CSIR-North East Institute of Science & Technology (CSIR-NEIST), Jorhat, Assam, INDIA
Activities: A Glimpse

Dr Pinaki Sengupta
Chief Scientist and Head, Materials Sciences and Technology Division


ASIA
Severnaya Zemlya
New Siberian Islands
Poluostrov Taymyr
Laptev Sea
ARCTIC OCEAN
East Siberian Sea
Ostrov Vrangelya
NORTH AMERICA
Barents Sea
Kara Sea
Arctic Circle
White Sea
Gory Putorana
West Siberian Plain
RUSSIAN FEDERATION
Verkhoyanskiy Khrebet
Yukagirskoye Ploskogor'ye
Kolymskiy Khrebet
Bering Strait
Bering Sea
Ural Mountains
Yenisey
Ob
Lena
Kolyma
Indigirka
Central Siberian Plateau
Vostochnyy Sayan
Angara
L. Baikal
Stanovoy Khrebet
Sea of Okhotsk
Kamchatka
Klyuchevskaya Sopka 4750
EUROPE
Tobol
Irtysh
Gora Munku-Sardyk 3491
Belukha 4506
Altai Mountains
Amur
Sakhalin
Kuril Islands
KAZAKHSTAN
Aral Sea
Lake Balkhash
MONGOLIA
Manchurian Plain
Sikhote-Alin
Gora Elbrus 5642
Black Sea
Caspian Sea
GEORGIA
ARMENIA
AZERBAIJAN
UZBEKISTAN
KYRGYZSTAN
Tien Shan
Lop Nur
Gobi Desert
Hokkaidō
TURKEY
Anatolia
TURKMENISTAN
TAJIKISTAN
K2 8611
Tarim Pendi
Qilian Shan
Altun Shan
NORTH KOREA
Sea of Japan (East Sea)
Honshū
Euphrates
Tigris
Elburz
Zagros Mountains
SYRIA
LEBANON
IRAQ
IRAN
AFGHANISTAN
Plateau of Tibet
CHINA
SOUTH KOREA
JAPAN
Yellow Sea
Kyūshū
Shikoku
ISRAEL
JORDAN
Helmand
Indus
Nanda Devi 7816
The Himalaya
Mount Everest 8848
Gongga Shan 7556
East China Sea
KUWAIT
PAKISTAN
Dhaulagiri 8172
NEPAL
BHUTAN
Saberen
Yangtze
Ryukyu Is.
The Gulf
SAUDI ARABIA
BAHRAIN
QATAR
U.A.E.
Thar Desert
Ganga
Yamuna
Brahmaputra
Xi Jiang
PACIFIC OCEAN
Tropic of Cancer
Arabian Peninsula
INDIA
BANGLADESH
TAIWAN
Rann of Kachchh
Narmada
Mahanadi
Irrawaddy
Mekong
HONGKONG
Red Sea
Deccan Plateau
Godavari
MYANMAR
LAOS
Luzon Strait
Hainan
OMAN
Western Ghats
Bay of Bengal
VIETNAM
YEMEN
Arabian Sea
Socotra (Yemen)
Gulf of Aden
Krishna
Eastern Ghats
THAILAND
South China Sea
CAMBODIA
PHILIPPINES
Philippine Sea
AFRICA
Lakshadweep Islands (India)
Palk Strait
SRI LANKA
Andaman & Nicobar Is. (India)
Gunung Kinabalu 4095 m
0 500 1000 1500 2000 KM
0 500 1000 Miles
MALDIVES
BRUNEI
MALAYSIA
Celebes Sea
SINGAPORE
Equator
Borneo
Makassar Strait
Sulawesi
Puncak Jaya 4884
Seychelles
INDIAN OCEAN
Sumatra
Java Sea
Banda Sea
Java
INDONESIA
OCEANIA
EAST TIMOR
Chagos Archipelago
LEGEND
Continent Boundary
Country Boundary
Disputed Boundary
River
Waterbody
Mountain Peak
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(Updated on 2nd Mar, 2015)


INDIA
TAJIKISTAN
AFGHANISTAN
PAKISTAN
CHINA
NEPAL
BHUTAN
BANGLADESH
MYANMAR
SRI LANKA
INDIAN OCEAN
Arabian Sea
Bay of Bengal
Andaman Sea
80°E
90°E
70°E
30°N
20°N
10°N
K2 8611 m
Nanga Parbat 8126 m
Karakoram Range
Karakoram Pass
Indus
Zanskar Range
Line of Control
Srinagar
Kargil
Leh
Kashmir
Pir Panjal Range
Chenab
Sutlej
Jammu
Manali
Harmandir Sahib (Golden Temple)
Amritsar
Shimla
Chandigarh
Dehradun
Nanda Devi 7816 m
Himalayas
Bathinda
Red Fort
NEW DELHI
Jim Corbett National Park
Gurgaon
Thar Desert
Bikaner
Jaisalmer
Taj Mahal
Agra
Jal Mahal
Hawa Mahal
Ajmer
Jaipur
Jodhpur
Keoladeo NP
Lucknow
Kanpur
Ganga
Plain of Ganges
Yamuna
Ranthambore NP
Gwalior
Jhansi
Allahabad
Varanasi
Gaya
Patna
Kosi
Nalanda
Khajuraho
Bandavgarh N P
Dhanbad
Hooghly
Kangchenjunga 8586 m
Gangtok
Darjeeling
Siliguri
Brahmaputra
Guwahati
Dishpur
Shillong
Itanagar
Dibrugarh
Kajiranga National Park
Kohima
Imphal
Naga Hills
Agartala
Aizawl
Tropic of Cancer
Guru Sikhar 1722 m
Aravali Range
Luni
Udaipur
Gandhi Sagar
Rann of Kachchh
Gulf of Kachchh
Bhuj
Gandhi Nagar
Ahmadabad
Bhopal
Indore
Vindhya Range
Jabalpur
Chota Nagpur Plateau
Ranchi
Victoria Memorial
Kolkata
Sundarbans National Park
Sundarban Delta
Rajkot
Vadodara
Narmada
Satpura NP
Seoni
Kanha National Park
Dwarka
Porbandar
Velavadar N P
Tapi
Satpura Range
Pench National Park
Junagadh
Gir National Park
Surat
Nagpur
Raipur
Simlipal National Park
Mouths of Ganges
Mahanadi
Diu
Daman
Deccan Plateau
Nawegaon National Park
Bhubaneshwar
Chilika Lake
Konark Sun Temple
Gulf of Khambhat
Nashik
Ajanta Ellora Caves
Gateway of India
Bhabha Automic Research Foundation (BHABHA)
Mumbai
Pune
Western Ghats
Eastern Ghats
Godavari
Vishakhapatnam
Hyderabad
Ratnagiri
Bijapur
Raichur
Krishna
Vijayawada
Goa
Panaji
Hubli
Hampi
Nellore
Bangalore (Bengaluru)
Tirupati
Chennai
Gomateshwara
Mangalore
ISRO
Mysore
Puduchcheri
Bandipur National Park
Kozhikode
Ooty
Kaveri
Coimbatore
Kerala (Backwaters)
Tiruchirappalli
Kavaratti
Minicoy
Kochi
Madurai
Lakshadweep Islands
Periyar National Park
Rameshwaram
Thiruvananthapuram
Tuticorin
Kanyakumari
Gulf of Mannar
Andaman and Nicobar Islands
Port Blair
LEGEND
Country Boundary
Major Road
Major River
Major City
Other City
Major Sea Port
Country Capital
Major Airport
Major National Park
Point of Interest
Major Lake
Major Mt. Peak
Map not to scale
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(Updated on 6th December, 2013)


