

Crystallizing new partnerships*

The first China–India–Singapore (CIS) symposium in crystal engineering was recently organized by the National University of Singapore (NUS). This trilateral meeting ushers a new focus on possible cooperation among these Asian neighbours with a clear goal to consolidate research potential, nurture mutual cooperation and to develop a lasting understanding among the three countries. Perhaps such an effort might lead to a formidable nexus in cutting-edge research areas in chemistry.

The economic turnaround in India and China in the last two decades, is a significant world phenomenon. Whereas the former is a dominant player in the services sector and is slowly realizing its capabilities and potential, the latter has rapidly emerged as a country with stupendous economic growth, with a massive export base. These distinct approaches are also reflected in science being done in these countries and the output in terms of publications. More importantly, it is widely believed that with a combined projected population reaching close to 3 billion by 2050, India and China are expected to provide precious ‘trained’ human resource in the coming decades. The youth of these countries possess an intense desire to lead from the front and excel in frontier areas of science and technology. This statement is also reflected in the fact that Indian and Chinese students and faculties are substantially represented in major universities outside their home countries. From within India and China, there is a visible increase in the publications in high-quality journals and many strong leaders have emerged in representative areas of contemporary chemistry.

*A report on the First China–India–Singapore Symposium in Crystal Engineering organized by the Department of Chemistry, National University of Singapore during 31 July–2 August 2010.

With this as a backdrop, a trilateral meeting dedicated to crystal engineering was envisaged by G. R. Desiraju (Indian Institute of Science, Bangalore), J. J. Vittal and Feng Xue (NUS) and Miao Du (Tianjin Normal University, China), which turned out to be a good platform for inorganic, materials and organic chemists, practising the art of crystal growth and design. The meeting was well attended with strong contingents of 12 members each from China and India, around seven speakers from Singapore and an overall audience of around 70. A significant number of the participants was under the age of 50 and there were also some very young, interested researchers.

The Department of Science and Technology, Government of India, supported the visit of Indian participants, indicating a positive feeling about interacting with China and Singapore in key thrust areas of chemical research. Notably, Indian and Chinese scientists have not had a chance for scientific exchanges at the research-worker level. Thus this meeting is expected to pave the way for future scientific events dedicated to other research areas and disciplines.

The inclusive nature of the area was elaborated by Desiraju and critical issues related to crystal engineering research, such as intermolecular interactions, concepts of synthon design and property optimization were discussed. The variety of research themes presented in this meeting reflects favourably on the scope of crystal engineering. The themes covered in this meeting included classic coordination chemistry, porous frameworks, cluster chemistry, high nuclearity metal complexes, and pharmaceutical co-crystals. An interesting extension of metal–organic framework synthesis was demonstrated on graphene sheets, which were shown to tune the formation of supramolecular motifs. Crystal engineering on graphene surface was proposed as

a new functional hybrid with potential applications in gas storage, photovoltaics and biomolecular sensing. Such a cross-talk between chemists from the three countries, with different approaches towards crystal engineering, was obvious during coffee breaks and evening break-out sessions. Posters were presented mostly by the students from NUS and they were highly appreciated.

A highlight of this meeting was the participation of Robin Rogers (Editor-in-Chief, *Crystal Growth and Design*), who made incisive remarks about the potential of the three countries in this research area. This *ACS* journal is one of the key specialist journals in the area of crystal engineering. Rogers repeatedly stressed the significance of a meeting where Chinese and Indian scientists were coming together and commented that such a combination was indeed unique. He emphasized on the quality of submitted papers and the future potential of high-level contributions coming out of the three countries. Towards the end of this fruitful meeting, there was a clear consensus that such interdisciplinary meetings should be promoted as they not only allow scientific inquiry, but also bring the Asian neighbours in proximity to each other in terms of research and cooperation. Opinions were expressed regarding the exchange of doctoral and postdoctoral researchers and the interaction of senior investigators in future meetings that are focussed to bring together scientists from the three countries. To carry on the enthusiasm generated by the First CIS meeting, it was decided to hold the second meeting in this series in Sun Yat-Sen University, Guangzhou, China, in October 2012.

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