

Life Sciences

in the crossover between human and animal



The World Health Organization expects 70% of future emerging diseases to be caused by zoonotic pathogens, i.e. to be transmitted from animals to humans, and vice versa. The best way to protect the human population from this type of animal disease, is to protect the animal population. For that, vaccines are essential.

It takes a united approach to develop new products and services that contribute to a harmonious environment in which healthy people live alongside healthy animals.

Where Life Sciences meets the crossover of human and animal health.

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Introduction

The Netherlands has significant expertise in infectious diseases, and it boasts a renowned animal health chain. World-class research institutes, universities and private-sector companies cooperate closely in the development of vaccines against viruses and other pathogens. By strong public-private partnerships, the Dutch have found their typical way of combining a top-tier knowledge base with an entrepreneurial focus on valorization. The Netherlands' relatively small size and open attitude allow all elements of the value chain to be nearby and open for business and cooperation. As a result, a vibrant and closely connected life sciences industry has developed, with a growing number of companies and employees, an increasing number of products and large growth (+272%) in private investments.

The Central Veterinary Institute and strong connections with nearby academic centers in Amsterdam, Utrecht and Wageningen, make Flevoland a crossover center in the Dutch bioregion, connecting specialized local hotspots and disciplines and facilitating crossovers between academic centers and SME's and between PPS's such as Immuno Valley and Food Valley. Enabling connections to facilitate worldwide distribution of knowledge and products is a main goal of our recent '*Humanimal*' initiative, in which research organizations and private companies are to work together and to share knowledge.

www.immunovalley.nl
www.foodvalley.nl



Research

The ALTANT research program develops alternatives for antibiotics in livestock

Immuno Valley is a consortium of over government, research and corporate partners in the Amsterdam-Utrecht-Flevoland region, focused on detection and control of infectious diseases in man and animal from a one-health perspective. This strong public-private partnership enables faster innovation and valorization by connecting research groups with market demand.

In the autumn of 2008, Immuno Valley launched the research program ALTANT at request of the Ministry of Economic Affairs, Agriculture and Innovation. Its main goal is to achieve innovative and promising lines of development within a period of two years, that could be alternatives to antibiotics in livestock. Through acquisition and rigorous assessment by an independent panel of international experts, four projects were selected:

1. ASIA, the development of animal-specific antimicrobial and immunomodulatory peptides (participants: Veterinary Medicine Faculty of Utrecht University, Free University Amsterdam, Central Veterinary Institute and Schothorst Feed Research)
2. EVAC, vaccine development against *Staphylococcus Aureus* in bovine animals (participants: University Medical Center Utrecht, Veterinary Medicine Faculty of Utrecht University and Intervet)
3. MODIPHY, the development of plant-derived pharmaceuticals and colibacillosis against coccidiosis in chickens (participants: Veterinary Medicine Faculty of Utrecht University, AFSG Wageningen University, GD Animal Health Service and PhytoGeniX)
4. RESUPLYS, phage therapy against *Streptococcus Suis* in pigs (participants: Veterinary Medicine Faculty of Utrecht University, Central Veterinary Institute and Rockefeller University, New York USA)

In two years, all four projects came to an initial efficacy study and all have good prospects. During this period the Immuno Valley project office provided research supervision and actively brought ALTANT to the attention of at least 35 relevant companies. As a result, one or

more interested business partners have been identified for each of the projects.

An independent review committee evaluated the projects on academic progress and valorization opportunities in the autumn of 2010. The committee unanimously advised the Ministry of Economic Affairs, Agriculture and Innovation to extend funding to two projects for the realization of an alternative to antibiotics in livestock. Immuno Valley is in the process of finalizing a research program for the selected two projects, with a duration of five years. The program will be financed by participating public and private partners and by support from the Ministry of Economic Affairs, Agriculture and Innovation. www.immunovalley.nl

Animal Sciences Group of the Wageningen University & Research Center (Wageningen UR)

The Animal Sciences Group¹ conducts research, provides education, and develops systems and innovations in the areas of animal husbandry, animal diseases, and fisheries and fish culture. The group employs some 650 people and boasts Europe's largest fresh-water fish-farming facilities, high containment units, livestock houses and laboratories. Customers include the European Union, public and private interest groups and businesses.



¹ Being Wageningen Livestock Research, Central Veterinary Institute and departments of Animal Sciences.

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Wageningen UR operates in the domain of a 'healthy food and living environment'. Its mission is to *explore the potential of nature to improve the quality of life*. Issues within this domain are almost never exclusively natural, technical or social by nature. Wageningen UR therefore fosters the unique interaction between the natural and social sciences. Both sets of disciplines are part of a cohesive package of research, education and services. This integrated approach offers additional possibilities for the effective application of expertise in policy or practice. One such application is Showcase Flevoland in which several partners work on projects that will provide solutions to the world's nr. 1 challenge: *To feed the growing world population we must produce three times as much food and simultaneously reduce our ecological footprint by a factor two.*

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The Central Veterinary Institute is an independent research institute and the national reference laboratory that, operating in the field of veterinary science, contributes to protecting the health of animals and humans in the Netherlands. Numerous times, CVI has proved to be the initiator of break-through research programs. The areas in which the Central Veterinary Institute works cover the entire range of infectious



diseases (caused by viruses, bacteria, prions and parasites) found among agricultural livestock, fish and shellfish and wild animals. The Institute also studies pathogenic organisms in animals that form a threat to humans (zoonoses). CVI maintains its own business development, technology transfer and licensing unit.

