Aggressive Innovation and Patenting Strategy – the Way to Success and National Well-Being

The success of Biohit is mostly based on an aggressive innovation and patenting strategy developed by prof. Osmo Suovaniemi, M.D., Ph.D.. He can be described as a pioneer in setting the said strategy as well as serving an example for both small and large companies in Finland; it was already in the 1970s when he established Labsystems (1972) and joint venture Eflab (1978). The idea underlying the attached case, **"**Aggressive Innovation and Patenting Strategy**",** is that adopting such strategy will benefit both small and large companies. On an overall level, it could be stated that giving up an aggressive innovation and patenting strategy may serve as a route towards the development of a new economic depression both in Finland and abroad.

With regard to the adoption of an aggressive innovation and patenting strategy Labsystems and Eflab, established and managed by Suovaniemi in the early 1970s, served as examples for numerous companies in the early 1980s. It has been demonstrated that many companies which have adopted an aggressive innovation and patenting strategy have been successful in their operations. Nokia and Kone corporations are good examples of this.

In 1986 Timo Louhenkilpi, Lic. Tech., moved from Labsystems to a leading position at Nokia Mobile Phones. Prior to joining Labsystems and Eflab in the early 1980s he served as an industrial assistant in Los Angeles. Nokia Mobile Phones had only one patent application when Louhenkilpi joined the company 1986. Prior to joining Nokia Mobile Phones Louhenkilpi had adopted prof. Suovaniemi's aggressive innovation and patenting strategy in Labsystems and Eflab.

According to the statistics of the Finnish magazine Suomen Kuvalehti (1983) Kone received 6 patents, Labsystems 7 patents and Nokia 8 patents in 1981 (Table 3). Currently Nokia is the leading applicant for patents in Finland. Kone corporation ranks also highly in this listing.

Aggressive Innovation and Patenting Strategy – Inventions Related with Liquid Handling and Instruments

Biohit's present management and certain key persons developed and commercialized successfully two inventions made by prof. Osmo Suovaniemi in the 1970s. The inventions were the single- and multichannel, adjustable, mechanical pipettes (Finnpipettes) and vertical light path photometry together with its instrument applications (e.g. FP-, Multiskan-, Fluoroskan, Luminoreader, Bioscreen-, Auto-EIA analyzers) and certain immunoassays. The value of the global business for products based on the above inventions exceeds today over USD 2.0 billion

annually. These inventions have been utilized so extensively that they can justifiably be called global industrial standards.

The liquid handling products and analyzers based on these inventions, e.g., for the screening and diagnosing of infectious and cancerous diseases (e.g. HIV and colorectal cancer) and the 96-well microtiter plates (microplates) served as the foundation for the global business and growth of Labsystems and joint venture Eflab. The success and potential enabled Labsystems to list as the first OTC- company on the Helsinki Exchanges in 1984.

In a publication by the National Technology Agency of Finland the innovations developed by Suovaniemi have been assessed as follows: *"The multichannel pipetting system and the vertical photometer capable of reading 96-well microtiter plates (microplates) are Finnish innovations that revolutionised laboratory routines worldwide in the 1970s and 1980s."* [1]

Labsystems and Eflab were taken over by Skop in 1986 (Table 1). In 1993 the businesses of Labsystems and Eflab were sold to the British Life Sciences Ltd., which, on the basis of the acquisition, established a new Labsystems. In an interview made by the Financial Times in August 1994 Sir Christopher Bland, the Chairman of the Board of Life Sciences, "*extends his thanks to Labsystems for the growth of the company"* (Kauppalehti 2.9.1994). On February 1, 1996, according to Helsingin Sanomat, Mr. Constantine, a Director of Life Sciences, stated that *"Labsystems has proven to be a goldmine"* after the acquisition, which took place in 1993.

