Ph.D. Open Seminar

Department of Chemistry, IISER Bhopal

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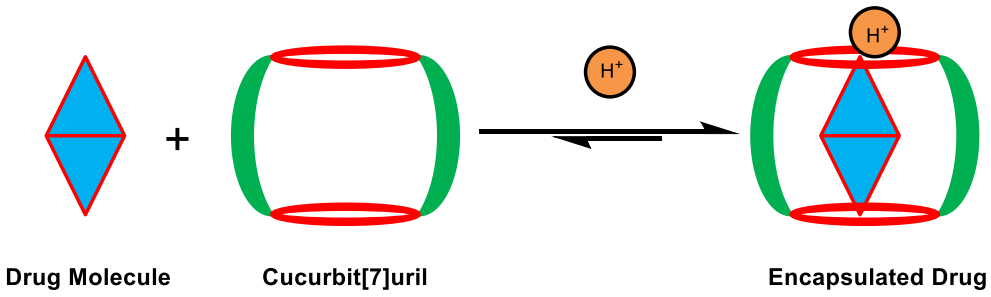
Title: Modulating Acid-Base and Photophysical Properties of Drugs Using Cucurbit[7]uril.

Date: **4th Dec. 2017** Time: **10:00 AM** Venue: **401, AB-II**

Abstract: Most of the drug molecules are poorly water-soluble. Therefore, the *in vivo* functionality of drugs is limited to water-solubility. The synthetic modification of the drugs is well-explored to enhance the stability, activity, and biocompatibility. However, the non-covalent approach to modulate the drug properties is still in its infancy. Thus, there is an urgent need for retaining the activity and increasing the solubility towards the supramolecular approach.[1] The water-soluble macrocyclic host molecule with hydrophobic cavity can offer a suitable environment for the drugs to be encapsulated and get delivered. Cucurbit[7]uril (CB7), is a relatively new family of water-soluble, non-toxic and biocompatible nano-container macrocyclic host which increases drug solubility and stability upon encapsulation.[1]



Scheme 1: Prototropic equilibrium between the drug molecule and CB7

As a part of my doctoral thesis work, I have an investigated CB7 encapsulation of three well-known fluorescent drug molecules and drug mimics *e.g.*, Prodan,[2,3] Quinine [4] and Norharmane.[5] Fluorescence-based techniques are used to investigate the photophysical characteristics of the drugs upon complexation. Such non-covalent approach of modulating chemical and physical properties using water-soluble macrocyclic container is a unique method for the development of a novel fluorescent assay and drug delivery system.

References:

1. (a) I. Ghosh, W. M. Nau, ***Adv. Drug Delivery Rev***., 2012, **64**, 764; (b) A. L. Koner, I. Ghosh, W. M. Nau, ***Can. J. Chem***., 2011, **89**, 140; (c) Z. Miskolczy, M. Megyesi, G. Tarkanyi, R. Mizsei, L. Biczok, ***Org. Biomol. Chem***., 2011, **9**, 1061; (d) R. N. Dsouza, U. Pischel, W. M. Nau, ***Chem. Rev***. 2011, **111,** 7941; (e) S. Walker, R. Oun, F. J. Mclnnes, N. J. Wheate, ***Isr. J. Chem***., 2011, **51**, 616

2. F. Chandra, K Pal, S. Lathwal, A. L. Koner, ***Mol. BioSyst***., 2016, **12**, 2859

3. F. Chandra, K Pal, A. L. Koner, ***ChemistrySelect,*** 2016, **19**, 6156

4. S. Mallick, K. Pal, F. Chandra, A. L. Koner, ***Phys. Chem. Chem. Phys.***, 2016, **18**, 30520

5. F. Chandra, A. L. Koner, (***Manuscript under preparation)***