Name of Mentor** : Dr.Jayesh Thakarar
7. **Summary of the project** : Project was undertaken with an aim to develop a Combo modality to offer advantages of Acupuncture and Acupressure in one machine. This can be used as a one of the physiotherapy treatment approach for patients with various Health conditions. These items included Acupuncture needles of different sizes, TENS (used in combination with programs for Acupressure/Acupuncture/Cupping etc.), Hot packs (used pre/post treatment) and electric massager (used pre/post treatment). The bills of the same are attached with this report.

8. **Photographs of project:**

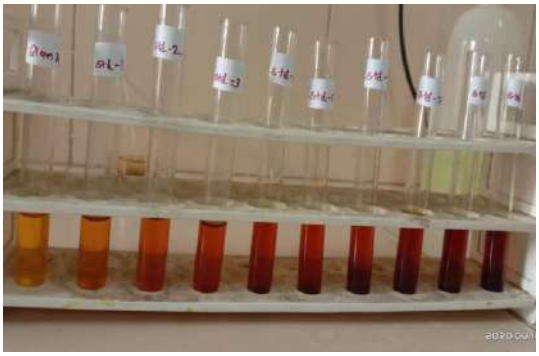
9. **Achievement:** Instrumental facility created and available at Nootan College of Physiotherapy

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_12

1. **Institute** : Smt. S.S. Patel Nootan Science and Commerce College
2. **Project title** : Amylase Production of Solid-State Fermentation
3. **SSIP Fund Disbursed** : Rs.20,000/-
4. **Name of Team leader** : Patel Ruchi Kiranbhai
5. **Name of Other Students** : (1) Bina Rabari (2) Ruchi Patel (3) Nima Patel (4) Priya Patel
6. **Name of Mentor** : Prof. Ankita Adesara
7. **Summary of the project** : Amylase production by solid-state fermentation of agro-industrial wastes using Bacillus sp. Aspergillus spp. Or any other best isolate. There are researches using wheat bran, gram husk, rice bran and isabghul husk. We are going to use isabghul husk as SSF media. Isabghul husk is produced in large amount in unjha region of North Gujarat. It is majorly used as animal feed. So we are trying to use it for amylase production which can reduce the price of amylase production in our region.

8. **Photographs of project:**



9. **Achievement:** Product developed and available at Nootan Science & Commerce College

Project ID: SPU_CRI_SSIP1.0_13

1. **Institute** : Nootan Pharmacy College
2. **Project title** : Drug design and development of novel naturally occurring antihypertensive agent using computational techniques
3. **SSIP Fund Disbursed** : Rs. 1,20,000/-
4. **Name of Team leader** : Patel Jimishkumar Rameshbhai
5. **Name of Other Students** : Vanita Marvaniya
6. **Name of Mentor** : Dr.Hirak V. Joshi
7. **Summary of the project** : Aliskiren is a first USFDA approval synthetic derivative as direct renin inhibitors. But Aliskiren has some major limitation like
   - Aliskiren has four chiral centre Which is difficult to synthesize
   - It may cause birth defects in the baby if taken during pregnancy
   - Administration it should be avoided along with fatty food

   It may case patient experienced the side effects: alanine aminotransferase increased, aspartate aminotransferase increased, blood creatine phosphokinase increased, blood sodium decreased, disease progression, electrolyte imbalance, grand mal convulsion, tongue biting. Considering above mentioned facts it was thought of making novel renin inhibitors. Synthesize drug was one chiral centre, may due to less side effect. We have Synthesize and natural marker novel renin inhibitor and check in vitro bioassay testing materials.

8. **Photographs of project:**

9. **Achievement:** Research Papers Published:

   1) Exploring novel endothelin receptor blocker as anti-hypertensive agents identified from a natural drugs library using induced fit docking and biological assay.

   2) In silico screening of natural compounds to identify lead as interleukin 17A receptor blockers as antihypertensive agents.

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_14

1. **Institute** : Nootan Pharmacy College
2. **Project title** : Formulation and evaluation of nanosized dosage form for poorly soluble drug
3. **SSIP Fund Disbursed** : Rs.25,000/-
4. **Name of Team leader** : Patel Nisha C.
5. **Name of Other Students** : -----
6. **Name of Mentor** : Dr.Hitesh A. Patel
7. **Summary of the project** : To perform preformulation studies and drug interaction studies for selected drug Canaglifozin. To prepare nanosuspension containing canaglifozin by media milling method. To screen the stabilizer, stirring time, amount of Zirconium Oxide beads, amount of drug and stirring speed with a set of experiments with Plackett–Burman (PB) screening design. To characterize various physico-chemical properties of the canaglifozin nanosuspension. Evaluation of the optimized formulation for in vitro. To compare *in vitro* dissolution profiles of prepared formulations with that of pure drug and respective marketed formulations. For convenience in handling dosage form, the lyophilized product shall be converted to the solid unit dosage form like pellets. In the present research work, canagifozin was used as a model drug and its nanosuspensions were prepared using media milling method for the dissolution improvement. Optimized nanosuspension was used as a binder for the preparation of immediate release (IR) pellets, where Micro crystalline cellulose MCC was used as a pelletizing agent and sodium starch glycolate (SSG) and Kyron T 314 was as super disintegrant and optimize the formula using 2^3 factorial design by extrusion/spheronization technique. Design Expert 12.0 was utilized. Design consisted of 8 experimental trials (Table 3), with 2 levels of 3 independent variables. The independent variable include, conc. of sodium starch glycolate (A) at 5 and 10%, spheronization speed (B) at levels 600, 900 rpm and Spheronization time (C) at 10, 15 min. were selected for evaluation of immediate release pellets and disintegration time (R1), Drug release at 10 min (R2) as dependent variables. From the 8 experimental batches PF5 was selected as optimized batch. Flow characteristics, drug content, disintegration time, In-vitro dissolution study, DSC study, FTIR study, XRD pattern and SEM analysis of PF5 was evaluated and it compare with pellets from pure drug (PDP). Then stability study of optimized formulation as per ICH guide line was carried out.
8. **Photographs of project:**

9. **Achievement:** Research Papers Published:

1) Application of Plackett-Burman Screening Design in Optimization of Process Parameters for Formulation of Canaglifozin Nanosuspension
2) A recent Solidification Approach for nanosuspension: Formulation, Optimisation and Evaluation of Canagliflozin Immediate Release Pellets.

