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THE NEED FOR LIFE SCIENCES IN IRELAND

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WHAT ARE LIFE SCIENCES?

Life Sciences are the study of living things, providing explanations about how they relate to one another and to their surroundings. Life Sciences consider everything from the food we eat, to the medical cures we seek, to the plants and animals in our environment. Previous centuries have seen great advances in chemistry and physics and the current century is delivering new knowledge on how organisms live, develop and die.

Achieving a complete understanding of life is one of the most daunting challenges in the history of science. Life Sciences are multidisciplinary and include anatomy, agriculture, behaviour, biochemistry, bioinformatics, biotechnology, botany, cell biology, developmental biology, ecology, evolution, food science, genetics, genomics, immunology, microbiology, molecular biology, neurobiology, nutrition, pharmacology, physiology, medicine, zoology and more. While these specialised disciplines have achieved great discoveries, their combined Life Sciences potential is both unprecedented and exciting.

Life Sciences not only hold the promise to improve our quality of life but also provide opportunities for economic development and environmental improvement for the benefit of society.

LIFE SCIENCES AND SOCIETY

Decision making requires knowledge, and the better informed society is on the challenges it faces, the more it will prosper. The people of Ireland face unprecedented challenges; in the Life Sciences area these include: the ageing population with associated increases in illness and pressures on health care systems; infectious disease threats in the face of a changing climate; and environmental challenges such as pollution, waste management and threats to species diversity. Life Science research must also inform society on lifestyle health choices, including the benefits of functional foods and nutraceuticals (foods that provide health benefits above basic nutritional function).

Consumers today are well informed—they have genuine concerns over biotechnology and how it may impact food safety and quality, human and animal health and the environment. They wonder about the ethical, social and legal implications of biotechnology research and development. Every effort needs to be made to continue to educate the public and keep Life Sciences in the public consciousness. Presenting cogent arguments on the pros and cons of individual biotechnologies to the general public remains a major challenge to life scientists.

THE LIFE SCIENCES AND THE ECONOMY

Ireland has a strong international reputation and track record in the Life Sciences—especially in the manufacture of pharmaceuticals and medical devices. Ireland is home to thirteen of the top fifteen global companies in this sector and manufactures nine of the world's top fifteen medicines. Today the Life Sciences sector generates almost one third of total exports from Ireland and employs in excess of 52,000 people in over 350 enterprises. The Life Sciences sector has contributed significantly to Ireland's economic development over the last decade, with about a 6% year-on-year increase in exports since 2000. Ireland contributes 9% of global sales (which now exceed US$750 billion a year), and as a country is the largest net exporter of medicines globally. Life Sciences products are predicted to be vital in driving export-led growth from Ireland into the future.

Ireland's challenge in the future is to bring together science and technologies to provide opportunities to stimulate entrepreneurship and the emergence and growth of new innovative companies. This is particularly true for the Life Sciences, where there is a shift towards personalised health care and the emergence of functional foods.

Ireland needs to invest in people and knowledge for the Life Science economy to thrive and compete on the world stage.

LIFE SCIENCES AND THE ENVIRONMENT

Ireland's international image is green and friendly, a reputation that underpins both tourism and food exports. Ireland exports in excess of 75% of its total agricultural output and has developed global competitive advantages through its strong grass-based farming system. While agriculture continues to grow in an environment that fosters innovation and greater reliance on renewable resources, our climate change commitments present a significant challenge to the agri-food industry to play its part in achieving at least a 20% reduction in greenhouse gas emissions by 2020. Life Sciences research has the opportunity to develop clean biofuels, to provide new environmental services (e.g. bioremediation), to provide carbon sequestration opportunities (e.g. forestry) and more. In addition, biodiversity is a major emerging issue, with many retailers and manufacturers introducing environmental assurance programmes that contain a strong biodiversity focus. These programmes recognise that if the countryside is managed in a sustainable way it can enhance biodiversity and have a positive impact on the environment.

THE NEEDS OF AN EVOLVING LIFE SCIENCES SECTOR

Ireland needs to invest in people and knowledge. There are growing calls from industry for highly skilled workers with PhDs relevant to the area of applied research. To this end it has been recognised that there is an urgency to reinforce the human capital pillar of Ireland's Smart Economy. There is a need to encourage participation in science and mathematics disciplines throughout the whole education system and to encourage young people to pursue careers in science and technology.

The Government of Ireland aims to develop a national system of innovation that will contribute to economic progress and the overall welfare of society. The Government has targeted the areas of health, environment, energy, agriculture, forestry and food and marine, all of which are reliant on Life Sciences knowledge. Support for research and development in these areas will be vital for this success. Establishing a strong research base in Ireland is a vital driver of major investment decisions by multinational and indigenous companies.

The return on investment in Life Sciences knowledge is increasing. However, there is international competition as Ireland is not unique in fostering Science, Technology and Innovation activity, with Life Sciences as a core element. It is essential that Ireland continues with its Life Sciences programme for the benefit of all its citizens.

SOURCES

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The Life Sciences Committee is a multi-disciplinary scientific committee of the Royal Irish Academy with remit to pursue strategic and policy development within Life Sciences on an All-Ireland basis
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