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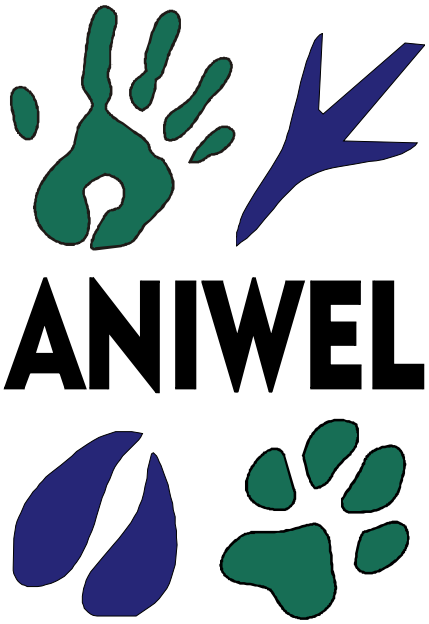
Proceedings of ANIWEL Seminar



5th October 2011

University of Helsinki

ANIWEL

Graduate School in Animal Welfare

Scientific committee

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ANIWEL Seminar 5th October 2011
University of Helsinki, Unioninkatu 34, 3rd floor, Auditorium XIV

Welcome!

The ANIWEL Autumn Seminar is held 5. 10. 2011 in the City Centre Campus of the University of Helsinki. ANIWEL is a doctoral programme in clinical veterinary medicine and in animal welfare. It is financed by the Academy of Finland in four years periods. Now we are in the middle of the funding period 2010-2013.

Evidence based veterinary medicine (EBM) is the key to develop treatment practices of animal patients. To fully understand the background of sicknesses of domestic animals we also have to understand the specific needs of various species. A disease is a disturbance of the physical and/or psychological balance. To help the animal to regain the balance we may need to use medical intervention. Sometimes it is necessary to make environmental changes to gain full recovery.

Animal health and welfare have an increasing value in the society. A need for safe and good quality food is self evident. Global fur markets exist and therefore fur animals are bred. Healthy and well-being laboratory animals are the basis of high quality science. Companion animals have a positive input to public health.

The public opinion and the position of domestic animals in the society cannot be figured out without the contribution of social sciences. ANIWEL doctoral program is bringing together all these animal related interferences.

I hope that you enjoy the ANIWEL Autumn Seminar 2011 in the headquarters of the University of Helsinki.

On behalf of the Organizing Committee

Outi Vainio

Abstracts

Preclinical studies of genetically modified oncolytic vaccinia virus for the treatment of canine and feline solid tumors

Karoliina Autio[1,2], Marko Ahonen[2], Sophie Escutenaire[2] and Akseli Hemminki[2]

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Cancer is one of the most common reasons for death in dogs, cats and humans. New therapeutic modalities are necessary to improve the disease outcome. One promising approach is oncolytic virotherapy based on replicating viruses. With the ultimate aim of conducting a clinical trial in cats and dogs presenting solid tumors, we assessed the oncolytic effect of genetically modified vaccinia viruses *in vitro* and in tumor-bearing mice.

Assays were based on two osteosarcoma (Abrams and D17) and one prostatic carcinoma (ACE-1) cell lines of canine origin and one feline squamous cell carcinoma (SCCF1) cell line. Luciferase assay, based on bioluminescent reaction, was used to assess viral gene expression in infected cells. This test enabled to estimate viral transduction *in vitro*. Cell viability after viral infection was measured using a colorimetric cell lysis test (MTS). *In vivo* model, tumors were grown in 6 nude female mice by injecting subcutaneously in both flanks 1 x 10^7 canine prostatic carcinoma cells. Mice were treated twice with the oncolytic vaccinia virus or placebo at 10-day interval and euthanized when tumors had reached the maximum allowed tumor size.

Infection of four cell lines of canine or feline origin with oncolytic vaccinia viruses resulted in efficient viral transduction and cell killing effect. We also showed anti-tumor activity in canine prostatic carcinoma xenografts following viral treatment.

Oncolytic vaccinia virus has an antitumor effect against selected canine and feline cell lines *in vitro* and canine prostatic carcinoma cell line *in vivo.* Based on these data, further biodistribution and toxicity studies will be performed in experimental dogs ultimately enabling the design of a clinical trial.

