SCOTTISH LIFE SCIENCES 2010 REVIEW

Life Sciences SCOTLAND

INDUSTRY FOREWORD

Scotland's life sciences community has remained resilient in the challenging global environment and the sector has continued to develop over the last 12 months. Our companies and the wider community together have continued to achieve significant successes, many of which are highlighted throughout this review.

The strength of Scotland's innovative and collaborative life sciences community has continued to attract new companies and significant quantities of investment with a number of companies expanding over the past year, further demonstrating Scotland's attractiveness as a global and competitive location for life sciences. Indeed, Edinburgh BioQuarter has been recognised as one of only two sites to have received investment from the UK Strategic Investment Fund. In this tough financial climate, it is encouraging to see many new life sciences companies being formed and companies successfully sourcing investment to fund their ambitions.

The Life Sciences Advisory Board (LiSAB) continues to be a real engine for change and development of life sciences in Scotland. Bringing together industry, academia, NHS and Government to deliver on and align objectives, it helps ensure the sector is well placed to respond to, and capitalise on, global opportunities. Over the past year we have been delighted to welcome 8 new members to LiSAB to ensure the Board continues to reflect the views of this hugely diverse sector.

The commitment of individuals and companies to working towards the future ambitions of the sector in Scotland has achieved real benefits and we, as Joint Chairs, are extremely pleased to see the progress that both LiSAB and its work streams have delivered. These include the MedTech Road Map, a result of collaboration between the NHS and industry, and the Scottish Life Sciences Skills Survey carried out by Scottish Enterprise and Skills Development Scotland with a number of partners.

The life sciences landscape has changed significantly, both in Scotland and globally, since the Scottish Life Sciences Strategy was published in 2008. As a result, LiSAB has had a strong focus this year on working with the community to review and refresh the Life Sciences Strategy for Scotland. This is a key priority for LiSAB as it ensures Scotland is positioned to

- maximise on new and existing opportunities in the global market;
- better capitalise on our existing strengths and assets.

Our focus over the next three years is to anchor, build and attract key businesses, people and capital. This includes growing capabilities to enable the life sciences sector to be a significant contributor to Scotland's sustainable economic growth and for Scotland to be the location of choice for life sciences companies to further grow. Key objectives are to build on the collaborative nature of the Scottish life sciences community to increase commercial collaborations and ensure Scotland realises the economic value of its life sciences assets.

As Joint Chairs, we look forward to working with the community to realise Scotland's ambitions.

Joint Chairs of The Life Sciences Advisory Board

DR JOHN BROWN, FRSE

Chairman Axis Shield plc, CXR Biosciences Ltd and the Roslin Foundation

NICOLA STURGEON, MSP

Deputy First Minister and Cabinet Secretary for Health and Wellbeing

SCOTLAND'S LIFE SCIENCES INDUSTRY

Over the past year Scotland's thriving life sciences sector has grown to comprise 640 organisations[1], employing in excess of 32,000 people[1], and contributing more than £3.1 billion to the Scottish Economy.[2]

Life sciences in Scotland is a diverse and flourishing sector with significant strengths across the academic and business base. In particular, Scotland has recognised strengths in both regenerative medicine and translational medicine and, combined with the significant investments made in these areas and emerging global opportunities, these provide exciting growth opportunities for the life sciences industry in Scotland. In addition, Scotland has a number of significant areas of business strength such as medical technology and drug development. Indeed, Scotland offers a hub of more than 50 contract research organisations and 60% of Europe's biosafety testing is carried out in Scotland.

According to the UK Life Sciences Start Up Report[3], Scotland is home to one of the four UK key clusters of life sciences start-ups and has the highest rate of life sciences start-ups per capita in the UK (2004-2009). The study hailed the quality of the scientific research at Scotland's universities and the "significant effort made by Scottish Enterprise to support and promote the sector". 2010 saw a continuation of this success; 19 new life sciences companies were generated, amongst them TPP Global Ltd, Ubiquigent Ltd and FixedPhage Ltd. Furthermore, overall private equity funding in life sciences companies in Scotland was in excess of £36 million in 2010. Successful exits for companies continue to make Scotland a good place for investors.

