



Carenet

Clinical Animal Research Network

Activity report 2015-2020

Carenet, Clinical Animal Research Network Activity report 2015-2020

Year: 2021, Uppsala

Publisher: SLU Future animals, nature and health

Layout: Cajsa Lithell, RedCap Design

Illustrations: Fredrik Saarkoppel p3, p18 & p22, Cajsa Lithell p8 & p9

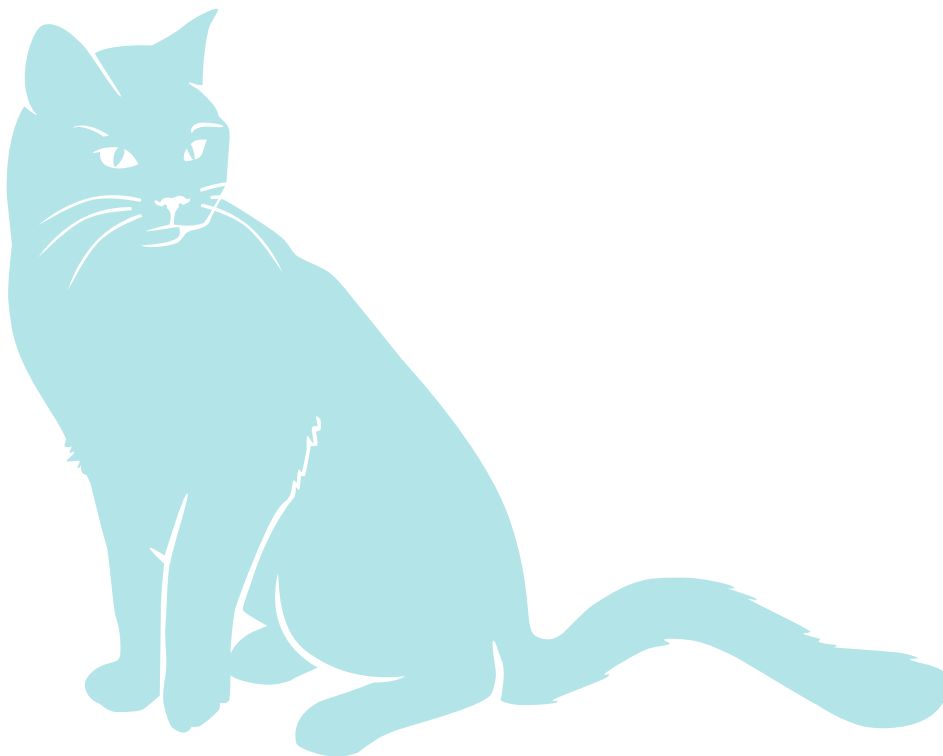
Cover photo: Mia Litström

Photos: Jenny Svénnås-Gillner, p4. Mia Litström, Janis Lunkas p10, Göran Ekeberg/AddLight AB, Viktor Wrangle, Camilla Wiik Gjerdrum, Petter Stahre, Göran Ekeberg/AddLight AB, Viktor Wrangle, Jonatan Fernström p12, Camilla Wiik Gjerdrum p14, p16 & p21, Malin Hagberg Gustavsson p20 and Daniel Gordin p24.

Print: SLU Repro

Contents

Promoting veterinary clinical research	5
Stronger together	7
The Carenet idea	8
Collaboration paves the way for impact	9
Together we take veterinary clinical research forward	11
Our steering group	13
Benefits of clinical research on sports and companion animals	15
Opportunities and challenges for veterinary clinical research	17
Networking meetings	19
Carenet Poster Award	20
Thematic meetings	21
Seed funded projects	22
Research education courses	23
About Carenet – thoughts from a PhD student	25





Promoting veterinary clinical research



—Bodil Ström Holst, chairman of Carenet

Carenet, Clinical Animal Research Network, is a collaboration between several large organizations working to develop veterinary clinical research; the Swedish University of Agricultural Sciences, Norwegian University of Life Sciences, University of Helsinki, Swedish National Veterinary Institute, AniCura and Evidensia. We bring together Nordic researchers and animal health professionals with a particular interest in research.

Carenet was first initiated in September 2014 to facilitate collaboration that strengthens and develops veterinary clinical research for sports and companion animals. Strong clinical research for sports and companion animals is essential for sustainable development of the animal healthcare sector, providing conditions for high quality care and patient safety. In a wider perspective, clinical research is needed to ensure animal welfare.

Many people have close relationships with cats, dogs and horses, and for many, quality of life is improved through the animals. Expectations of health care for animals are large, and research promoting health and welfare of sport and companion animals makes it possible for the animal healthcare sector to live up to the expectations of animal owners of today.