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_15

1. **Institute** : Nootan Pharmacy College
2. **Project title** : Synthesis and design of some novel dairy1 urea derivatives
3. **SSIP Fund Disbursed** : Rs.40,000/-
4. **Name of Team leader** : Vanita Hirenkumar Marvaniya
5. **Name of Other Students** : Jimishkumar R. Patel
6. **Name of Mentor** : Dr.Hirak V. Joshi
7. **Summary of the project** : Over the years, a multitude of molecular mechanism studies about cancer have been conducted. We are now in an era with many more molecular targets for particular cancers than ever before. However, RAS is still a notorious oncogene, driving almost a third of all tumors. Cancer, the uncontrolled growth of cells, is a major cause of death throughout the world. In 2007, it killed ~7,900,000 people worldwide, a value that represents ~13% of total deaths. While great strides have been made in the treatment of cancer over the past 50 years, it continues to be a major health concern and, therefore, extensive efforts have been devoted to searching for new therapeutic approaches. Based on literature search and docking study plan to synthesis of biaryl urea derivatives. After Particular derivative synthesis isolated by column chromatography and characterized by spectroscopy techniques. Finally, characterized compounds will be screen for cytotoxic activity.
8. **Photographs of project:**

9. **Achievement:** Research Papers Published:

   1) Molecular Docking, In silico Prediction and In vitro Anti-Cancer Activity studies for Nitrogen Rich Hybrids of Diaryl Urea-Pyridine Adducts.

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_16

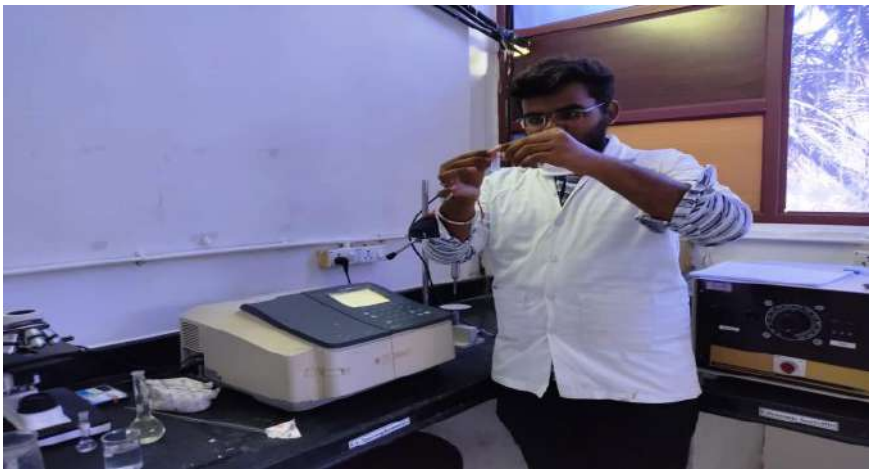
1. **Institute** : Nootan Pharmacy College
2. **Project title** : Development and evaluations of transdermal drug delivery system
3. **SSIP Fund Disbursed** : Rs.25,000/-
4. **Name of Team leader** : Momin Rima Sadikbhai
5. **Name of Other Students** : -----
6. **Name of Mentor** : Prof. Nidhi P. shah
7. **Summary of the project** : Transdermal Microemulsion based gel of antifungal drug is developed for the effective treatment of fungal disease. Drug containing microemulsion is converted into gel employing polymer without affecting its structure from which the drug gets released in a sustained and controlled manner. From literature Review procurement of various drug, oils, Surfactants and Co-Surfactants has been done. The Preformulation study of drug such as Fourier transform infrared spectroscopy (FTIR), Differential Scanning Colorimetry (DSC), and Scanning of λmax of Sulconazole nitrate by UV spectrophotometer were carried out. Followed by Solubility of drug in various oil, Surfactant and Co surfactant was check through which Capmul as oil, Tween 80 as Surfactant and Triacetin as Co Surfactant were selected. Psuedoternaryphase diagram of oil, surfactants/ co- surfactants (S/CoS) and water were developed using water titration method. From which surfactants/ co- surfactants (S/CoS) ratio (1:1) was fixed and by applying Software Design, checkpoint batches were prepared of Microemulsion. Optimized Microemulsion was evaluated for Globule size, solubility, viscosity, pH, % Transmittance, Conductivity and Zeta potential. Further Microemulsion based gel was prepared by adding 1.5% Carbopol 940 as gelling agent and evaluated for Stability study, drug content, Antifungal zone Inhibition study and In vitro drug release. Hence the microemulsion based gel of sulconazole nitrate was successfully formulated for topical delivery to treat fungal infections. By seeing these results it can be concluded that microemulsion based gel of sulconazole nitrate is promising for topical delivery against fungal infections.
8. **Photographs of project:**

9. **Achievement:** Transdermal Formulation is developed and Research Paper is under process.

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_17

1. **Institute** : Nootan Pharmacy College
2. **Project title** : Development and evalution of in-situ gelling system for treatment of glucoma
3. **SSIP Fund Disbursed** : Rs. 10,000/-
4. **Name of Team leader** : Karm Atulbhai Patel
5. **Name of Other Students** : -----
6. **Name of Mentor** : Dr.Khusbu S. Patel
7. **Summary of the project** : In situ drug delivery systems that are in sol form before administration in eye, but once administered, undergo gelatin *in situ*, to form a gel. Brimonidine is an alpha adrenergic agonist drug which is used in treatment of glaucoma. Ophthalmic in-situ gel now days proved a sustained drug delivery in Glaucoma. The formulation of in situ gels for eye which carries the advantages like easy for administration, reduces frequency of dose and improves patient compliance. The formulation of in-situ gel depends on phase transition system or sol-gel transition system. Preformulation study like, organoleptic properties, solubility in different solvent and melting point of Brimonidine, Drug compatibility study by DSC and FTIR was done. Preparation of in situ gel using ion sensitive polymer and evaluated different parameters of in situ gel formulations is completed. The Evaluation parameter of in situ gel like drug content uniformity in methanol*, in vitro* drug release study is completed. The sterility test by using FTM and SCDM of optimized formulation is completed and pass from sterility testing. The selected formulation showed sustained release for the period of 8 hours thus showing increased residence and contact time with eye. All studies showed favorable results thus, *in situ* gelling system can be considered as an alternative for conventional ophthalmic drops.
8. **Photographs of project:**