Access to the unique expertise and facilities of the Central Veterinary Institute

The risk of serious outbreaks of new infectious diseases in farm animals can be elevated by a great variety of causes. New or emerging infectious diseases in the veterinary field also pose a serious zoonotic risk to humans. About 70% of infectious diseases in animals can also be contracted by humans. Many of these pathogens are so dangerous, that it is necessary to study these diseases in biological containment level (Bio-Safety Level, BSL) 3 or even 4. There are but few such facilities in Europe and their capacity is limited, because they are often only available to selected government agencies.

A high-containment research unit is being developed in the Netherlands. With the ambition to act as 'national facility' for BSL 3 experiments. Expertise, know-how and facilities are available to private interest groups and businesses, according to contract research conditions. The existing facility of the Central Veterinary Institute is to be extended, so that research can be performed with pathogenic organisms under the more stringent safety BSL 3 and 4, because of their risk to humans. This new research unit is also unique because it enables research on large livestock animals.

www.cvi.wur.nl/uk

Private sector

Schothorst Feed Research

Schothorst Feed Research is an independent research institute, anchored in the Dutch animal feed sector. Its goal is to improve the clients' competitive position. The intensive and long-standing cooperation with animal feed producers forms the basis for the drive to bridge the gap between applied research and its practical implementation. This is expressed through structural attention to the conversion of qualitative feed concepts into quantitative feedstuff-related data.

In the coming years, animal feed manufacturers all over the world will be forced to distinguish themselves even more in feed quality and results. The compounding industry faces the challenge of manufacturing optimal compound feeds from the ingredients available on the market, while balancing nutrition and animal health against costs. Knowledge of the nutritional value of feedstuffs and the nutrient requirements of farm animals is crucial. The most important tools offered by Schothorst Feed Research are an extensive, sound list

of feedstuff and nutrient requirements. Determining the nutritional value of each individual feedstuff for each animal category requires a tremendous research effort, combined with great accuracy. This is a continuous process, because the feedstuff supply on the market forever changes and the developments in the field of technology or breeding continue, while consumers raise their requirements for animal products or the way in which animals are kept. The most efficient way to evaluate the nutritional value of feedstuffs and to determine nutrient requirements is collective research, shared by the parties involved.

www.schothorst.nl

Dr. Van Haeringen Laboratorium: well-known for its use of DNA technology

Dr. Van Haeringen Laboratorium (VHL) is a well-known, certified and accredited laboratory, specialized in DNA technologies. With regard to Quality, Service and Know-How, it has become an established name in international markets. Their various quality systems



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comply with e.g. ISO9001 and ISO17025. For 25 years, VHL has been serving customers with research and routine tests based on materials originating from animals, plants and microorganisms. VHL continually improves the technology and instrumentation in its laboratory. The technology is fast, cheap and more reliable than conventional techniques.

www.vhlgenetics.com

www.vhpgenetics.com

www.snpexpert.com

GD Animal Health Service, part of Dutch animal health chain

GD Animal Health Service is an innovative business on the Dutch and European markets and realizes a turnover

of almost Euro 50 million. Each day, approximately 450 employees engage in the health of farm animals and pets on the instructions of animal holders, veterinary clinics, authorities and the business community. The largest veterinary laboratory in the world forms the heart of their business. Each year, this lab carries out 4,3 million lab determinations. Not only does GD have a team of vets, specialists and scientists who carry out practical research and develop programs to prevent and combat animal diseases, it also has its own Research and Development facilities for the development and validation of diagnostic products. This unique combination of laboratory, knowledge and data enables GD to offer customers high-quality and customized advice.

www.gddeventer.com

Prionics Lelystad handles worldwide logistics

Prionics AG is world leader in farm animal diagnostics. Its their expertise to discover, develop and market innovative diagnostic solutions for major farm animal diseases, to protect consumer health. Prionics Lelystad B.V. is a 100% subsidiary of Prionics AG, Switzerland, and operates as a marketing & sales hub for the Benelux and Nordic markets. Prionics Lelystad B.V. has its own production facility in the Life Sciences Center. In addition, Prionics AG has handled global logistics for a number of products from their location in Lelystad. Using its central location and nearby Schiphol Amsterdam Airport as main advantages.

www.prionics.nl



Veterinary diagnostics production by Prionics Lelystad B.V.

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Summary

The focus on collaboration is increasing all the time: as a consequence of open innovation and as a main challenge in life science business models. Where better to start your quest for new and innovative solutions than in the open Dutch society? We invented the 'polder model' and pioneered PPP's that are recognized internationally as best-practice examples of collaborative innovation.

Our country is a relatively small space packed with 14 universities and strong food, health and agriculture sectors; with leading multinationals, a host of SME's and a large and growing number of start-ups. Every major agricultural company in the world seeks out Dutch plant breeders. Our food sector contains some of the most innovative food and ingredient companies. The medical

infrastructure with its universities, university medical centers and bio-banks is world class. And we hold a strong track record in the area of infectious diseases, monitoring human and animal health in a densely populated area with intensive animal husbandry. All elements in the life science value chain are at arm's-length, used to cooperate in open innovation processes and enabling you to create momentum.

The Netherlands: one vibrant bioregion with local hotspots on only 42,000 square meters, a gateway to European life sciences.



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Flevoland Development Agency



OMFL

The Flevoland Development Agency (OMFL) supports international entrepreneurs who have plans for expansion and investments in the Netherlands/Flevoland and helps the Flevoland-region to attract foreign investors. OMFL is a regional partner of the Netherlands Foreign Investment Agency (NFIA), an operational unit of the Ministry of Economic Affairs, Agriculture and Innovation.

OMFL is executory partner of the Province of Flevoland.

www.omfl.org



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