

Stem Cell sector in Finland

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Business Opportunities and
Consulting Services for
International Companies

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1. Finland – high potential for the stem cell business

Stem cell research and stem cell technology promises the potential to dramatically change the treatment of human disease as well as offering exciting possibilities for investment. As a target country for setting up business in this area, Finland holds great potential, drawing on solid stem cell technology know how, and focused and sustained development in the field of biotechnology.

There are several unique factors which single out Finland as a base for the stem cell business:

- Strong collaboration between universities, hospitals and the stem cell industry in developing and testing new treatments and products.
- Special support by The National Agency of Medicine (FIMEA) to advance expertise in the field of stem cells.
- Positive public and professional opinion towards stem cell research which facilitates product development and clinical testing.
- Comprehensive resources and services to support clinical studies including highly specialised Clinical Research Organisations, bioanalytics services, clean room facilities and so on.

2. Research - the foundation stone for the Finnish stem cell industry

Five of Finland's university towns (Helsinki, Turku, Tampere, Oulu and Kuopio) are engaged in both basic and applied stem cell research. For further information on stem cell research and background information on Finland's academic research organisations and institutions please visit:

<http://www.aka.fi/en-gb/A/>

<http://www.research.fi/en>

<http://www.tekes.fi/eng/>

<http://www.minedu.fi/OPM/?lang=en>

One greater hub of scientific and clinical activities for stem cell research is the Regea Institute of Regenerative Medicine in the Tampere region. The stem cell research conducted at Regea focuses on the differentiation of nerve, heart, retinal, bone and cartilage cells from different stem cells while the Regea Tissue Bank processes and supplies tissues for clinical use. Some of the Regea laboratory and cleanroom facilities and equipment are also available for rent to research groups and enterprises. One of Regea's more notable successes in the application of stem cell technology was the creation of new jaw bone grown from a patient's own stem cells. To read more about this success story go to:

<http://www.reuters.com/article/idUSL012172320080201>

2.1. Directions for business

Against a solid background of academic research, business opportunities are focused on the emergence of start-ups formed in incubators both related to stem cell therapies and technologies and services supporting this field. This emerging business is underpinned by several technology companies whose technologies and services are applicable to stem cell research and its eventual therapeutic use. Some examples of stem cell technology businesses operating in Finland include:

- ChipMan Technologies, which provides researchers around the globe with tools that enable them to study live cell behaviour in an optimised and stable environment and analyse the findings automatically.
- EvoStem, which develops and markets products based on stem cell and tissue technologies. Their main product based on stem cell technology is TendoStem®, a form of equine tendon treatment. The company is also expanding into the area of human medicine.
- FinnStem, established in 2004, specialises in the development of services for supporting the adoption of new regenerative stem cell therapies in health care and technologies and methods for the storing and handling of adult stem cells.

Finland has also emerged as a leader in functionalising biomaterials by combining them with stem cells; enabling implanted cells to prosper and subsequently repair the injured area – be it cranial

bone or myocardial tissue following a heart attack. Finnish companies active in the field of biomaterials include Inion, Scaffdex and Vivoxid, to name just a few.

Overall, despite these positive examples of Finland's emerging stem cell business, its development and future growth is presently being hampered by a lack of funding. Opportunities nevertheless exist for drawing upon the country's rich pool of research and well educated human resources.

3. Finnish legislation favours stem cell research

Finnish legislation is more flexible than many other countries in the advancement of basic stem cell research. Medical research using human stem cells is governed by the Medical Research Act (1999). According to this Act, embryos left over from fertilisation treatments can be used for research, providing that the donors have given written consent. Embryos must not be moved into a body and must be destroyed within 14 days of fertilisation. Eggs and sperm can be stored in liquid nitrogen for 15 years e.g. in cases in which an early adulthood disease leads to infertility. After 15 years, the eggs and sperm cannot be used in research and must be destroyed. More information on the legislation and the differences between nations can be found in e.g. Bionet Online [links see 1, 2]

To further clarify Finnish legislation, tissue bank operations must be non-profit organisations and the donors themselves do not receive payments. The authorisation for such operations is granted by the national agency for medicines (FIMEA) and quality requirements for such operations are very high.

3.1. Stem cells available where most needed

Adult stem cells are routinely used for treatment of leukemia and other blood/bone cancers. The collection of cord blood and the maintenance of a bone marrow register has been one of the core activities of Finnish Red Cross Blood Services for already a decade. The collection, handling and storage of stem cells for routine use takes place mostly in cooperation with hospitals in Helsinki but there are plans to expand this activity to other cities as well thus increasing the availability of raw material.

The stem cells used by research groups are collected from cooperating hospitals which are principally sourced from surplus or bad quality embryos received from fertilization clinics. Increasingly, however, also other tissue types are used as raw material.

The Finnish Red Cross Blood Services have also been conducting groundbreaking research analysing the surface structures of cells. This research enables improved targeting of stem cells in the organism and their improved use in the treatment of diseases.

