

Klaster Life Science Kraków: Using new thinking to solve life sciences problems in the Kraków region

Krakow, Poland





General Information

Title	Klaster Life Science Kraków	
Pitch	Using new thinking to solve life sciences problems in the Kraków region	
Organisation	Klaster LifeScience Kraków	
Country	Poland	
Author	Dr. Samo Pavlin (University of Ljubljana)	
Nature of interaction	<input checked="" type="checkbox"/> Collaboration in R&D <input checked="" type="checkbox"/> Commercialisation of R&D results <input type="checkbox"/> Mobility of staff <input checked="" type="checkbox"/> Academic entrepreneurship <input checked="" type="checkbox"/> Governance	<input type="checkbox"/> Lifelong learning <input type="checkbox"/> Joint curriculum design and delivery <input type="checkbox"/> Mobility of students <input checked="" type="checkbox"/> Student entrepreneurship <input type="checkbox"/> Shared resources
Supporting mechanism	<input type="checkbox"/> Strategic <input checked="" type="checkbox"/> Structural <input type="checkbox"/> Operational <input checked="" type="checkbox"/> Policy	
Summary	LSK is an ecosystem created to develop collaboration networks in the area of life sciences in order to pool and exploit the potential of individuals and institutions: students, businesses, universities, independent research units, business support organisations and local authorities in the Małopolska region. Members of LSK are connected through the common goal to enhance innovation in the areas of biotechnology, pharmaceuticals, medicine, and food production. The aim of LSK is to make better use of scientific, cultural and economic resources of the region as well as to integrate the life science environment in Małopolska, helping to establish new contacts, facilitating access to information and exchange of experiences.	



Introduction & Overview

1. BACKGROUND

The idea of creating a cluster dedicated to 'life sciences' in the Małopolska region was based on recognition by leading scientific institutions (mainly Jagiellonian University) and companies of the existing potential of both the life sciences industry and R&D in the region.

In the Małopolska region, there are 24 higher education institutions (10 public and 14 private), which employ 21,092 people (including about 1,800 teachers) and 210,046 students (including postgraduate, PhD and external students; this number accounts for 10% of the students in the country).

Many strong educational centres conduct teaching in the area of life science. This includes not only the oldest and the most prestigious university in Poland, the Jagiellonian University (est. 1364) together with its Collegium Medicum, but also the University of Agriculture, University of Science and Technology and independent national institutes of Pharmacology, Nuclear Physics and Animal Production.

Further attributes of the region which align the this competency include:

- ▶ 13% of the total number of scientists in Poland are employed in 30 R&D institutions and 32 universities or school of higher education;
- ▶ Five universities and 10 R&D institutions are involved in life sciences – the LifeScience Technology Park and Bioincubator (JCI), Małopolska Biotechnology Centre (MCB), Medical Technology Park (CTTMPT);
- ▶ over 3,700 scientists work in the field of life sciences, incl. over 600 professors and over 2,000 PhDs;
- ▶ 13 of the 30 most often cited scientists in this field are from Kraków, and eight of them are from the Jagiellonian University;
- ▶ over 200,000 students study in the Małopolska region, which is more than 10% of the total number in Poland and
- ▶ 16,000 studies in the field of life sciences.

Development of LSK

Following a regional smart specialisation review of the Małopolska region, the life sciences sector was identified as one of the sectors with the greatest potential growth for the city of Kraków, the innovation centre of the region where 'tradition meets innovation'. Despite its potential, the need for significant investment and promotion of the life science sector was acknowledged in order to stimulate an area in which a substantial amount of the city's intellectual capital was deployed and one of the biggest prospects for growth.

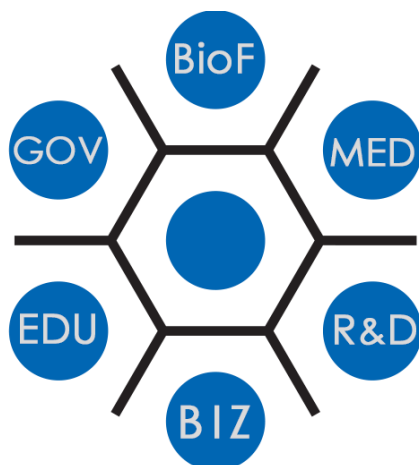
The review recognised that presently in Poland (with a focus in Małopolska) there is a **sizeable scientific potential in the field of life sciences**, which remains untapped. It has also been identified that there is a latent entrepreneurship potential, particularly in respect to qualified students.