In summary, our results suggest that oncolytic vaccine virus may offer an effective treatment option for otherwise untreatable canine and feline solid tumors.

Canine kidney perfusion after dexmedetomidine with or without MK-467, a peripheral alpha-2-adrenoceptor antagonist, using quantitative contrast-enhanced ultrasound method

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Dexmedetomidine reduces blood flow in kidneys (Lawrence et al, 1996). MK-467 attenuates its peripheral cardiovascular responses in dogs (Honkavaara et al, 2010). There are no studies concerning their effect on organ blood perfusion. Quantitative contrast-enhanced ultrasound (CEUS) was performed in six conscious healthy laboratory beagles (CTRL). The animals were treated twice: dexmedetomidine 10 µg kg-1 (DEX) and DEX + MK-467 500 µg kg-1 (DMK) IV in a randomized, cross-over design. Ten minutes after treatment, 0.05 ml kg-1 contrast medium was injected IV and kidney cortex was examined with CEUS. The variables analysed were arrival time (AT), time to peak from injection (TTPinj), peak intensity (PI) and wash-in rate (Wi). Heart rate (HR) was measured before treatment and after CEUS was performed. Data were analysed with a repeated measures ANOVA, with the level of significance set as $P<0.05$. When F values were significant, means were compared by the least-significant-difference method. HR was analysed within group by paired T-tests.

Results for CEUS variables are presented in the table as mean ± SD. AT (sec) TTPinj (sec) PI (db) Wi (dB/sec) CTRL 6 ± 3.3 9.5 ± 3.9 35.5 ± 4.4 8 ± 3 DMK 4.2 ± 3.5 8.3 ± 4.7 36.9 ± 5.4 2.7 ± 0.8 DEX 17.8 ± 6a,b 25.6 ± 6.4a,b 26.8 ± 6.5b 8.3 ± 4.5a,b a Significant different ($P<0.05$) from CTRL, bsignificant different ($P<0.05$) from DMK Heart rate decreased significantly ($P=0.003$) after both treatments (113.3 ± 19.5 to 41.2 ± 25.8 and 105.7 ± 14.2 to 84.7 ± 10.0 beats minute-1 for DEX and DMK, respectively). Addition of MK-467 prevented the reduction of kidney blood perfusion induced by dexmedetomidine.

Lawrence, CJ; Prinzen, FW; de Lange, S (1996) The Effect of Dexmedetomidine on Nutrient Organ Blood Flow. Anesth Analg 83, 160-165

Honkavaara, JM, Restitutti, F, Raekallio et al. (2010) The effects of increasing doses of MK-467, a peripheral alpha2-adrenergic receptor antagonist, on the cardiopulmonary effects of intravenous dexmedetomidine in conscious dogs. J Vet Pharmacol Ther, doi: 10.1111/j.1365-2885.2010.01242.x

Preliminary observations of a novel canine probiotic

Peiponen Susanna [1], Ylinikkilä Marianna[2], Pirttijärvi Tuija [2], Manninen Riitta [2],Beasley Shea [1]

1. Vetcare Ltd, Salo Finland 2. HAMK University of Applied Sciences, Hämeenlinna Finland

Introduction. Three strains of lactic acid bacteria (LAB) isolated from faeces of healthy dogs found safe in a previous study were proposed as potential probiotics. The aim of this study was to manufacture and investigate the palatability of a canine probiotic product and evaluate survival of the strains in gastro-intestinal (GI) tract.

Methods. *Lactobacillus rhamnosus* VET16A, *Lactobacillus fermentum* VET9A, and *Lactobacillus plantarum* VET14A were selected to manufacture two milk-based products. Pasteurized and cooled milk was inoculated with viable LAB and fermented for 20-24 h at 30°C (P1) or 37°C (P2). Products were kept refrigerated. Three dogs tested the palatability of the products for 6 days (days 1-3 P1 and days 4-6 P2) twice daily. Owners monitored dogs' willingness to taste the products. Faecal samples were collected on days 13, 16, 20 and 27 post feeding period. LAB detection was performed to the samples with species specific quantitative polymerase chain reaction (qPCR).