9. **Achievement:** Research Papers Published:

   1) Development and Evaluation of Ion-sensitive In-situ gelling System for the treatment of Glaucoma

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_18

1. **Institute** : Nootan Pharmacy College
2. **Project title** : Development and evaluation of fexofenadine In situ gelling for nasal drug delivery system
3. **SSIP Fund Disbursed** : Rs. 10,000/-
4. **Name of Team leader** : Patel Ritika Pravinbhai
5. **Name of Other Students** : -----
6. **Name of Mentor** : Dr.Khusbu S. Patel
7. **Summary of the project** : In situ drug delivery systems that are in sol form before administration in the nasal cavity, but once administered, undergo gelatin *in situ*, to form a gel. Fexofenadine is a non sedative 2nd generation antihistaminic drug which is used in treatment of allergic conditions like urticaria, cold. Nasal in situ gel formulation of fexofenadine increased residence time of drug in nasal cavity and decreased frequency of drug administration from other dosage form. So, Considering above mentioned facts it was thought of preparing nasal in situ gel formulation. Preformulation study like, organoleptic properties, solubility in different solvent and melting point of fexofenadine, Drug compatibility study by DSC and FTIR was done. Preparation of in situ gel using ion sensitive polymer and evaluated different parameters of in situ gel formulations is completed. The Evaluation parameter of in situ gel like drug content uniformity in methanol, *in vitro* drug release study is completed. The sterility test by using FTM and SCDM of optimized formulation is completed and pass from sterility testing. It can be concluded that the development of a Fexofenadine HCL *in situ* nasal gel which may offer effective and sustained protection against various infections.
8. **Photographs of project:**

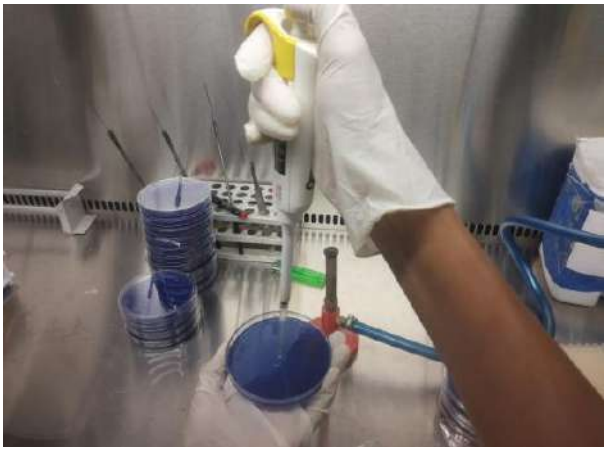
9. **Achievement:** Research Paper under preparation:

   1) Development and Evaluation of Fexofenadine HCL in Situ Gelling For Nasal Drug Delivery System

Sankalchand Patel University
Centre for Research & Innovation
Student Startup & Innovation Policy (SSIP) 1.0

Project ID: SPU_CRI_SSIP1.0_19

1. **Institute** : Narsinhbhai Patel Dental college And Hospital
2. **Project title** : The effect of coconut oil Pulling on streptrococcus mutans: A randomized controlled trial
3. **SSIP Fund Disbursed** : Rs. 10,000/-
4. **Name of Team leader** : Dr. Kety Pilcher
5. **Name of Other Students** : -----
6. **Name of Mentor** : (1) Dr Rahul Patel (2) Dr. Hiren Patel
7. **Summary of the project** : Coconut Oil pulling is not having any significant effect on Streptococcus mutans count. So, we closed the study.
8. **Photographs of project:**



9. **Achievement:** Research Paper under process

Project ID: SPU_CRI_SSIP1.0_22

1. **Institute** : Narsinhbhai Patel Dental college And Hospital
2. **Project title** : Clinical evaluation of the efficacy of agave Americana sutures vs silk sutures
3. **SSIP Fund Disbursed** : Rs. 30,000/-
4. **Name of Team leader** : Patel Urvish Dilipkumar
5. **Name of Other Students** : -----
6. **Name of Mentor** : (1) Dr.Rushit Patel (2) Dr.Anil Managutti (3) Dr.Shailesh Menat (4) Dr.Jigar Patel (5) Dr.Nirav Patel
7. **Summary of the project** : In dentistry, in most of the cases, non-resorb able silk sutures are used for tissue approximation; the main drawback of these sutures are that is it wax coated which reduces knot security, incites tissue reaction, infection and capillarity. So in order to overcome these drawbacks we have found an alternative option for silk suture i.e. 'Agave Americana Suture 'composed of thick hard and rigid leaves and has a low glycemic index as of 90% fructose content. Also it has antibacterial, anti-diabetic properties. Knowing all the benefits of these natural plants, we decided to implement it in dentistry by making natural medicated sutures from "Agave Americana". A total of 25 [both male and female] were selected randomly from the Dept. of OMFS, NPDCH requiring alveoplasty procedure to evaluate its properties.

This study revealed that Agave Americana and silk sutures showed no statistically significant difference in terms of local irritation caused by the suture material, wound dehiscence, pain after the removal of the suture and the ease of removal of the suture. Loosening of the knot, food lodgment and infection was found to be higher in silk sutures than agave Americana sutures. The agave Americana showed less intra oral handling properties compared to silk sutures.

Based on our study we can say that Agave Americana suture can be used effectively as an alternative suture material to the gold standard Silk suture because it is natural, non-resorb able, easily available, and biocompatible, with satisfactory results and the added natural benefits of having an antimicrobial property and the ability to hold the tissue edges until they gain strength, indicating its good tensile strength. Furthermore, Agave Americana suture is both affordable and feasible.
8. **Photographs of project:** --
9. **Achievement:** Research Paper under progress.