INDIA
NORTH-EAST ZONE MAP
N
ARUNACHAL PRADESH
Itanagar
SIKKIM
Gangtok
BHUTAN
NEPAL
Dispur
ASSAM
NAGALAND
Kohima
Shillong
MEGHALAYA
BIHAR
Imphal
BANGLADESH
MANIPUR
Agartala
Aizawl
MYANMAR
JHARKHAND
TRIPURA
MIZORAM
WEST BENGAL
ODISHA
LEGEND
International Bdy.
State Boundary
Country Capital
State Capital
Map not to Scale
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CSIR-North East Institute of Science & Technology (CSIR-NEIST), Jorhat, Assam, INDIA

OUTLINE

- About CSIR-NEIST
- Major contributions over the years
- Activities making impact
- Some of the Current R&D programs

  - Few Technologies under development

CSIR-North East Institute of Science & Technology (CSIR-NEIST), Jorhat, Assam, INDIA

ABOUT CSIR-NEIST

- Established in 1961 as Regional Research Laboratory , Jorhat
- Renamed as CSIR-NEIST, Jorhat in 2007

- **Branch Laboratories:**
  1) Itanagar, Arunachal Pradesh
  2) Imphal, Manipur

CSIR-North East Institute of Science & Technology (CSIR-NEIST), Jorhat, Assam, INDIA

MANDATE : The development of indigenous technologies by utilizing the immense natural resources of north eastern India like petroleum, natural gas, minerals, tea, aromatic and medicinal plants.

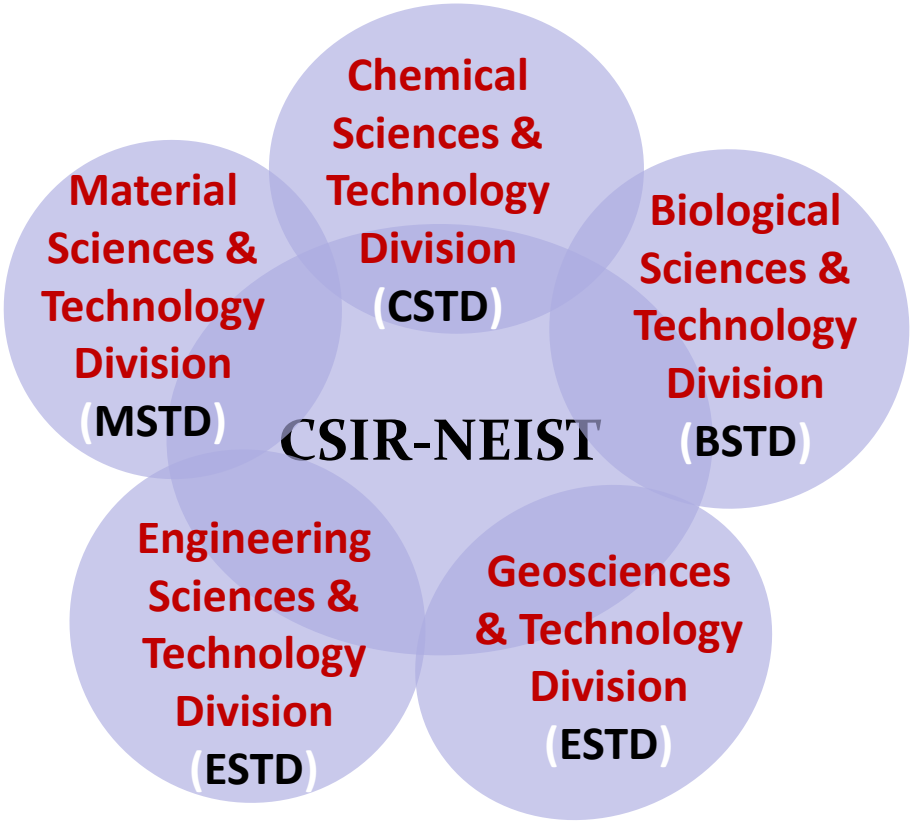
MISSION : To achieve excellence in R&D in frontier areas and to generate and develop Products, Processes and Technologies, which meet international standard in terms of quality, cost and efficiency.

MOTTO : "Connecting Science & Technology for a Brighter Tomorrow"

CSIR-North East Institute of Science & Technology (CSIR-NEIST), Jorhat, Assam, INDIA

R&D EXPERTISE

- Agro-technologies
- Medicinal & Aromatic Plants
- Natural Products Chemistry
- Synthetic Organic Chemistry
- Herbal Formulations & Natural Pesticides
- Bioremediation & Phytoremediation
- Inorganic Chemicals
- Catalysis and Nanomaterials
- Coal Chemistry
- Paper Products & Natural Fibers
- Soil and Building materials
- Membrane Technologies
- Earthquake Seismology
- Geotechnical investigations



➢ **Branch Laboratories:**

1) Itanagar, Arunachal Pradesh
2) Imphal, Manipur

CSIR-NEIST HUMAN RESOURCES

(As on 30.09.2016)

Regular staff	
Scientists	69 (21*)
Technical Officers/ Assistants	62 (14*)
Administrative staff	85
Tech/Non-Tech	102
Total:	318

* Recruitment in Progress

Others

- JRF/SRF / PA/RA : 144
- DST Inspire Faculty, WOS-A, Fast Track Young Scientists : 5
- Ramanujan/ Ramalingaswamy Fellows : 2
- CSIR TWAS Fellows : 2
- DBT trainee/student : 4
- Skilled/Unskilled : 145
- Security : 77
- House Keeping : 64

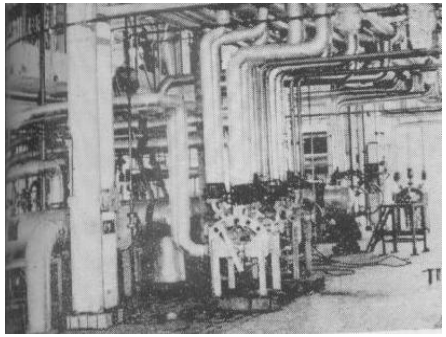
Total : 443

❑ **TOTAL:** 318+443 = 761

MAJOR CONTRIBUTIONS OVER THE YEARS

TECHNOLOGIES/SERVICES

STAKEHOLDERS/ CLIENTS SERVED



Phosphamidon pesticide plant

Mini Cement Plants (> 30 Units)

➢ **PUBLIC:**

✓ONGC, OIL, NRL, NECL, IOCL, MSME, BHEL, NEEPCO, CMPDIL, ICAR, Air Force- Jorhat, etc.