Carenet has an important role to play in promoting both quality and quantity of Nordic veterinary clinical research, and in ensuring critical mass in research groups by bringing Nordic researchers together.

We are stronger together!
Sincerely,

Bodil Ström Holst

Uppsala, December 2020

Carenet connects researchers and animal health care professionals interested in research, to strengthen and develop veterinary clinical research.



Stronger together

—building an infrastructure to support clinical research

Strong clinical research is important for sustainable development of the veterinary sector, providing conditions for high quality care and patient safety. For society, veterinary clinical research is imperative for animal welfare. Veterinary clinical research, however, includes numerous disciplines and research areas, and the Nordic need for veterinary clinical scientists with competences in various research and practice specialties is larger than any one of the Nordic countries can carry on its own. Therefore, Nordic and broader international collaboration is vital for veterinary clinical research.

Our vision: Good health and welfare for sports and companion animals through world-leading clinical research.

Background

To strengthen veterinary clinical research collaboration, the Clinical Animal Research Network, Carenet, was initiated in 2014 by the Swedish University of Agricultural Sciences (SLU), the Swedish Veterinary Institute (SVA), and the leading providers of veterinary care in the Nordic region, Anicura and Evidensia.

During 2016, Carenet developed to a Nordic collaboration and the steering group was expanded with representatives from the Norwegian University of Life Sciences (NMBU) and the University of Helsinki.

Members

Today, Carenet has brought together more than 270 members from academia, practice and governmental institutions in Sweden, Norway, Finland and Denmark, all interested in different aspects of veterinary clinical research.

Main goals

To fulfil the network vision, Carenet aims to achieve the following goals:

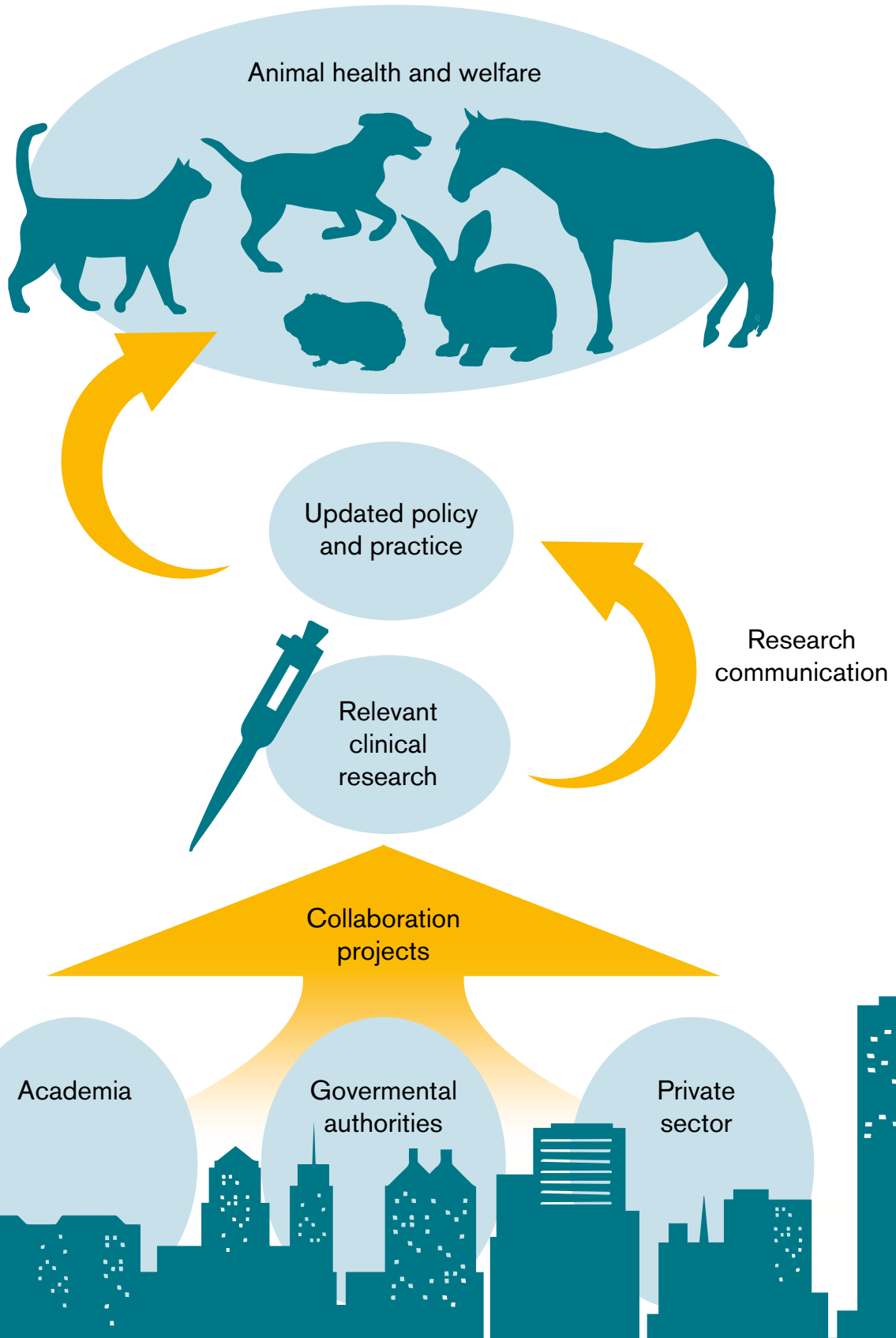
- High quantity of high quality Nordic clinical research for sports and companion animals
- Establishment of a Nordic funding body aimed at clinical research for sports and companion animals
- Well-developed research collaboration between actors involved in clinical research, such as academia, animal health care providers, governmental agencies and stakeholder organizations
- Knowledge building and information exchange between actors involved in clinical research for sports and companion animals
- High visibility of Nordic clinical research for sports and companion animals
- Broad awareness of sports and companion animals as a resource for a sustainable societal development