In 2006, 32 research institutions and companies **established the cluster LifeScience Kraków (LSK)** with the mission to support enterprises and innovations in the sphere of life sciences and create adequate conditions for effectively commercialising R&D results. LSK aims to foster and facilitate cooperation amongst regional stakeholders, support university graduates' employment possibilities as well as the application of research findings.

Within the LSK cluster are about 85 partners employing some 30,000 employees. It is a collaborative cluster of institutions that represent **six areas of interest**: biotechnology and life sciences business, R&D, science and education, healthcare, business support and local government. They actively guide and facilitate cooperation at the regional level.

LSK is very important for regional development, mainly due to the fact that it represents many interest groups. It is oriented towards the creation of Malopolska's most resilient region through the transfer of knowledge into practice, create new products and technologies that improve the quality of life and health, and thus new jobs.

Scheme 1: LSK is an ecosystem



1. BioF – enterprises
2. BIZ – business environment
3. MED – healthcare
4. R&D – institutes of R&D
5. EDU – education
6. GOV – administration

2. OBJECTIVES AND MOTIVATIONS

LSK's mission therefore is to bring together and frame the cooperation of all players with the purpose of supporting increased business productivity, accelerating the speed of development of innovation processes, building new business formations and utilising highly-qualified and highly-motivated young people that count the most for the idea of the cluster.

The purpose is to **create and sustain a life sciences network** by:

- ▶ enabling effective global connectivity and optimising the existing potential of individuals and organisations;
- ▶ supporting innovation and encouraging the effective commercialisation of research results in the life sciences field;
- ▶ promoting the sector as an important branch of the regional economy (Małopolska Bio-Region) and
- ▶ developing resources and competencies to effectively explore existing and future opportunities entailed in developing a knowledge-based economy.

LSK aims to **support representatives of science and business sectors** interested in the issues of commercialisation and transfer of the knowledge generated in research centres to the economy as well as the search for institutions able to conduct specific research. This includes government, administration and financing institutions to help support the environment in establishing successful cooperation and growth.

To achieve its aims, **collaboration between researchers and business** are facilitated by LSK to help combine and develop resources and competencies in the life sciences area to effectively use both the current opportunities and opportunities arising from developing an innovative knowledge-based economy. LSK supports entrepreneurship and innovation in the life sciences field, and creates conditions for the successful commercialisation of R&D project results.

3. STAKEHOLDERS

Organisations of various types, structures and sizes operate in the LSK¹:

- ▶ service and manufacturing companies from the life sciences sector (biotechnology, environmental protection, health protection, clinical trials, etc.);
- ▶ universities and research institutes employing highly qualified staff specialising in the life sciences field;
- ▶ specialist hospitals, equipment and competence in all disease treatments;
- ▶ business support organisations, government and public administration units;

The largest group is represented by SMEs (47%), public institutions (31%) and large enterprises (18%).





Implementation

4. INPUTS

Between 2006 and 2013, LSK was mainly financed by the Jagiellonian University through its Centre of Innovation (JCI), however as the initiative has grown, more recently it has sourced additional **funding sources**.

Since 2013, LSK functions and manages its activities as a foundation. In that year, a new membership scheme was introduced to provide funding for their activities. The fee for individual services depends on the membership package, with LSK offering three packages: standard, silver and gold (fees vary from €250–3,000 annually).

In 2016, the initiative was nominated as a key national cluster by the Polish government, which means that it receives financial endorsement in the programme 'Smart Growth 2014-2020'. Key national clusters are assisted in internationalisation approaches and projects; they additionally obtain targeted support through cluster-specific analyses and consultation.

Other funding comes from EU funds, individual or institutional donations, as well as payable services available for non-members. LSK applies for grants to run the programmes and projects, however does not receive direct support from public funds to run the organisation; public funds are only used to run the projects.

