Molecular factories based on {M(2,2':6',2''-terpyridine)$_2$}$^{2+}$–zipped co-block polymer vesicles

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We show how the chelating power of bis(2,2':6',2''-terpyridine)metal(II) complexes can be applied to 'zip' together co-block polymer vesicles to give pre-organized assemblies.[1] Different approaches have been used to functionalize polymer vesicles which condense with appropriately functionalized 2,2':6',2''-terpyridine (tpy) domains; sequential reaction with metal ions e.g. Fe^{2+} leads to an organized assembly. All reactions are carried out under ambient conditions and in aqueous media. The principle of the procedure is shown in the scheme below:

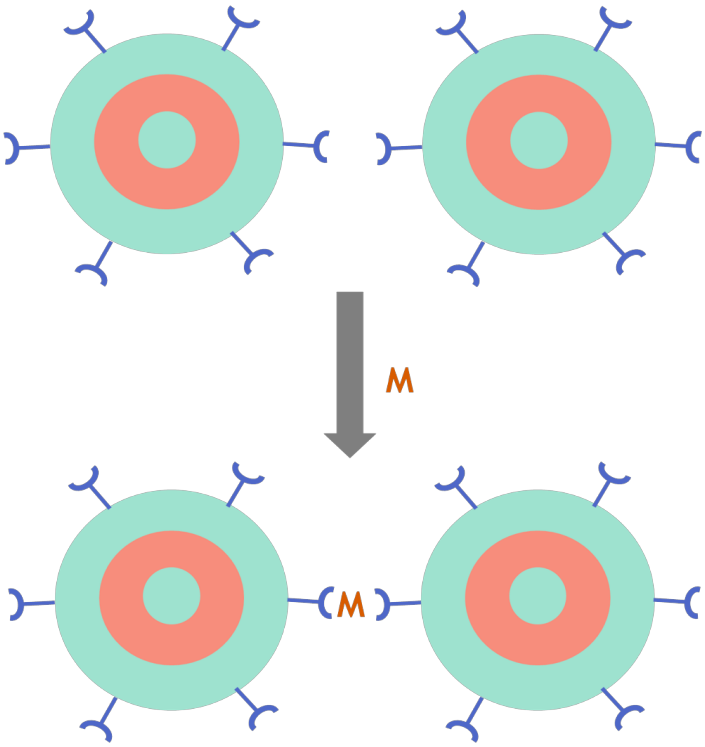

Figure 1: *Strategy for assembly of arrays of coupled polymer vesicles.*

The characteristic MLCT absorption associated with the {Fe(tpy)$_2$}$^{2+}$ chromophore is a powerful probe with which to assess the degree of vesicle aggregation. This along with AFM and TEM studies will be discussed.

The ordered structure of the polymer vesicle assembly provides a platform for an array of artificial compartments for a molecular factory. Surface modification is particularly attractive.[2] Future directions of the work will be discussed, e.g. encapsulation of components of the 'factory' within hollow vesicles and communciation between the compartments.

[1] Constable, E.C.; Meier, W.; Nardin, C.; Mundwiler, *S. Chem. Commun.* **1999**, 1483 – 1484
[2] Langowska, K.; Kowal, J.; Palivan, C.G.; Meier, *W. J. Mater. Chem. B* **2014**, 2, 4684.