➢ **PRIVATE:**

✓**Tata Chemicals Ltd., Mumbai; Ashapura Group of Ind., Mumbai; Zydus Cadila Healthcare Ltd., Ahmedabad; Amrit Organic Fertilizer, Duliajan; NE Small Scale Industries Association; Mushroom Dev. Foundation, Guwahati; All Mizoram Farmers' Union, Aizawl; Ethereal Aromatics Pvt. Ltd, Guwahati, etc.**

✓**Technologies available for transfer**

50 (Agro-practices, agro-technologies, bio-fertilizers, building materials, herbal formulations, in-organic chemicals and cottage level technologies)

✓**Types of Consultancy and Analytical services :**

220 (Feasibility reports, geo-technical investigations, coal gradation, water, soil, aromatic oil, minerals, coal, natural gas products)

ACTIVITIES MAKING IMPACT

- ✓ **Technologies for Healthcare, Agriculture and MSME Industries**
- ✓ **Seismicity Studies**

HERBAL ANTI-ARTHRITIS PRODUCT

Arthritis

✓Affordable and herbal solution against Arthritis from rich biodiversity of NE India

✓Effective in both Rheumatoid arthritis and other joint pains

✓Created Herbal Drugs Processing Unit

- To maintain consistent quality and to keep the price of the product affordable

➢Technology transferred to:
M/s Kudos Laboratories India, New Delhi

✓Marketing Rights transferred to 5 Parties from Kolkata, Ahmedabad, Jorhat and Jammu

New products being developed

1. Spray 2. Cream

❖More than 100000 tubes supplied so far!

HERBAL FUNGI-DESTRUCT PRODUCT

- ✓Target specific herbal formulation developed from plants available in NE India
- ✓Potential for killing various fungi
- ✓Antifungal potentiality of Fungi-Destruct was evaluated against the pure human pathogenic fungal strains
- ✓Marketing Rights transferred to 3 Parties from Kolkata, Gujarat and Assam
- ✓More than 50,000 tubes supplied so far!

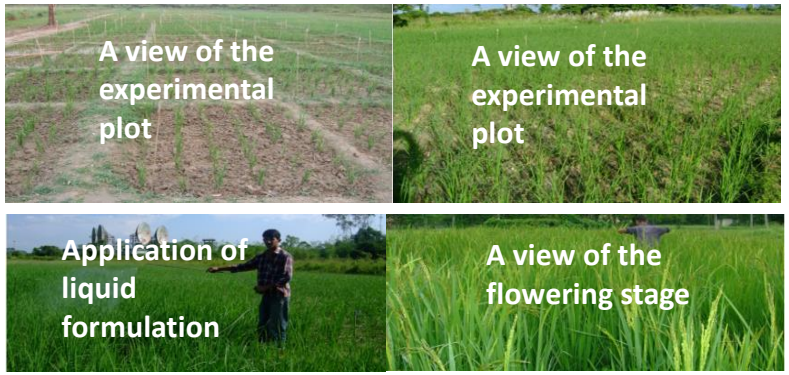
Starting Day to 23rd Day

- ✓Topical application of the formulation to 1600 patients, cured them from pathogenic fungal infection of various types

➢Target Industries:
Pharmaceutical Companies

TP-16 BIOFERTILIZER FOR SUSTAINABLE CROP YIELD

✓Field experiments conducted on efficacy of TP-16 bio-fertilizer

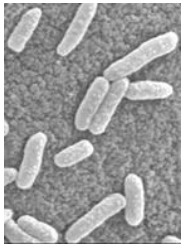


✓Technology transferred to one party in Assam: M/s Amrit Organic, Duliajan

✓**Technology package:**
Technical knowhow and consultancy for installation and commissioning the plant

✓**Target Industries:**
Biofertilizer industries

✓Bioformulation for enhanced soil fertility and increased crop productivity



TP-16

TP-16 Biofertilizer

- Developed liquid and carrier based formulations from a plant growth promoting *Pseudomonas aeruginosa* TP16
- Reduces the use of synthetic Nitrogen urea without compromising the yield
- No toxic residual
- Strain also showed *in vitro* antifungal activity against different rice pathogens

BIOREMEDIATION TECHNOLOGY
(Reclamation of Crude Oil Contaminated Soil)

✓**The technology consists of two phases:**

- **Bioremediation with the formulation**
- **Phyto-remediation**

✓**Bioformulation**

- **Mixed culture of certain bacteria isolated from soils of Assam**
- **Provides a Site-specific solution**

✓**Reclaimed six contaminated sites of ONGC, Nazira (Assam)**

ONGC, Geleky drill site

ONGC, Borholla drill site

✓**New client for Technology Transfer:**

- **M/s Better Tomorrow Technologies, Guwahati**
  (Technology Transferred on Dec 21, 2015)

✓**Target Industries:**

Oil industries

BIOFORMULATION FOR BAMBOO AND WOOD CARE

- ✓Insect and fungal infections on wood and bamboo products have been a serious problem causing huge loss to its artisans and users
- ✓Climatic conditions of the NE region also responsible for degradation of these products

CSIR-NEIST wood care formulation:

- Prevents damage of wood and bamboo from fungal and insect attack
- Enhances the durability and strength
- Eco-friendly product

Wood Care

Testing of the formulation

✓**Target industries:** Wood /Plywood

✓ **The technology is ready for transfer**

✓ **Scale of development: Cottage scale (100L / Day)**

DISPERSIBLE SOLID DEODORANT

✓ **Solid Deodorant:**

- An eco-friendly solid deodorant & cleaner with mosquito repellent properties
- Portable deodorant in the form of tablets
- Easy to handle with longer durability
- For surface cleaning of floor, tiles, glass & ceramic materials, etc

Dispersible Solid Deodorant

✓ The technology is available for transfer

✓ Scale of development: Cottage scale (1500 tablets/Day)

✓**Target industries:**
Medium & Small scale industries

➢**Technology transferred recently to:** M/s DSP Agrofoods & Chemical Industries, Bhubaneswar

LIQUID DEODORANT & CLEANER

✓ Liquid Deodorant:

- An eco-friendly Liquid deodorant & cleaner with mosquito repellent properties
- For cleaning of floor, tiles, glass & ceramic materials, etc
- No sophisticated machineries involved

Liquid Deodorant & cleaner

✓Applications/uses:

As deodorant & cleaner in households, hospitals, clinical center, hotels and restaurants etc

✓Target industries:

Medium & Small scale industries

➢Technology transferred recently to: M/s DSP Agrofoods & Chemical Industries, Bhubaneswar

- ✓ The technology is available for transfer
- ✓ Successfully commercialized by parties from Assam, Odisha, Tripura and Gujarat
- ✓ Scale of development: Cottage scale (100 L/Day)