LSK employs five professionals plus accesses external support as required. LSK is supported by the infrastructure of Jagiellonian Centre of Innovation which is represented by LSP and JCI in the cluster's executive bodies **playing active role to provide necessary knowledge, expertise and advise**. Moreover, JCI provides investment capital for new enterprises from the life sciences sector via a seed fund, called JCI Venture. The Fund targets new cluster members projects derived from academic institutions, research and development departments of the companies from the area of life science, scientists, entrepreneurs, and innovators. JCI Venture is capable of supporting each project with the investment range from hundreds of thousands to few million Euros. Apart from money itself, the Fund provides also a laboratory infrastructure, and professional business consulting. The Fund, in exchange for the invested capital is usually acquiring a minor package of shares, in newly established enterprises.

LSK does not own its **facilities**, but uses the business space of LifeScience Park (LSP), the first dedicated life sciences park in Central and Eastern Europe. A key asset, LSP is owned and managed by the JCI, and provides an extensive research infrastructure that helps to create ideal conditions for the development of cooperation between enterprises and research units.

LSP is a complex made up of three connected buildings covering a combined area of 20,000 m², which support the incubator and spin-off activities as well as attracting investors for the life sciences industry, an essential factor for LSK development. LSP offers complex laboratory, analytical and contract research services, property investments and laboratory infrastructures

ranging across all life science areas including biotechnology, biotechnics, biomedicine, chemistry, biochemistry, pharmacology, biophysics and physics.

5. ACTIVITIES

All LSK initiatives aim to connect and support the development of innovation of different origins and applications. The scope of the 'health and quality of life' science competencies and the resources available within the ecosystem at Kraków is the main competitive advantage.

LSK offers a range of services to its members:

- ▶ access to knowledge and information resources;
- ▶ facilitated access to specialised research resources;
- ▶ organisational, legal, marketing, financial, logistics and technology support;
- ▶ the creation of strategic alliances including centres of excellence and project groups between enterprises and research centres at both regional and international level; and
- ▶ facilitation and commercialisation of the results of joint research.

Key **processes** of the cluster are related to:

- ▶ development of marketing and communication tools;
- ▶ tools of cooperation through the cluster's intranet;
- ▶ conferences, courses, workshops and seminars such as a cluster open day or the 'Life Science Open Space' annual conference;
- ▶ thematic working groups (special interest groups) such as Medical Diagnostics, Innovative Hospital or the Cluster's Innovation Team; and
- ▶ internationalisation through international projects.

LSK offers access to an established life sciences network comprising:

- ▶ production and contract manufacturing enterprises;
- ▶ R&D services, including contract research and clinical trials;
- ▶ universities and R&D institutions with highly-trained staff competent in the life sciences area;
- ▶ a modern research infrastructure, including modern laboratories and high-quality R&D services; and
- ▶ seed funds dedicated to supporting life science or IT endeavours.

Additional activities

LSK is one of the main players elaborating and implementing the **regional innovation strategy** in the Małopolska region and is involved in all strategic development bodies in the Małopolska Marshall Office (regional public administration), and is an LSK member.

LSK is also engaged in developing and offering **educational programmes and courses**, such as postgraduate study programmes in business and bio-economy or an MBA in life science business.

LSK created a **technology transfer platform** and offers tools for networking and cooperation at the website www.lifescience.pl in two languages, and an Internet platform that helps partners cooperate within the cluster.

The cluster supports **participation in the activities of selected 'thematic working groups'** (special interest groups) whose aim is to coordinate collaborative activities concerning a chosen subject (programme, issue or challenge).

LSK organises the cyclical **conference** LifeScience OpenSpace in Kraków and regular networking events.

Taking part in **applications for many European projects** (6th and 7th Framework, H2020, Interreg Programmes) has enabled LSK to gain and exploit invaluable experience that is continuously shared with its members.

LSK has opened in LifeScience Park the first Polish '**bio-hacker space**' named the Life Science Garage, which is a co-working space for so-called 'do-it-yourself community (DIY)' offering access to the equipped laboratory.

Finally, LSK created the **technology transfer group** (ZIN) which is involved in the collaboration of the partners' transfer centres and acts as a taskforce within LSK. It supports innovation and academic entrepreneurship, boosts the efficiency of activities connected with commercialising knowledge and technology transfers, and develops ties between the science and business environments in the fields of biotechnology and life sciences in the Małopolska bio-region. The group puts the concept of open innovation into scientific and business practice. It has changed the way of thinking and acting in terms of technology transfer being the outcome.