Funding and administration

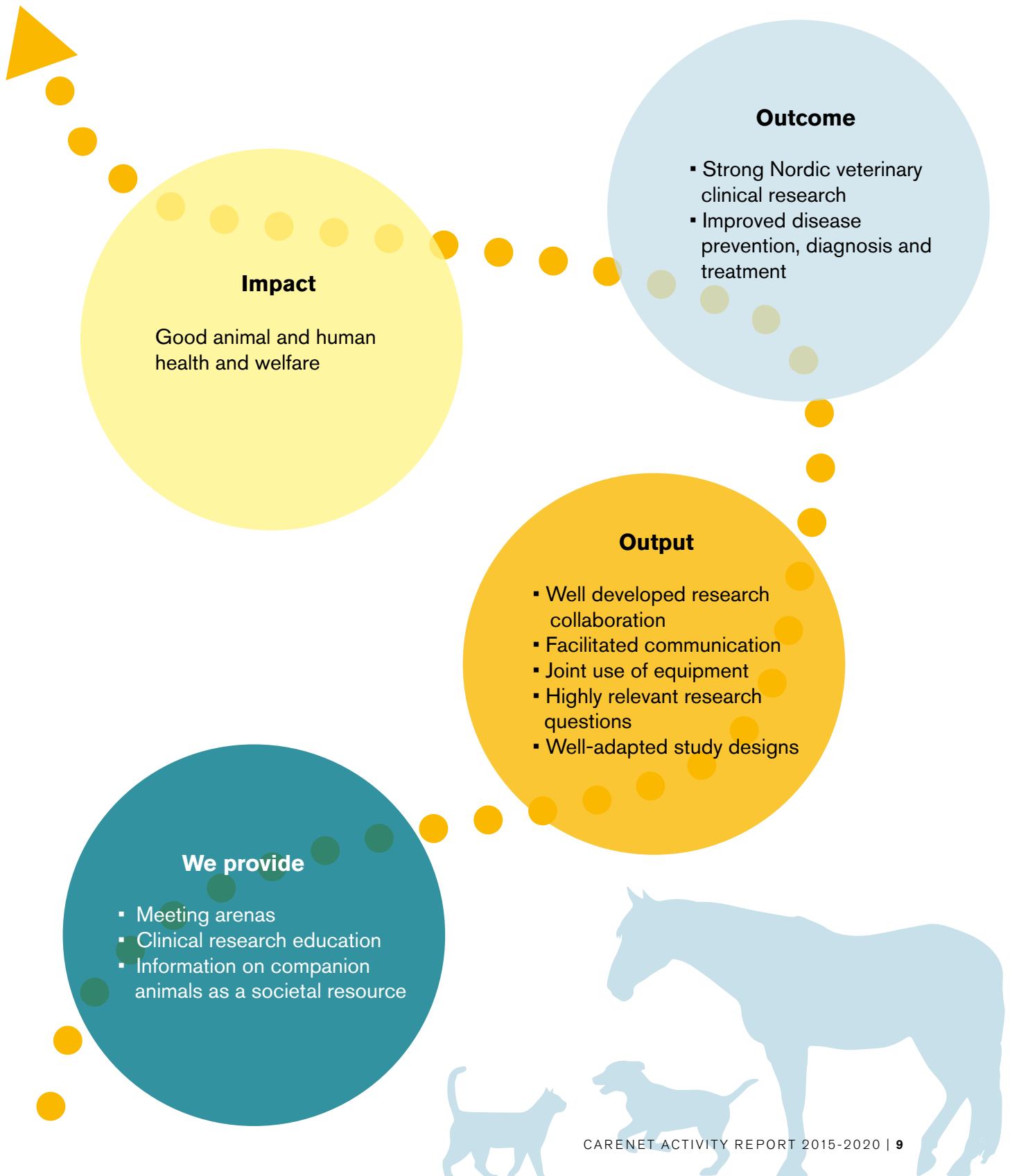
Caretnet has basic funding from and is administered by SLU, the partner organization fund travel costs etc. for their employees to able to join Carenet activities.