HERBAL MOSQUITO REPELLENT INCENSE STICKS

✓ **Herbal incense sticks:**

- Fragrant and mainly protects against mosquitoes
- Low cost technology for socio-economic development
- Prepared from indigenous plants of NE India
- No sophisticated machineries involved

Herbal Incense Sticks with Mosquito repellent properties

✓**Applications/uses:**

Household domestic use and in hotels /lounges and other rooms

✓ The technology is ready for transfer

✓ Technology transferred to 4 parties from Assam and Tripura

✓ Scale of development: Cottage scale (5000 sticks/day)

✓**Two Patents filed in India**

✓**Target industries:**

Medium & Small scale industries

HIGH YIELDING VARIETY OF CITRONELLA

✓Improved variety of Java Citronella with high oil yield content

CSIR-NEIST Jor-Lab C-5 variety

- Superior clone developed through EMS mutant progeny
- Oil yield up to 1.2% essential oil (4 seasons/ environment). Available varieties have 0.8-0.9% essential oil
- Obtained 35% Citronellal content, which is better than the known varieties (30%)
- Variety registered at ICAR

Potential users/target industries:

- Cultivators/agencies engaged in commercial cultivation of this valuable aromatic plant
- Perfumery industries

Improved variety of Citronella (Jor Lab C-5)

Variety released to the farmers by Shri Narendra Modi, Hon'ble Prime Minister of India & President, CSIR on the occasion of CSIR Platinum Jubilee Foundation Day Celebration on 26 Sept., 2016

HIGH YIELDING VARIETY OF LEMON GRASS

✓Improved variety of Lemon grass with high oil yield content

CSIR-NEIST Jor-Lab L-8

- Oil yield up to 1% essential oil and herbage yield 260q/ha (4 seasons/ environment). Available varieties have 0.4-0.8% essential oil
- Obtained 78% citral content, which is superior by 22% when compared with the existing varieties
- Variety registered at ICAR

Improved variety of Lemon grass (Jor Lab L-8)

Potential users/target industries:

- Cultivators/agencies engaged in commercial cultivation of this valuable aromatic plant
- Perfumery industries

Variety released to the farmers by Shri Narendra Modi, Hon'ble Prime Minister of India & President, CSIR on the occasion of CSIR Platinum Jubilee Foundation Day Celebration on 26 Sept., 2016

MUSHROOM CULTIVATION

Beneficiary: Mr Sapan Sarkar, Laluk, Assam-Arunachal Pradesh border

Before

Marginal farmer

- ✓ **Income not sufficient to support the family**

Production Unit of Mr S Sarkar

After

- ✓ **Association with CSIR-NEIST since 2013**
- ✓ **Production during September to March: 50 kg/day (average)**
- ✓ **Total income (during production period): Rs 150,000/- per month (Rs.5000/- per day) with sale price of Rs.100 /kg fresh Mushroom**
- ✓ **Supporting family from earnings entirely through Mushroom cultivation**

VSK MINI CEMENT PLANT TECHNOLOGY

- Vertical Shaft Kiln for Portland cement production 25 to 100 TPD capacity
- Advantage of utilizing smaller deposits of limestone
- Stringent measures incorporated in the system design to tackle the pollutants

✓Technology transferred to 39 parties across India

✓Confidentiality Agreement signed with

- M/s Bhairabi Infrastructures Pvt. Ltd., Guwahati for preparing DPR for setting up of 200 TPD plant

✓VSK cement plant

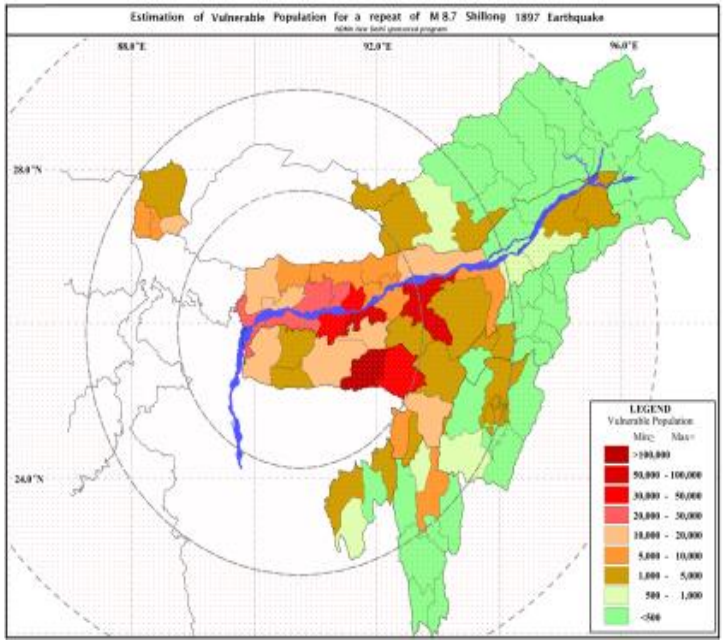
✓Target Industries:

✓Cement manufacturing industries

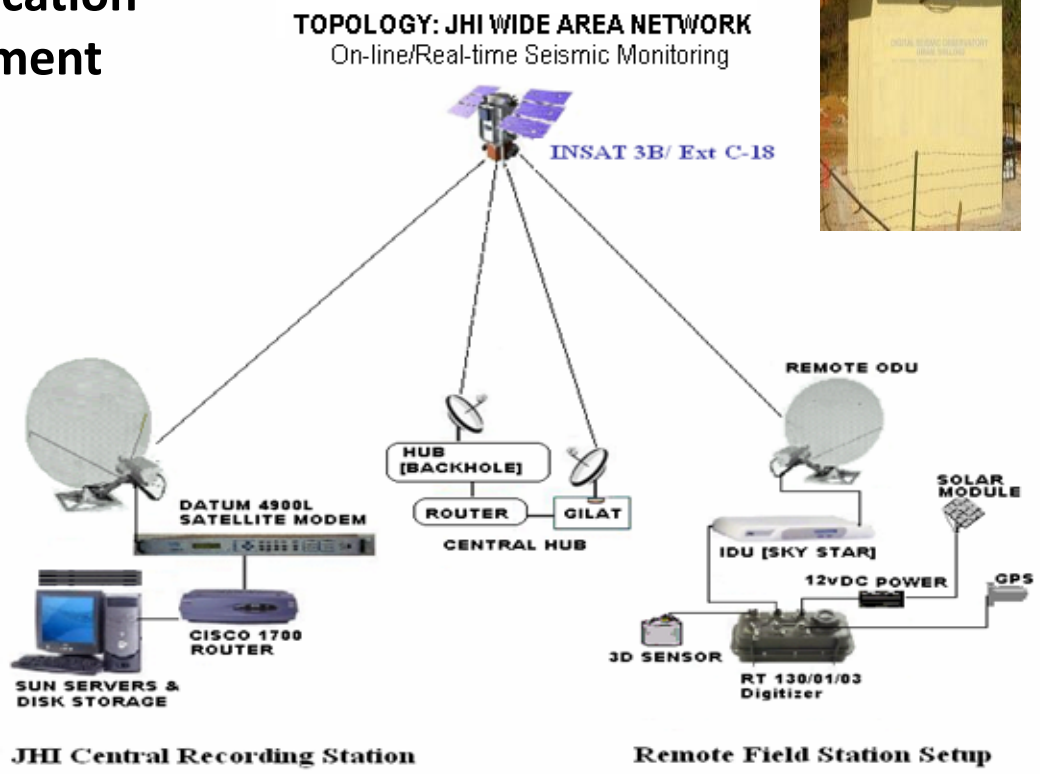
SEISMICITY STUDIES

Expertise developed in the areas like-

- ✓Real-time Seismic Detection & Location
- ✓Hazard-Risk-Vulnerability Assessment
- ✓Earthquake Scenario Building
- ✓Seismic precursor related studies



