

**1. Professional Details:**

**B. V. Subba Reddy**, PhD, Chief Scientist  
Fluoro & Agrochemicals  
CSIR-Indian Institute of Chemical Technology, Hyderabad-500007  
E-mail: basireddy@iict.res.in/bvsreddyiict@gmail.com  
☎: +91-9440906803 (mobile); 040-27193535 (Office)

**2. Education Details:**

- ❖ PhD in Organic Chemistry @ CSIR-IICT.
- ❖ Post Doctoral Fellow @ Harvard University under Prof E. J. Corey (Nobel Laureate in Chemistry)
- ❖ Alexander von Humboldt Fellow @ Max-Planck Institute, Germany.

**3. Fellow of Academy:**

- ❖ Life Fellow of Indian Chemical Society **2021**
- ❖ Fellow of Telangana Academy of Sciences **2015**
- ❖ Fellow of Andhra Pradesh Academy of Sciences **2014**
- ❖ Fellow of National Academy of Sciences **2013** (FNASc)

**4. Awards and Honors:**

- ❖ Prof Dhananjay Nasipuri Memorial Award **2020** by Indian Chemical Society
- ❖ Life time achievement award by A.P. Academy of Sciences **2018**
- ❖ Chemical Research Society of India (CRSI) Bronze Medal **2016**
- ❖ NASI-Reliance Industries Platinum Jubilee Award **2014**
- ❖ Alexander von Humboldt Fellowship **2010**
- ❖ CRSI Young Scientist for the year **2010**
- ❖ AVRA Young Scientist Award **2009**
- ❖ IICT Roll of Honor Award **2009** by IICT
- ❖ Scopus Young Scientist Award **2008** by Elsevier Science
- ❖ Best Performance Award for the Year **2007** for publishing highest number of research papers 52 with a total impact factor 124.5.
- ❖ Best Performance Award for the Year **2001** for publishing highest number of research papers 35 with a total impact factor 78.2; Average I F= 2.25
- ❖ Director's Special Award for the Year **2001** for outstanding effort in publishing highest number of research papers 24 with a total impact factor 50.4.
- ❖ Y.S. Raja Reddy **GOLD MEDAL** for the year **1995** by SKD University.

**5. Publications and Citations:**

- ❖ No of publications: > **785**
- ❖ No of citations: **23,098**
- ❖ Average Citations without self-citations: **27.2**
- ❖ H-index: **68**
- ❖ Received **16<sup>th</sup>** most productive scientist (Chemical Sciences) in India for the years **1996-2006** (Current Science).
- ❖ Received **5<sup>th</sup>** rank in average citations per paper and **8<sup>th</sup>** rank in H-index by Scopus (Elsevier's abstract and citation database).
- ❖ Received **60** Citations in Jerry March, 7th Edition, Text Book.
- ❖ Ranked among top 2% scientists in world by Stanford University (**2020**).

- ❖ Ranked in Top 2% most influential scientists (Single Year) in **2023** Stanford University List: Analysis of Indian Researchers
- ❖ Review articles published: **15**
- ❖ Book chapters published: **6**

**6. PhD Students Guided:**

- ❖ Ph.D Awarded– 45 Nos
- ❖ Research Scholars presently working for PhD-15
- ❖ MSc Dissertations – 60 Nos

**7. Sponsored Projects from Cosmetic Industry:**

Industry sponsored projects from Colgate Palmolive Company, USA, have successfully been completed and developed natural product based novel anti-bacterial agents for oral care products like mouth wash, tooth paste, shampoo etc to substitute existing antibacterial agent, Triclosan due its adverse effects on human health.

- ❖ Synthesis of Novel Classes of Color Changing Dyes for use in Personal Care Products as Sensory Cues (**2007-08**)
- ❖ Honokiol Synthesis (**2008-09**)
- ❖ Conversion of 2kgs of Honokiol into Propyl Honokiol (**2009-10**)
- ❖ Synthesis of Magnolol and Honokiol (**2009-10**)
- ❖ Synthesis of Different Classes of Ester Quats and Study of their Hydrolytic Stability (**2009-10**)
- ❖ Synthesis of Honokiol from 1,4-Cyclohexadione via Grignard Route and Up-scaling the Synthesis of Magnolol, Butyl Magnolol and Propyl Magnolol (**2009-2010**)
- ❖ Synthesis of Dichloromagnolol from o-Chlorophenol (**2009-10**)
- ❖ Assignment of Lab Scale Process for Synthesizing Magnolol (**Technology transferred**) (**2010-11**)
- ❖ Synthesis of Magnolia Analogs (**2010-11**)
- ❖ Synthesis of Propyl, Butyl, Isobutyl and Isobutyl Magnolols (**2010-11**)
- ❖ Licensing the Process for Making Propyl Isomagnolol (**Technology transferred**) (**2011-12**)
- ❖ Development of Novel Synthetic Route for Hinokitiol (**2011-12**)
- ❖ Process Development for the Synthesis of Poly(allyl)guanidine (200 g) (**2012-13**) for Gum care
- ❖ Development of Novel Routes for Synthetic Shellac (**2014-2015**)
- ❖ Process development for gram scale preparation of Hinokitiol (150 g) (**2015-2016**)
- ❖ Process development for the large scale synthesis of Honokiol (200 g) (**2015-2016**)

