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Synthetic biology / engineering biology analytics

United Kingdom & Scotland
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Synthetic biology (SynBio) / engineering biology – United Kingdom & Scotland analysis

Synthetic biology (SynBio), also known as engineering biology, is an emerging multidisciplinary field with many definitions. It is generally accepted that SynBio at least involves the design or redesign of biological systems for the development of useful and sustainable new products, etc. This includes novel metabolic pathways, engineered enzymes, artificial genomes and much more. Previous patent landscape studies[1] have recognised the difficulty of mapping the synthetic biology patent landscape due to the emerging and broad scope of the science and technologies involved. To further investigate synthetic biology from a patent perspective, Inevus Advanced Analytics Ltd have prepared a bespoke dataset to identify technologies and stakeholders within the United Kingdom. The analysis identifies key trends with a standardised methodology, it is not intended to be 100% exhaustive due to complexity issues, especially when balancing precision and recall.

The identified UK dataset for SynBio patent families with at least one UK resident assignee is mapped to UK postcodes using GeoJSON data obtained from the Office of National Statistics. Inventor address data was not used. This enables UK postcodes, etc. to be mapped to ITL3 regions (a replacement to the Eurostat system)[2]. The dataset excludes the Isle of Man, Jersey, Guernsey and overseas territories beyond direct UK borders. The analysis is only possible with assignee address data. Data cleaning also removed individuals from the analysis, focusing on three sectors; companies, universities and government / non-profit.

Dataset notes

Stakeholder discovery - this project identifies synthetic biology related INPADOC patent families with at least one UK based assignee, verified via the assignee address field. There are no country limitations applied to enable optimal stakeholder discovery. For example, previous reports were solely based on European Patent Office (EPO) patents, this restricted the analysis and did not allow for patent families where applicants may have filed in different territories or have filed recent PCT / WO patents which have not yet entered the European phase.

Address data - patent office's differ in their data policies regarding address data, there is also the lack of availability of GB patent address data which is not released to the commercial databases. The project relies predominantly on EPO, US, WO data and any patent family member where address data is available and searchable within the Questel Orbit database. Beyond 2023 there is a noticeable drop-off due to the lack of address data availability.

Data availability – the project cleaned data up to and including may 2025, there were 369 new families in 2024 and 182 in 2025 which is quite the drop-off (2024) due to a lack of data availability regarding the assignee address field. Therefore, trend visualisations and compound annual growth rates involved capping data to 2023. However, in sections regarding stakeholder discovery the patent families from 2024 & 2025 have been included. In these instances the dataset is discussed as patent families published since 2014 (and up to and including May 2025) to maximise discovery of stakeholders / applicants for analysis.

Innovation – the statistics produced in this report analyse innovation from a patent perspective. The findings act as a proxy for innovation, they cannot account for intellectual property protection via trademarks, designs and copyright.

Further applicable notes include:

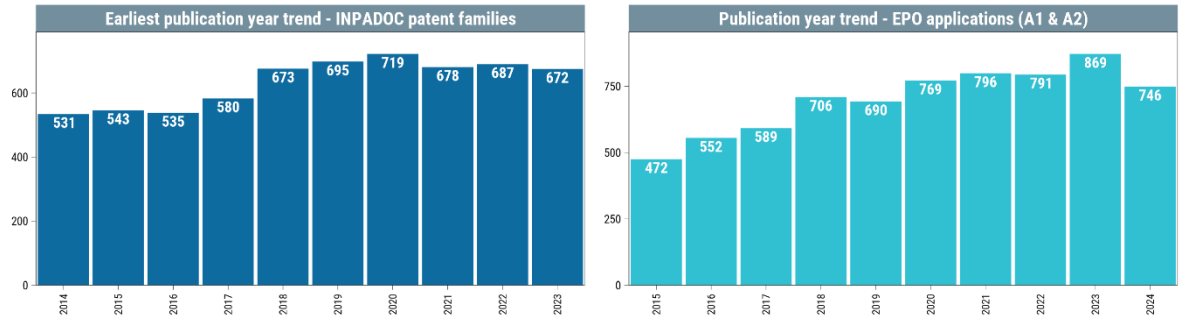
- The dataset is subject to the standard 18-month publication delay, due to the publication routines and examination timeframes of patent offices. Therefore, the dataset represents a snapshot in time.
- The dataset aims to capture key technologies within the synthetic biology field which broadly encompasses engineering biology. This approach also captures relevant broader biotechnology patents which form the background from which synthetic biology technologies have emerged e.g. protein engineering, genetic engineering and much more, including biofuels, etc.
- A major part of the dataset methodology relies on using patent families assigned to highly relevant IPC/CPC subgroup classification codes identified via review of patent portfolios of

prominent synthetic biology applicants. This is further supplemented with keyword searches to extend the scope of the analysis, data cleaning also sufficiently balances the need for precision and recall, providing a very robust tool to conduct analyses.

