

APPENDIX

A NATIONAL BIOTECH AGENDA FOR GROWTH

sweden**BIO**

THE SWEDISH BIOTECHNOLOGY INDUSTRY ORGANIZATION JANUARY 2004

OVERVIEW OF LONG LIST OF POTENTIAL IDEAS

Allocation of R&D resources

- Create a national strategy for R&D funding and co-operation
- Coordinate biotech funding on a national level by coordinating/merging

Vinnova/Teknikbrostiftelsen, Strategiska Forskningsstiftelsen etc

- Do not dilute economic resources through administrative procedures
- Concentrate R&D funding to fewer research groups to avoid dilution
- Concentrate R&D to established life science universities, Mälardalen, Medicon Valley and Gothenburg
- Focus on a selected number of areas for basic research at universities
- Support investigations into emerging areas. For example xenotransplantation, biomaterials.
- Create centres-of-excellence for next generation research areas. E.g. nanotechnologies, proteomics.
- Stimulate leading/high quality companies with a good chance of success
- Establish institutions/positions of cross-scientific character with industry representatives
- Focus and differ between applied and basic R&D in the debate
- Conduct international benchmark on a governmental level for new innovative ideas
- Stimulate Cross-Scientific Collaboration
- Create a biotechnology risk assessment group to assess emerging technology issues and develop regulations where needed

Education

- Provide training for researchers in IP-rights, business sense, development as part of the core curriculum
- Improve the business development competency among the universities
- Change culture in academia to focus on product creation/commercialisation. The mindset in R&D needs to be: Problem, Solution, Commercialisation
- Establish collaboration between industry and academia through internships for scientists giving lectures at Upper Secondary Schools and Universities
- Introduce Cross-functional programs/cooperation in natural sciences
- Invest in educating science teachers at elementary school, Upper Secondary Schools and universities
- Invest in science books and equipment at högstadiet and gymnasiet
- Introduce a science coordinator in all Upper Secondary Schools
- Continuously educate Upper Secondary Schools and elementary school teachers in science. Safeguard the quality in the "Education Production Line", from elementary school to Upper Secondary Schools)
- Make companies "adopt" an elementary school and provide education in science and biotechnology
- Define the role of Högskolorna vs. Universities (A, B, C)

Career in Academia/Industrial research

- Create an industrial biotechnology education focussing on business in biotech
- Introduce a more open accreditation system for patenting in academia
- Introduce a merit system for professors giving credit for industry collaboration
- Provide funding to scientist who want to do "big science" (i.e. large projects such as Decode, proteomics screening platforms etc)
- Improve funding to universities by reducing overhead costs for industry collaborations
- Create conditions for a structure in the interface between industry and university which catches researchers with "production thinking"
- Reflect and value IPR in R&D funding
- Establish Post-Doc scholarships within the life science industry

Students conditions

- Review the academic merit system; develop other career paths than just PhDs

- Make it more financially interesting to become a researcher at the universities, including financial support during student years
- Reform tax and wage systems to make education more financially attractive
- Market that education payoff
- Create housing during 2-3 years available in biotech regions

International Students

- Facilitate the process of attracting more international R&D students (e.g. from India, China, the Baltic States)
- Create good international schools in prioritised biotech regions
- Improve tax holiday to five years for ex-pats and foreign specialists
- Reduce the complexity of the application process for expats (Denmark as benchmark)
- Introduce more and better possibilities for foreign Post-Docs
- Facilitate and stimulate foreign professors / positions

Physical Infrastructure

- Provide housing opportunities for foreign researchers
- Improve the quality of life in Sweden with the objective to attract and retain leading researchers.
- Improve the public infrastructure, including affordable housing, transportation etc
- Improve Sweden's international business climate, including airports

International and Nordic Cooperation

- Stimulate co-operation and co-ordination between Sweden and Denmark
- Promote common industry initiatives in Scandinavia
- Align the Swedish biotech strategy to EU