6. OUTPUTS

In the 10 years of LSK's operation, the number of members has grown from 32 to 95. Cluster members invested over €207m in R&D large-scale infrastructure and more than €202m has poured into R&D and competence projects in the life sciences field in Małopolska Region. Three seed funds dedicated to life sciences have been established which funded about 40 successful start-up companies.

It is one of the most developed clusters in Poland, and the first Polish cluster to achieve a global reach. It has established international contacts and cooperation based on projects with clusters from France, Germany, the UK and the USA.

Working within a cluster provides the opportunity to gather considerable resources and enables efficient achievement of goals. Moreover, LSK remains a more visible target for enterprises, institutions and consortia searching for associates; and are believed to be more effective in innovative activities (i.e. Innovative Hospital, Diagnostic and Research Innovation Team).

7. IMPACTS

Even when there is no statistical data available to measure the benefits of participation in clusters or to give a cross-sectional picture of the state of the cluster members, members stress the importance and prestige arising from being an LSK member – in their words, 'there is no option of remaining out if you want to mean something in the business'.

LSK operations led to increased overall resources, public and private, dedicated to research, development and innovation. LSK members have generated revenue and employment, creating new employment opportunities for well-educated graduates in the region. With the vertical integration, co-ordination and interaction between all members of the LSK it has developed the scientific and technological culture in the region.

An important impact is currently seen at the political level, at the level of regional policy. For the first time, LSK has integrated the cluster strategy with the regional development strategy. The result is that their strategy and structure, especially the concentration on so-called special interest groups focusing on interdisciplinary problems to be solved, are officially the same as they are in the regional development strategy. The impact will be visible in regional projects, namely, the regional amount of money devoted to developing innovation in life sciences.

The life science sector has accumulated the biggest share of projects applying for funds from the regional programme designed to support the innovative development of SMEs, 'The Innovation Voucher'.

LSK is a strategic platform for sharing knowledge and views, facilitating UBC cooperation through regular meetings and seminars. Even though the explicit impacts are difficult to capture in statistics, all LSK members stress the importance of the new projects and joint initiatives and the actual value of informal meetings and contacts.



Support & Influencing factors

8. SUPPORTING MECHANISMS

The development of UBC is founded on a wide-ranging partnership and the involvement of entities representing various communities, which act as the links and actors in the regional system of innovation and entrepreneurship (academia, science, NGOs, local government, partners from other regions, including foreign partners).

Life sciences are **included in several regional strategies** (innovation, smart specialisation, development) resulting in a high amount of funding being available.

Well-developed **infrastructure** exists for establishing and creating innovative businesses (e.g. LifeScience Park), which is developed on a continuous basis.

LSK provides a **communication platform** for its members. This helps spread knowledge and exchange information, including marketing and communication tools on the Internet. LSK intranet at www.podio.com provides information about projects, events, enterprises, institutions, ideas and other dynamically defined operations, funds and financing, news, data about events and projects as well as invitations to collaborate on an international level. The platform also serves as a promotional tool for extending the network of contacts.

Knowledge advancement in the cluster is achieved through LSK's training, seminars, workshops and annual international conferences in the life sciences field and are most valued by LSK members. Regular meetings amongst LSK members held monthly also contribute to there being many LSK-driven networking opportunities for cluster members.

The members have the opportunity to participate in activities of chosen '**thematic working groups**' whose objective is to coordinate collaborative activities concerning a selected subject (project marketing – use of LSK as a partner as well as a platform for promoting the results of projects; foundation – as Klaster's leader may be a partner in the realisation of collaborative projects).

9. BARRIERS AND DRIVERS

Several positive factors **drive** the development of UBC within the cluster. These include access to talent and qualified labour force, strong science, diversified economy in the region, investments in research and R&D infrastructure, well-established networks for cooperation and support for innovation, strong support from local authorities as well as an effective business environment supporting entrepreneurship.

The existing social network, which is built on trust, allows the emergence and development of innovation by creating an environment open to the exchange of information (formal or informal), capacities and knowledge. These create value within the cluster and thus enhance its size and standing on the international scene.

LSK guarantees cluster members' continuous access to information, e.g. about the initiatives taken by the cluster, available financing sources and stimulation of cooperation among cluster members. The matters of trust and reputation, as well as recommendations among LSK members, seem to be very important for creating successful collaboration projects or consortia.