The Carenet idea

Nordic collaboration for animal health and welfare



Collaboration paves the way for impact





Together we take veterinary clinical research forward

— Marlene Areskog, Country Medical Director, Evidensia Sweden



The Carenet initiative is important and provides benefits for both the veterinary health care industry and for researchers at the Nordic universities. The relatively small Nordic countries are similar, and collaboration strengthens us.

Working across national and organizational borders, we access a larger base of patients, and the body of clinicians and researchers becomes large enough even within smaller research areas. The data obtained this way has the potential to deliver exciting applicable results that truly improve future animal health.

Working as a clinician often means that you have left the academic world behind and it takes an effort to reconnect when you have a research idea or want to explore a research area, for instance during your time as a resident. In academia, on the other hand, it may be difficult to get in touch with colleagues working in private practice that can contribute to or participate in studies. By creating a platform for those who are interested in research collaboration, we decrease the gap and facilitate contact.

Clinical veterinary research is often limited to geographical areas or by other practical conditions, resulting in small study populations from which it is difficult to draw general conclusions. An animal healthcare market with a wide variety of actors, approaches and systems also provides a difficult situation when setting up studies and collecting data without biases, and further contributes to problems in drawing

general conclusions. In addition, it is difficult for clinicians to find time for research and many clinicians lack key research competences, such as statistics and research methodology.

By collaborating in groups we can contribute with our own competencies and reach larger sectors, both of the market and geographically. In this way, we take veterinary research in the Nordic region forward.

Evidensia covers a large geographical area and a large proportion of Swedish clinics and specialist animal hospitals with research interested personnel. We find it stimulating to contribute to Carenet, and Evidensia therefore holds a chair in Carenet's steering group and encourages our residents and research interested clinicians to participate in the network activities.

In my role as Country Medical Director for Evidensia Sweden, I develop medical quality within all our clinics. To reach progress in this work, research connection is essential. For me as an actor in the private market, Carenet has been very helpful as a platform for collaborations and to keep a foot left in the world of research that I otherwise slowly would have slipped away from. Carenet's activities provide unique networking opportunities between the private market, universities, and governmental agencies.



**Malin Hagberg
Gustavsson**



**Lotta
Gunnarsson**



**Anita Haug
Haaland**



**Anna Hielm-
Björkman**



**Marlene
Areskog**



**Henrik
Rönnberg**



**Bodil
Ström Holst**



**Ulrika
Grönlund**

Our steering group

Carenet's steering group has the overall responsibility for the operations of Carenet and is designed to facilitate information exchange between Carenet and the member organizations. The steering group is led by one of SLU's external collaboration specialists, and steering group members are appointed by the managements of the respective organizations.

Chairman

Bodil Ström Holst, senior lecturer, Department of Clinical Sciences, Swedish University of Agricultural Sciences

Steering committee members

- Anita Haug Haaland, Associate Professor, NMBU, SLU and SVA
- Anna Hielm-Björkman, Adjunct Professor, Department of Equine and Small Animal Medicine, Helsinki University
- Henrik Rönnerberg, Vice Dean, Faculty of Veterinary Medicine and Animal Science, Swedish University of Agricultural Sciences
- Lotta Gunnarsson, Assistant State Veterinarian, the Swedish National Veterinary Institute
- Marlene Areskog, Country Medical Director (Sweden), Evidensia
- Ulrika Grönlund, Group Medical Quality Manager, AniCura

Deputy members

- Anna-Maria Andersson, Hygiene Director, Evidensia
- Gittan Gröndahl, Assistant State Veterinarian, the Swedish National Veterinary Institute
- Karin Holm, Clinic Director of the horse clinic at the University Animal Hospital, Swedish University of Agricultural Sciences
- Lars Moe, Professor, Department of Companion Animal Clinical Sciences, Norwegian University of Life Sciences
- Outi Vapaavuori, Professor, Department of Equine and Small Animal Medicine, Helsinki University

Coordinator

Malin Hagberg Gustavsson, PhD, Department of Clinical Sciences, Swedish University of Agricultural Sciences.