3.2. Further information on legislation governing stem cell research internationally

[1] Bionet: What is legal?

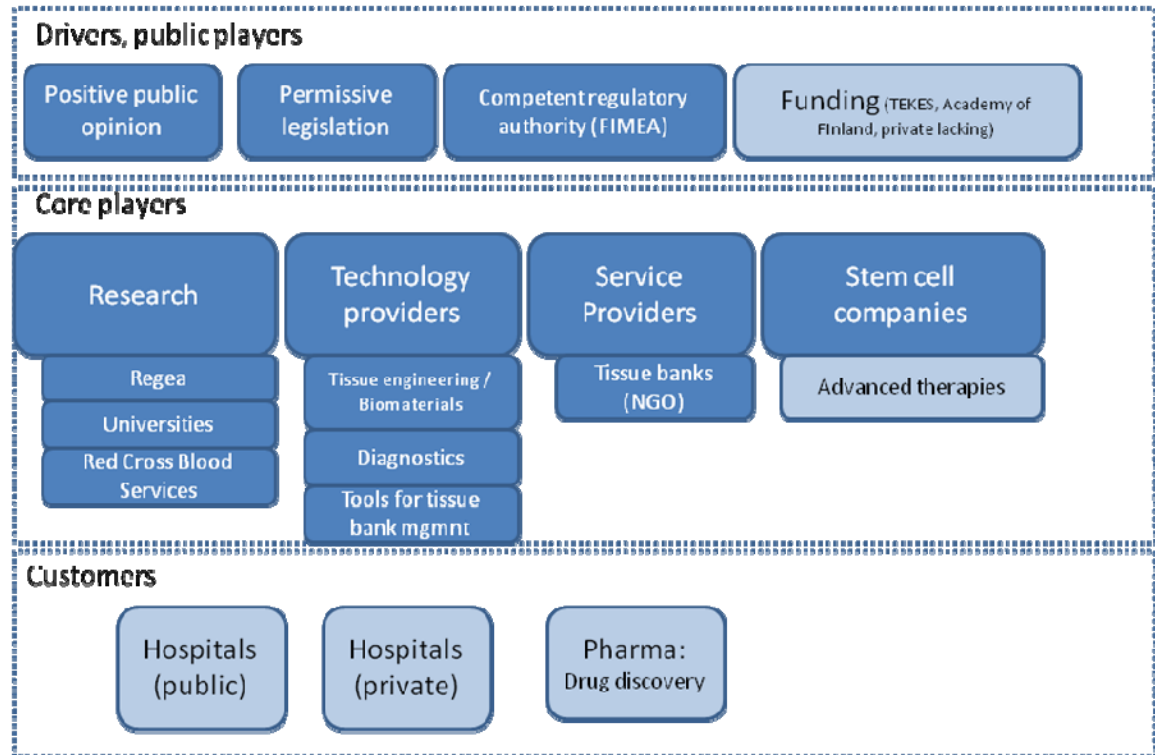
http://www.bionetonline.org/english/Content/sc_leg2.htm

[2] National Institute of Health - Stem Cell Policy: World Stem Cell Map

<http://www.mbbnet.umn.edu/scmap.html>

4. Value chain

As the following diagram demonstrating Finland's value chain in stem cell technology shows, there is still much room for development. The light blue colour boxes indicate those areas yet to be developed.



5. Conclusions

As a whole, the stem cell industry is emerging steadily in Finland with many of the key elements required for its growth already in place. The lack of funding is, however, a clear factor slowing down the process. Strategic investment in those areas highlighted in the diagram above could yield benefits for both promising new lines of research and the business in general.

Many of the global giants in other fields of medical technology have acquired or established operations here (GE Healthcare, Philips, PerkinElmer, to name a few), providing evidence on the feasibility of such operations. The innovations and expertise related to stem cells offers great potential for investors and entrepreneurs alike to take them further.

The logistics chain is ready for providing good quality stem cells for research and therapeutic use, providing a fertile ground for companies active in the area. Services are available for support. Invest in Finland's fact-based consulting services provide extensive guidance on the market entry strategy right for you as well as information on registration and compliance with the Finnish taxation system.

For its part, Tekes (the Finnish Funding Agency for Technology and Innovation) provides R&D funding for projects. In this regard, foreign-owned companies registered in Finland can receive project funding on an equal footing with Finnish companies.

6. Links to organisations

Regea Institute for Regenerative Medicine: www.regea.fi

Finnish Red Cross Blood Services: www.veripalvelu.fi

National Institute for Medicine: www.fimea.fi

Tekes: www.tekes.fi

ChipMan Technologies: www.chipmantech.com

EvoStem: www.evostem.fi

FinnStem: www.finnstem.fi

Inion: www.inion.com

Scaffdex: www.scaffdex.com/index_en.php

Vivoxid: <http://vivoxid.fi/>