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GlycoScience Ireland Initiative

In terms of manufacturing output, Ireland is currently the number one location for the biopharmaceutical industry in Europe. Indeed, 5 of the top 10 biopharmaceutical companies have built, or are in the process of building, plants in Ireland. Many of the new "biological" drugs or "biologics" are glycoproteins that carry essential N- and/or O-linked glycans. Hence, glycoscience research in Ireland is critically important for understanding the parameters that control glycosylation at every stage in the bioproduction of these therapies. In particular, it is important to generate recombinant proteins that have appropriate glycosylation to avoid antigenicity, control serum half-life, ensure that the molecules have the required effector functions, and protect proteins from aggregation during production and from degradation afterward.

During the past 3 decades, the crucial roles played by glycans in almost every essential biological process have been revealed. For example, glycans are involved in reproduction, signaling, cell differentiation and immunity, and diseases such as cancer. Today, improved analytical technologies—some of which have been pioneered and developed in the Dublin–Oxford Glycobiology Laboratory at the National Institute for Bioprocessing Research and Training (NIBRT) in Dublin—may enable researchers to further decipher the glyco-world and its unique biochemical language.

Scientists working in the glycoscience field in Ireland have a wealth of basic and applied research expertise that is directly relevant to the biopharmaceutical and food industries, and many research collaborations between academic and industrial teams already are flourishing. Consequently, leading academics in Ireland recently formed a research network, GlycoScience Ireland, to encourage interdisciplinary collaborations among glycoscientists, biologists, chemists, engineers, information scientists, and clinicians, thus advancing novel approaches to specific research questions. GlycoScience Ireland also provides an international forum for communication and interaction to assist in the translation of glycoscience discoveries into commercial realities.

The official launch of GlycoScience Ireland took place on April 8, 2008, in the new Science Gallery in Trinity College Dublin. The event was sponsored by NIBRT and the Centre for BioAnalytical Sciences (CBAS); ~140 people attended. Professor Raymond Dwek, Fellow of the Royal Society and member of the Oxford Glycobiology Institute (U.K.), gave an inspiring keynote lecture about new glycosylation-based strategies for antiviral drugs. This talk provided a focus for other speakers from academia, pharmaceutical companies, and funding bodies. The interdisciplinary nature ensured that the meeting buzzed with excitement as new networks and ideas were generated.

As Ireland aspires to become a world leader in the generation of new technologies and therapies, GlycoScience Ireland will provide a coherent platform for the development of research activities that can address bioproduction challenges. The aim is to provide a seamless flow from academia to industry that will lead to novel solutions that, although application-oriented, are built on the solid foundations of basic research. Further, to sustain Ireland's clinical, biopharmaceutical, and nutraceutical research activities, NIBRT and CBAS, in association with Irish universities, are expanding their programs to train exceptional glyco-talent at every level. The expertise generated by these initiatives will ultimately represent a strong cohort of human capital that will allow this innovative biopharmaceutical sector to thrive on this island.

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