Veterinary clinical research depends on availability of human and financial resources, research facilities, and infrastructure.



Benefits of clinical research on sports and companion animals

Veterinary clinical research involving client owned animals is a key tool for advancing medical knowledge and patient care, and thereby critical for the health and well-being of animals. Through clinical research, better ways to diagnose, prevent, and treat diseases are developed. Sometimes the participants themselves benefit from the study and sometimes the studies benefit patients down the line. Spontaneously developed diseases in animals can also be models of corresponding diseases in humans.

Valued animals and our responsibility

Sports and companion animals are of societal importance through their psychosocial effects on humans, their assistance to those with physical or other handicaps, as well as for their roles in assisting police, rescue, and customs services.

To keep the resource of sports and companion animals in society, ensuring animal health and welfare is a human responsibility.

Clinical research objectives

In conducting clinical research, the veterinary community for example gains insight on:

- disease causes and risk factors, making it possible to identify preventive interventions,
- effective diagnostic, therapeutic and prognostic measures,
- translation of basic science research findings to clinical use.

Such results from veterinary clinical research improve the quality of life and life length of afflicted animals.

Benefits for human health

Clinical research for sports and companion animals is different from laboratory animal studies because the procedures being tested are designed to treat animal conditions. Many human medical challenges are however shared by our pets since we have biological similarities and live in the same environments. The pathogenesis, clinical manifestations, progression, and response to therapy of several diseases – including cancer, degenerative conditions, infectious diseases, metabolic disorders, and genetic defects – are often similar between humans and animals.

Spontaneously developed diseases in animals can be used as models of corresponding diseases in humans, and development of diagnostic, therapeutic, and preventive strategies for animal health will sometimes benefit human health as well.

Veterinary clinical research involving client owned animals also have public health implications in regards to emerging zoonotic infectious diseases of sports and companion animals.



Competences from a wide variety of specialties, disciplines and professional categories are needed to move clinical research forward



Opportunities and challenges for veterinary clinical research

—a Nordic perspective



The Nordic countries are often put forward as good examples on issues regarding animal welfare. The legislation on animal welfare is strict, and the generally high socioeconomic status of the public provides good possibilities for owners of sports and companion animals to invest in their animals' health and welfare. Animals are insured to a high degree and owners expect to receive state of the art veterinary care when their animals become ill.

Demand for clinical research

The willingness of Nordic households to purchase veterinary services generates a high demand of research and development within the area.

Research facilities

In each of the Nordic countries, veterinarians and veterinary nurses are trained at a single university. At these educational establishments, also most of the clinical research is performed. The universities however have limited financial and human resources that should be divided between teaching, research and clinical work.

Funding

Funding for clinical research can come from a number of different places. Governmental research funding agencies, health care providers, pharmaceutical companies, non-profit organizations, and private foundations and donations, to different extent fund veterinary clinical research. Unfortunately, funding, especially concerning small animal research (dogs and cats), is fragmented into small funds and funding for

personnel working hours is hard to obtain. The funding challenge is compounded by the fact that veterinary clinical research can be quite expensive.

