T. Govindaraju
Bioorganic Chemistry Laboratory, New Chemistry Unit and School of Advanced Materials (SAMat), Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Jakkur P.O., Bengaluru 560064, Karnataka, India

CDP Architectonics: Upcycling Cyclic Dipeptide

Molecular architectonics has its essence in the custom design and engineering of molecular assemblies by judicious exploitation of the noncovalent forces to construct desired architectures with novel properties and functions. This concept of designing noncovalent systems enable us to construct functional architectures for biological and non-biological applications, while strengthen our efforts in understanding the art of controlled molecular assemblies. In this context, biomolecules, or biomimetic auxiliaries with built-in information for molecular recognition can guide the controlled molecular assembly of functional modular units to construct nano, micro, and macro-architectures. Cyclic dipeptides (CDPs) are the simplest form of cyclic peptides and can serves as both functional core and auxiliary in the design of molecular building blocks owing to numerous assembly and functional properties. CDPs are the major by-products and continuous efforts have been made to suppress or prevent their formation during the peptide synthesis. In our laboratory, we have undertaken the task of upcycling of CDPs as mainstream products with biomimetics and biomedical applications, which is termed as CDP architectonics. In this talk, I shall present CDP architectonics and its potential applications.

1. Govindaraju et al. *Acc. Chem. Res*., **2018**, *51*, 414.; *Bull. Chem. Soc. Jpn.*, **2019**, 92, 1883. *Chem. Asian J*. **2021**, *16*, 423.
2. Book: Molecular Architectonics and Nanoarchitectonics, in the series of Nanostructure Science and Technology, Springer Nature, Eds. T. Govindaraju, and Katsuhiko Ariga (2021).
3. Govindaraju, et al. *Adv. Healthcare Mater*. **2016**, *5*, 1222.; *ACS Appl. Mater. Interfaces* **2016**, *8*, 22849.
4. C. Blachandra, D. Padhi and T. Govindaraju, ChemMedChem **2021**, *16*, 2558-2587.
5. S. Manchineella and T. Govindaraju, *ChemPlusChem* **2017**, *82*, 88-106.
6. C. Madhu, C. Voshavar, K. Rajasekhar and T. Govindaraju, *Org. Biomol. Chem*, **2017**, *15*, 3170.

T. Govindaraju is a professor at Bioorganic Chemistry Laboratory, New Chemistry Unit, JNCASR, Bengaluru, India. He received MSc in Chemistry (2000) from Bangalore University and Ph.D (2005) from the National Chemical Laboratory, Pune, India. He carried out postdoctoral research at the University of Wisconsin-Madison, USA and Max Planck Institute of Molecular Physiology, Dortmund, Germany. His research interests are at the interface of chemistry, biology and biomaterials science, include Alzheimer's disease, peptide chemistry, molecular probes, diagnostic therapy (theranostics), molecular architectonics, and silk & cyclic dipeptide-inspired biomimetics and biomaterials. He has published >120 research papers in peer reviewed journals, >37 patents, 18 book chapters and four books. He has co-founded a startup company (VNIR Biotechnologies Pvt. Ltd., http://vnir.life) to translate his lab inventions for bioimaging and point-of-care or clinical care diagnostics.