- When investigating the assignee country data, the analysis is reliant on the accuracy and coverage of Questel Orbit Innovation. Data cleaning was carried out to ensure a fair procedure. This analysis can be influenced by patent filings which may use the applicants headquarters for the address. Nevertheless it is a very useful tool for international comparison of patenting activities and identifying specific assignees. In some instances, companies house was utilised to double check incomplete address data. Address data may not be updated if a company moves their headquarters, the coverage is dependent on database updates.
- Innovation statistics are analysed from a patent perspective which acts as a suitable proxy of innovation levels. There may be intellectual property protected via trade secrets, etc. Scientific and econometric literature accepts patent data as a solid proxy for measuring technological innovation.
- The SynBio topic model was developed using data mining techniques, it is not intended to be exhaustive and provides an analytical tool to look deeper within SynBio patenting in the UK. The methodology balances the need for precision and recall when working with large data and numerous categorical combinations, determined via complex classification and keyword searches.

Overall publication trends

In figure 1, the earliest publication year trend is visualised for the SynBio patent families identified (UK assignees), the data is capped to 2023 due to the drop-off encountered. However, the publication figures for European Patent Office (EPO) publications within the patent families identified are also shown for a different perspective of patenting activity. The data here is for all families identified across the United Kingdom.



When analysing the SynBio patent families by earliest publication date during 2014-23, the compound annual growth rate is 2.7%. This reflects a reasonable level of growth for new patent families and innovation across the United Kingdom, where INPADOC patent families represent specific inventions. The growth rate of the EPO applications (A1 & A2 kind codes) identified was 5.2% CAGR during 2015-24. This rate of patenting activity corresponds to EPO patents being filed by synthetic biology related applicants within the United Kingdom at the European Patent Office.

Top 60 ITL3 regions – INPADOC patent families

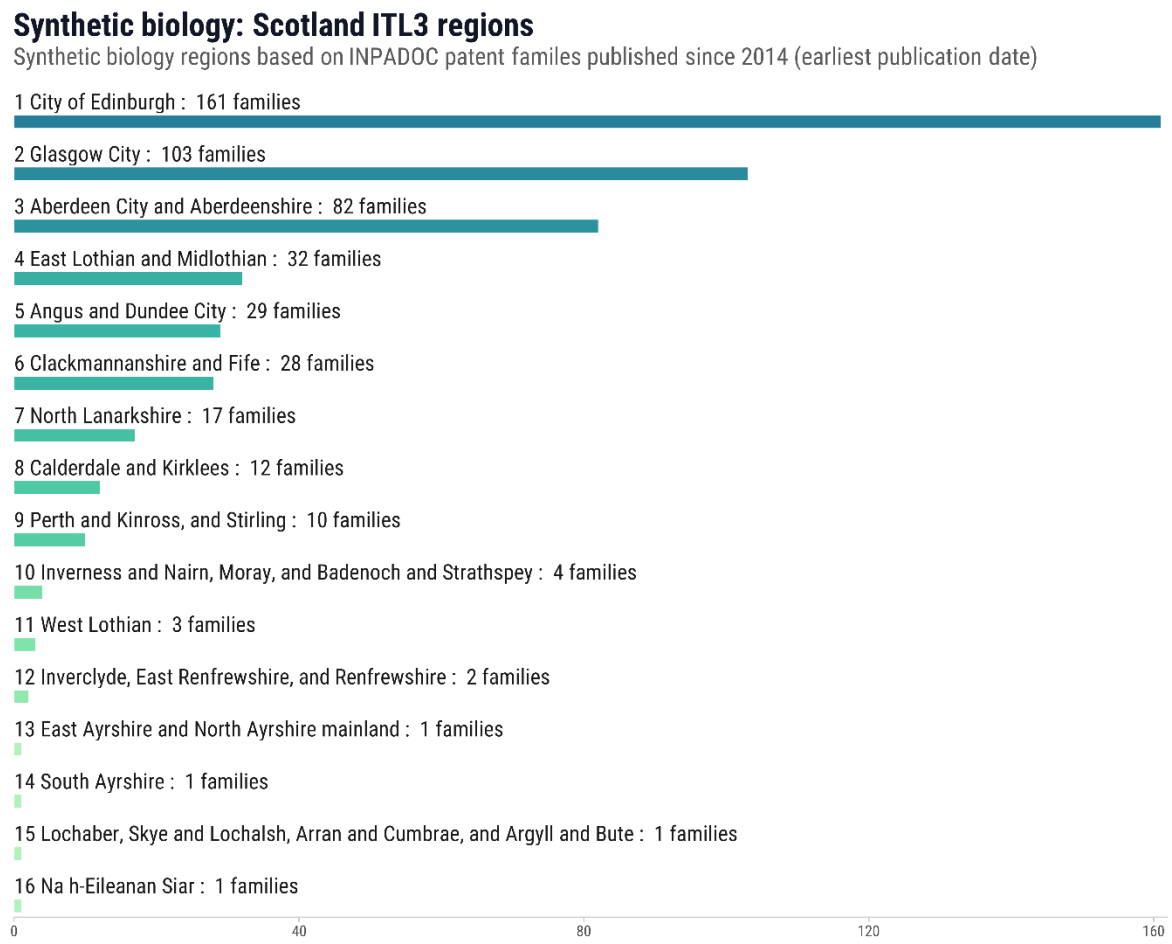
In figure 2, the top 60 UK regions for synthetic biology patenting based on the ITL3 system are analysed, ranked by number of patent families published since 2014 (earliest publication date).

