

biotech focus

Edinburgh Science Triangle: visionary initiative to serve the next generation of life scientists

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Scotland and science are synonymous. The country's reputation for innovation and ingenuity have seen it record numerous firsts across the medical, engineering and technology fields, cementing its status as a pioneering hub of ground-breaking research and making it the natural location for Europe's first science park at Heriot-Watt University, Edinburgh, in 1971.

Over the past 34 years, Scotland has continued to develop its science skills and facilities, and Edinburgh is at the core of life sciences knowledge and talent in Scotland (Figure 1). With nine research institutes and 37 departments across three universities – the University of Edinburgh, Heriot-Watt University and Napier University – dedicated to groundbreaking life-sciences-related R&D, there are numerous opportunities for industry-academic partnerships to produce commercial benefits. Equally important is the fact that Scotland has one of the best trained and most cost-competitive workforces in the world. More than 12% of Scottish graduates hold life-sciences-related qualifications at different levels and new qualifications are constantly being developed.

Rapidly expanding scientific community

With the initiation of the Edinburgh Science Triangle in 2004, Scotland has created a multi-site super-campus focused on active collaboration, idea exchange and prolific scientific development. Encompassing seven of Scotland's

leading science parks (Table 1), the Edinburgh Science Triangle aims to develop modern science and exploit the opportunities presented by converging disciplines.

The Edinburgh Science Triangle is ambitious. It is already one of the 20 largest science parks in the world, ranking alongside Cambridge and London as a leading UK research base, but it also aims to be consistently one of the top 10 research and development locations in Europe.

Key to the foundation of the Triangle is its academic associations. At its core are some of Scotland's leading life sciences universities and institutes – Edinburgh, Heriot-Watt, Moredun Research Institute and Roslin Institute – making it home to more than 3300 world-class researchers with the potential to create a further 15,000 new high-value research jobs. All seven of the campus sites are within a 45 min drive of each other.

With life sciences expertise spanning genomics, bioinformatics, animal health and stem cell research, and facilities exploring microelectronics, petroleum discovery and extraction, and brewing and distilling, the Triangle forms a truly diverse and dynamic scientific community – taking products from initial design through to market launch.

Coupling its research facilities with commercial operations has unlocked huge potential. The Edinburgh Science Triangle has already attracted

almost 100 companies to its sites, including multinational businesses, such as Ethicon, Aptuit and Charles River Laboratories, who sit alongside Scottish corporations like Viragen, Lux Biotechnology, Lab901 and Alba Bioscience – all keen to share knowledge, opportunities and economic success (Table 2).

Life sciences centres of excellence

Life sciences are a major success story in Scotland, with almost 500 separate companies and academic institutions employing over 26,000 people in a range of disciplines, such as therapeutics, diagnostics, veterinary science, agri-bio and medical devices.

Within the Edinburgh Science Triangle, life sciences activity is centred in four of the seven science parks, each providing a distinct specialist focus. These facilities are linked through an Edinburgh Science Triangle steering group so that their breadth of expertise can be combined, and industry and academic partnerships encouraged.

Each of the four bioscience 'hotspots' within the Triangle have been equipped with bespoke facilities, allowing the crucial centres to conduct detailed R&D activity in high-calibre surroundings dedicated to their particular speciality.

With world-ranking expertise in stem cell research, genetics, genomics and bioinformatics, Roslin BioCentre was formed around the famous Roslin Institute. Known worldwide as the birthplace of Dolly the sheep, the first cloned mammal from an adult cell, the centre has expanded significantly and is now the location of choice for a wide range of companies specialising in life sciences.

The Roslin BioCentre has attracted multinational and spin-off tenants including Geron Biomed, the Genesis Faraday Partnership and Cygenics.