Table 1 The largest Finnish manufacturers within the health care and laboratory sectors in 1986, 1998, and 2000 (Net sales MFIM, one Euro= 5,95 FIM)

Establishment Yeari	Company	1986	1998	2000
1972	Labsystems (MFIM 128) and			
1978	Eflab (MFIM 84) (1,2)	212	390	725
1970	Planmeca Group	120	779	1 546
1960¨	Perkin Elmer Wallac (formerly. Wallac)	120	830	1 000 (4)
1970	Konelab (3)	106	130	
1965	Datex-Ohmeda (5)	80	2 331	3 800
1978	Polar Electro	14	473	630
1988	Biohit		100	144

1 In 1986 Skopbank took over Labsystems and Eflab after which prof. Suovaniemi left the companies. In 1993 Skopbank sold the businesses of these companies to Life Sciences Ltd. Currently, these businesses are owned by Thermo Electron.

2 In 1986 the total value of Eflab Oy measured by the P/E -ratio 14 was FIM 560 million. In 1987 before the issuance of new shares and option loan of Labsystems, the OTC-value of Labsystems totalled FIM 427 million.

3 Labsystems acquired Konelab Oy (formerly Kone Instruments Oy), Clids Oy and Bio-Orbit Oy in spring 1999.

4 Includes the sales of the subsidiary companies of Wallac, which today belongs to the PerkinElmer Group.

[1] The National Technology Agency of Finland (2001). *Paving the Way for Evidence-Based Medicine: Diagnostics 2000*.

5 Net sales of Datex, which belongs to the Instrumentarium Group, FIM 1079 million in 1997. Datex acquired Ohmeda in 1998

After Skop had taken over Labsystems and Eflab, these companies were valued, on the basis of expert statements to be over FIM 1.0 billion in 1986 and their net assets on the basis of the statement provided by the authorized public accountant of Price Waterhouse altogether FIM 330 178 400 on Oct. 14, 1986. According to the calculations by prof. Heikki Niskakangas the market potential for the products of Labsystems was FIM tens of billions in 1986 (Talouselämä 18/1986, p. 13).

Eljas Sukselainen, a manager of Skopbank, told Kauppalehti in 1986, e.g., the following*: "We know the company from a longer period of time and it is one of the leading companies in its field. For us the image of Labsystems is also important."* Timo Summa, the managing director of Interpolator, which belonged to the Skop group, states the following in Kauppalehti Optio on 6.4.1989*: "He (Summa) considers Labsystems to be among the technological spearheads of Finland together with Vaisala, Wallac and certain units of Nokia."*

Skop had motivated for taking over Suovaniemi's companies as defined by the indictment of city public prosecutor Ritva Santavuori "*preplanned, grand blackmail on Oct. 14, 1986*", because *"Estimated profit huge. let's go."* (A quotation from the memoirs of Skop's General Director Wegelius: *"I, Christopher Wegelius")*.

On 13.4.1984 Suovaniemi was awarded an honorary prize by Finnish economic reporters. The award had previously been granted to Pekka Herlin, Nikolai Patolitshev, Ahti Karjalainen, Mauno Koivisto, Uolevi Raade, Pentti Uusivirta and Klaus Waris. The justification for awarding the prize was: *"The group of companies directed by Suovaniemi is exceptionally innovative, export-oriented and focused on high technology."*

Aggressive Innovation and Patenting Strategy of Biohit

Biohit Oyj, established by Suovaniemi in 1988, develops, manufactures and markets globally electronic and mechanical liquid handling devices, which are based on the Finnpipette invention made in the 1970s. The current market for these products is USD 600-700 million. Biohit is the global market leader of electronic pipettors, and the range of electronic and mechanical liquid handling devices is currently the widest in the world. In January 2000 the companies listed on the New Market (NM) -list of the Helsinki Exchanges possessed altogheter 11 patents whereas Biohit possessed 16 patents. Biohit was the first biotechnology company to be listed on the NM-list (Table 2).