In figure 2, approx. 53% of the UK-based applicants of the patent families identified since 2014 in engineering biology / SynBio have been filed from within the golden triangle. From a Scottish perspective, the city of Edinburgh is ranked in the top 10 (7th) with a 2% share of the overall distribution of patent families. This is behind the leading innovative hubs of Cambridgeshire CC (15.6%) and Oxfordshire CC (11.9%). However, the analysis suggests that the City of Edinburgh ITL3 region is making a significant contribution to the innovation occurring within synthetic biology and is one of the most prominent regions in the United Kingdom for SynBio expertise and research and development.

The Glasgow city region is ranked 14th and comfortably within the top 20 regions with 103 families published since 2014 (1.4%). Aberdeen city and Aberdeenshire is also ranked 20th, there exists SynBio expertise within Scotland, which is reasonably comparable with other major cities such as Manchester and Nottingham. The city of Edinburgh ITL3 region, has kept pace with regions where there are large established companies such as Hertfordshire cc which benefits from the close proximity to the city of London.

Scottish regions

The Scottish regions in full, identified during the geolocation analysis (patent families published since 2014) are shown in figure 3. The city of Edinburgh is a key innovative hub for synthetic biology / engineering biology, the Glasgow city region is comparable with 103 patent families. With both regions ranked in the top UK innovative areas, they represent important regions for synthetic biology research and development. Whilst there is a drop-off beyond Edinburgh & Glasgow, Aberdeen city and Aberdeenshire may be viewed as a secondary hub within Scotland (82 families). There are also 3 regions with similar distributions of patent families acting as tertiary innovative hubs within Scotland, which could be further developed.



Identifying top stakeholders – Scottish regions

The largest stakeholders / patent assignees identified within the top Scottish regions are documented in table 1, capped to the top 10 for City of Edinburgh, Glasgow City regions and Aberdeenshire.

Index	Assignee	Patent families	ITL3 region
1	UNIVERSITY OF EDINBURGH ([GB])	90	City of Edinburgh
2	IOMET PHARMA ([GB])	8	City of Edinburgh
3	HERIOT WATT UNIVERSITY ([GB])	7	City of Edinburgh
4	LOTHIAN HEALTH BOARD ([GB])	4	City of Edinburgh
5	ADORX THERAPEUTICS ([GB])	4	City of Edinburgh
6	WOBBLE GENOMICS ([GB])	3	City of Edinburgh
7	MACOMICS ([GB])	3	City of Edinburgh
8	AILURUS ([GB])	3	City of Edinburgh
9	MI RNA ([GB])	3	City of Edinburgh
10	MEDANNEX ([GB])	3	City of Edinburgh
1	UNIVERSITY OF GLASGOW ([GB])	39	Glasgow City
2	SOLASTA BIO ([GB])	17	Glasgow City
3	UNIVERSITY OF STRATHCLYDE ([GB])	12	Glasgow City
4	IN3BIO ([GB])	6	Glasgow City
5	3F BIO ([GB])	4	Glasgow City
6	FIXED PHAGE ([GB])	4	Glasgow City
7	MIRONID ([GB])	4	Glasgow City
8	SOLASTA BIOLOGICS ([GB])	3	Glasgow City
9	SISTEMIC SCOTLAND ([GB])	3	Glasgow City
10	CAUSEWAY THERAPEUTICS ([GB])	2	Glasgow City
1	4D Pharma ([GB])	53	Aberdeen City and Aberdeenshire
2	UNIVERSITY OF ABERDEEN ([GB])	12	Aberdeen City and Aberdeenshire
3	ELASMOGEN ([GB])	4	Aberdeen City and Aberdeenshire
4	GTINVENT ([GB])	4	Aberdeen City and Aberdeenshire
5	NCIMB ([GB])	1	Aberdeen City and Aberdeenshire
6	CYTOSYSTEMS ([GB])	1	Aberdeen City and Aberdeenshire
7	SIGNAL PHARMACEUTICALS	1	Aberdeen City and Aberdeenshire
8	RAB MICROFLUIDICS RESEARCH & DEVELOPMENT ([GB])	1	Aberdeen City and Aberdeenshire
9	ARJO WIGGINS FINE PAPERS ([GB])	1	Aberdeen City and Aberdeenshire
10	EPITOGENX ([GB])	1	Aberdeen City and Aberdeenshire
1	SYNPROMICS ([GB])	13	East Lothian and Midlothian
2	ASKBIO ([GB])	10	East Lothian and Midlothian
3	MOREDUN RESEARCH INSTITUTE ([GB])	6	East Lothian and Midlothian
4	INGENZA ([GB])	3	East Lothian and Midlothian
5	ROSLIN TECHNOLOGIES ([GB])	3	East Lothian and Midlothian
6	GREEN BIOACTIVES ([GB])	3	East Lothian and Midlothian
7	CARCINOTECH ([GB])	2	East Lothian and Midlothian
8	BIOTANGENTS ([GB])	1	East Lothian and Midlothian
1	UNIVERSITY OF DUNDEE ([GB])	19	Angus and Dundee City
2	BIOCONTROL ([GB])	2	Angus and Dundee City
3	XSCIENTIA AI	2	Angus and Dundee City
4	EXSCIENTIA AI ([GB])	2	Angus and Dundee City
5	TAY THERAPEUTICS ([GB])	2	Angus and Dundee City
6	VASCULAR FLOW TECHNOLOGY ([GB])	1	Angus and Dundee City
7	SIRAKOSS ([GB])	1	Angus and Dundee City
8	DUNDEE UNIVERSITY OF ([GB])	1	Angus and Dundee City

Table 1. Top assignees identified in key Scottish ITL3 regions for SynBio / engineering biology

The analysis identifies the University of Edinburgh as a key organisation making significant contributions to the research and development of SynBio related technologies in Scotland. Given Edinburgh's ranking overall identified in figure 2, this would indicate that the University of Edinburgh is a key institution within

the United Kingdom. The University of Glasgow is also an important organisation making a significant contribution.

