Chirality (handedness) is a property of asymmetry, which normally controls biological activities of molecules. It is quite a challenge for Organic Chemists to develop methods to synthesize chiral molecules (enantiomers or mirror image isomers) in high level of enantioselectivity (optical yield). This is popularly called asymmetric synthesis, which is important for pharmaceutical companies.

There are several ways to accomplish these transformations. One of the ways is via enantioselective reactions using chiral ligands/catalysts (Lewis acids & Lewis bases). Chiral organic compounds can also catalyze these reactions (Asymmetric Organocatalysis). Thus, one can avoid toxicity of metals, making the process environment friendly. In all these methods, we induce chirality from the chiral ligands/catalysts to the prochiral substrates - a process called asymmetric induction. In this lecture, I will be taking some of the examples of asymmetric synthesis carried out in our laboratory.

About the Speaker

Professor Singh's research falls in the area of Synthetic Organic Chemistry, more specifically, asymmetric synthesis. He has been recognized with several awards and honours such as Swarnajayanti Fellowship (1998), Shanti Swarup Bhatnagar Prize (2004) and Padma Shri (2014), among others. In addition, he has been elected as a fellow of all the Indian science academies (FNA, FASc, and FNASC) and The World Academy of Sciences (FTWAS), Italy.


As a Founding Director of IISER Bhopal (2008-2018), Professor Singh built the institution ground up. He has served as the Mentor Director of IISER Berhampur, Director of SPA Bhopal (additional charge) and the Chairman of BoG, NITTR Bhopal. He also held the additional charge of Directorship of MANIT Bhopal and IIIT Bhopal. Professor Singh had been a Member of the Scientific Advisory Council to the Prime Minister (SAC to PM) during 2009-2014. He is currently the President, Chemical Research Society of India (CRSI).