Since its establishment Biohit has applied a very aggressive innovation and patenting strategy (Table 2). A similar strategy was also applied by Labsystems and Eflab already in the 1970s (Table 3). This pioneering strategy has served as an example for many other companies. Finnish companies who have applied such strategy have been successful; for instance Nokia became in the 1990s the company which submitted annually most patent applications in Finland.

Innovations and the development of new technologies has enabled Biohit to find a basis for new market segments the potential of which may be as high as USD 1.5 billion for liquid handling products and much more for diagnostics and diagnostic analyzing systems in the future. Currently a clear demand exists for ergonomic, accurate and safe liquid handling products. Biohit's important OEM-accounts include companies such as 3M and Johnson & Johnson for whom Biohit manufactures tailor-made electronic liquid handling devices to complement their diagnostic product ranges. The products developed and patented by Biohit, which conform with international quality standards, form the basis for the success of this long-term co-operation.

New Immunodiagnostic Methods for Research and Diagnostics

The principle of vertical measurement and multichannel pipettors have since the late 1970s enabled the development of the use of non-radioactive markers (e.g. enzymes and fluorescent markers) for safe and accurate immunodiagnostic applications. It has been estimated that the market potential for test reagents and related products used in immunodiagnostic applications totals USD billions. Moreover, it has been estimated that the value of immunodiagnostic services provided by laboratories in the US, Japan and Europe totals USD 40 billions annually.

In the area of diagnostics Biohit develops, manufactures and markets test kits based on the enzyme immunoassay (EIA) –method and monoclonal antibodies for the diagnosis and screening of different types of disease. Biohit's diagnostic product range includes, e.g., the GastroPanel for screening and diagnosing functional dyspepsia, *H. pylori* –infection and atrophic gastritis as well as for assessing the risk of gastric cancer, peptic ulcer and esophageal reflux disease from one blood sample, and the tests for the detection of lactose intolerance and systemic *lupus erythematosus* (SLE).

In order to be able to offer complete analyzing systems for its customer base the product range of Biohit includes, in addition to liquid handling products and diagnostic tests, instruments used for the analysis of test results. The instruments are manufactured by the US company Bio-Tek and they are based on the principle of vertical measurement and multichannel pipettors. Biohit has developed complementary software for the said instruments.

Biohit's diagnostic tests are patent-protected and there are numerous patents pending. It has been estimated that the market potential for Biohit's diagnostic tests is approx. USD 5.0 billion (MeritaNordbanken Research 2000).

Multichannel Pipetting and Vertical Photometry Serve as an Aid also for Genetic Studies and the Medical Industry

Since the 1990s the markets for products used in applications related with the replication of DNA (PCR: Polymerase Chain Reaction) and HTS (High Throughput Screening) have grown considerably. The production method of monoclonal antibodies as well as the PCR- and HTS-methods utilize products which are based on multichannel liquid handling devices and the vertical measurement principle. It has been estimated that the market value of systems, instruments, accessories and reagents totals annually USD billions.

The future poses many challenges and much work for basic research and medicine, which utilize, e.g., instruments and products needed for the PCR- and HTS-techniques. The same applies for companies manufacturing this equipment. This area of work can be expected to expand when, in addition to human genes, also the genes of animals, plants and microbes will be studied.

Especially products based on multichannel pipetting and vertical measurements used for PCR- and HTS-applications have proven to be a success for numerous companies such as the multinational Perkin-Elmer, the Finnish company Wallac, which was acquired by Perkin Elmer, and the Swiss Tecan Group (the market value of Tecan totalled on Dec. 31, 2000 USD 1.3

billion, i.e., eight times its net sales in 2000). In the future the number of companies utilizing the above innovations can be expected to increase rapidly while the existing ones will grow.