ANNEXURE

PATENTS AND RSESRACH ARTICLES

PUBLISHED

FROM THE PROJECTS

Office of the Controller General of Patents, Designs & Trade Marks
Department for Promotion of Industry and Internal Trade
Ministry of Commerce & Industry,
Government of India

(http://ipindia.nic.in/index.htm)

INTELLECTUAL PROPERTY INDIA (http://ipindia.nic.in/index.htm)

Application Details	
APPLICATION NUMBER	202321055711
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	20/08/2023
APPLICANT NAME	1 . CHAUHAN SOHILKHAN DOLATKHAN 2 . Dr. SANTOSH KUMAR
TITLE OF INVENTION	A THIOSEMICARBAZONE COMPOUND WITH ANTICANCER ACTIVITY
FIELD OF INVENTION	CHEMICAL
E-MAIL (As Per Record)	info@silverliningip.com
ADDITIONAL-EMAIL (As Per Record)	bd@silverliningip.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	10/11/2023

Application Status	
APPLICATION STATUS	**Awaiting Request for Examination**

View Documents

➡ Filed ➡ Published ➡ RQ Filed ➡ Under Examination

➡ Disposed

In case of any discrepancy in status, kindly contact ipo-helpdesk@nic.in

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Department for Promotion of Industry and Internal Trade
Ministry of Commerce & Industry,
Government of India

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INTELLECTUAL PROPERTY INDIA (http://ipindia.nic.in/index.htm)

Application Details	
APPLICATION NUMBER	202021027392
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	28/06/2020
APPLICANT NAME	1 . Dr Hiteshkumar H Mehta (Faculty of Smt. S.S. Patel Nootan Science and Commerce College) 2 . Ms. Margiben Kanubhai Prajapati (Student of Smt. S.S. Patel Nootan Science and Commerce College) 3 . Ms. Krimal Maheshkumar Saigal (Student of Smt. S.S. Patel Nootan Science and Commerce College) 4 . Ms. Sonalben Dilipbhai Lakhara (Student of Smt. S.S. Patel Nootan Science and Commerce College) 5 . Ms. Ami Jagdishbhai Darji (Student of Smt. S.S. Patel Nootan Science and Commerce College) 6 . Ms. Janvi Chiragbhai Soni (Student of Smt. S.S. Patel Nootan Science and Commerce College) 7 . Ms. Maitri Balgopal Prajapati (Student of Smt. S.S. Patel Nootan Science and Commerce College) 8 . Ms. Jankiben Kamalkumar Mehta (Student of Smt. S.S. Patel Nootan Science and Commerce College) 9 . Ms. Bhumika Dashrathbhai Patel (Student of Smt. S.S. Patel Nootan Science and Commerce College) 10 . Ms. Digvisha Rohitbhai Mevada (Student of Smt. S.S. Patel Nootan Science and Commerce College)
TITLE OF INVENTION	BIODEGRADABLE ABSORBENT ARTICLE AND METHOD OF MAKING THEREOF
FIELD OF INVENTION	BIO-MEDICAL ENGINEERING
E-MAIL (As Per Record)	ipr@ipcalculus.com
ADDITIONAL-EMAIL (As Per Record)	ipr@ipcalculus.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	03/07/2021
PUBLICATION DATE (U/S 11A)	06/08/2021
REPLY TO FER DATE	01/07/2022

Application Status	
APPLICATION STATUS	Reply Filed. Application in amended examination

View Documents

➡ Filed ➡ RQ Filed ➡ Published ➡ Under Examination ➡ Disposed

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INTELLECTUAL PROPERTY INDIA

क्रम सं/SL No :022142124

सत्यमेव जयते

पेटेंट कार्यालय,भारत सरकार | The Patent Office, Government Of India

पेटेंट प्रमाण पत्र | Patent Certificate

(पेटेंट नियमावली का नियम 74) | (Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No.	:	527733
आवेदन सं. / Application No.	:	202021027392
फाइल करने की तारीख / Date of Filing	:	28/06/2020
पेटेंटी / Patentee	:	1.Dr Hiteshkumar H Mehta (Faculty of Smt. S.S. Patel Nootan Science and Commerce College) 2.Ms. Margiben Kanubhai Prajapati (Student of Smt. S.S. Patel Nootan Science and Commerce College) 3.Ms. Krimal Maheshkumar Saigal (Student of Smt. S.S. Patel Nootan Science and Commerce College) 4.Ms. Sonalben Dilipbhai Lakhara (Student of Smt. S.S. Patel Nootan Science and Commerce College)

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित *BIODEGRADABLE ABSORBENT ARTICLE AND METHOD OF MAKING THEREOF* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख जून 2020 के अट्ठाईसवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled *BIODEGRADABLE ABSORBENT ARTICLE AND METHOD OF MAKING THEREOF* as disclosed in the above mentioned application for the term of 20 years from the 28th day of June 2020 in accordance with the provisions of the Patents Act,1970.