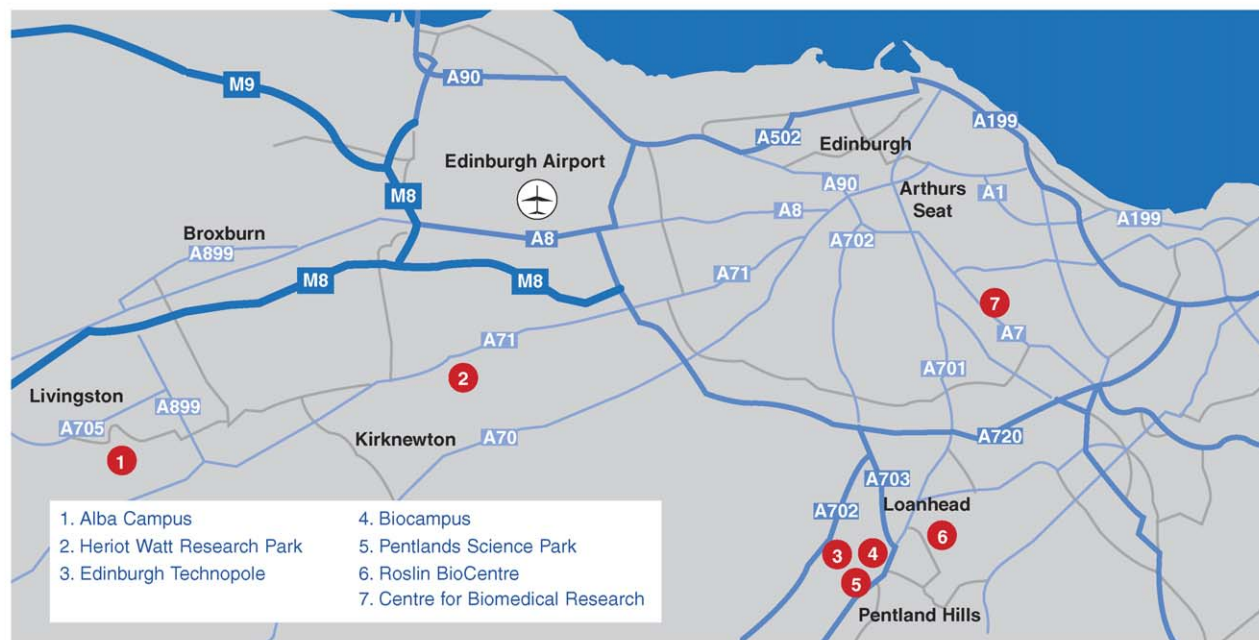


FIGURE 1
Map of the Edinburgh region.

With the original 200,000 square feet (sq ft) of laboratory and research studio space already occupied, the centre expanded in 2004 with an additional 20,000 sq ft of space in a new multi-occupancy building. The Wallace Building provides accelerator facilities comprising fully serviced laboratory and office accommodation for life science organisations in a supported environment. The site also has detailed planning permission for a further 40,000 sq ft of premium multi-occupancy lab and office accommodation, ensuring that Roslin BioCentre remains a magnet for any company operating in the life sciences sphere.

Specialising in veterinary science, Pentlands Science Park is home to the Moredun Research

Institute and has strong links with the University of Edinburgh, the Royal Dick Veterinary School and the Scottish Agricultural College. The close alliance of these bodies provides a critical mass of veterinary scientists who, through the park's world-class animal facilities, can collaborate with the Moredun Research Institute and fellow Pentlands Science Park tenants to expand knowledge and discovery.

Supporting the thriving life sciences industry is the flagship Biocampus. Just eight miles south of Edinburgh, it houses a 25,000 sq ft cGMP manufacturing unit and the first dedicated national manufacturing nucleus for next generation life-science-related products. In addition to its phase 1 facilities, there are plans for the

Biocampus to add a further 15,000 sq ft of manufacturing space coupled with dedicated plots for customized commercial buildings. The close proximity of three of the top-five cell culture media manufacturers in the world – Invitrogen, Sigma-Aldrich and Hyclone – less than three hours away by car, reinforces the centre's prime position in the European biomanufacturing market.

Meanwhile, the Centre for Biomedical Research (CBR) is a new centre for biomedical research adjacent to the Edinburgh Royal Infirmary, a five-star teaching hospital, and the University of Edinburgh's medical school and Institute for Medical Cell Biology. Due to open in May 2006, the centre will comprise over 500,000 sq ft of academic research space and a further 900,000 sq ft for commercial research-based companies, including a range of laboratory and office accommodation. Bringing together world-class R&D and medical training in an inclusive environment, the CBR is set to harness Scotland's expertise in infectious diseases, reproductive biology and stem cell research. It has already been heralded as a serious rival to the Kobe Institute in Japan, the internationally celebrated genomics and stem cell research institute. According to Deputy Director of the RIKEN Centre for Developmental Biology at Kobe, Shin Ichi Nishikawa, the CBR will help establish Edinburgh as one of the world's top-

TABLE 1
Science park fields of distinction

Centre	Specialism
Alba Campus	Electronic design
Biocampus	Dedicated biomanufacturing campus
Centre for Biomedical Research	Interdisciplinary research facility: reproductive biology, cardiovascular science and inflammation research
Edinburgh Technopole	Electronics and informatics
Heriot-Watt Research Park	Electronics, energy, crossover and convergent technologies and medical physics
Pentlands Science Park	Veterinary science
Roslin BioCentre	Life sciences: stem cells, genetics, genomics and bioinformatics