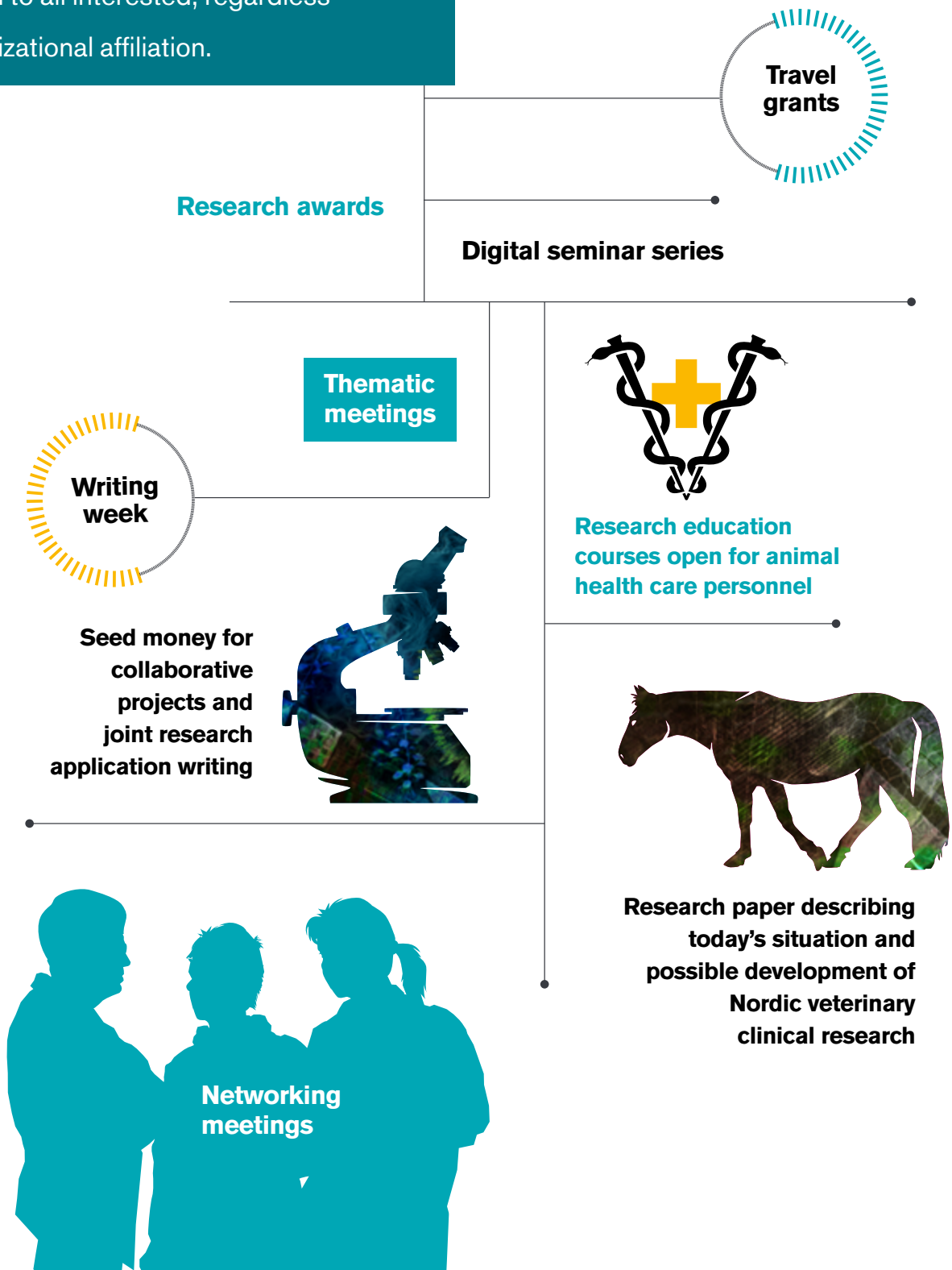
Wide scope

To conduct strong clinical research, competences from a wide variety of specialties, disciplines and professional categories are needed. In addition, a large patient base and a clear link to everyday clinical practice is of essence.

Importance of collaboration

In light of these challenges, it is important that the Nordic clinical researchers collaborate, both with each other and with research-interested colleagues in the private sector. In this way, the critical mass of people within different disciplines becomes greater, and clinical and research experience is optimally combined.

Carenet activities strengthen Nordic clinical research collaboration and are open to all interested, regardless of organizational affiliation.



Networking meetings

Carenet networking meetings are informal setting where Nordic researchers and animal health professionals come together. At networking meetings, invited speakers share their experiences from clinical research and provide Carenet members with tools to perform strong clinical studies. Also, members are offered the possibility to present own planned, ongoing or performed research. This gives an overview of current Nordic clinical research, and shows existing and possible future collaborations.

Every year Carenet's networking meeting has a different focus aiming to strengthen clinical research from different angles.

2019: How to write successful research grant applications

Invited speaker was Professor Annemarie T. Kristensen, DVM, PhD, DACVIM-SA, DECVIM-CA & Oncology, Department of Veterinary Clinical Sciences, University of Copenhagen. Professor Kristensen described what distinguishes a successful research application in a sports and companion animal context, and the research councils' views on what constitutes excellent research ideas. Carenet members presented current projects, and three research funding bodies gave their view on excellent research applications.

2018: Evidence based research and practice

Invited speaker was Sebastian Arlt, PhD, Dipl. ECAR, Department of Veterinary Medicine at the Freie Universität in Berlin. Dr Arlt gave lectures on how to implement evidence based veterinary medicine into practice and how to critically evaluate scientific information. The lectures were followed by a workshop on how to read papers critically. Carenet members presented current projects and Dr Mia Holmberg from the Swedish National Veterinary Institute gave an update on NAVEDA, the up-coming Swedish clinical records database.

2016: Future clinical research

Invited speakers were Kerstin Bergvall, PhD, Dipl. ECVD, Department of Clinical Sciences, SLU, Anna Bergh, Associate Professor, Department of Anatomy, Physiology and Biochemistry, SLU, and Casper Lindegaard, PhD, Dipl. ECVS, Evidensia. The invited speakers gave lectures on future clinical research within their respective field and Carenet members presented own ongoing clinical research. In the afternoon, group discussions were held on strategically important future clinical research.