[1] Scottish Enterprise, [2] ONS annual life sciences report, [3] UK Life Science Start Up Report, Mobius Life Sciences 2010

HIGHLIGHTS 2010:

The **Scottish Life Sciences Strategy Refresh** has been the main focus for LiSAB in 2010. In a significant research effort, Scotland's strengths were re-assessed and aligned to global trends and markets. Complemented by findings from consulting the wider life sciences community, a refreshed strategy for the sector was developed to build, anchor and attract key businesses, people and capital to Scotland. This strategy will ensure that the life sciences sector continues to flourish, returning economic benefit to Scotland.

The **Edinburgh BioQuarter** was recognised as a strategically important location for life sciences in the UK with investment for a Bioincubator building from the UK Government Strategic Investment Fund. Both the Bioincubator and the Scottish Centre for Regenerative Medicine will open in 2011.

The **NHS Research Scotland Permissions Coordinating Centre** reduced R&D permission time for commercial and non-commercial multicentre studies to an impressive median of 15 and 16 working days during 2010. A new website provides easy access to a single, centralised point of contact for those wishing to conduct multi-centre clinical research involving the NHS Health Boards in Scotland.

Scotland's position as a leading location for regenerative medicine was confirmed with **ReNeuron's** ground-breaking Phase I stroke trial in Glasgow, the world's first using expanded neural stem cells. Scotland's significant investment in stem cells and regenerative medicine is now generating real returns with the combination of world-leading science, a commercial supply chain and clinical expertise capturing international attention.

GSK has continued to invest in their sites in Scotland, with investment totalling over £150 million in the past 5 years. GSK's plants in Montrose and Irvine contribute over £80 million to the Scottish economy annually. Irvine generates nearly 20% of the world s penicillin with Montrose manufacturing 10 APIs for leading GSK products.

Axis Shield plc has shown strong growth, with total revenues in 2010 expected to exceed £100 million for the first time in the Company's history, an increase of approx 6% compared to 2009.

The first **Scottish Life Sciences Skills Survey** was undertaken, led by Scottish Enterprise and Skills Development Scotland. This comprehensive survey has investigated a variety of topics including skills needs, recruitment requirements, skills utilisation and training provision. Over 150 companies responded to provide a wealth of information, which is now being utilised to address skills gaps in the industry.

2010 saw the publication of the document "Introducing New Technologies into the NHS in Scotland" (also known as the MedTech Road Map). Initiated by LiSAB, it is the result of a collaboration between key stakeholders from the Scottish Government, the NHS and industry. Its ultimate aim is to increase the **uptake of local innovation into the NHS in Scotland** by helping companies bring products to market that meet the needs of the NHS.

The refreshed **Life Sciences Scotland website** has been embraced by the life sciences community, as reflected by steadily growing user numbers. Usage of the website bears witness to its central role in connecting the community: News and events are the most popular features and a steady stream of blogs informs life scientists of the latest developments, such as funding calls.

These highlights are just a few of the outstanding achievements of 2010. In the pages that follow, we celebrate more of the world class achievements of the Scottish life sciences community.

PEOPLE

Scotland enjoys a strong international reputation based on the quality and strength of its scientific education and world class skills base. The people work stream is coordinating strategic interventions to address skills gaps and ensure that Scotland has a robust, appropriately skilled population to support growth of the sector and attract international firms looking to locate here.

Keith Brown, MSP, the then Minister for Skills and Lifelong Learning with two of the first Life Sciences Modern Apprentices at Ingenza Ltd. Photo supplied courtesy of Ingenza Ltd.

Key highlights from 2010 include:

The **Scottish Life Sciences Skills Survey** was completed with responses from over 150 life science organisations. The survey, led by Scottish Enterprise and Skills Development Scotland, has been a collaborative effort between all of the relevant stakeholders in Scotland. This has ensured delivery of a single survey covering all of the skills issues facing the industry. Focussed task groups are being set up to address the key areas that have been highlighted.

The information gathered in the skills survey has already been used to inform projects such as the **Life Sciences Skills Utilisation Programme**, funded by the Scottish Funding Council and led by Dundee College. The project aims to identify and develop unused workplace skills and experience to increase business performance.

The **Life Sciences Modern Apprenticeship**, launched in 2009, has continued to be well received throughout the community. The programme has attracted over 75 registrations across 26 life science organisations in Scotland with many more companies considering the Modern Apprenticeship as a route to skilling their workforce in 2011.