Earthquake scenarios to simulate ground acceleration for different intensity zones under GIS platform



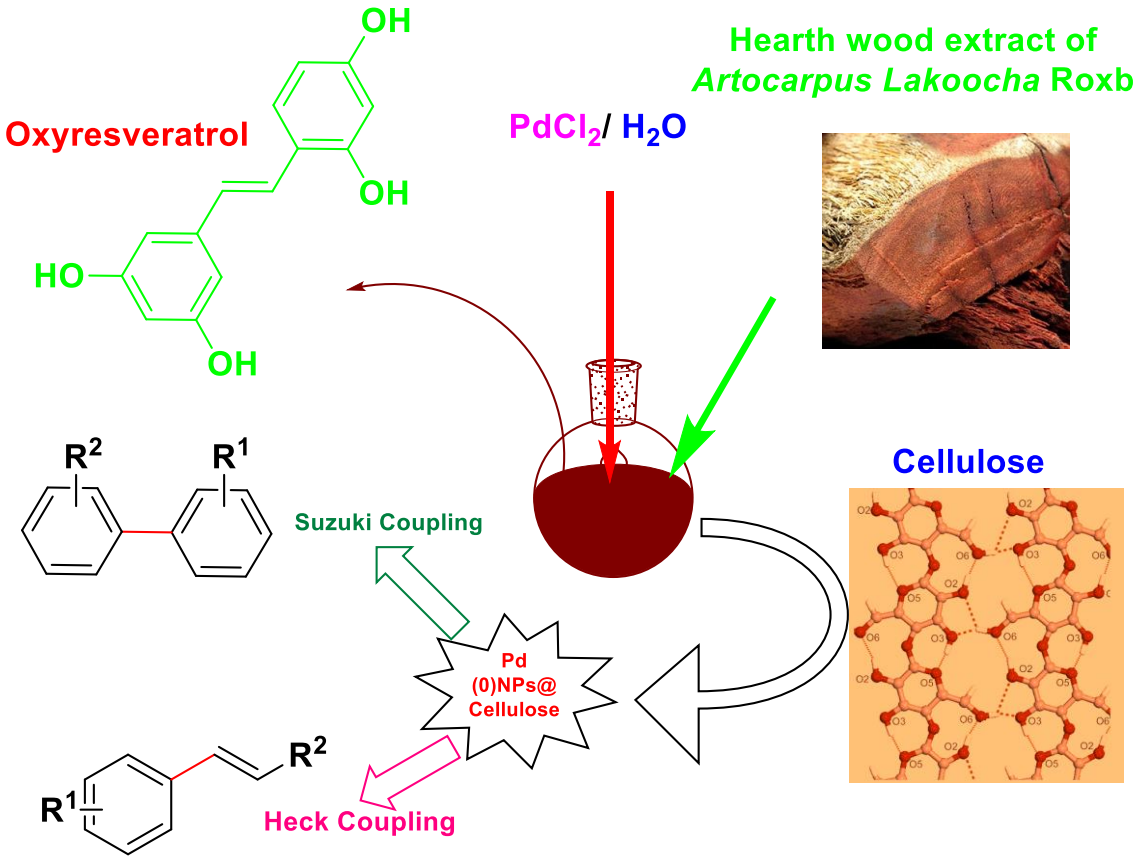
Wide-area seismic net-work of 27 high resolution observatories

Some of the CURRENT R&D PROGRAMS

- Few Technologies under development

Synthesis and reactivity of cellulose supported Pd-nano particles

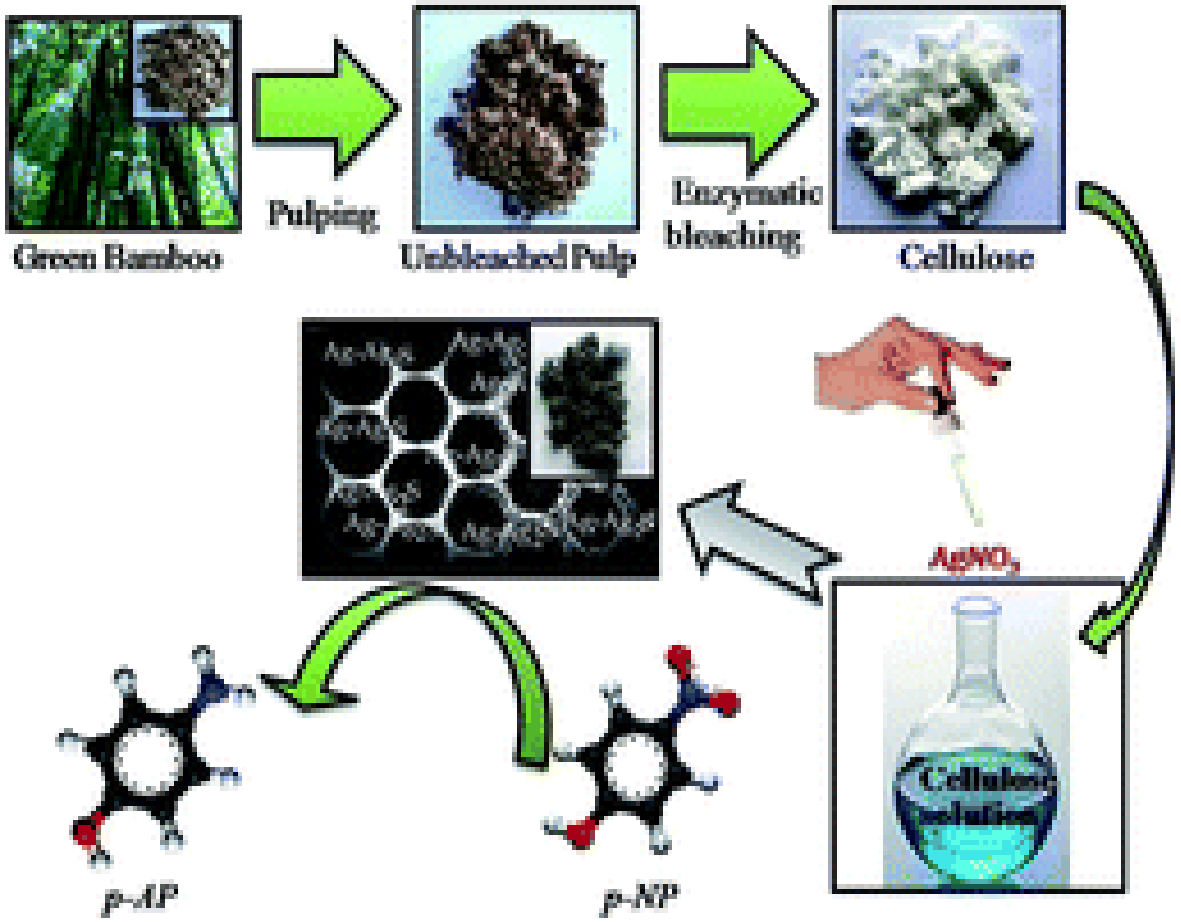
Efficient catalyst for Suzuki and Heck coupling reactions in water under microwave irradiation. The catalyst can be recycled up-to ten times without losing its activity significantly.