Whilst the majority of assignees from the company sector have smaller portfolios of patent families, there exists a healthy ecosystem of innovative stakeholders. There is also the potential for the number of company stakeholders to increase should companies be formed during the R&D commercialisation process originating from university research. Additional assignees may be added to patent families which could be investigated with future research.

Edinburgh university collaboration – within the UK
Investigating the impact of Edinburgh university further, the stakeholders assigned to patent families where Edinburgh University is an assignee is analysed in table 2, here assignees are based in the UK.

Assignee	Patent families	Assignee	Patent families
IP21PO INNOVATIONS ([GB])	2	IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY & MEDICINE ([GB])	1
LOTHIAN HEALTH BOARD ([GB])	2	UNIVERSITY OF SOUTHAMPTON ([GB])	1
IMPERIAL INNOVATIONS ([GB])	2	LAMELLAR BIOMEDICAL ([GB])	1
UNIVERSITY OF GLASGOW ([GB])	2	UNIVERSITY OF NOTTINGHAM ([GB])	1
CHANCELLOR MASTERS & SCHOLARS OF UNIVERSITY OF OXFORD ([GB])	2	EDINBURGH NAPIER UNIVERSITY ([GB])	1
UNIVERSITY COLLEGE CARDIFF CONSULTANTS ([GB])	1	IMP COLLEGE INNOVATIONS LIMIITED ([GB])	1
QUEEN MARY UNIVERSITY OF LONDON ([GB])	1	WOBBLE GENOMICS ([GB])	1
GLAXOSMITHKLINE INTELLECTUAL PROPERTY ([GB])	1	HYALTECH ([GB])	1
UNIVERSITY OF OXFORD ([GB])	1	SCOTLANDS RURAL COLLEGE SRUC ([GB])	1
UNIVERSITY OF LIVERPOOL ([GB])	1	UNIVERSITY OF STRATHCLYDE ([GB])	1
BIOCAPTIVA ([GB])	1	IMPERIAL COLLEGE INNOVATION ([GB])	1
MEDICAL RESEARCH COUNCIL ([GB])	1	KING S COLLEGE LONDON ([GB])	1

Table 2. UK based patent family assignees co-assigned with Edinburgh university – investigating collaboration & knowledge transfer.

In table 2, there are notable research links with other leading universities within the UK and connections with multiple companies. While the patent family counts are low, there could be multiple national filings within the families representing solid levels of overall patenting activity. Much like the EPO levels of patenting documented in figure 1. The diverse ecosystem of research connections is a positive sign of healthy collaboration between Edinburgh University and other organisations within the UK.

Beyond the UK, notable organisations collaborating with the University of Edinburgh include UNIVERSITY OF MARYLAND ([US]), WASHINGTON STATE UNIVERSITY ([US]), BIOLAMINA ([SE]), BOEHRINGER INGELHEIM INTERNATIONAL ([DE], BAYER CROPSCIENCE ([BE], BASF ([DE], BATAVIA BIOSCIENCES ([NL] and JANSSEN VACCINES & PREVENTION ([NL]). These research networks indicate that Edinburgh University is a key organisation within one of the prominent innovative hubs for SynBio with plentiful collaboration occurring at home and abroad.

Sector analysis

The key stakeholder sectors across the UK were analysed for England, Scotland, Wales and Northern Ireland as shown in figure 4. The analysis highlights the proportion of stakeholder sectors based on the assignees of patent families identified.

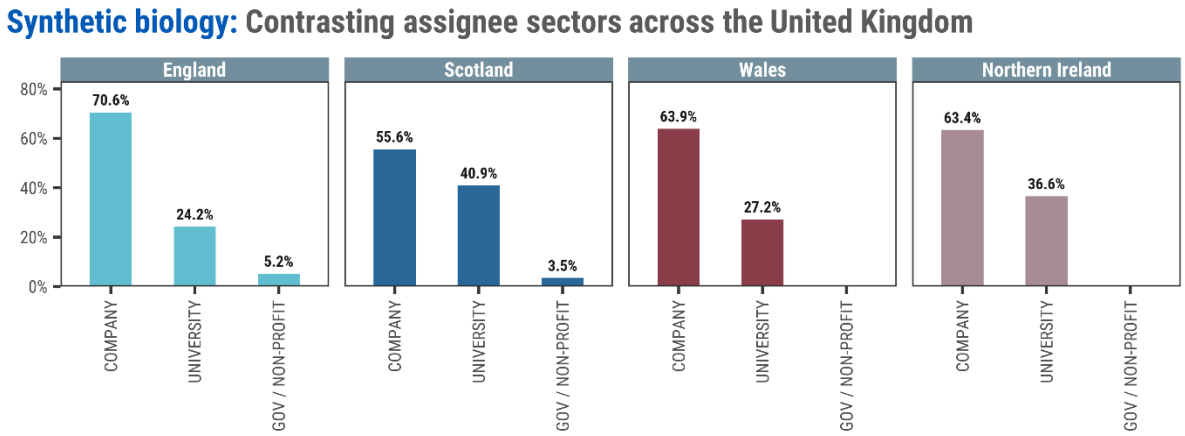


Figure 4. Contrasting UK assignee sectors via patent families published since 2014.