Vertical measurement has enabled the development of microarray biochip technologies as well as related instruments and software during the last fifteen years. Biochips helped to dramatically accelerate the ongoing worldwide research collaboration known as the Human Genome Project. In addition to genetic applications, the biochip is being used in toxicological, protein, and biochemical research. Immunoassay analyzers based on biochip arrays also combine biotechnology, imaging and electronics to enable vertical measurement of multiple parameters in a single drop of serum. The market of biochip research and clinical applications can be estimated to grow as a result of numerous factors including, e.g., drug discovery demands, a desire for fast decentralized laboratory diagnostics and cost savings as well as the entrance of new companies the markets. It has been estimated that the market size will be 10-fold compared to its current magnitude by 2006.

Vertical Measurement Principle and the Origins of the Microplate

The vertical measurement principle in photometric assays, which was invented by prof. Osmo Suovaniemi, M.D., Ph.D, led in the early 1970s to a new theory and the development of batch analyzing instruments using a vertical light path for measurement[2,3,4,5.] As a result, the Suovaniemi equation, A = (a/S)m for data deduction was introduced[6,7,8]. This innovation made it possible to develop the unique FP-9 analyzing systems and the Titertek Multiskan, the very first microplate reader in the world. Suovaniemi also invented and developed the cuvette blocks (3x3 wells)[9] and the microplates (8x12 wells)[10] for vertical light path measurement as well as the first adjustable multichannel pipettors[11] for the cuvette blocks and microplates. The cuvette blocks and microplates are equipped with a flat, optical window in the bottom of a well and excellent properties as a solid phase in immunoassays, such as the enzyme immunoassay (EIA) and fluoro immunoassay (FIA) methods.

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[2] Suovaniemi, O. U.S.-patents 4 144 030 and 4 290 997, Canadian patent 1 031 183, U.K. patent 1 486 210 and French patent 4 144 030.

[3] Suovaniemi, O. in Proceeding of the Second National Meeting on Biophysics and Biotechnology in Finland, A.L. Kairento, E. Riihimäki, and P. Tarkka. Eds., 183 – 187 (1976).

[4] Suovaniemi, O. Discrete Multichannel Analysis Systems Am. Lab. 14(6), 106 – 111 (1982).

[5] Suovaniemi, O. The Vertical Measurement Principle in Photometry, Intl. Biotech. Lab., May / June, 43 – 45 (1984).

[6] Suovaniemi, O. Discrete Multichannel Analysis Systems Am. Lab. 14(6), 106 – 111 (1982).

[7] Suovaniemi, O. The Vertical Measurement Principle in Photometry, Intl. Biotech. Lab., May / June, 43 – 45 (1984).

[8] Suovaniemi, O. Automated Instrumentation for Clinical and Research Laboratories – Innovations and Development of Vertical Light Beam Photometers and Electronic Pipettors, Ph.D. Thesis, University of Helsinki (1994).

[9] Suovaniemi, O. U.K. patent 1 486 841.

[10] Suovaniemi, O. et al. U.S. patent 4 319 841.

[11] Suovaniemi, O. U.S-patents 3 855 868, 4 058 370 and 4 215 092.

These innovations have been utilized so extensively that they can justifiably be called global industrial standards, and they revolutionized laboratory routines worldwide in the 1970s and 1980s[12]. The instruments and analyzing systems based on these innovations served as the foundation for Labsystems Oy and joint venture Eflab Oy, the Finnish companies founded by prof. Suovaniemi in the 1970s and subsequently, for the global business of numerous other companies.

The instruments and analyzing systems, based on the principle of vertical measurement as well as multichannel liquid handling devices and microplates of high optical quality as a solid phase, have enabled to perform the extensive research on and fast development of immunoassay techniques and related applications, e.g., for the analysis and screening of cancer and infectious diseases. During the past ten years, the immunoassay technology has been followed by the rapid development of molecular biology techniques, such as Polymerase Chain Reaction (PCR). The microplates (8x12, 16x24 and 32x48 wells), the multichannel liquid handling devices and the principle of vertical measurement have made it possible to develop High Through-Put Screening (HTS) systems for, e.g., PCR- and related analyzing procedures. Biohit has introduced a new microplate (12 strips with 8 wells) with improved optical quality and high binding capacity of antigens and antibodies[13].