Synthesis of Ag–Ag_2S Janus nanoparticles supported on an environmentally benign cellulose template and their catalytic applications

RSC Adv., 2016,**6**, 85173-85181

DOI: 10.1039/C6RA16941D First published online 01 Sep 2016



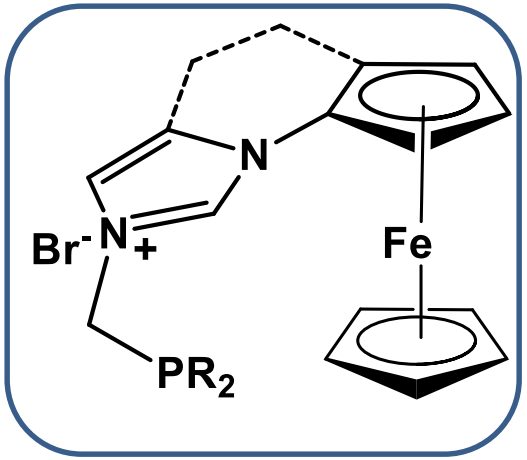
Non-Innocent Ligands in Homogeneous Catalysis

Choice of Ligands

- NHC
- Phoshphine
- Ferrocene functionalized

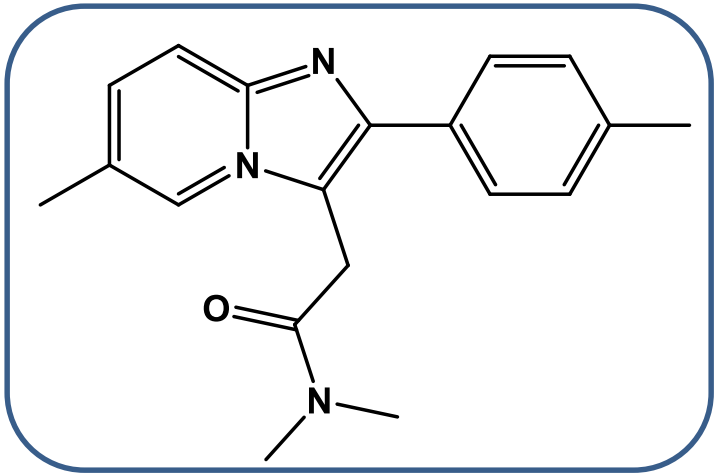
Choice of Metals

- First-row transition metals
- Ru, Rh, Ir, Pd, Mo



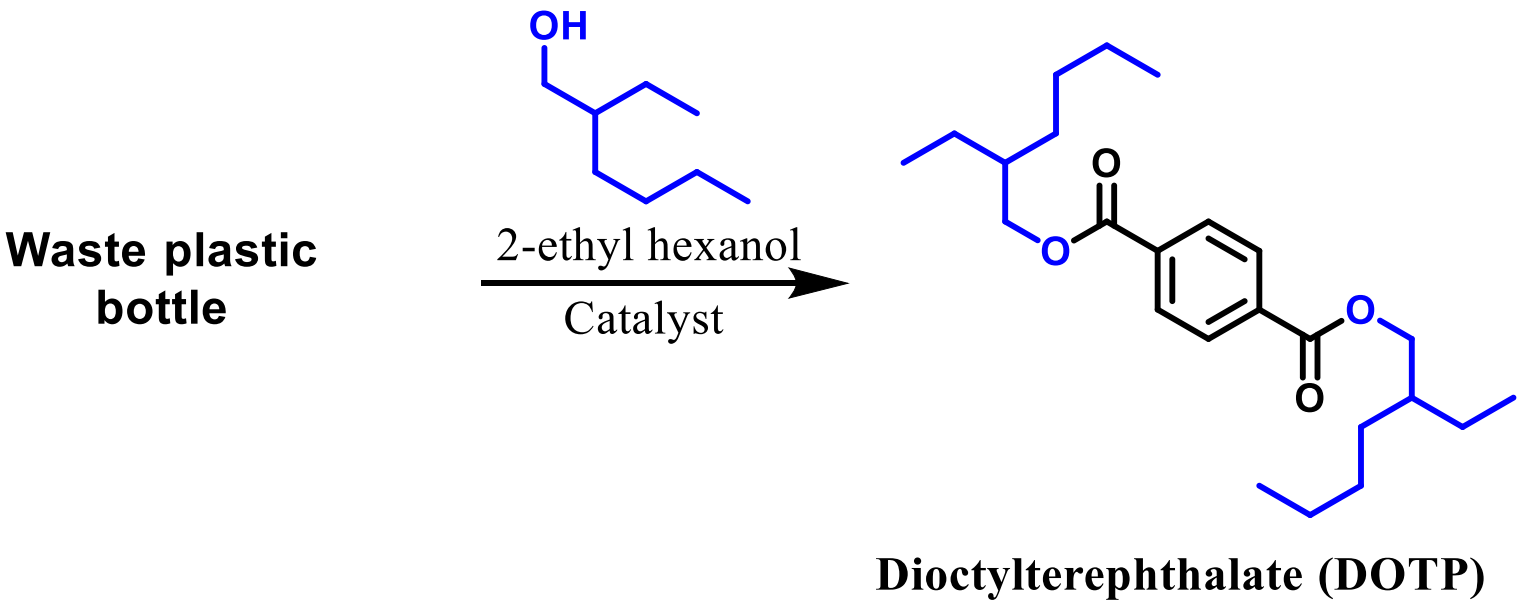
Catalysis Reactions

- Hydroamination
- C-C bond formation
- Water splitting
- Nitrogen fixation
- Hydrogen production
- Drug molecules synthesis



Process for the preparation of dioctyl terephthalate (DOTP) from waste PET bottle

DOTP is a non-toxic plasticizer used in polymer industries.

