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**Many-blob modelling: Developing the theoretical underpinning of protein unfolding in biocompatible and biodegradable hydrogels**

A number of emerging global and societal problems can be addressed by developing novel biodegradable and biocompatible materials with controllable properties, and protein hydrogels are ideally suited to this goal. However, a key aspect of protein functionality - the ability to fold and unfold - is routinely omitted by full hydrogel models, limiting the effectiveness of simulation support to experiments. In this project, you will develop models for proteins that are complex enough to represent protein (un-)folding, while simple enough to be scalable to full hydrogel simulations, thus allowing richer, and more realistic, predictions to be made. This project includes collaboration with the experimental Dougan lab, and there is an option to take a role in the experiments.