[12] The National Technology Agency of Finland (2001), Paving the Way for Evidence-Based Medicine: Diagnostics 2000.

[13] U.S. patent 5 308 584 of Biohit.

Table 2 Patenting in Finland by Finnish Companies Recently Listed on Helsinki Exchanges (January 2000)

Company	Patents	Patent Applications
Biohit *)	16	31
Perlos	6	13
Teleste	3	4
Eimo	1	2
Sanitec	1	1
Stonesoft	-	3
Keskisuomalainen	-	1
Aldata	-	-
Comptel	-	-
F-Secure	-	-
Janton	-	-
Liinos	-	-
Marimekko	-	-
Nedecon	-	-
Proha	-	-
Sponda	-	-
Sysopen	-	-
Technopolis Oulu	-	-
TH Tiedonhallinta	-	-
Tieto-X	-	-
TJ Group	-	-

Source: National Board of Patents and Registration of Finland 27.1.2000
*) Finnish patents: 29 and Finnish patent applications: 10 on August 15, 2003

Table 3 25 largest Finnish export companies in 1980, their awarded patents and those awarded to certain Finnish companies operating in the health care, laboratory, medical and other high tech industries (*) in 1981.

Company	Exports in 1980		Company	No. of Finnish patents
	MFIM	% /net sales		in 1981
Enso-Gutzeit	2919	71	Valmet Oy	27
Rauma-Repola	2626	67	Oy Tampella Ab	18
Valmet-Yhtymä	1273	26	Rauma-Repola Oy	16
Outokumpu	1908	71	Oy Wärtsilä Ab	12
Yhtyneet				
Paperitehtaat	1907	74	Enso-Gutzeit Oy	11
Nokia-Yhtymä	2441	55	Outokumpu Oy	10
			*) Oy LM Ericsson Ab	10
Kymi	1510	74	Oy Nokia Ab	8
Ahlström	1521	46	A.Ahlström Oy	7
Neste	1730	13	***)** Labsystems Oy	7
Wärtsilä-Konserni	1350	52		
Metsäliitto-Yhtymä	1237	51	Yhtyneet	
Veitsiluoto	1229	84	Paperitehtaat	7
Valio	1043	32	*) Orion-Yhtymä Oy	7
Wilh. Schauman	1211	79	*) Farmos-Yhtymä Oy	6
Rautaruukki	803	35		
Tampella	1161	68	*) Instrumentarium Oy	6
Finn-Stroi	894	99	Kone Oy	6
			*) Vaisala Oy	5
Serlachius	1090	61		
Kaukas	852	84	G.A.Serlachius Oy	3
Kemira	999	37	Kemira Oy	3
Kajaani	699	87	*) Huhtamäki-Yhtymä Oy	2
			Oy Kaukas Ab	2
Ovako	512	42	Oy W.Rosenlew Ab	2
Myllykoski	570	93	*) Oy Star Ab	2
Hollming-Yhtymä	573	68	Metsäliiton Teollisuus Oy	1
Kemi	500	78	Valio Meijerien	
			Keskusosuusliike	1
Kaukomarkkinat	689	69	Oy Wilh. Schauman Ab	1
Rosenlew	682	54	Hollming	1
Kone-Yhtymä	577	30	*) Huhtamäki Oy Lääketehdas	
			Leiras	1

Sources: 1. Timo Airaksinen and Kalle Tammisto: Western Exports, Marketing Problems and Success of Companies Operating in the Metal Industry, (Teollistamisrahasto Oy 1982)

2. Patent Magazine no 13, 1981

Some History of Biohit, Labsystems and Eflab

1. Professor Osmo Suovaniemi, M.D., Ph.D., is the founder and the Chairman of the Board of Directors of Biohit Corporation. His background as the founder, the Chairman of the Board of Directors and President of both Labsystems Oy 1971-1986 and joint venture Eflab Oy 1978-1986 and as the innovator of the major products of these companies demonstrate his experience and skills in this field of business. He has been awarded some 70 patents alone in Finland and a few hundred world-wide, mainly in the fields of medical laboratory diagnostics, optics and mechanics.