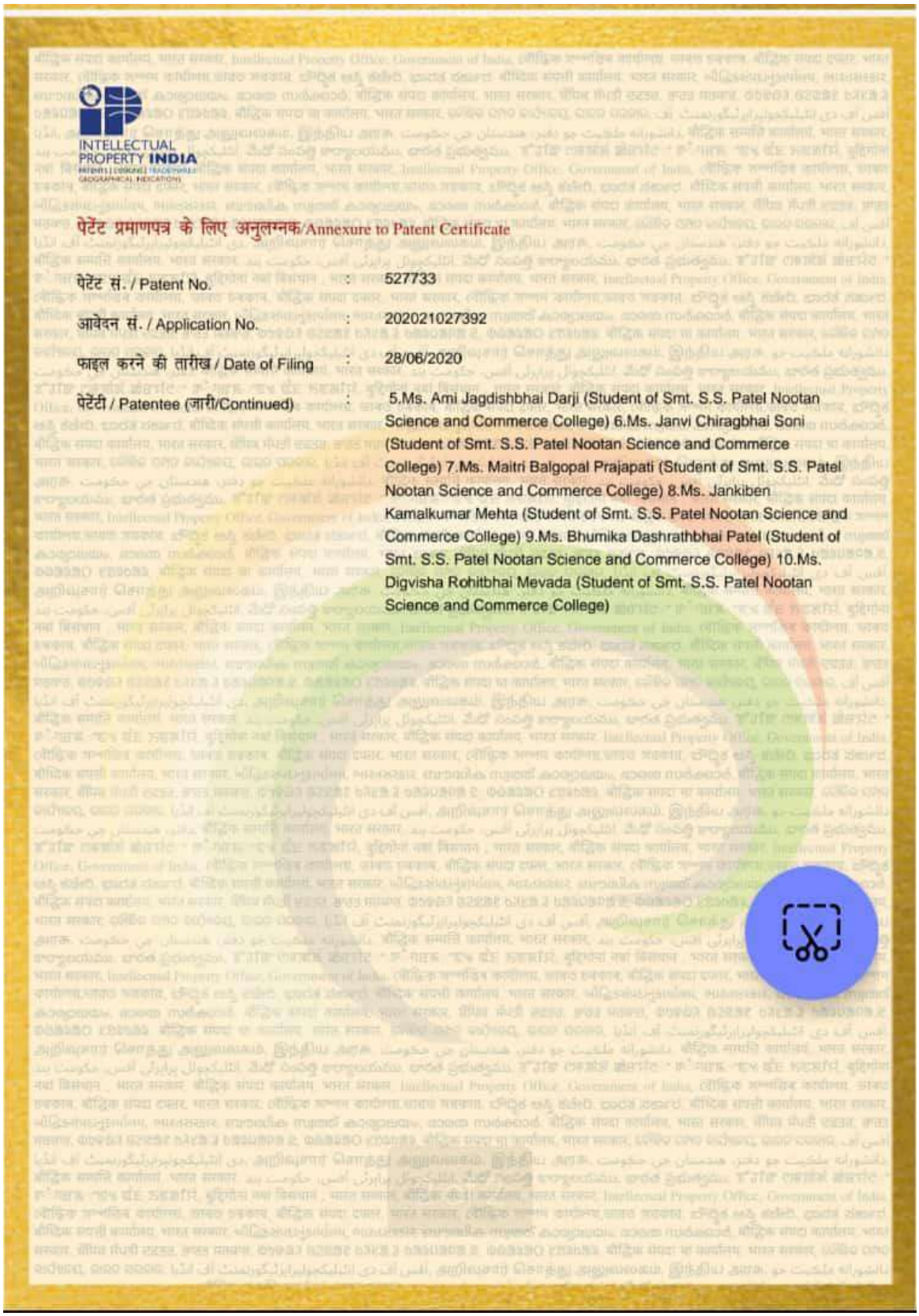
अनुदान की तारीख : 15/03/2024
Date of Grant :

पेटेंट नियंत्रक
Controller of Patents

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, जून 2022 के अट्ठाईसवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 28th day of June 2022 and on the same day in every year thereafter.

*चूंकि पेटेंटी व आविष्कारकों की संख्या अधिक है, पेटेंटी व आविष्कारकों के नाम पृष्ठ संख्या 2 पर जारी हैं।
*Since the Number of Patentees / Inventors is more, the name of Patentees / Inventors are continued on Page No. 2



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पेटेंट प्रमाणपत्र के लिए अनुलग्नक/Annexure to Patent Certificate

पेटेंट सं. / Patent No.	:	527733
आवेदन सं. / Application No.	:	202021027392
फाइल करने की तारीख / Date of Filing	:	28/06/2020
पेटेंटी / Patentee (जारी/Continued)	:	5.Ms. Ami Jagdishbhai Darji (Student of Smt. S.S. Patel Nootan Science and Commerce College) 6.Ms. Janvi Chiragbhai Soni (Student of Smt. S.S. Patel Nootan Science and Commerce College) 7.Ms. Maitri Balgopal Prajapati (Student of Smt. S.S. Patel Nootan Science and Commerce College) 8.Ms. Jankiben Kamalkumar Mehta (Student of Smt. S.S. Patel Nootan Science and Commerce College) 9.Ms. Bhumika Dashrathbhai Patel (Student of Smt. S.S. Patel Nootan Science and Commerce College) 10.Ms. Digvisha Rohitbhai Mevada (Student of Smt. S.S. Patel Nootan Science and Commerce College)

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Department for Promotion of Industry and Internal Trade
Ministry of Commerce & Industry,
Government of India

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INTELLECTUAL PROPERTY INDIA (http://ipindia.nic.in/index.htm)

Application Details	
APPLICATION NUMBER	202121019638
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	29/04/2021
APPLICANT NAME	**Dr DHRUVI PATEL**
TITLE OF INVENTION	MULTIPURPOSE INTRAORAL DEVICE
FIELD OF INVENTION	BIO-MEDICAL ENGINEERING
E-MAIL (As Per Record)	rubina.ipconsultant@gmail.com
ADDITIONAL-EMAIL (As Per Record)	dhruvipatel167@gmail.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	04/06/2021

Application Status	
APPLICATION STATUS	**Awaiting Request for Examination**

View Documents

➡ Filed ➡ Published ➡ RQ Filed ➡ Under Examination

➡ Disposed

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Department for Promotion of Industry and Internal Trade
Ministry of Commerce & Industry,
Government of India

(http://ipindia.nic.in/index.htm)

INTELLECTUAL PROPERTY INDIA (http://ipindia.nic.in/index.htm)

Application Details	
APPLICATION NUMBER	202221019422
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	31/03/2022
APPLICANT NAME	1 . Dr. Nikunjkumar Bhikhabhai Patel 2 . Haresh Shukalbhai Kalasariya 3 . Hardikkumar Balvantray Bhatt
TITLE OF INVENTION	NATURAL SKIN CARE FORMULATION
FIELD OF INVENTION	CHEMICAL
E-MAIL (As Per Record)	ipr@ipcalculus.com
ADDITIONAL-EMAIL (As Per Record)	patelkirtim@gmail.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	06/07/2023
PUBLICATION DATE (U/S 11A)	28/10/2022

Application Status	
APPLICATION STATUS	Application referred u/s 12 for examination.