In figure 4, it is evident that across the four nations of the United Kingdom there is a healthy ecosystem of university stakeholders making contributions to synthetic biology innovation. This study has identified the influence of universities within the two major Scottish SynBio hubs (Edinburgh & Glasgow). Therefore, it is unsurprising to learn that Scotland has the largest proportion of patenting involving university stakeholders which are assigned to 40.9% of patent families identified for Scotland. However, future growth within Scotland could be supported by commercialising academic research, launching new companies and delivering a similar sector profile to England. Within England and Scotland, there is a noticeable influence of government and nonprofit institutions who may provide funding and collaborate with companies and universities. The institutions are identified as co-assignees assigned to patent families. They were not detected when analysing patent families with at least one assignee based in Wales and Northern Ireland. Whilst England has a larger number of stakeholders filing SynBio patents, Scotland has shown promising potential with diverse groups of stakeholders plus a strong university sector, contributing to the growth of SynBio within the UK and beyond the golden triangle.

UK publication trends – patent families (earliest publication date)

The publication trends of the four countries of the United Kingdom are shown in figure 5 based on the earliest publication date of the synthetic biology patent families identified. As discussed in the data notes section, the figures are capped to 2023 due to the drop off in the availability of the assignee address data field.

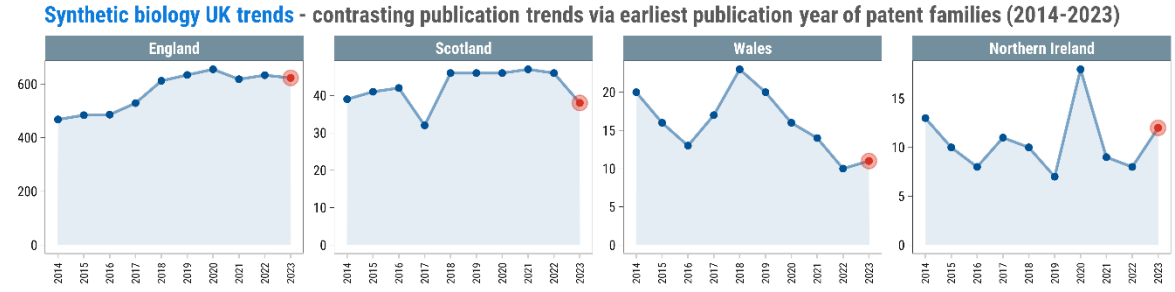


Figure 5. Synthetic biology – UK applicant publication trends via patent families published since 2014.

In figure 5, the compound annual growth rates for the individual nations between 2014-23 are England (3.5%), Scotland (-0.3%), Wales (-6.4%) and Northern Ireland (-0.9%). Whilst the CAGR for Scotland was slightly negative, published new families have been consistent since 2018, which is a positive. For example, the compound annual growth rate between 2014-2022 would have been 2.1% for Scotland. The

slight decline in 2023 may be due to natural variation year to year. The consistent patenting activity can be expected to continue as there is a recent and consistent history of SynBio patenting in Scotland.

SynBio topics

The study identified 60 key SynBio topics which are deemed to be a reasonable representation of the dataset analysed. Providing an analysis tool to look within the diverse areas that encompass synthetic biology innovation within the UK. Patent families can be classified in more than one topic to reflect multiple invention embodiments. The topic model totals for the whole of the UK are shown in figure 6, based on patent families published since 2014 (earliest publication date). The analysis enables comparison of Scottish based ITL3 regions with the rest of the UK, which is explored in figure 7.

Figure 6. Synthetic biology topic counts for UK SynBio patent families published since 2014.

Synthetic biology in the United Kingdom is heavily influenced by therapeutics such as pharmaceuticals and antibodies. However, there is a large degree of genetic engineering occurring and innovation involving microorganisms. Biodegradable materials are ranked just outside of the top 20 (23rd – 415 families). Niche topics such as waste conversion / recycling (32nd – 272 families) and biofuels (42nd – 178 families) reveal the diverse areas of research occurring within the United Kingdom.

Synthetic biology topics - regional breakdown

In figure 7, the synthetic biology topics have been mapped across the identified ITL3 regions. This enables an understanding of regional technical expertise and comparison of innovative hubs across the United Kingdom. The counts represent INPADOC patent families. The data was organised so that a region is counted once per family to avoid duplication issues and ensure fair comparison via a standardised procedure.