2. Suovaniemi received the M.D. in 1972 and the Ph.D. in 1994 from the University of Helsinki. He has also studied at the Helsinki School of Economics and Business Administration between 1976-1977. He has served as a member of the Board of Directors, as the Vice-Chairman and as the Chairman of the General Industry Group in Finland between 1978-1986 (from 1991 onwards the General Industry Federation) and as a member of the board of the Confederation of Finnish Industry in 1986 (from 1992 onwards the Confederation of Finnish Industry and Employers).

3. Suovaniemi has been awarded by the Club of Business Journalists for the economic feat of the year in 1984. The justifications for the award were: *"The corporate group managed by Dr. Osmo Suovaniemi is exceptionally innovative, export-oriented and focused on high technology."*[14] The Managing Director of Kone corporation, Mr. Pekka Herlin, received the same award in Finland in 1983. Previously the award has been granted to the Minister of Foreign Trade, Mr. Nikolai Patolitshev, Dr. Ahti Karjalainen, Dr. Mauno Koivisto when serving as the Chairman of the Board of the Bank of Finland (Dr. Koivisto served as the President of Finland between 1982 - 1994), Honorary Mining Counsellor Mr. Uolevi Raade, Departmental Chief Mr. Pentti Uusivirta and Chancellor, professor Klaus Waris. For the same reasons *"Labsystems is selected as the company of the year in Southern Finland"* in 1984. In 1976 Suovaniemi was awarded by the Foundation of Finnish Inventions for his single- and multichannel Finnpipette inventions, which *"led to successful production."*

4. When Suovaniemi left Labsystems and joint venture Eflab in 1986-1987 approximately 100 inventions were used by the companies. The companies had applied for approx. 700 patents internationally and by the beginning of 1986 over 200 had been awarded. As to the 100 inventions the importance of two clearly exceeds the others. Suovaniemi's inventions, i.e., the analysers with the principle of the vertical measurement, e.g., Titertek Multiskan, FP-9 and FP-900 and the single- and multichannel, adjustable Finnpipettes have since the 1970s served as examples for numerous companies worldwide. Up until now the concept of these vertical light path analyzers with complementary products has generated an over USD 2.0 billion annual global business, and the adjustable pipettors and tips a USD 0.7 billion business *per annum*.

5. The Finnpipette- and vertical measurement inventions may justifiably be called "*the industrial standards for the future*", which can be considered as the highest and most

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[14] *The italicized texts are direct quotations from reference sources.*

valuable goal for innovation activity. Also Labsystems, owned currently by Thermo Electron, has realized this and, consequently, it has communicated in its international advertizing: "*Science demands standards. After having manufactured over 10,000 Multiskans and more than one million Finnpipettes, we consider having set them*." These inventions have accelerated in an invaluable way also basic medical and industrial research since the late 1970s.

6. The Titertek Multiskan and other analyzing systems based on the inventions of vertical measurement and Finnpipettes, the consumables used with the products as well as HIV- and other enzyme immunoassay (EIA) -test kits for infectious diseases form the basis for the equipment delivered by Labsystems to the blood banking center in China. These products and inventions originate primarily from joint venture Eflab Oy. In addition, Labsystems has delivered to the projects EIA -test kits for diagnosing HIV- and liver infections, which Labsystems developed as a pioneer in the world under Suovaniemi's management up until 1986.

7. Titertek Multiskan and multichannel Finnpipettes have created since the late 1970s highly valuable preconditions for the rapid development of the EIA -test kits especially for the needs of screening and diagnosing infectious and cancer diseases as well as blood banking. Later the entire HIV-diagnostics, which was in its early stage based on the use of EIA -test kits, was performed in many blood banking laboratories with Titertek Multiskans and Finnpipettes and with products imitating them.