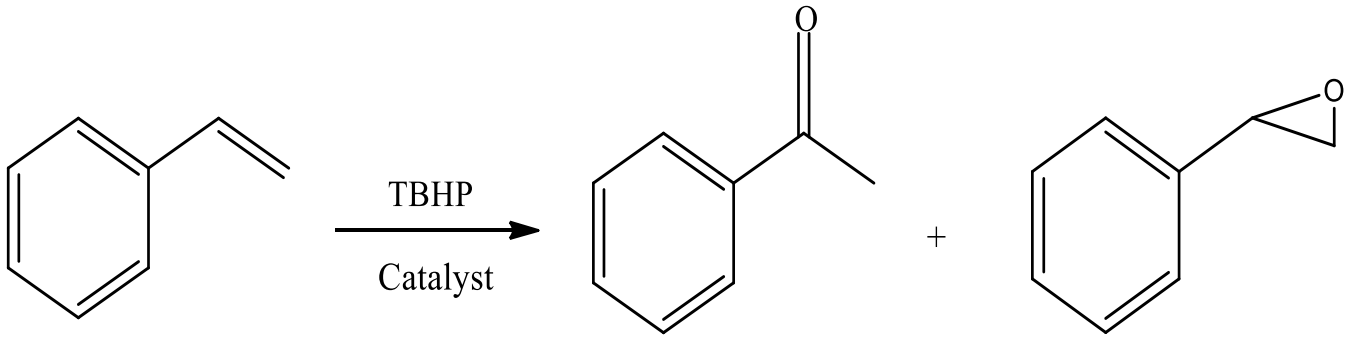


Synthesis and Reactivity of Nanoporous Metal–Silica Composites – Novel Heterogeneous Catalysts for Selective Oxidation Reactions.

DST, New Delhi, India and Russian Foundation for Basic Research (RFBR)
Dr Lakshi Saikia (Indian-PI), Dr Oxana A Kholdeeva (Russian-PI): Boreskov Institute of Catalysis, Novosibirsk; Russia

Au-Ag bimetallic nanoparticles on SBA-15 in a core shell type arrangement

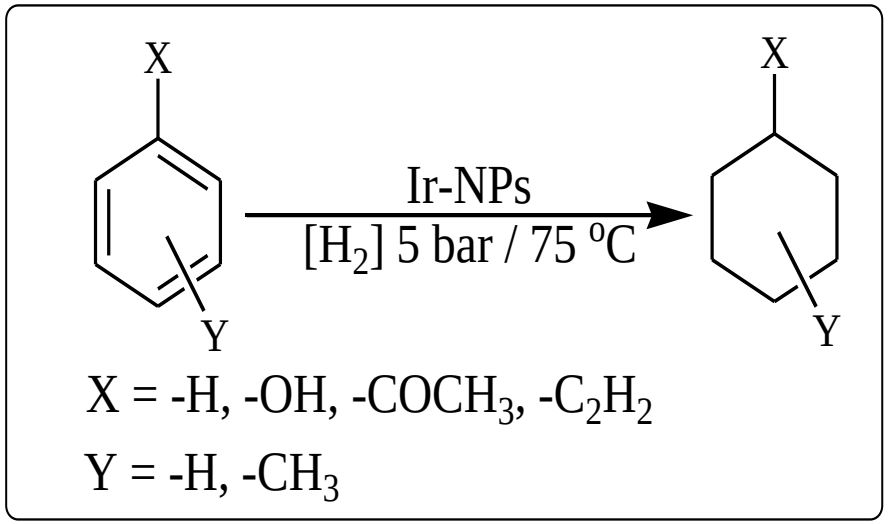
The catalytic oxidation of styerene showed conversion up to 65 % with both aldehyde and epoxide as product.



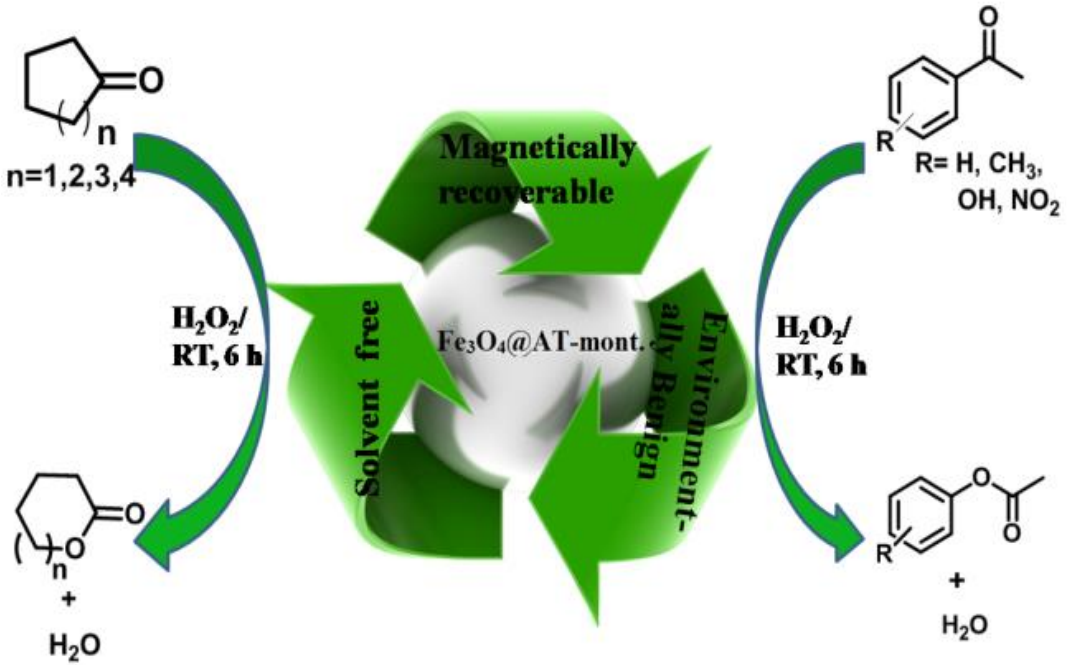
Catalyst-Ag@Au-Ag-ap/SBA 15

Scheme - Schematic representation of oxidation of styrene with TBHP

Aromatic ring hydrogenation catalysed by efficient Ir(0)-nanoparticles supported nanoporous montmorillonite composite under solvent free condition



Stabilized Fe_3O_4 magnetic nanoparticles into nanopores of modified montmorillonite clay: A highly efficient catalyst for Baeyer-Villiger oxidation under solvent free condition



Nano oxidic Membrane by Green Chemical Approach

Silica-Layered Double Hydroxide (LDH) core shells of different binary and ternary LDHs in non-aqueous solvent at various SiO_2 : LDH and fabricated core-shell coated monolithic nano catalytic reactor for decomposition of toxic gases like N_2O.