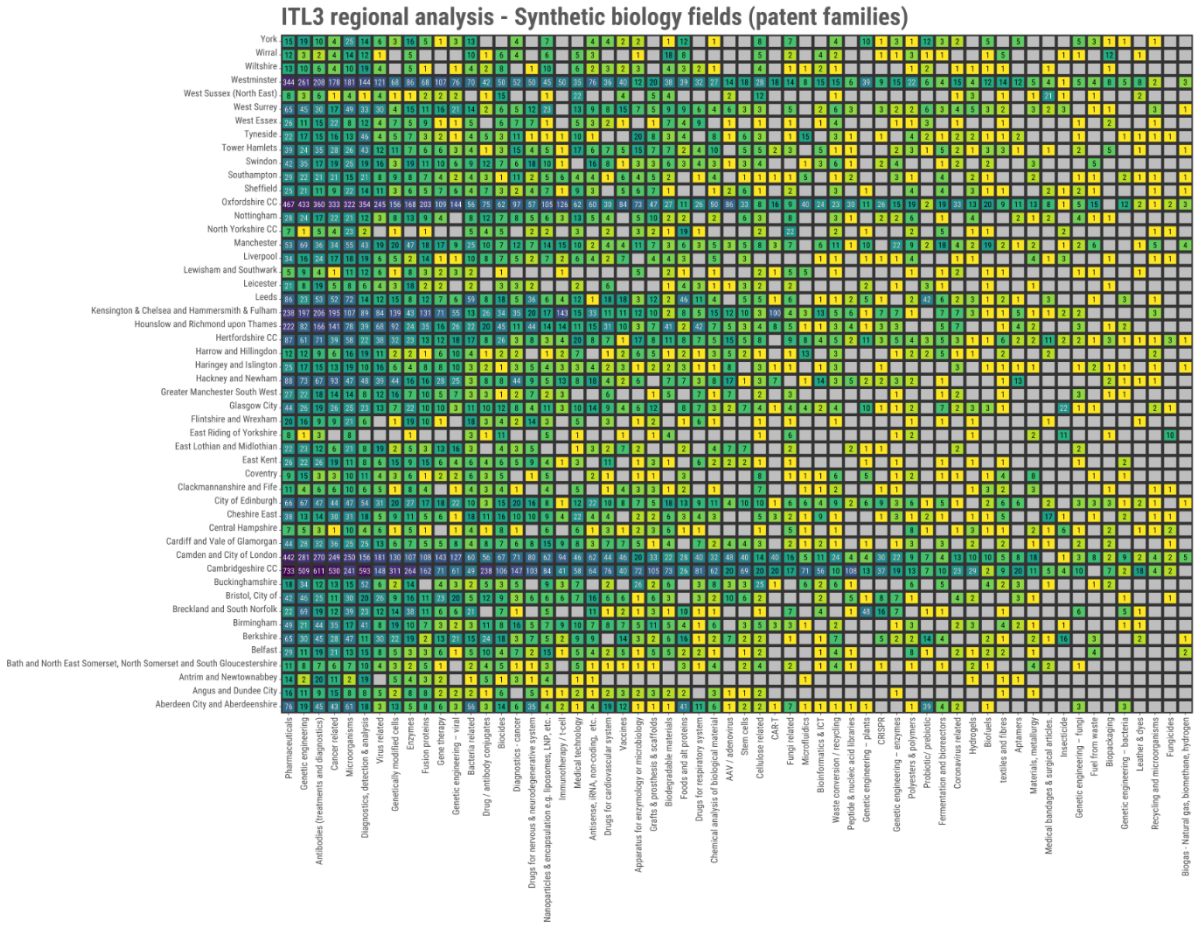


Figure 7. Synthetic biology – SynBio topics via ITL3 regions (patent families since 2014).

In figure 7, the influence of the golden triangle is considerable, there is innovation across the 60 topics identified within these regions. Outside of London, the levels of patenting in Cambridgeshire CC and Oxfordshire CC are comparable and within specific topics actually higher, representing significant innovative hubs within the UK for synthetic biology. From a Scottish perspective, the city of Edinburgh was active in 56 of 60 topics identified. In particular there was a reasonable distribution in the genetic engineering topic which is a key aspect of synthetic biology / engineering biology with plentiful research involving microorganisms. Glasgow city has a similar profile with activity across 50 of 60 topics identified. The evidence suggests that the key Scottish regions are punching above their weight and are influential hubs within the UK for synthetic biology.

Synthetic biology topics - country breakdown

In figure 8, the ITL3 regions have been mapped to their specific countries. The distribution for England is much larger, given the greater population and number of universities and companies involved. However, the diversity of the research and innovation occurring within Scotland is very positive for future growth potential, with representation across all 60 SynBio topics identified.

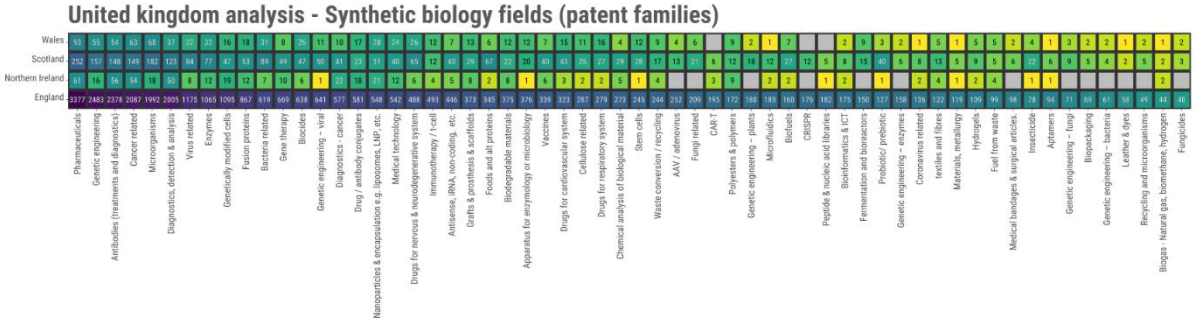


Figure 8. Synthetic biology – SynBio topics aggregated via UK countries (patent families since 2014).