8. Under the management of Suovaniemi university scientists collaborating with Labsystems made in 1985 a revolutionary invention for corneal wound healing. Numerous patients, who were losing their sight due to the unhealed corneal ulcers caused by the long-lasting use of contact lenses, injury or infection, were treated successfully with the drug. This invention was patented by Labsystems in several countries world-wide.

9. Labsystems and joint venture Eflab were pioneers in the world and launched the following unique products to the global market by 1986:

9.1. Adjustable single- and multichannel manually-operated liquid handling device (Finnpipettes) (1971 - 1973).

9.2. Analyzing systems based on the vertical measurement (1977).

9.3. Titertek Multiskan, for microplates (1978).

9.4. Human blood specific- FECA-EIA- test system for the screening and diagnosing of colorectal cancer (1982).

9.5. Test based on the utilization of certain cells for the diagnosis of chlamydia (1982).

9.6. Monoclonal antibodies (MAbs) to intermediate filaments for the characterization of different types of tumors (1983).

9.7. The Mutascreen analyzing system, which was based on the principle of vertical photometry, for measuring the mutagenicity of chemicals, such as medications, pesticides, additives in nutrition, cosmetics etc. (1984). Due to certain technical and commercial problems the Mutascreen-project was postponed in 1985.

9.8. The spin-off analyzing systems of Mutascreen, i.e., Auto-EIA (an automated system for EIA applications for the screening and diagnosing of infectious and cancer diseases) and Bioscreen (an automated microplate-based analysing system to study bacterial growth in numerous research and industrial applications) were successfully marketed worldwide as of 1985-1986.

10. In 1985 Labsystems was the only company in Finland with the P-4 facilities, in which dangerous pathogens such as the HI-virus were studied and components for the HIV test kits were being produced. Labsystems was in 1985 the only site where it was possible to produce synthetic peptides, which formed the basis for, e.g., the second generation HIV tests of Labsystems. Thus, Labsystems and joint venture Eflab Oy were also the pioneers for the screening and diagnosing of HIV by using the vertical measurement based analyzers (first Titertek Multiskan and later the Auto-EIA), multichannel Finnpipettes and tests.

11. At Labsystems and joint venture Eflab Oy the research and application of biotechnology formed the basis for international competitive ability and intensive growth in areas where new and better solutions were badly needed. These companies employed approx. 700 persons, and Labsystems had foreign subsidiaries in 10 countries in 1986.

Professor Osmo Suovaniemi: Possessor of Most Patents in Finland on June 29, 2002

Osmo Suovaniemi, M.D., Ph.D., Professor. Founder, President and CEO and member of the Board of Biohit. His background as the founder, main shareholder, Chairman and CEO of Labsystems Oy and Eflab Oy until 1986, and as a major innovator of the products of those companies, demonstrates his experience and skills in this field of business. He received the M.D. in 1972 and the Ph.D. in 1994, both from the University of Helsinki, Finland. He has also completed a study program (JOKO) at the Helsinki School of Economics in 1976-1977 and at the Finnish Institure of Management (LIFIM) in 1982. In 1976 he received an award from the Finnish Foundation of Inventors for the single- and multichannel Finnpipette invention. He has served as board member, Vice-Chairman and Chairman of the General Industry Group in Finland between 1978-1986 and as a board member of the Confederation of Finnish Industry in 1986. In 1984 the Finnish economic reporters awarded him an honorary prize for his economic achievements in 1983. Suovaniemi possessed most patents in Finland on June 29, 2003. Furthermore, he has been awarded hundreds of patents worldwide in the areas of diagnostics, optics and mechanics. He received an honorary relief from the National Board of Patents and Registration in Finland on June 29, 2003. This day commemorated the awarding of the first Finnish patent 160 years ago. The President of Finland awarded Suovaniemi the title of Professor in June 2002. In 2003 he was appointed as the member of the Academy of Technical Sciences.