## *Poster 12*

# Making PEGA Microbeads for Applications in Biology and Medicine

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Polymer hydrogels are becoming an increasingly important area of research due to their biocompatibility. Poly(ethylene glycol) acrylamide, PEGA was initially developed for solid phase peptide synthesis[1] (SPPS), the properties that suit this use, combined with its good enzyme compatibility make it an ideal material for use with biological systems.[2,3]

PEGA is typically used in the form of beads and is made by inverse suspension polymerisation. Beads that are commercially available are between 100-500 μm in diameter. For applications such as drug delivery and encapsulation smaller beads are preferred as they have greater surface area to volume ratios.

In our research PEGA beads have been polymerised with different mean diameters and distributions by varying the stirring speed and surfactant concentration. To test the compatibility of the beads with enzymes, dipeptides were coupled to the beads and exposed to enzyme solutions. HPLC was used to analyse any cleaved residues. The homogeneity of the free amine groups was evaluated with two-photon microscopy.

The microbeads formed have a mean diameter less than 20μm, have a homogeneous distribution of free amine groups, are compatible with enzymes and enzyme reactions have been found to occur more rapidly than on conventional beads.[4]

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