View Documents

➡ Filed ➡ Published ➡ RQ Filed ➡ Under Examination

➡ Disposed

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Ministry of Commerce & Industry,
Government of India

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INTELLECTUAL PROPERTY INDIA (http://ipindia.nic.in/index.htm)

Application Details	
APPLICATION NUMBER	202221019423
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	31/03/2022
APPLICANT NAME	1 . Dr. Nikunjkumar Bhikhabhai Patel 2 . Hardikkumar Balvantray Bhatt
TITLE OF INVENTION	A FORMULATION OF ALCOHOL FREE HERBAL HAND SANITIZER AND METHOD THEREOF
FIELD OF INVENTION	CHEMICAL
E-MAIL (As Per Record)	ipr@ipcalculus.com
ADDITIONAL-EMAIL (As Per Record)	patelkirtim@gmail.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	01/04/2022
PUBLICATION DATE (U/S 11A)	22/04/2022
FIRST EXAMINATION REPORT DATE	05/05/2022
Date Of Certificate Issue	05/12/2023
POST GRANT JOURNAL DATE	08/12/2023
REPLY TO FER DATE	05/07/2022

Application Status	
APPLICATION STATUS	**Granted Application, Patent Number :476942**

E-Register | Order(s)/Decision(s) | View Documents

➡ Filed ➡ RQ Filed ➡ Published ➡ Under Examination ➡ Disposed

In case of any discrepancy in status, kindly contact ipo-helpdesk@nic.in

INTELLECTUAL PROPERTY INDIA

क्रम सं/Sl. No :202132215

सत्यमेव जयते

पेटेंट कार्यालय,भारत सरकार — The Patent Office, Government Of India

पेटेंट प्रमाण पत्र | Patent Certificate

(पेटेंट नियमावली का नियम 74) | (Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No. : 476942

आवेदन सं. / Application No. : 202221019423

फाइल करने की तारीख / Date of Filing : 31/03/2022

पेटेंटी / Patentee : 1.Dr. Nikunjkumar Bhikhabhai Patel 2.Hardikkumar Balvantray Bhatt

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित *A FORMULATION OF ALCOHOL FREE HERBAL HAND SANITIZER AND METHOD THEREOF* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख मार्च 2022 के इकतीसवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled *A FORMULATION OF ALCOHOL FREE HERBAL HAND SANITIZER AND METHOD THEREOF* as disclosed in the above mentioned application for the term of 20 years from the 31st day of March 2022 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख : 05/12/2023
Date of Grant :

पेटेंट नियंत्रक
Controller of Patents

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, मार्च 2024 के इकतीसवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 31st day of March 2024 and on the same day in every year thereafter.

Medicinal Plants
Vol. 12 (3), September 2020, 405-413

doi : 10.5958/0975-6892.2020.00051.9

IndianJournals.com

Research Article

Exploring novel endothelin receptor blocker as anti-hypertensive agents identified from a natural drugs library using induced fit docking and biological assay

Jimish R. Patel[1,2]*, Hirak V. Joshi[3], Ujashkumar A. Shah[3] and Jayvadan K. Patel[3]

[1]Department of Pharmaceutical Chemistry, Shri B.M. Shah College of Pharmaceutical Education and Research, College Campus, Dhansura Road, Modasa-383315, Gujarat, India

[2]Sankalchand Patel University, S.K. Campus, Kamana Cross Road, Visnagar-384315, Gujarat, India

[3]Department of Quality Assurance & Pharmaceutical Chemistry, Nootan Pharmacy College, Sankalchand Patel University, S.K. Campus, Kamana Cross Road, Visnagar-384315, Gujarat, India

Received: July 04, 2020; Accepted: August 24, 2020

ABSTRACT

For millions of years, nature has provided many potent drugs for complicated diseases. Natural products have exhibited paramount sources of novel drugs and have gained a dominant role in drug design and discovery. Dual endothelin receptor blockers are established as novel anti-hypertensive agents in recent years. Therefore, an attempt has been made to discover molecules from different plant active chemical constituents against anti-hypertensive target. To discover the definite anti-hypertensive sources from natural products, in silico induced fit docking and virtual screening were implemented to obtain potential compounds, which were further identified by biological screening to check the efficiency of identified compounds with bosentan. Out of all compounds, bacoside A had a good affinity towards (Docking score; 10.7 kcal/mol) the antagonism of endothelin receptor. The docking affinity was also confirmed through biological assay. The bacoside A showed more inhibition of endothelin receptors as compared to bosentan. Therefore, our computational study suggested that bacoside A as a lead compound for further exploring more potent compounds as endothelin receptor blockers.

Keywords: Novel endothelin receptor blocker (ERB), bacoside a antihypertensive agent, ET-A/ET-B blockers, plant derivative antihypertensive agents, *in-vitro* bioassay and ADMET study

INTRODUCTION

Blood pressure (BP) control is the main challenge for the health care system. Many classes of antihypertensive drugs are available in the market, but presently few classes exhibit side effect, drug-drug contraindication, low potency so it is require to improve potency, efficacy and less side effect to develop novel antihypertensive drugs (Israili *et al.*, 2007). Many plants have been used as hypotensive effects (Duke, 2002). According to WHO (World Health Organization), world's 80% people, primarily use traditional medicinal utilization (Ekor, 2014). Approximately, 25% of synthetic allopathic medicine leads analogs derived on the plant base (Kala *et al.*, 2006). However, herbal ayurvedic medicine used to develop novel drug design to potent and effective lead molecules for antihypertensive treatments. Endothelin receptor blockers is novel targeted antihypertensive class for pulmonary arterial hypertension. Present endothelin dual

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2019-20
2020-21

Original Article

Thai Journal of Pharmaceutical Sciences

In silico screening of natural compounds to identify lead as interleukin 17A receptor blockers as antihypertensive agents

Jimish R. Patel[1,2], Hirak V. Joshi[3], Ujashkumar A. Shah[3], Jayvadan K. Patel[3]