Legal Framework

- Improve and safeguard procedures to obtain permission to conduct animal experimentation
- Improve R&D legislative conditions for individuals and companies
- Analyse Lärarundantaget
- Define usage of the Swedish blood/biobank

Marketing and PR

- Market that biotech is a future industry
- Use "Biotech-friendly trends" within industry marketing
- Market Sweden abroad as a leading biotech country to attract investments

Financing

- Improve conditions and regulations for Venture Capital
- Establish R&D funds with focus on product-ideas with industrial representation in the evaluation system
- Establish R&D funds for applied research
- Improve Swedish biotech companies' access to EU funding sources
- Finance development projects in the industry (benchmark USA)
- Provide governmental support in seed/bridge financing
- Provide economic stimulation to university education and research
- Increase funding for basic research at universities
- R&D funds that merit true industry collaboration and application of work
- Introduce system for sale of tax credits generated by research intensive biotech firms

Clinical Trials

- Recognize the importance for biotechnology of clinical trial activities in Sweden
- Create a national organisational body and strategy to coordinate clinical trials
- Create career paths and incentives for Medical Doctors to conduct clinical trials
- Change Biobankslagen to improve conditions for clinical trials

PARTICIPANTS IN THE STUDY

Anders Reifeldt, CEO, Demetech
 Anna Sandström, Biotech expert, IVA
 Bengt Ågerup, CEO, Q-Med
 Bengt Ågerup, CEO, Q-med
 Bengt Julander, CEO, Pharmalink
 Björn Forsman, CEO, Orexo
 Björn Nilsson, CEO, Karobio
 Björn Odlander, Founding Partner, HealthCap
 Borje Haag, cluster leader, Biotechvalley
 Christer de Flon, CEO, Carlsson Research
 Claes Holmberg, CEO, Biolight
 Claes Wilhelmsson, Former Head of R&D, AstraZeneca
 Conny Bogentoft, CEO, KIAB
 Dan Pitulia, CEO, Entific
 Daniel Spasic, CEO, Trial Form Support Group
 Erling Holmlund, CEO, Mercodia
 Ernst Westman, CEO, Boule Diagnostics
 Eugen Steiner, partner, Healthcap
 Göran Forsberg, Head of R&D, Active Biotech
 Gösta Sjöholm, CEO, Sidectech Technologies
 Gunnar Fernstrom, Innkap
 Hans Arwidsson, CEO, Lipocore Holding
 Hans Hultberg, Director Global Discovery Alliances, AstraZeneca
 Hans Johansson, CEO, Personalchemistry
 Hans Sievertsson, Chairman, Kvarnhealth
 Henrik Jönsson, CEO, Erysave
 Jakob Lindberg, CEO, Collectricon
 Jan Hed, CEO, Anamar Medical
 Jan Lundahl, Head of Life Sciences, Capman
 Jan Sundqvist, Managing Director, SLS venture
 Jarl Molin, VP Business Development, BioLipox
 Johan Ihre, CEO, Tripep
 Johan Kördel, Head of Business Development, Biovitrum
 Jonas Frick, Senior Investment Director, SLS Venture
 Jörgen Lönngren, Managing director, Industrifonden
 Lars Adlersson, CEO, Medivir
 Lars Gatenbeck, CEO, H&B Capital
 Lars Hagel, Head of R&D, Amersham
 Lars Henriksson, Controller Life Sciences, Industrifonden
 Lennart Hansson, CEO, Arexis
 Magnus Lundberg, CEO, Pharmacia Diagnostics
 Maris Hartmanis, CEO, Gyros
 Martin Nicklasson, Executive Vice President, AstraZeneca
 Mats Jirstrand, CEO, Innetics
 Mats Pettersson, CEO, Biovitrum
 Mattias Kalen, CEO, Angiogenetics
 Mikael Brönnegård, Investment Partner, InnovationsKapital
 Nicholas Waters, CSO, Carlsson Research
 Nils Bohlin, Vice President, Arthur D. Little
 Ola Forsstrom-Olsson, CEO, Ludesi
 Olle Nilsson, CEO, CanAg Diagnostics
 Ove Öhman, CEO, Åmic
 P.O. Wallstrom, CEO, Melacure Therapeutics
 Per-Erik Sandlund, CEO, Amersham Biosciences Sweden
 Per-Ola Forsberg, CFO, Probi
 Peter Bramberg, CEO, Doxa
 Roger Johanson, CEO, Medicarb
 Rolf Ehrenberg, Head of R&D, Gyros
 Staffan Josephson, Managing Director, Investor Growth Capital
 Stefan Löfås, Head of R&D, Biacore
 Stefan Ohlsson, CEO, Amarin Development
 Stig Blom, CEO, Berzelius Clinical Research Center
 Sune Rosell, CEO, Innate Pharmaceuticals
 Svein Mathisen, CEO, Bioinvent
 Sven Andréasson, CEO, Active Biotech
 Ted Ternander, CEO, Got-a-Gene
 Thomas Welander, CEO, Anox
 Torben Jørgensen, CEO, Affibody
 Ulrica Sehlstedt, CEO, Lightup Technologies
 Ulf Boberg, CEO, Global Genomics
 Ulf Jönsson, CEO, Biacore