BIOCONTROL OF RED SPIDER MITE IN TEA CROP

- **Development of a herbal pesticide from a locally available plant**
- **Effective against a major tea pest, Red Spider Mite (RSM), which largely affects production and quality of tea produced**

Infected tea leaves by RSM

✓One patent filed in India

Target Industries:

✓Tea producing companies
✓Biofertilizer companies

✓Collaboration with Tata Chemicals Ltd., Mumbai for further research & field trials

✓Anti-RSM extract

NOVEL HERBAL EXTRACT AGAINST LUNG CANCER

Development of novel anti-lung cancer product from natural sources of NE India through vapor inhalation

Major Findings

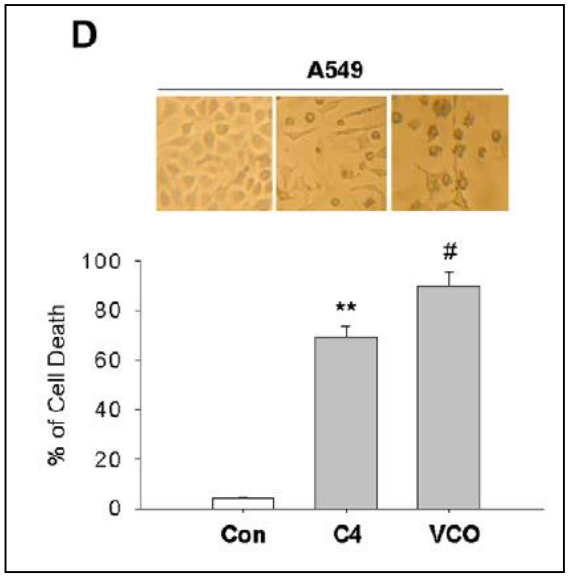
- **Effective herbal oil found against lung cancer cell line**
- **Observed significant pain killing property too**

✓One Patent filed in India and abroad

Target industries:

✓Pharmaceutical industries

✓Collaboration with M/s Zydus Cadila, Ahmedabad for various animal and clinical studies



(D) Effect of VCO (C2:C3:C4 as 1:1:1) and C4 on cell death at 72 h was observed by MTT assay, which was visualized by microscopic images

- **Proposal submitted for grant under CSIR-NMITLI for further research**
- **Collaborative efforts with Visva-Bharati, Santiniketan under NEEP project**

HERBAL ANTI-HYPERTENSIVE DRUG

- **Scientifically validate the blood pressure lowering properties of *Clerodendrum colebrookianum* (Local name: Nephapu)**
- **Development of a herbal drug for treatment of high blood pressure**

Target industries:
✓Pharmaceutical industries

Activities so far:

- **Extraction of the plant material with ethyl alcohol completed**
- **Bioassay of dried plant extract is in progress in collaboration with CSIR-CDRI and CSIR-CCMB**

HERBAL ANTI-ACNE FACE CREAM

✓Cost-effective and herbal face cream against acne

Pre-application.

After 1 month of application.

After 2 months of application

✓Herbal cream for protecting face skin from humidity, dust and other environmental factors causing acne and burning problem

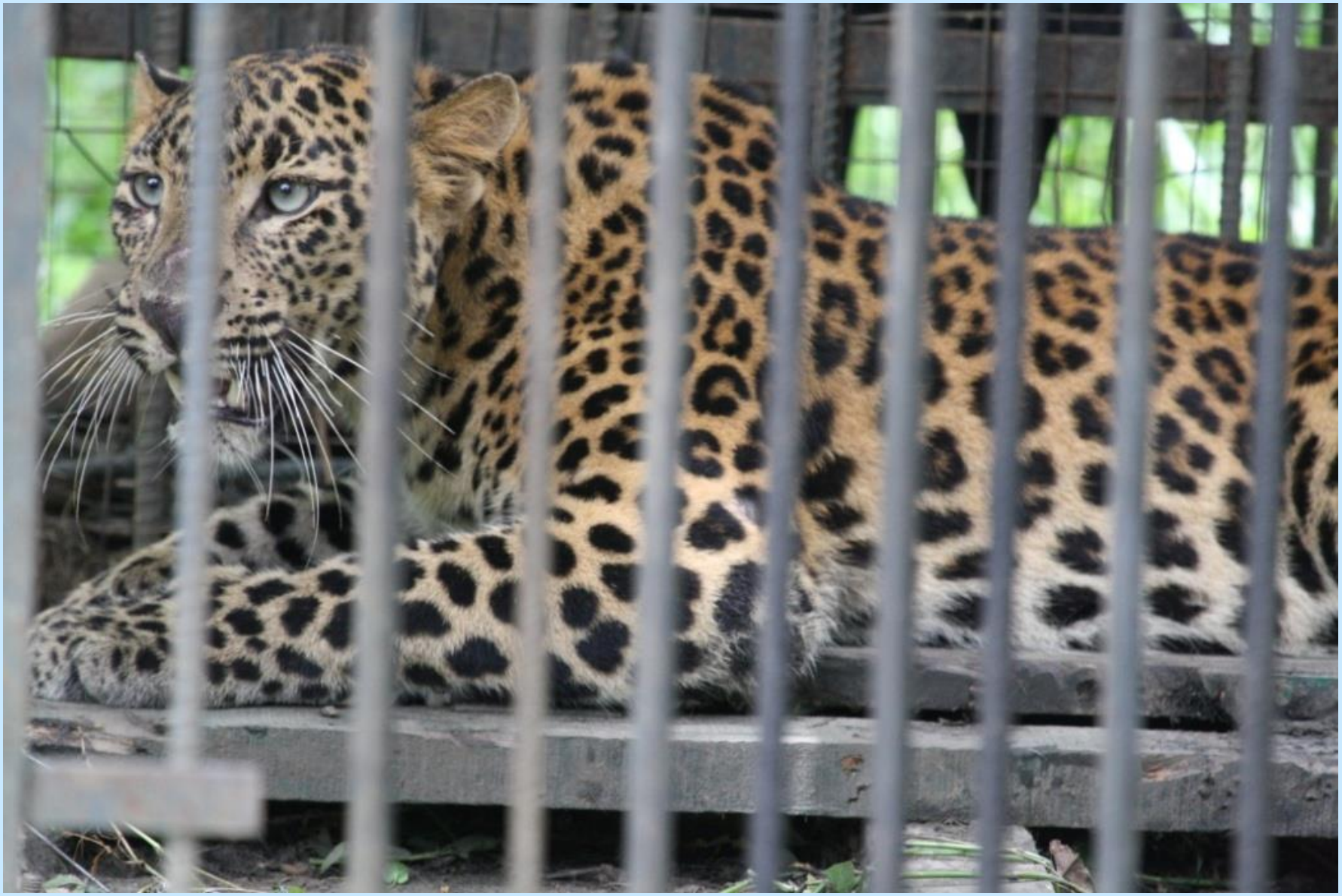
Research findings:

- Found better result and effect in reducing black spot or scars and acne.
- Cream tested on some volunteers.

HERBAL ANTI-FUNGAL FORMULATION FOR DOMESTIC ANIMAL

- **Effective against dermal infection of animals**
- **Protect infected wounds from housefly**
- **Herbal formulation**


ИНСТИТУТ НЕОРГАНИЧЕСКОЙ ХИМИИ



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