2015: Challenges with clinical research

In 2015 the first Carenet networking meeting was arranged. Invited speakers were Professor Pia Haubro Andersen, Department of Clinical Sciences, SLU, Tove Fall, Associate Professor, Department of Medical Sciences, Uppsala University, and Helene Hamlin, Associate Professor, Department of Clinical Sciences, SLU. The invited speakers gave lectures candidly describing personal experiences of practical challenges in clinical research as well as opportunities and challenges with collaborations in clinical research. There was also a lecture on how to properly design case-control studies. After this Carenet members presented their own ongoing clinical projects.



Carenet Poster Award

Since 2018, outstanding posters at Carenet's yearly networking meeting are granted the Carenet Poster Award. A scientific jury selects the winning posters based on scientific excellence, clarity and visual presentation.

Carenet Poster Award 2019

In 2019, Karolina Engdahl, Department of Clinical Sciences, SLU, and Gudrun Seeberg Boge, Department of Companion Animal Clinical Sciences, NMBU, received the award in recognition of their poster presenting *Cranial cruciate ligament disease in cats – An epidemiological retrospective study of 50 cats*.

Carenet Poster Award 2018

In 2018, Cecilia Ley, Department of Biomedical Sciences and Veterinary Public Health, SLU, received the award in recognition of her poster presenting *Objective post-mortem body fat evaluation in cats*.



Carenet Poster Award winner 2018, Cecilia Ley, and Carenet chairman Bodil Ström Holst.



Carenet Poster Award winners 2019, Karolina Engdahl and Gudrun Seeberg Boge.

Thematic meetings

To specifically target areas with high potential for developing new Nordic research collaborations, Carenet arranges thematic meetings. The goal is to establish contact between researchers and clinicians interested in the same field of research.

Discussions held at Carenet thematic meetings focus on joint future activities, for example journal clubs, joint research applications, recurrent meetings circulating between the Nordic countries, and on plans for realization of selected activities. Discussions are mixed with study visits and social activities to give room for informal talks and let participants get to know each other.

2020 Carenet kidney meeting

Discussion moderator: Malin Hagberg Gustavsson, Dept. Clinical Sciences, SLU. Outcome: Nordic collaborative projects and a joint journal club, plans of a large research application.

2017 Pain - objective measures and treatment

This theme attracted a broad mass of Carenet members and was conditioned to fit a larger

group. Current Nordic research within the area was presented by invited speakers Anna Hielm-Björkman, Associate Professor, Department of Equine and Small Animal Medicine, University of Helsinki, Karina Bech Gleerup, Assistant Professor, University of Copenhagen, Kate White, Professor and Clinical Director of SVMS, Faculty of Medicine & Health Sciences, University of Nottingham, Andreas Haga, PhD, Dipl. ECVA, NMBU, Anna Kendall, Dipl. ECEIM, Mälaren Horse Clinic. Outcome: Several new research connections established, especially for young researchers and PhD students.

2015 Infection control in animal health care facilities

Discussion moderator: Ulrika Grönlund, Associate Professor, Department of Clinical Sciences, SLU. Outcome: A joint Formas research application.



Seed funded projects

To promote collaborative projects and to investigate the effect of seed funding, Carenet in 2020 seed funded collaborative projects led by SLU. The proposed project plans were assessed for clinical relevance, scientific excellence, novelty, future potential, feasibility and collaboration, by Carenet's steering group.

The four projects that received Carenet funding were:

- A pilot study of the accuracy and clinical utility of a mobile phone application for assessment of lameness in horses, Elin Hernlund, counter funded by SLEIP AI AB.
- Value of using the video endoscopy capsule ALICAM® for evaluating dogs with chronic enteropathy, Jens Häggström, counter funded by Anicura Albano Animal Hospital.
- Serum creatinine and SDMA concentrations in cats admitted to a small animal teaching hospital, Lena Pelander, counter funded by AniCura Animal Hospital Bagarmossen.
- Fertility in male Bernese mountain dogs, Göran Andersson, counter funded by Evidensia Small Animal Clinic Jönköping.

About the call

The main applicant had to have a PhD degree and be affiliated to SLU (the call was fully funded from SLU). The proposal had to include collaboration with at least one partner from the private sector and at least one partner organization had to counter fund SLU with a corresponding amount, monetarily or in kind.



Research education courses

Carenet organizes research education courses in collaboration with SLU's graduate school for veterinary medicine and animal sciences. The courses are open for animal health care personnel, as well as for research students. The aim is to further increase the quality of future clinical studies, and to promote collaboration by bringing together Nordic research students, researchers and clinicians that for example undergo national or European specialization.



