During 2007 an aim of one of our research projects was the synthesis of a "hybrid calixarene". That is a calix[4]arene that has appended onto it a series of functional groups that are fully amenable to the introduction of secondary, different substituents attached to each other via a covalent bond. We wanted to undertake the appendage of the second substituent (onto the upper-rim,) using an enzymatic biotransformation; this had not been previously reported. Towards this goal we reported in 2007 in Organic Letters the first application of "click" chemistry to the upper-rim of a calix[4]arene for the synthesis of a-amino acid and carbohydrate derived calix[4]arenes.1

It was our intention to investigate, again for the first time the potential application of trans-sialidase for its ability to chemoselectively append sialic acid onto a carbohydrate derived calix[4]arene. Thus we were delighted to find that trans-sialidase did indeed transfer via fetuin sialic acid to lactose, indeed using the EPSRC Mass Spectroscopy service we were able to show that the trans-sialidase mediated the transfer of only one and two sialic acids onto the upper-rim of the calix[4]arene (Scheme 1) that had, previously been appended with four lactose carbohydrates, thus demonstrating the chemo- and regioselectivity of the biotransformation process.

![Scheme 1](image_url)