The **SULSA BioSKAPE programme,** funded by the Scottish Funding Council, was launched in 2010 to drive collaboration and innovation between Industry and the Scottish life sciences research base. Funding is available for industry PhDs, industry interchanges and masterclasses.

The **STEM Ambassadors Programme** continued to promote science in schools throughout 2010 with the number of STEM Ambassadors in Scotland growing to 2820. At the first STEMNET Ambassadors Awards for Scotland (March 2010), 2 of the 4 winners were from the life sciences sector.

Science Graduates for Work was launched in March 2010. The pilot programme at Forth Valley College, that provides science graduates with 12 weeks practical lab bench training and employability skills, has had two intakes in 2010 and will be expanded in 2011.

Lombard Medical Technologies PLC announced it is to create 39 jobs at its facility in Ayrshire. The Prestwick site will become the main facility for the manufacture of Lombard's Aorfix endovascular stent graft for treating abdominal aortic aneurysms.

Controlled Therapeutics Ltd was awarded Highly Commended status in both the 'Best Small Company' and 'People Management and Skills Development' categories of the 2010 Best Factory Awards from Cranfield Business School. The company was also awarded the Queen's Award for Enterprise in the International Trade category.

LifeScan Scotland Ltd, part of the multinational Johnson & Johnson family of companies, has been voted the top UK company for encouraging young people to pursue scientific subjects.

LiSAB PEOPLE CHAMPION: CHRIS HILL, MSD

For additional information, to provide input or to become involved with the People work stream, please contact Sharon McKendry at sharon.mckendry@scotent.co.uk

CAPITAL

Scottish life science companies continue to demonstrate that investors have funds for the right projects, despite the challenging financial climate, with a record amount of private investment funding raised in 2010.

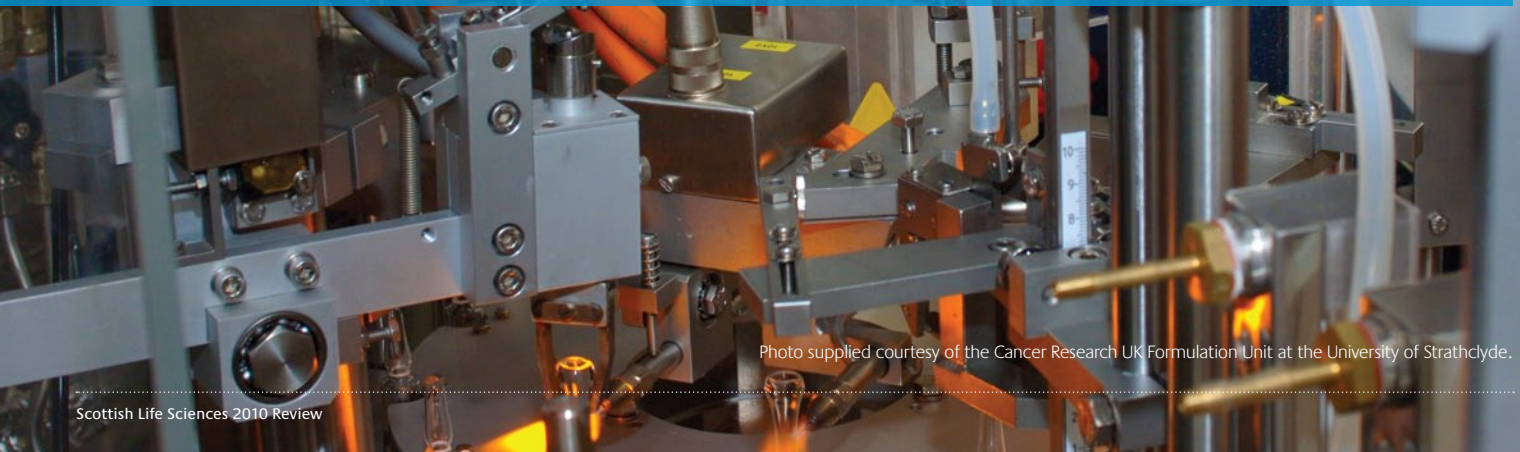

Photo supplied courtesy of the Cancer Research UK Formulation Unit at the University of Strathclyde.

A number of firms have raised significant funding this year:

TPP Global Development Ltd raised £9.6 million for future drug candidate development and has chosen to locate its new headquarters in Edinburgh's BioQuarter.