[1]Department of Pharmaceutical Chemistry, Shri B M Shah College of Pharmaceutical Education and Research, Modasa, Gujarat, India, [2]Department of Pharmaceutical Chemistry, Sankalchand Patel University, Visnagar, Gujarat, India, [3]Department of Quality Assurance and Pharmaceutical Chemistry, Nootan Pharmacy College, Sankalchand Patel University, Visnagar, Gujarat, India

Corresponding Author: Jimish R. Patel, Department of Pharmaceutical Chemistry, Shri B M Shah College of Pharmaceutical Education and Research, Modasa, Gujarat, India. Phone: +91- 9429633525. Fax: +91-2774-249482. E-mail: jimish_patel_1986@yahoo.co.in

Received: Jun 04, 2020
Accepted: Jul 16, 2020
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ABSTRACT

Objectives: Nature gives disease and nature gives the medicine. Natural products have exhibited paramount sources of novel drugs. Due to this, natural products have gained a dominant role in drug design and discovery. Interleukin 17 (IL-17) is a potent pro-inflammatory cytokine produced by activated memory T cells. Recent studies have created a vast amount of interest in the IL-17A as it is a key novel marker for the new potential therapeutic target for antihypertensive treatment. **Materials and Methods:** The X-ray crystallographic proteins of novel antihypertensive target IL-17A receptor blocker PDB ID Shi3 were selected as receptors. The research has been carried out using computer-aided drug design to identify natural compounds using virtual screening to establish as a novel lead compound for a novel target of antihypertensive by inhibition IL-17A receptor blocker. **Results:** Out of 151 natural compounds, our research finding has put natural compound gamma (γ)-oryzanol which is a lead compound for developing novel IL-17A receptor blocker as antihypertensive agents. **Conclusions:** Therefore, the findings of this study may help researchers to identify new molecules or design of new molecules which can specifically be used as novel target IL-17A receptor blocker as antihypertensive agents after lead optimization.

Keywords: Antihypertensive, gamma (γ)-oryzanol, interleukin 17A blockers, virtual screening

INTRODUCTION

Cardiac disease and heart stroke data from the American Heart Association show that in recent total death, 17 million and every year.[1] Blood pressure (BP) control is the main challenge for the health-care system. As it is evident that many antihypertensive classes are currently available in market but these drugs have many serious side effects, drug-drug contraindication and having low potency. Therefore, there is an urgent need to develop newer antihypertensive drugs with improved potency along with fewer side effects.[2] Many natural plants have been used as hypotensive effects.[3] According to The World Health Organization, world's 80% of people primarily use traditional medicine of plant origin.[4] Approximately 25% of synthetic allopathic medicine lead analogs derived on plants base. However, herbal Ayurvedic medicine used to develop novel drug design to potent and effective lead molecules for antihypertensive treatments.[5] The term interleukin derives from two words such as "*inter*" and "*leukin*," "*inter*" means of contact, and "*leukin*" means leukocytes. The function of the immune system depends on a large part on interleukins is a group of cytokines they secreted proteins and signaling molecules. Interleukin 17 (IL-17) is a potent pro-inflammatory cytokine produced by activated memory T cells. The role of inflammatory mediators such as T cells and cytokines is well established in the treatment of hypertension.[6,7] The IL-17A was thought to represent a distinct signaling system that appears to have been highly conserved across vertebrate evolution.[8] The IL-17A is a key novel marker for the new potential therapeutic target for antihypertensive treatment [Figure 1].[9,10]

An essential component is inflammation in pathophysiology for arterial hypertension activity. Arterial hypertension is not

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Application of Plackett-Burman Screening Design in Optimization of Process Parameters for Formulation of Canaglifozin Nanosuspension

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ABSTRACT

In this study, we sought to improve the dissolution characteristics of a poorly water-soluble BCS class IV drug canaglifozin, by preparing nanosuspension using media milling method. A Plackett–Burman screening design was employed to screen the significant formulation and process variables. A total of 12 experiment were generated by design expert trial version 12 for screening 5 independent variables namely the amount of stabilizer in mg (X1), stirring time in hr (X2), amount of Zirconium oxide beads in gm (X3), amount of drug in mg (X4) and stirring speed in rpm (X5) while mean particle size in nm (Y1) and drug release in 10 min (Y2). were selected as the response variables. All the regression models yielded a good fit with high determination coefficient and F value. The Pareto chart depicted that all the independent variables except the amount of canaglifozin had a significant effect ($p<0.001$) on the response variables. The mathematical model for mean particle size generated from the regression analysis was given by mean particle size = +636.48889 -1.28267 amt of stabilizer(X1) -4.20417 stirring time (X2) -7.58333 amt of ZrO2 beads(X3) -0.105556 amt of drug (X4) -0.245167 stirring speed(X5) (R^2= 0.9484, F ratio = 22.07, $p<0.001$). Prepared canaglifozin nanosuspension exemplified a significant improvement ($p<0.05$) in the release as compared to pure canaglifozin and marketed tablet with the optimum formulation releasing almost 80% drug within first 10min. Optimized nanosuspension showed spherical shape with surface oriented stabilizer molecules and a mean particle diameter of 120.5 nm. There was no change in crystalline nature after formulation and it was found to be chemically stable with high drug content.

KEYWORDS: Nanosuspension, Plackett–Burman screening design, canaglifozin, media milling, stabilizer, Pareto chart, mean particle size.

Introduction

The design and formulation of a dosage form require consideration of the physical, chemical, and biological characteristics of all the drug substances and pharmaceutical ingredients to be used in its preparation. An important property of a drug substance is solubility, especially aqueous system solubility (Seedher et al., 2003). The solubility–dissolution behavior of a drug is a key factor to its oral bioavailability. An improvement in the solubility of poorly water-soluble drugs remains one of the most challenging tasks of drug development. The techniques that can generally overcome the problem of solubility are salt formation, micronization, use of surfactant, and use of prodrugs. However, all these techniques have certain limitations. Over the last ten years, nanoparticle engineering processes have been developed and reported for pharmaceutical applications (Verma et al., 2009, Muller et al., 2000).