However, LSK faces certain **challenges** that limit its organisational activities. These include the sometimes low active involvement of members and low funding for administrative activities.

Due to the **restricted financial and human resources**, the range of services offered to members (especially around the financial evaluation of patents or research services) is limited.

Some serious differences exist in respect to managing intellectual capital issues between LSK members (companies and university sector). The main reason is the polarised perception of the utilisation of research results. Companies prefer the R&D results to be quietly implemented and protected, while researchers aim to generate scientific publications. Some fundamental changes in the national educational policy should be made to guarantee mutual satisfaction and interest from both sides in the cooperation.

The difference between the research needs of the university and those of the company is often serious barrier. The priority for companies is to allocate funding to research areas in which the company is facing specific challenges instead of the basic research that is preferred by universities.

For developing UBC, there is a high level of dependence on grants from members and external funding. All LSK members also see social capital as a fundamental driver for the exchange of ideas and innovation.

10. FUTURE CHALLENGES

Sustainable financing remains the main challenge to ensure the smart utilisation of the regional development funds. Despite good prospects for the sustainability of the collaborative research project, the availability of continuous funding is a serious concern. To cope with this challenge, LSK is actively seeking to broaden its research funding sources. LSK's plan, partly executed, is to introduce services related to job mobility (the database of employment offers, support for job seekers in the life science business).

One of biggest challenges is increasing the level of cluster members' engagement. Attracting further big multinational companies from the life science sector would be very beneficial for the further development.

LSK is also engaged in developing and offering educational programmes, as the main problem identified is the lack of people with experience in running licensed and innovative businesses.

There is a gap, and a need to educate people who will be able to run such businesses. People in this postgraduate study programme would be recruited from among students of medical schools, bio-technology and others related to the life sciences.

In 2016, postgraduate studies of 'Business in Biotechnology' have been launched to educate a group of managers/scientists prepared to conduct a business oriented to technology transfer and commercialisation of research.

11. CONTEXT

Human capital has the biggest positive influence on UBC. The region is one of the most important academic centres in Poland, providing a high level of education. There are 4 universities and other 24 higher education institutions (10 public and 14 private) which employ 21,000 people (including about 1,800 teachers) and >200,000 students (including postgraduate, PhD and external students; this number accounts for 10% of students in the whole country). Of these, most of the strong education centres conduct teaching in the life sciences area, e.g.: [Jagiellonian University](#), [Cracow University of Technology](#) or the [AGH University of Science and Technology](#) and Agricultural University (>16,000 undergraduates, >600 professors, >2,000 PhD students and about 3,000 scientists in life sciences alone at all higher education institutions in the region).

UBC is positively influenced by the high attractiveness of the region for investment, good transport accessibility, the presence of a high technology sector, R&D institutions, universities and a well-developed network of banking services, and rich natural resources.

Apart from universities, private companies also carry out R&D, mainly in the following sectors: biotechnology, pharmacy, medicine, IT, system automation, and automotive industry.

Malopolska is one of two regions in Poland which belongs to prestigious Vanguard Initiative where a network from 29 regions in Europe have agreed to collaborate to generate innovations in four selected fields, including bio-economy and 3D printing. The region is interested in those two fields and engages in these activities at the European level as a region. In the regional development strategy Małopolska is looking to foster economic growth, job creation, and further development of the region through new technologies. The Vanguard Initiative allows all participating regions to join forces and spread the benefits of innovative solutions across the European Union. Malopolska strives to transform industry through an entrepreneurial spirit and 'smart' attitude.

Additional pace to help foster the bio-economy is given by an agreement signed between Malopolska and four other regions in Poland also involving joint Bio Business Industries Joined Undertaking (BBI JU).

12. KEY SUCCESS FACTORS

LSK are committed to the biotechnology sector in Małopolska and sees its chance to develop and attract entrepreneurs. There are a number of factors that are believed to be crucial for the clusters success, including:

- ▶ the development of good working relationship between the crucial players from education, business and administration in the region and supports the building of trustful relationships, working in a network (open innovation) and interdisciplinary research;
- ▶ to support its members right through the innovation process, from the early development of basic research to the final stage of marketing and entrepreneurship;
- ▶ to tap into the quality of human resources within the region as a crucial factor in developing productive collaboration to promote collaboration in the life science industry;
- ▶ to develop greater knowledge and expertise about life sciences commercialisation;
- ▶ to develop a scientific and technological culture in the region; and
- ▶ to increase community awareness of science and innovation.