**8. Sponsored projects from Pharma Industry:**

- ❖ Process optimization of **Ciclesonide** and **Budesonide** (Asthma)
- ❖ Resolution of (**±**)-**Salbutamol** using (+)-2,3-dibenzoyl-D-tartaric acid
- ❖ Enzymatic desymmetrization for (**R,S**)-*trans*- and (**R,R**)-*cis*-**Cyclopenten-1,3-diols**, KSM for **Ticagrelor** to prevent heart attack or stroke (*Tetrahedron*, **2018**, 46, 6673).
- ❖ Process improvement of **Fluconazole** and **Fexofenadine**.
- ❖ Enzymatic reduction of phenyl ketone (a key intermediate for **Vibegron**)

- ❖ Process development of **L-Methioninesulfoximine**, a glutamine synthetase inhibitor
- ❖ Process development of **Loxoprofen**, an anti-inflammatory drug
- Projects from Perfume and Fragrance Industry**
- ❖ Process development of *mono*-Terpene derived perfumery chemicals.
- Projects from Nutraceutical Industry**
- ❖ Process development of Nicotinamide Riboside Chloride (**NRCI**), sports diet (dietary supplement).
- ❖ Process development of Nicotinamide Mononucleotide (**NMN**), anti-aging agent

#### 9. Technology Transferred to Cosmetic and Pharma Industry:

- ❖ Synthesis of magnolol and its analogue compounds (US8519197B2) technology transferred to **Colgate-Palmolive Company**
- ❖ Processes for making magnolol derivatives (US9676690B2) tech transferred to **Colgate-Palmolive Company**
- ❖ An antioxidant compound having anti-atherosclerotic effect and preparation thereof (US9580452B2) technology transferred to **Sun Pharmaceutical Industries Ltd**
- ❖ Antioxidant compound having anti-atherosclerotic effect and preparation thereof (US9963476B2) technology transferred to **Sun Pharmaceutical Industries Ltd**
- ❖ 2-Deoxy-D-Glucose (**2-DG**): Technology transferred to **10 Pharma industries**. The process know-how was successfully demonstrated to **Aurobindo Pharma** and **Emmennar Pharma**, Hyderabad.

#### 10. Translational Research on Active Pharmaceutical Ingredients (APIs)

- ❖ Asymmetric synthesis of (**R**)-**Sitagliptin** for the treatment of type II diabetes, *ChemistrySelect* **2016**, 1, 5445.
- ❖ Enantioselective syntheses of **Solifenacin** to treat overactive bladder and neurogenic detrusor over activity, *Synthesis* **2014**, 46, 2794.
- ❖ Asymmetric synthesis of **Almorexant** for the treatment of Insomnia, *Tetrahedron Letters*, **2014**, 55, 3157.
- ❖ Enantioselective synthesis of (**-**)-**Dihydrotetrabenazine**, a drug used for the treatment of hyperkinetic movement disorders, *Tetrahedron Letters*. **2012**, 53, 6916.
- ❖ Synthesis of **Sivelestat** (an inhibitor of human neutrophil elastase) by aromatic C-H activation, *Asian J. Org. Chem.* **2017**, 6, 1851.
- ❖ Improved process for **Terbinafine**, an anti-fungal agent.
- ❖ A novel process for **Voxelotor** to treat sickle cell disease.
- ❖ Practical approach for the synthesis of **Miglustat** to treat type I Gaucher disease.
- ❖ Developed a novel process for **Molnupiravir**, a drug for the treatment of COVID-19 (*Tetrahedron Letters*, **2022**, 97, 153783).
- ❖ Three-step process for the synthesis of **Favipiravir** (*Results in Chemistry*, **2023**, 5, 100895).
- ❖ Biocatalytic enantioselective synthesis of **Cenobamate**, an Antiepileptic drug, *Chirality*, **2023**.

- ❖ Convergent approach for the synthesis of **Bempedoic acid**, an hypercholesterolemia drug, *Current Organic Synthesis*, **2023**.....
- ❖ Enantioselective Kinetic Resolution of ( $\pm$ )-Alcohol using TL Lipase: A Sustainable Approach for **Tegoprazan**, *Biocatalysis and Agricultural Biotechnology*, **2023**.

**11. APIs processes under development:**

- ❖ Non-infringing process for the synthesis of **Tolvaptan** (hyponatremia drug)
- ❖ Cost-effective process for the synthesis of **Eliglustat** (Gaucher's disease)
- ❖ Asymmetric total synthesis of **Staurosporine**, anti-cancer drug.
- ❖ Stereoselective total synthesis of **Vibegron** (to treat overactive bladder)
- ❖ Process development of **Vortioxetine** (anti-depressant)
- ❖ Development of novel process for **Tafamidis** used for the treatment of heart disease.
- ❖ Novel synthesis of **Noscapine**, an antitussive agent (cough-suppressing agent)
- ❖ Process development of **Apremilast** used to treat psoriatic arthritis.