Average patent families by Region - Per capita patent families

To compare innovation activity from a patent family perspective across regions by differing population sizes, a per capita measure of patent activity based on the average number of patent families published during 2014-23 (10-year period) is analysed in table 3. The figures are calculated per 100,000 people for regional comparison across the top 20 identified regions (see figure 2). Population data for ITL3 regions was obtained from the Scottish government website and the office of national statistics using data from 2023. Some regions such as Hackney and Newham involved merging the population totals of individual regions. The population data is appropriate for reasonable comparisons to be made, there were 3 regions where population data could not be easily sourced.

Rank	ITL3 Region	Average patent families (2014-23)	Est. population 2023	Patent families per 100k people
1	Camden and City of London	56	232054	24.1
2	Westminster	49.4	209996	23.5
3	Cambridgeshire CC	119.9	710317	16.9
4	Oxfordshire CC	84.4	763218	11.1
5	Kensington & Chelsea and Hammersmith & Fulham	29	333205	8.7
6	Hounslow and Richmond upon Thames	25.9	496102	5.2
7	Aberdeen City and Aberdeenshire	8.1	264320	3.1
8	City of Edinburgh	15	523250	2.9
9	Tower Hamlets	7.8	331886	2.4
10	Manchester	13.8	589670	2.3
11	Hackney and Newham	11.4	641281	1.8
12	Cardiff and Vale of Glamorgan	7.7	519662	1.5
13	Buckinghamshire	8.4	578772	1.5
14	Leeds	10.7	845189	1.3
15	Glasgow City	7.9	631970	1.3
16	Hertfordshire CC	12.5	1236191	1.0
17	Birmingham	8.3	1183618	0.7
18	Berkshire	10.1	n/a	na
19	West Surrey	10.1	n/a	na
20	Tyneside	7.5	n/a	na

Table 3. Patent families per capita for top 20 ITL3 regions.

In table 3, the London based regions have a distinct advantage where companies are choosing to locate their headquarters in the city region. However, the Scottish regions of Aberdeenshire (7th) and City of Edinburgh (8th) are comfortably ranked in the top 10. This indicates the top 10 ranked Scottish regions and to a reasonable extent Glasgow city, are punching above their weight from an innovation perspective

within SynBio. Admittedly there is a large difference when contrasted with the golden triangle, however, the Scottish regions are identified as influential hubs for SynBio innovation within the United kingdom.

Scotland – technology concordance

To understand where synthetic biology is positioned amongst other technology fields within Scotland, a technology concordance analysis was carried out. This involved working with all patent families with at least one GB applicant. The dataset here is published since 2015 to work with a manageable data size that could be exported from Questel Orbit. The patent families are worldwide, no country limitation was used to maximise identification of Scottish based assignees. The assignee address data was analysed to identify Scottish postcodes or towns and cities where this data is available.

Technology concordance – established by the World Intellectual Property Organisation (WIPO) to map patents to 35 technology fields. An additional life sciences proxy has been added which merges (biotechnology, food chemistry, pharmaceuticals & medical technology as one field). The technology fields are rough indicators for each technology area (37 in total including SynBio). In figure 9, the number of patent families identified across Scotland for the bespoke technology concordance, reveals Synthetic Biology is a top 10 ranked field (ranked 9th – 447 families). The evidence suggests Synthetic Biology is an important area of innovation within Scotland and is comparable to related fields such as pharmaceuticals and medical technology.