TABLE 2

List of Edinburgh Science Triangle occupier companies

Science park	Tenant companies					
Alba Campus	<ul style="list-style-type: none"> • The Alba Centre • Cadence 	<ul style="list-style-type: none"> • Careshare Nurseries • Epson 	<ul style="list-style-type: none"> • The Institute for System Level Integration 	<ul style="list-style-type: none"> • Motorola 	<ul style="list-style-type: none"> • Plexus 	<ul style="list-style-type: none"> • Virtio
Edinburgh Technopole	<ul style="list-style-type: none"> • 3MRT • BEST • Business Equilibrium 	<ul style="list-style-type: none"> • Coeval • Future Factory • Henzteeth 	<ul style="list-style-type: none"> • i4 Product Design • Indigo Vision 	<ul style="list-style-type: none"> • Lightfolio • Purple Patch Wireless 	<ul style="list-style-type: none"> • Roseberry Chartered Accountants • Sigma Seven 	<ul style="list-style-type: none"> • Texonet • Xilinx
Heriot-Watt Research Park	<ul style="list-style-type: none"> • A-Life • Aptuit • BioLitec Pharma • Business.Com • Charles River Laboratories • Chemical Consultancy Services 	<ul style="list-style-type: none"> • CMIST • Company Net • Computer Application Services • Department of Petroleum Engineering 	<ul style="list-style-type: none"> • Edinburgh Instruments • Edinburgh Petroleum Services • Edinburgh Surface Analysis Technology • E.R.T. (Scotland) 	<ul style="list-style-type: none"> • Helica Instruments • HyaltechLtd • Institute of Occupational Medicine (IOM) • The Knowledge • Microsulis • Origo Services 	<ul style="list-style-type: none"> • Renishaw • Scotch Whisky Research Institute • Scottish Environmental Protection Agency • Scottish Road Safety Campaign 	<ul style="list-style-type: none"> • Scottish Water • Scottish Woodlands • Surfactant Solutions • Trak Microwave
Pentlands Science Park	<ul style="list-style-type: none"> • Alba Bioscience • Angel Biotechnology • Applied Generics • Biobest • Bioreliance • Invitrogen Bioservices 	<ul style="list-style-type: none"> • Bmt Codah • CSI Europe • ECTF • Edinburgh Centre For Rural Research • Edinburgh Pharmaceutical Processes 	<ul style="list-style-type: none"> • ENTEC • Global Alliance for Livestock Vaccines • Hycor Biomedical • LGC 	<ul style="list-style-type: none"> • LTS International • Microscience Technologies • Moredun Foundation 	<ul style="list-style-type: none"> • Moredun Research Institute • Moredun Scientific • SASA • Schering Plough 	<ul style="list-style-type: none"> • Scottish National Blood Transfusion Service • VLA Lasswade • Vetaid • Viragen Scotland
Roslin BioCentre	<ul style="list-style-type: none"> • Argentix • BCG Europe • Cygenics 	<ul style="list-style-type: none"> • Endpoint Research • Eyesupply • Genecom 	<ul style="list-style-type: none"> • Genesis Faraday Partnership • Genetics Society • Geron Biomed 	<ul style="list-style-type: none"> • Ice Robotics • Invinity Bioscience • Nexus Oncology 	<ul style="list-style-type: none"> • Roslin Institute • Roslin Nutrition 	<ul style="list-style-type: none"> • Thoeris Consulting • Xeroshield
New developments						
BioCampus	25,000 sq ft advanced cGMP manufacturing unit complete					
Centre for Biomedical Research	Due to open May 2006					

ten centres for biomedical research, placing it among renowned institutions like Biosquare in Boston, MA, and Mission Bay in San Francisco, CA, in the USA, the Biopolis in Singapore and Kobe, Japan.

The centre will also be home to the distinguished Centre for Regenerative Medicine in Scotland – concentrating industry expertise, excellence and research in purpose-built facilities of the highest calibre.

Facilities to exploit commercial opportunities

The Edinburgh Science Triangle is a significant boost to Scotland's world-class science base and is crucial in stimulating economic growth for specialist life sciences operators. It offers a wealth of technical specialist support to provide swift product development, a fast track to market, and business advice and development facilities across its super-campus structure.

For example, Heriot-Watt Research Park has developed a reputation for excellence in the science and technology convergence arena, providing a host of academic resources and commercial facilities. As a result, it boasts several highly successful spin-outs and niche tenants operating in the life science, energy and environmental industries, such as Aptuit, Charles River Laboratories, CMIST and Renishaw.

Similarly, Edinburgh Technopole is home to 15 companies, including Indigo Vision, Xilinx, Texonet, Sigma Seven, Lightfolio, Purple Patch Wireless and Future Factory, with expertise in areas ranging from video technology to consultancy and development services. The provision of these additional operations continues the diversity of the Edinburgh Science Triangle, providing room for continued economic and academic growth over years to come.

These services allow tenants at each of the seven centres to exploit commercial opportunities effectively and efficiently. New product introduction (NPI) facilities and expertise allow for a quicker time-to-market, and result a tangible commercial edge – a crucial advantage in the highly competitive and fast-paced life science industry.

Continuing modern science

Scotland has identified that it must maintain and enhance its international reputation as a leading location for science, a place where it is profitable to invest in scientific work and where it is advantageous to complete ground-breaking scientific research. It is building on its proven track record for firsts, and believes that sharing ideas, information and collaboration to influence development is central to the continued advancement of science.

Through the Edinburgh Science Triangle, with its strategic long-term visionary developments, Scotland is providing an attractive nucleus for the next generation of life sciences. With specialist services, facilities and resources, Scotland, and in particular Edinburgh, will be able to recruit, retain and develop leading scientists across a range of

disciplines. To take its place as one of the world's leading science locations, the Edinburgh Science Triangle is progressing modern science, sustaining the global scientific network and continuing the prosperity of life sciences.

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