2019 How to read and write a scientific paper

The overall objective of the course was to teach students effective writing practices and to give them a general understanding of the basic principles for critical reading and self-critical writing. Lecturer: Professor Stig Larsen, Department of Production Animal Clinical Sciences, NMBU. Course leader: Malin Hagberg Gustavsson, Department of Clinical Sciences, SLU.

2019 Statistical analysis of laboratory and clinical studies

The overall objective of the course was to train students to plan and perform suitable statistical analysis of own data, and to have a general understanding of the basic principles for statistical analysis of data from clinical studies and thereby be able to evaluate results presented also in other studies. Lecturer: Professor Stig Larsen, Department of Production Animal Clinical Sciences, NMBU. Course leader: Malin Hagberg Gustavsson, Department of Clinical Sciences, SLU.

2018 Construction of trial protocols for controlled clinical trials

The overall objective of the course was to train students to plan clinical research projects with appropriate methods, and to make the students aware of how different trial protocols relate to different statistical models. Lecturer: Professor Stig Larsen, Department of Production Animal Clinical Sciences, NMBU. Course leader: Malin Hagberg Gustavsson, Department of Clinical Sciences, SLU.

2017 How to read and write a scientific paper

The overall objective of the course was to teach students effective writing practices and to give them a general understanding of the basic principles for critical reading and self-critical writing. Lecturer: Professor Stig Larsen, Department of Production Animal Clinical Sciences, NMBU. Course leader: Malin Hagberg Gustavsson, Department of Clinical Sciences, SLU.

2015 Implementation – how to change people's behaviour

The focus of the course was the complex nature of implementation, potential barriers to implementing knowledge, tools that may facilitate the implementation of research results into practice, and ways to evaluate the outcome of such implementations. The course was taught by eight lecturers from veterinary and human research and practice. Course leader: Ulrika Grönlund, Department of Clinical Sciences, SLU.

2015 Construction of trial protocols for controlled clinical trials

The overall objective of the course was to train students to plan clinical research projects with appropriate methods, and to make the students aware of how different trial protocols relate to different statistical models. Lecturer: Professor Stig Larsen, Department of Production Animal Clinical Sciences, NMBU. Course leader: Malin Hagberg Gustavsson, Department of Clinical Sciences, SLU.



About Carenet – thoughts from a PhD student

Doctoral student Emilia Gordin at the University of Helsinki describes how she came in contact with Carenet and how this has affected her situation.



I am a veterinary doctoral student at the Department of Equine and Small Animal Medicine, University of Helsinki. My research topic is biomarkers in acute kidney injury in dogs. I have a particular interest in renal and lower urinary tract diseases in small animals.

The clinical research at our department is focusing on three main areas; cardiac, gastrointestinal, and pulmonary diseases in dogs and cats. At the moment we are 6 senior researchers and 8 PhD students at the department. A benefit of the fairly small group is that we all know each other well and are positive to share our expertise and opinions. After joining the group just two years ago, I already strongly feel like being one of the team.

Being the only one in Helsinki focusing on research in nephrology may however have some downsides, such as not having a colleague to share thoughts with on a daily basis. Luckily, I do have colleagues at the Veterinary Teaching Hospital who are interested in clinical nephrology. Together we have set up a dialysis program, something I have been looking forward to after becoming familiar with the methodology during a two years period at Tufts University in the US. Further, I am lucky to have three great supervisors with excellent knowledge in nephrology that help me whenever needed.

I heard about Carenet while organizing a NOVA course in nephrology and urology for PhD students in November 2019. I was fortunate to get to know several extremely nice Nordic colleagues during this event. Shortly after the course, I was

invited to a Carenet kidney workshop in Uppsala and I decided to join the network. I felt very welcome at the workshop and was so pleased to meet up and network with colleagues.

The meeting was a success; people were open about their research projects and the atmosphere relaxed. It also gave me new ideas on what to focus on in my future.

Meeting colleagues face to face in events like this is extremely valuable, allowing not only to launch Nordic collaboration but also to share opinions. Besides sharing thoughts and ideas, research collaboration can help solve practical dilemmas. One such common problem in veterinary clinical research is that patient numbers within a certain disease tend to be low. It might thus take years to recruit a sufficient number of patients as single center studies. Multicenter studies in turn help to overcome this challenge and after our Carenet meeting I already got a preliminary request regarding a joint project with colleagues in Norway. Sharing many thoughts around e.g. ethical questions, usages of antibiotics and research collaborations are easy to implement within the Nordic countries.

Although the planned Carenet meeting in April 2020 was withdrawn due to COVID-19, I am very excited to be part of future Carenet meetings. It is always nicer to meet people face to face, but even video conferences are a good way to meet up with colleagues!



SCIENCE AND
EDUCATION **FOR**
SUSTAINABLE
LIFE