

Ireland for Science, Technology, and Innovation

by Sean Davis

Ireland is an exciting place when it comes to research, development, innovation, and commercialization in biologics and life sciences. The government of Ireland's strategy for Science Technology and Innovation (ST&I 2006–2013) includes key deliverables stressing the importance of a dynamic infrastructure to enable further growth in these important fields. A strong foreign direct investment policy has secured >US\$5 billion from global players including Genzyme, Centocor, Merck, Wyeth, and Pfizer in recent years. Ireland also has built a strong indigenous biotech sector with companies such as Elan, Trinity Biotech, Merrion Pharmaceuticals, Sigmoid, Eirgen, and Opsona. A high level of government funding (through Enterprise Ireland, IDA Ireland, and Science Foundation Ireland) supports growth and a strong foundation of science and technology in the country's academic institutions as well as its infrastructure for business and academic collaborations.

In January 2009, Enterprise Ireland launched an industry-led research program in process analytical technology for the biopharmaceutical sector. This three-year program will bring together multinational drug development companies, indigenous Irish businesses, and academic expertise. Its focus is next-generation efficiencies in biopharmaceutical production. Of the sixteen companies involved, eight are Irish: BioUetikon, Stokes Bio, Valcon Consulting, Luxcel Biosciences, Cellix, DPS Engineering, Pharmeng, and Technopath. Eight multinationals are also involved: ABB, Wyeth, J&J (Centocor), Genzyme, Pfizer, Schering Plough, Eli Lilly, and Elan.

Education is key to maintaining a place as one of the world's leading biotechnology centers. Ireland was recognized by the International Institute for Management Development as having one of the best educational systems in the world. ST&I 2006–2013 aims to double the number of PhDs coming out of Irish universities.

The government established the National Bioprocessing Research, Education, Training, and Services facility (NIBRT) after extensive consultation with business and academia in the United States and Europe. It will generate the highest levels of best-practice skills across the spectrum of bioprocessing activities.

An integral part of Science Foundation Ireland investment is in Strategic Research Clusters (SRCs) and Centers for Science, Engineering, and Technology (CSETs). Specific SRCs are in the following research areas: Solid State Pharmaceuticals Cluster in Limerick; the Network of Excellence in Functional Biomaterials and Glycoscience Research Centers in Galway; and the Irish Drug Delivery Network and BioNanoInteract cluster based at University College Dublin. The SRCs have fostered industry partnerships with multinational companies including Medtronic, Boston Scientific, Pfizer, and GlaxoSmithKline.

These commitments have led to the escalation of world-class Irish companies, particularly in the field of new drug development. Opsona Therapeutics is one example. The company is building on a considerable body of expertise in immunology and in Toll-like receptor (TLR) signaling amassed by its scientists. The company's internal pipeline of drug candidates is expected to enter the clinic over the next few years. Late last year, Opsona added a novel asset to its preclinical pipeline when it in-licensed from Nestlé a protein found in human breast milk and serum that exerts immunomodulatory effects by inhibiting TLRs. The company has secured an alliance with Wyeth based on that discovery and development of antagonists to TLRs and on finding new targets within TLR-signaling pathways.

THREE IRISH COMPANIES

Headquartered at the Invent Centre advanced technologies incubator on the

campus of Dublin City University, Sigmoid Pharma has developed a proprietary oral pharmaceutical formulation technology called liquid/emulsion drug delivery system (LEDDS). The company has alliances with pharmaceutical and biotechnology companies to develop specialist formulations of partner compounds. It is also developing its own pipeline of proprietary formulations in the therapeutic areas of transplantation, gastrointestinal disease, and neurodegeneration.

Located at the Dublin City University campus, BioUetikon Limited provides high-quality process development and current good manufacturing practice (CGMP) bioproduction services to the biopharmaceutical, medical device, and related industries. Proximity to academic expertise allowed the company to harness the R&D capabilities of the university, to build collaborations, and to further develop its contract manufacturing service. The CMO provides a range of services to international and local clients. Over the past 10 years, it has successfully produced a recombinant protein for market supply. Other services include bioprocess development/optimization, GMP cell line banking, mammalian/insect cell culture to the 1,000-L scale, and downstream processing and development.

Those are just three innovative Irish companies. Across the bioprocessing landscape, Ireland and Irish companies have invested significant resources to develop and grow core competencies to meet the biotechnology sector's rising demands. From biologics to drug discovery and development to plant design, construction, and engineering, the Ireland biotechnology sector is a dynamic environment of innovative solutions. 🌐

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