

Bioconjugation and targeting of light activated anti-cancer agents
Novel biosensors for reactive oxygen species
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2010 has been a very exciting year, both in terms of results from long-term projects, and also from recently instigated programmes. Our research into bioconjugation and targeting of light activated anti-cancer agents resulted in two publications in high impact journals, *Bioconjugate Chemistry* and *Immunology*. The former article finally addressed the issue of random conjugation to monoclonal antibodies, one of the major issues preventing antibody conjugates progressing to the clinic. In order to achieve this some highly light sensitive molecules with bioconjugatable groups susceptible to hydrolysis were analysed at Swansea, these were very difficult molecules to handle, as they were highly polar, but also hydrolytically sensitive. Analysis was attempted for these molecules in-house, but failed to give mass ions, which were found by the Swansea team. The *Immunology* article shows, for the first time, that administered drug doses can be reduced by between 2 and 3 fold by conjugation of the anticancer drug to antibodies, while maintaining the same anti-cancer activity; a factor which could minimise side effects in cancer treatments. Once again the molecules were very sensitive, but the service at Swansea obtained mass ions in both low and high-resolution modes.

Our work in the field of novel biosensors for reactive oxygen species (ROS) is progressing well. ROS are important transient species implicated in ageing, heart disease, cancer and Alzheimer's disease, but currently available probes do not allow accurate measurement in cellular systems. Our work on multimodal nanosensors for studying intracellular ROS was published this year in the RSC journal *Photochemical and Photobiological Science*. The rapid turnover times and accuracy of measurement provided by the Swansea service allowed this project to proceed rapidly, and several of the key intermediates failed to give mass ions in-house, but subsequently were found when submitted to the National MS service. Preliminary results from this project also resulted in a successful grant proposal, which is now funded by EPSRC.

References:

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