Glasgow based global CRO **ClinTec International** completed a strategic £8 million investment deal with **Elephant Capital**. ClinTec International reported a 45 per cent rise in global sales revenues in 2009 with innovative services developed in 17 new countries.

MGB Biopharma Ltd, the biopharmaceutical company established to develop a completely new class of anti-infective medicines based upon compounds which are DNA Minor Groove Binders (MGB), has raised £2 million and has commenced operations.

Ambicare Health Ltd, which develops ambulatory light sources for medical and consumer healthcare applications, raised £1.7 million. This will allow the company to roll out across Europe its lead product Ambulight PDT, a skin-cancer treatment, and bring its acne therapy product Ambulight Acne to market.

Big DNA Ltd, raised a further investment of £2 million to enable the company to progress its first product, a vaccine against Hepatitis B, towards Phase I clinical trials.

Aquapharm Biodiscovery Ltd, the marine biotechnology company based in Oban, has raised a further £4.2 million to further the development and commercialisation of its product portfolio. The company has appointed serial entrepreneur Prof Simon G. Best, OBE, FRSE as its new CEO.

American biotechnology company **Stemgent** announced an investment of £3 million in a new company **Ubiquigent Ltd**, a collaboration with the Scottish Institute for Cell Signalling (SCILLS) at the University of Dundee. Working with SCILLS, Ubiquigent is developing ubiquitin proteasome pathway related products, kits and services to support drug discovery research in the field.

NovaBiotics Ltd announced the successful completion of a Phase IIa clinical trial for Novexatin® in May 2010 and a successful £1.6 million rights issue to fund the IND filing planned for a Phase IIb study.

Other investments include:

Actual Analytics Ltd, a spinout from the University of Edinburgh School of Informatics, raised £900,000 and have since released the world's first online behaviour analysis solutions which increase the speed and accuracy of behavioural experiments at a fraction of the cost of traditional software.

MODE Diagnostics Ltd, a University of Glasgow spin-out company, secured £600,000 investment to further develop medical diagnostic screening products for home testing consumer markets.

Sistemic Ltd raised $1 million funding to further develop its proprietary SistemRNA compound-centric drug discovery technology.

Tayside Flow Technologies Ltd raised a further £800,000 to drive the commercialisation of lead products from its spiral laminar flow technology.

Successful investor exits in 2010 include:

Mpathy Medical Ltd and its sister operation **Gyneideas Ltd**, that have developed and brought to market a range of surgical solutions used to restore pelvic health to women, were sold to Danish firm Coloplast in a £22 million deal.

Reactivlab Ltd, a University of Glasgow spin-out which specialises in animal health diagnostic technology using Acute Phase Proteins, was acquired by the Avacta Group.

LiSAB CAPITAL CHAMPION: BILL BLAIR

For additional information, to provide input or become involved with the Capital work stream, please contact Andrew Henderson at andrew.henderson@scotent.co.uk

TECHNOLOGY

Scotland continues to build on its reputation as a world leader in life sciences innovation. There have been a number of successes across the life sciences company base, while the wider community has been working together to address the uptake of innovation within Scotland through mechanisms such as implementation of the MedTech Roadmap and model contracts for company/university collaborations.

Photo supplied courtesy of Optos plc.

Technology developments in the last year include:

ReNeuron Ltd began a ground-breaking Phase I trial in 2010, the world's first using expanded neural stem cells in stroke patients. The trial is taking place through the NHS at the Southern General Hospital, Glasgow. The stem cells used in the trial are being manufactured by **Angel Biotechnology Holdings plc** in Edinburgh.

Optos plc unveiled the 200Tx™, its newest ultra-widefield retinal imaging device. The 200Tx™ offers multiple wavelength imaging including options for colour, red-free, fluorescein angiography and autofluorescence, each of which can reveal different pathologies.

BigDNA Ltd, located at the Roslin Biocentre in Edinburgh, has been granted a key patent in Japan which covers its vaccine against hepatitis B.

Sistemic Ltd launched SistemQC™ which characterises/monitors the QC of cells including stem cells for cell therapy/bioprocessing markets. SistemTOX™ was launched as an early predictive/ investigational toxicology tool for drug developers.