LSK supports responding and adapting to the evolving needs of the labour market; improves the quality of human resources and ensures the existence of support structures to effectively promote the flow of knowledge from the university to companies, the region and society at large.





Further Information

13. MONITORING AND EVALUATION

LSK provides annual financial and content reports about the clusters' activities, available at www.lifescience.pl (in Polish only). Indicators (number of events, number of participants, number of projects, number of members) are set in the annual plans and monitored by the cluster board, which is responsive to changes in the indicators. There is an internal method to monitor this.

LSK also implements indicators concerning the success on regional and individual level (increase of investment in R&D, number of new companies created, number of new working places, number of innovations implemented, direct impact of innovations, number of innovative programmes, number of employees, number of innovators).

As LSK is Poland's largest organisation in the medical industry, biotechnology and life sciences sector, it has received the status of Key National Polish cluster. After that, at the national level within a programme of national key clusters which also involves some monitoring indicators, indicators will be checked after a period of three years.

This means LSK will be asked in three years (by an Evaluation Committee composed of representatives of ministries and government agencies complemented by independent experts with different backgrounds) to report indicators related to development of the cluster activity. However, while similar indicators already existed, they were more addressed than checked. Terms and conditions for the Evaluation Committee and assessment process have been stipulated in the *Key National Cluster Rules*.



KEY
NATIONAL
CLUSTER

14. SUSTAINABILITY MEASURES

LSK faces serious sustainability challenges, as there is no direct measure to support its existence. The organisation has long-term plans and long-term problems concerning how to final-

ise those plans. Financing remains the biggest problem. Therefore, they are working on developing a five-year financing period to ensure they can focus on activities rather than fundraising.

15. TRANSFERABILITY

LSK model is transferable, especially their activities in the field of developing the open innovation concept. LSK is considered to be a good practice in Eastern European, and envisages new opportunities in promoting and utilising this concept.

To get greater engagement in the existing platform, LSK is leading the discussions and negotiations with other clusters in Poland and with other partners and sectors outside Poland, especially between companies.

Some LSKs structural parts are also transferable including formal elements of structuring the collaboration, tools used to foster cluster communication and the engagement of members.

An organic approach and strategy can be applied, although LSK was not built entirely from scratch. LSK is based on a long history and tradition in the region as the organic cluster of education and business has been here for 650 years (counted from establishment of Jagiellonian University in 1364).

16. AWARDS AND RECOGNITION

In 2009, LSK was awarded the Bronze Label of Cluster Management Excellence.

In 2014, a case study of LSK was published by the PARP (Polish Agency for Enterprise Development) in a brochure of good practice regarding national projects.

LSK works actively within the framework of the world's leading biotechnology congress – EUROBIOTECH 2017.

In 2016, LSK was awarded the 'National Key Cluster' Status

LSK's key international programmes are the Baltic Fracture Competence Centre (<http://www.bfcc-project.eu/home.html>) (Interreg BSR) and the prestigious programme COST - Anti-Microbial Coating Innovations to prevent infectious disease (devoted to combating infections in hospitals with the use of innovative methods for preventing infections) <http://amici.lifescienceopenspace.pl/>.

17. LINKS

LSK web page <http://lifescience.pl/>

Technology transfer offers of LSK <http://tto.lifescience.pl/>

Annual conference of LSK <http://lifescienceopenspace.pl>

Malopolska region presentation <http://businessinmalopolska.pl>

Vanguard Initiative <http://www.s3vanguardinitiative.eu/>

PPP – bio based industries consortium <http://bbi-europe.eu/>

Polish Innovation Programme

[http://www.pi.gov.pl/PARPFiles/file/ANG/clusters/Selection of Key National Clusters Poland 2016.pdf](http://www.pi.gov.pl/PARPFiles/file/ANG/clusters/Selection_of_Key_National_Clusters_Poland_2016.pdf)

Bio-based industries <http://bbi-europe.eu>

18. CONTACT PERSON



Mr Kazimierz Murzyn,
Managing Director of
Klaster LifeScience Kraków
kmurzyn@lifescience.pl

19. REFERENCES

¹ Members are listed and presented at: <http://lifescience.pl/en/members>