**12. Process Development of Agrochemicals and their KSMs:**

- ❖ Improvement of *cis*-selectivity in the synthesis of methyl *cis*-4-methoxy-cyclohexanc-1-aminocarboxylate hydrochloride, a key intermediate of **Spirotetramat**, an insecticide
- ❖ Development of non-infringing process for **Cyazofamid**, a fungicide
- ❖ Development of a novel process for **L-Glufocinate**, an alternate herbicide to glyphosate
- ❖ Development of novel process for **Chlorantraniliprole**, an insecticide
- ❖ Process know-how for the fungicide, **Mandipropamid**.
- ❖ Process development of **Saflufenacil**, a broad spectrum herbicide.

**13. Process Development of Pheromones**

- ❖ Enantioselective synthesis of the mosquito oviposition attractant, **6-Acetoxy-5-hexadecanolide**.
- ❖ Synthesis of female sex-pheromone of olive fruit fly, **1,7-Dioxaspiro[5.5]undecane**,
- ❖ Asymmetric Synthesis of **(S)-2-Hydroxy-3-decanone**, used to control white stem borer in coffee.

**14. Implementation of CSIR–IICT pheromone technology in crop protection**

- ❖ **National Food Security Mission:** Implemented pheromone technology in Telangana and Andhra Pradesh under NFSM to manage the pest in different crops over 3.0 Lakhs acres.
- ❖ **Dr YSR Polambadi:** Implemented pheromone technology in **Andhra Pradesh** under Polambadi.
- ❖ Implemented pheromone technology in 2022 for the crop protection in collaboration with NRRI, **Odisha**.

- ❖ During the Kharif season 2018, Pink Bollworm (PBW) pest infestation was controlled over 25000 acres in cotton fields in **Telangana** using pheromone lures/traps by pest monitoring and mass-trapping.
- ❖ During the Kharif season 2019, Fall Armyworm (FAW) was successfully controlled in Maize and Corn over 42440 acres in 120 mandals of 28 districts of **Telangana** by pest monitoring and mass-trapping.
- ❖ During the Kharif season 2019, Pink Bollworm (PBW) infestation was minimized in **Andhra Pradesh** through pest monitoring in 62400 Hectares (156000 Acres) over 9 districts.
- ❖ During the Rabi season 2020, pheromone technology was successfully implemented in **Andhra Pradesh** for pest monitoring in Rice (YSB) over 43,781 acres and Maize (FAW) over 15,875 acres in 13 districts under **Dr YSR Polambadi**.
- ❖ Implemented pheromone technology for early detection of the pest PBW in cotton by Wadhwani AI in six districts of Telangana in the Kharif season 2021.
- ❖ Implemented pheromone technology in **Andhra Pradesh** (Srikakulam, Vizianagaram and West Godavari to control Yellow Stem Borer in Rice 2021.
- ❖ Implemented pheromone technology in **Odisha** to control pest in Rice, Maize, Sweet Potato, Brinjal and Fruit fly 2021.

### 15. CSIR-mission mode projects

**CSIR-800 program:** Implemented pheromone technology in controlling pests in vegetable crops like cucumber, brinjal, cabbage, cauliflower, ridge guard, bitter guard, bottle guard, and ash guard etc.

**CSIR-Harit program:** During the Kharif season 2020, pheromone technology was successfully implemented in three **Aspirational districts of Telangana** to control the pink bollworm in cotton over 25,000 acres.

**CSIR-Cotton mission:** Development of next generation insect resistant cotton: Implemented pheromone technology successfully for the early detection of pest in cotton in the state of **Telangana**.

- ❖ Implemented pheromone technology in **Anantapuram** to control the pink bollworm in cotton 2021.
- ❖ Provided the training on pheromone formulations to MSME and start ups to establish the pheromone lure making centre.
- ❖ Deployment of pheromone technology in odisha-2023-24 for pest surveillance in 23K hectares.

**CSIR-Agromissions 1 & 2:** Innovative technologies for off-patented agrochemicals. Technologies developed for 12 Agrochemicals under agromission 1.0. Developing technologies for 20 Agrochemicals under agromission 2.0

**CSIR-Millet mission:** Managing the insect pest in stored grains by pheromone application technology

**16. Technology Transferred to Agro-Industry:**

- ❖ Demonstrated synthetic processes to **Nova Agritech Ltd**, in 25g scale for the following pheromones:
  - *Bactrocera cucurbitae* (Melon fly)
  - *Leucinodes orbonalis* (Brinjal shoot borer)
  - *Pectinophora gossypiella* (Pink boll worm)
  - *Scirpophaga incertulas* (Yellow stem borer)
- ❖ Process developed for Profenofos and technology transferred to PMFAI
- ❖ Process developed for sodium TCP and technology transferred to AIMCO Pesticides
- ❖ Process developed for Cyazofamid and technology transferred to Insecticide India.
- ❖ Process developed for Glufocinate to Rallis.
- ❖ Improvement of enantioselectivity in the synthesis of chiral intermediate of Indoxacarb- Adama
- ❖ Process development of spiro intermediate of spirotetramat, an insecticide- Adama

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