CarieScan Ltd, a leading producer of handheld devices for the early detection and monitoring of tooth decay, announced that it has signed exclusive agreements with Patterson Dental for the distribution of the company's CarieScan PRO product in the USA and Canada.

In October 2010 **Bio-Rad Laboratories, Inc.** and **Axis-Shield plc** announced the U.S. FDA clearance and U.S. launch of Bio-Rad's BioPlex® 2200 Anti-CCP test for the early detection of rheumatoid arthritis. Axis-Shield also acquired key homocysteine clinical chemistry products and patents from US partner Catch Inc.

Touch Bionics Ltd, developer of advanced upper-limb bionic technologies and clinical solutions, has been named the Most Innovative Company of the Year in Europe in the 2010 International Business Awards and was also awarded the Queen's Award for Innovation. Furthermore, Touch Bionics launched their latest product – the i-LIMB Pulse – this year.

Aircraft Medical Ltd launched the McGRATH® MAC, the world's first high value, low cost video laryngoscope. This innovative device has been designed to address increasing clinical demand and make video intubation technology more accessible to doctors world-wide.

Aquapharm Biodiscovery Ltd has signed a research agreement with the **University of Dundee** to help it develop new drugs based on marine natural products that may help in the fight against Alzheimer's disease. This research agreement combines leading expertise to discover marine natural product inhibitors of O-GlcNAcase.

LiSAB TECHNOLOGY CHAMPION: SCOTT JOHNSTONE, ANTOXIS

For further information, to provide input or to become involved with the Technology work stream, please contact Oonagh Loughran at oonagh.loughran@scotent.co.uk

COLLABORATION

Collaboration is one of the great strengths of the vibrant life sciences community in Scotland. To support the growth of the sector, the collaboration work stream has focused on sharing best practice and building links with global life sciences clusters.

Photo provided courtesy of Nexxus.

Examples of key collaborations include:

In February 2010 **Taconic** established a specialised facility in Edinburgh for the development and production of technologically advanced models that are predictive of the pharmacokinetic and toxicological effects of candidate drug compounds and their metabolites in the human body. This site builds on the collaboration between **TaconicArtemis GmbH** and **CXR Biosciences Ltd.**

BioOutsource Ltd and the **Millipore Corporation** formed a strategic alliance that will enable the companies to bring a full range of biosafety services for biotechnology and vaccine clients who seek a world-class supplier.

In June 2010 **Cellartis AB**, a premier provider of stem cell derived products, announced that it will be a key partner in ScreenTox. This is a five-year joint research and development project which will address the unmet need for test methods for predicting toxicity of drugs, chemicals, and cosmetic ingredients.

Roslin Cells Ltd, a leading provider of clinical grade pluripotent stem cells (PSCs), launched the Roslin Cell Therapy Partner Program to advance the field of cell therapy. Roslin Cells also announced a research collaboration agreement with Lonza Inc. (US) for the development of customized cell culture media production of PSCs.

NovaBiotics Ltd entered into a collaboration agreement with Isogenica Ltd to fast-track the development of the company's anti-infective peptide technology platform.

B1 Medical Ltd, the medical development company based in Aberdeen, signed an agreement with **Giltech Ltd**, a world leader in the field of controlled delivery and biodegradable technologies, to collaborate on the development of B1's pioneering suture anchor.

Scottish Stem Cell Network and a number of partners announced in 2010 that the Technology Strategy Board has awarded the consortium a grant to develop a Therapy Pathway Realisation Tool (TRPT) applied to three representative regenerative medicine therapeutic products (REALISE).

TPP Global Development Ltd (TPP) announced an agreement with the **University of Edinburgh** to collaborate on the development of novel pre-clinical intellectual property originating within the University. This collaboration will focus on commercialisation opportunities in the areas of nervous system disorders, immunology/ inflammation and oncology.

In May 2010 the **University of Dundee** and **CXR Biosciences Ltd** announced that they are to play key roles in MARCAR, a €12 million collaborative research project. This will combine skills and experience of both industry and academia across Europe, with the aim of finding early indicators of certain types of cancer and increasing the effectiveness of the development of new drugs.

The **Scottish Academic Health Science Collaboration (SAHSC)** has continued to build upon the close NHS and academic partnerships existing in Scotland. The Collaboration aims to create a fully integrated platform for world-class translational medicine research in Scotland and will benefit from a £10 million investment by the Chief Scientist Office in NHS Research Scotland infrastructure that will be complete by March 2012. A key focus of the SAHSC is on development of mutually beneficial partnerships with the life sciences industry.