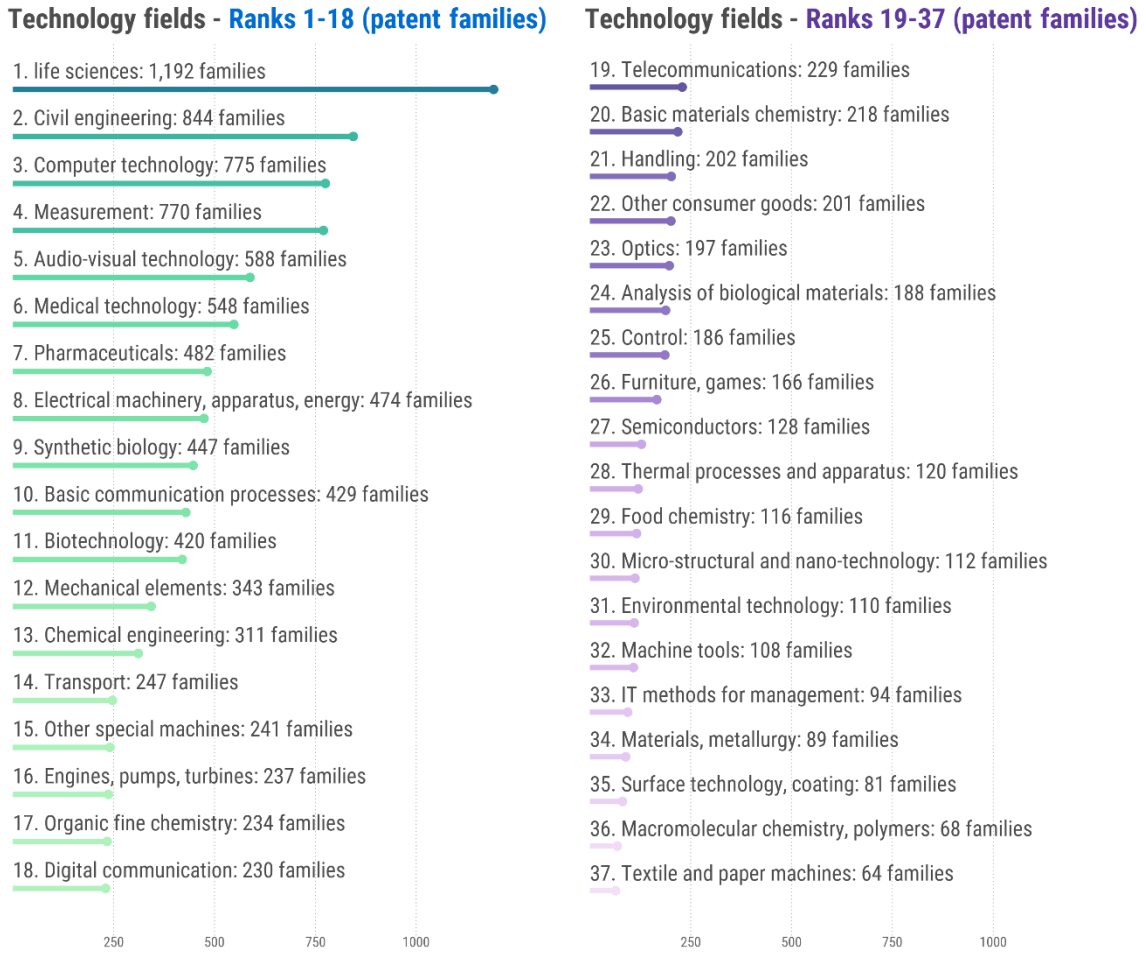


Figure 9. Technology concordance analysis – patent families with at least one assignee based in Scotland (patent families published since 2015).

Rate of growth – technology concordance

In table 3, the rate of growth for each field was determined via compound annual growth rate (CAGR) using patent families published between 2015-23. The dataset is capped to 2023 due to the coverage of the assignee address field and the observed drop-off (see data notes section at the top of this report).

Patent Families - 2015-23 (earliest publication date)		
Rank	Field	CAGR %
1	IT methods for management	26.8
2	Electrical machinery, apparatus, energy	18.7
3	Basic communication processes	11.9
4	Surface technology, coating	10.4
5	Thermal processes and apparatus	10
6	Semiconductors	7
7	Micro-structural and nano-technology	6.6
8	Macromolecular chemistry, polymers	5.2
9	Optics	4.9
10	Basic materials chemistry	4.6
11	Other special machines	1.7
12	Chemical engineering	1.1
13	Engines, pumps, turbines	0.5
14	Control	0
15	Medical technology	-0.4
16	Handling	-0.5
17	Synthetic biology	-0.9
18	Environmental technology	-1.2
19	Transport	-1.3
20	Computer technology	-1.4
21	life sciences	-2
22	Furniture, games	-2.8
23	Biotechnology	-3.2
24	Organic fine chemistry	-3.3
25	Audio-visual technology	-3.5
26	Machine tools	-3.8
27	Measurement	-4
28	Telecommunications	-4.3
29	Civil engineering	-4.3
30	Food chemistry	-4.9
31	Pharmaceuticals	-5.6
32	Digital communication	-5.7
33	Other consumer goods	-6.8
34	Materials, metallurgy	-7.1
35	Mechanical elements	-7.2
36	Analysis of biological materials	-8.6
37	Textile and paper machines	-18.2

Table 4. rate of growth of technology concordance fields based on patent families published since 2015 with at least one assignee based in Scotland.

In table 4, since 2015 the rate of growth for synthetic biology is very near to zero and only slightly negative (0.9%), this is due to a very recent drop-off in 2023 which is a deviation from the prior 5 years of stability. Within Scotland, SynBio / engineering is an important field and ranked mid table (17th) based on compound annual growth rates during 2015-2023. The analysis indicates that the rate of growth within SynBio has been lowered by aspects of synthetic biology which overlap with other fields such as pharmaceuticals (-5.6%) and biotechnology (-3.2%) with negative growth during the period analysed. This suggests that the therapeutic aspects of Synthetic biology within Scotland are lowering the overall growth rate. The genetic engineering and biomaterials, etc. aspects of SynBio provide a strong basis to support further growth within Scotland. Exploiting the existing innovative hubs and expertise making prominent contributions to innovation within Scotland and continuing to make an impact within the United Kingdom.

Compound annual growth rates are just one metric for measuring growth, the calculation can be influenced by a recent deviation (such as the SynBio decrease in 2023). The SynBio field has been consistent during the last decade in Scotland, patenting figures are comfortably ahead of Wales and Northern Ireland. Given the influence of Edinburgh University which appears to have a larger portfolio than other institutions in cities such as Nottingham and Manchester with Russell group universities. This also includes Glasgow university to a lesser extent. The evidence produced during this study suggests there is an excellent research base within Scotland to enhance future growth prospects for synthetic biology / engineering biology within the country. This can be expected to drive future growth and make an impact within the UK, increasing the ranking of SynBio / engineering biology in Scotland as the field continues to build momentum and exploit world class research and development.

References

[1] *https://www.biorxiv.org/content/10.1101/483826v1*
[2] *https://www.ons.gov.uk/methodology/geography/ukgeographies/eurostat*

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