Nanosuspensions are submicron colloidal dispersions of pure drug particles in an outer liquid phase. Nanoparticle engineering enables poorly soluble drugs to be formulated as nanosuspensions either alone or with a combination of pharmaceutical excipients. The nanosuspension engineering processes currently used are precipitation (Kakrana et al., 2010), high-pressure homogenization (Liversidge et al., 1995a), and pearl milling (Sharma et al., 2009), either in water or in mixtures of water and water-miscible liquids or in non-aqueous media (Trotta et al., 2001). In the present study, a wet-milling technique was used to prepare nanosuspensions; an aqueous suspension was formulated with Zirconium Oxide beads as a milling medium. As the beads rotated, they flew to the grinding vial interior and impacted against the sample on the opposite grinding vial wall. The combination of frictional forces and impact forces led to a high degree of particle size reduction. Cavitation fields generated inside the chambers also contributed to particle size reduction. The main advantage of this technique is that no hazardous solvents are used (Liversidge et al., 1995b; Kayser et al., 2003).

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Original Article

A Recent Solidification Approach for Nanosuspension: Formulation, Optimisation and Evaluation of Canagliflozin Immediate Release Pellets

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Abstract

Introduction: Canagliflozin is a BCS class IV drug. Nanosuspension is known to enhance the saturation solubility and dissolution rate of poorly soluble drugs owing to the increased surface area of nanosized particles.

Aim: In the present study, we aimed to improve the dissolution characteristics of a poorly water-soluble drug canagliflozin by nanosuspension formulation and stability of this solubility enhancing system - nanosuspension can be improved by converting them into solidified forms as immediate release pellets.

Materials and methods: Canagliflozin nanosuspension was formulated using the media milling method. Poloxamer 407 was used to stabilise nanosuspension. Prepared nanosuspensions were subjected to the characterisation of particle size, polydispersity index (PDI), and drug content. Optimised nanosuspension (NS1) was solidified by converting into immediate release pellets: as improved stability, where canagliflozin nanosuspension was used as a binder. Pellets were prepared by +extrusion-spheronization technique using microcrystalline cellulose (MCC) as pelletizing aid and sodium starch glycolate as super disintegrant. Different important process parameters e.g. concentration of sodium starch glycolate (A), spheronization speed (B) and spheronization time (C) were investigated by 2^3 factorial design to accomplish desired disintegration time (R1) and drug release at 10 min (R2).

Results: The optimised nanosuspension had 120.5 nm particle size, 99.14% drug content and the optimised immediate release pellets (PF5) disintegrated within 23.29 second, and had 99.11% drug content. In vitro dissolution studies showed 89.59% drug release within 10 min in 0.75% w/v SLS. Scanning electron microscopy (SEM) confirmed uniform and spherically shaped pellets. Fourier transform infrared spectrometry (FTIR) and differential scanning calorimetry (DSC) analysis reveal no significant interaction between drug and excipients.

Conclusions: It can be concluded from the findings of this study that the formulation of nanosuspension and its use as a binder in the formulation of immediate release pellets should be investigated further in order to improve the dissolution rate and formulation stability.

Keywords

canagliflozin, extrusion, media milling, nanosized, spheronization

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MOLECULAR DOCKING, IN SILICO PREDICTION AND IN VITRO ANTI-CANCER ACTIVITY STUDIES FOR NITROGEN RICH HYBRIDS OF DIARYL UREA-PYRIDINE ADDUCTS

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ABSTRACT

Novel Diaryl urea-pyridine hybrids (**R1-R9**) were synthesized using Pyridine-4-carboxylic acid, 4-amino thiophenol and 4-Chloro-3-(trifluoromethyl) aniline as starting materials by a multi-step process to afford Diaryl urea derivatives (R1-R9) in good yields. The synthesized compounds were docked in the crystal structure of Raf Kinase (PDB ID: 4DBN) to get insights into structural requirements for anticancer activity. In vitro anticancer activity against MCF-7 cell line showed that compounds **R4** and **R9** were found to be the most potent (Docking score: -13.1; MIC = 17.45 µg/mL) among the synthesized molecules. All the synthesized compounds showed acceptable drug-like properties which make them suitable for further lead modification using in silico design approaches.

Keywords: Diaryl urea, Pyridine, 4DBN, MCF-7, Molecular docking, Drug likeness

1. INTRODUCTION

Cancer continues to be the most serious threat to human health in the world's most developed nations [1]. Globally, it is estimated that 3.5 million people die each year as a result of cancer. Chemotherapy, while intended to kill cancer cells in a patient's body, also damages normal and healthy cells, causing significant side effects and, as a result, numerous organ failure [2]. In 2020, 1,392,179 people in India will be diagnosed with cancer in 2020. The breast, lung, mouth, cervix,

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DEVELOPMENT AND EVALUATION OF ION-SENSITIVE INSITU GELLING SYSTEM FOR THE TREATMENT OF GLAUCOMA

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A. Abstract:

The present research work deals with the formulation and evaluation of *insitu* gelling system based on sol-to-gel transition for ophthalmic delivery of Brimonidine tartrate (BT), a selective alpha-2 adrenergic agonist agent, to overcome the problems of poor bioavailability and therapeutic response exhibited by conventional formulations based on sol-to-gel transition in the cul-de-sac upon instillation.

In the present work, sodium alginate and gellan gum was used as an ion-activated gelling agent for the preparation of ophthalmic *insitu* gel. The prepared formulations were evaluated for parameters like pH, appearance, drug content, *invitro* gelation study, viscosity, *invitro* release study, sterility test and stability studies.

In this study, the release profile depends on the concentration of sodium alginate and gellan gum. The selected formulation showed sustained release for the period of 8 hours; thus, showing increased residence and contact time with the eye. All studies showed favorable results, therefore, *insitu* gelling system can be considered as an alternative for conventional ophthalmic drops.

Hence, the development of BT *insitu* gel may offer effective and sustained protection against various infections.

B. Introduction:

Worldwide, glaucoma is the second most common cause of blindness and there were 60.5 million people with open angle glaucoma & angle closure glaucoma in

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