LiSAB COLLABORATIONS CHAMPION: CHRIS PACKARD, NHS GREATER GLASGOW AND CLYDE

For additional information, to provide input or to become involved with the Collaborations work stream, please contact Gillian Cay at gillian.cay@scotent.co.uk

INFRASTRUCTURE

The life sciences industry faced a number of challenges in 2010. Despite the economic downturn, both private and public sectors in Scotland continued to invest in the infrastructure that is required to enable this key sector to grow. 2010 also saw the creation and expansion of several research facilities that underpin our great tradition of biomedical innovation.

Very good progress has been made this year at Scotland's flagship **Edinburgh BioQuarter** project with the new BioIncubator facility due to open in 2011. Jointly funded by Scottish Enterprise and the UK Strategic Investment Fund, the **BioIncubator** building will accommodate startup businesses, scientific collaboration teams and larger tenants from November 2011 and discussions are now being held with potential occupiers.

This building complements the **Scottish Centre for Regenerative Medicine** which is currently under construction and also due to open in 2011. During the course of 2010, further commitment has also been secured in relation to the redevelopment of the Royal Sick Children's Hospital on site and the implementation of a public transport link to the site.

Private sector investment:

The **West of Scotland Science Park** is expanding to meet the needs of growing businesses. The state-of-the-art £4.5 million Venture Building, with exceptional eco-credentials, was opened in November 2010. This offers 31,000 sq feet of office and laboratory space for life science companies.

In June 2010 **Ingenza Ltd** opened a cGMP compatible laboratory, the company's fourth, augmenting its existing biotechnology, process development and fermentation laboratories.

The East Kilbride-based **Mentholatum Company**, the UK's largest manufacturer of topical pain relief products, has rapidly expanded with a £10 million investment to ensure it further develops its expanded R&D and manufacturing capabilities.

In September 2010 **Renishaw Diagnostics Ltd** opened expanded premises on the Nova Technology Park. The company is a world leading provider of trace level detection technologies utilising Surface Enhanced Resonance Raman Scattering (SERRS) for clinical research and molecular diagnostics applications.

In September 2010 **Angel Biotechnology Holdings plc** announced that, in response to continuing increased demand for its products, it is planning an increase in its manufacturing capacity and has expanded its Business Development team.

Public sector investment in life sciences:

The **Scottish Metabolomics Facility (ScotMet)** opened in February 2010 to receive samples and collaborate with academic and industry users. ScotMet is funded by the Scottish Universities Life Sciences Alliance (SULSA) and is run jointly by the Universities of Glasgow and Strathclyde.

The new **Strathclyde Institute of Pharmacy and Biomedical Sciences** building will be complete and formally opened in Summer 2011. This £36 million investment will harness the University's strengths in drug development and discovery to drive forward the search to find new drugs and treatments to tackle major diseases.

The **Clinical Research Imaging Centre** in Edinburgh was opened in November 2010. This unique £20 million facility brings together the very latest imaging technologies in a single facility and will be used to improve diagnosis and treatment of illnesses.

The University of the Highlands and Islands' new **Lipidomics Research Facility** is now fully operational at the Centre for Health Sciences in Inverness.

LiSAB INFRASTRUCTURE CHAMPION: JOHN A BROWN, SCOTTISH GOVERNMENT

For further information, to provide input or to become involved with the Infrastructure work stream, please contact Elisabeth Stark at elisabeth.stark@scotland.gsi.gov.uk

LIFE SCIENCES ADVISORY BOARD (LiSAB)

LiSAB was established in 2009 to build on the successful work previously carried out by the Life Sciences Industry Advisory Group. LiSAB is jointly chaired by a minister/industry and membership includes CEOs representing different parts of the industry as well as various public sector bodies.

LiSAB is responsible for setting the overall strategy for the growth of the Life Sciences sector in Scotland, advising the Scottish Government and the wider public sector on the key issues facing the industry both domestically and internationally and what needs to be delivered to help the industry fulfil its growth potential.

For current members of LiSAB please go to **www.lifesciencesscotland.com** and click on 'About Us'.

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Scottish Enterprise

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