PROJECT TEAM:

Hans Nyctelius	David Jern
Mats Berggren	Bengt Anell
	Markus Wistrand

REFERENCE LITERATURE AND SOURCES

Biotech in General

"Swedish Biotechnology – scientific publications, patenting and industrial development", 2003, Anna Sandström, IVA & Lennart Norgren, Vinnova, Vinnova Analysis VA 2003:2.

Vinnova, 2003, Swedish Biotechnology - scientific publications, patenting and industrial development, by A. Sandström and L. Norgren.

Tax, legislative and regulatory issues

"Innovation and competitiveness in European biotechnology", European Commission, 2002, Enterprise Papers, No 7 - 2002, by A. Allansdottir, A. Bonaccorsi, A. Gambardella, M. Mariani, L. Orsenigo, F. Pammolli, M. Riccaboni

"Effectiveness of Innovation Policies", Epohite, 2003

"Canadian biotech advisory committee – Annual Report 2002", 2003, Canadian Biotechnology Advisory Board

"Inventory of public biotechnology R&D programmes in Europe", European Commission, 2000
Invest in France, Invest in Sweden

Financing of biotech (public and private)

"Medicinsk forskning för hälsa, god sjukvård och ekonomisk tillväxt", Vetenskapsrådet, 2003:8

"Rewriting the rules – is today's integrated business models right for tomorrow?", 2003, Mercer Management Consulting

"Annual Survey of Pan European Private Equity & Venture Capital Activity", 2003, EVCA Yearbook
Eurostat, Statistics Canada, Statistiska Centralbyrån

"Beyond Borders – the global biotechnology report 2003", 2003, Ernst & Young

Governmental leadership

"Benchmarking Biotech – en studie av Kanadas och Sveriges biotekniksektorer", 2003, Invest in Sweden Agency.

"Wettbewerbsfähigkeit Deutschlands als Standort für Arzneimittelforschung und – entwicklung", 2001, The Boston Consulting Group.

"MassBiotech 2010 – Achieving global leadership in the life science economy", 2002, The Boston Consulting Group

Sheridan, C., German biotech gets second chance, *Nature Biotechnology*, 21:12 1414-1415.

"Bioscience 2015 – Improving national health, increasing national wealth", 2003, The U.K. Bioindustry Organisation

"Pharmacia & Upjohn – erfarenheter från ett världsföretags utveckling", 1999, Per Frankelius

"Benchmarking business angels", European Commission, November 2002, p. 40.