Results. The dogs enjoyed both products with good appetite without side effects. The viability of the LAB monitored on LBS medium post manufacturing was $1,3*10^9$ cfu/ml in P1 (P2 monitoring failed) and after three weeks $1*10^9$ cfu/ml in P1 and $0,5*10^9$ cfu/ml in P2. *L. fermentum* was detected in collected faeces with species specific qPCR until day 27 in higher numbers than $2*10^5$ gene copies/g, detection of *L. plantarum* varied but was detected in all the day 21 samples, *L. rhamnosus* was not detected in any of the samples.

Discussion. Probiotic products were found for this small animal number to be well-tolerated and to have excellent palatability. GI survival and other probiotic characteristics need further studies.

Body weights and survival of diet board fed rats in a simulated two-year safety study

Sakari Laaksonen

University of Oulu, Laboratory Animal Centre

Ad libitum feeding of laboratory rats leads to shortened life span, changes in metabolism, and increased incidence of tumours, degenerative diseases and subclinical pathological changes. This is especially harmful in long-term safety studies, in which survival must not be under 50 % in any study group for a negative test result to be acceptable. These problems are avoidable with moderately restricted feeding, but methods in use have not been practically compatible with legally mandated group housing.

In diet boards food is embedded in holes drilled into aspen board. Food is available continuously, but rats have to gnaw wood to get it.

In this two-year experiment we study the effects of diet board feeding of group-housed rats on a wide variety of parameters, but only body weight development and survival rates are reported here.

The study began with 144 Hsd:Sprague-Dawley rats, half on diet boards (DB) and half eating *ad libitum* (AL), in four birth cohorts of 18 males and 18 females from five litters, housed in groups of three. Rats were 9 weeks old at the beginning.

Body weights in the DB groups first declined for two weeks, after which the mean weight curves continued approximately parallel to those of the AL groups. The difference of mean body weights between the feeding groups varied from 5,7 to 10,8 % in females and from 10,8 to 18,5 % in males. The difference is highly significant ($p<0,000$) for both sexes. (SPSS 15.0, GLM repeated measures)

The two-year survival rate was 11,1% for DB and 36,1% for AL females, and 36,1% for DB and 64,1% for AL males. The difference is significant both for females ($p=0,015$) and males ($p=0,013$). (SPSS 15.0, Crosstabs, Pearson Chi-Square). The difference between survival distributions in Log Rank test of Kaplan-Meier survival analysis is highly significant ($p=0,001$).

Tail biting alters feeding behavior of victim pigs

Elina Viitasaari, Laura Hänninen, Marja Raekallio, Mari Heinonen, Anna Valros

Research Centre for animal welfare, University of Helsinki, Finland

Tail biting is painful to the victim pigs and impairs daily weight gain. Tail-biting alters feeding behaviour of victims in a single-space feeder system, where the victim's tail is exposed to other pigs' manipulation while feeding. However, little is known about the effect of pain on the feeding behaviour of victim pigs. Therefore, we studied computerized feeder data from 13 tail-bitten pigs weighing 30 – 90 kilograms in 7 pens from 5 days before to 5 days after the bite wound was first noticed (day 0). Pigs with fresh bite wounds were selected from a finishing herd with one automatic one-space feeder per group of 11 pigs.

We calculated daily duration at feeder, mean daily intervals between feeder visits and mean daily feeding efficiency (feed consumed in grams divided by time spent at feeder in seconds). The differences between observed days were compared with repeated measures mixed models.

The time spent in feeder, feeding efficiency and feeder visit intervals differ significantly between days ($p<0.001$ for all). The duration in feeder decreased from day -1 to day 0 and increased again until day 2 ($p<0.05$). Feeding interval increased from day 0 to on day 2 ($p<0.05$) and feeding efficiency elevated significantly from day -1 to day 2 ($p<0.05$).

Behavioural changes may occur even prior to visible damage, as shown here how feeding efficiency changes already on day -1. We suggest that these feeding pattern changes at the onset of tail-biting might be due to pain experienced by the victim pigs.

Conceptions of Equine Welfare

Nora Schuurman

University of Eastern Finland

Lay conceptions about animal welfare are constructed on the interpretations of the animal and its relations with humans and are tied into the practices of keeping animals. Various arguments about animal welfare are based on these conceptions and used as justifications for practices in everyday contexts of caring for and handling the animals. In this paper, I investigate the understandings of equine welfare in the contemporary riding horse culture in Finland. The conceptions of equine welfare are studied within the theoretical discussions of anthropomorphizing and naturalizing animals and animals as hybrids.

The data for this paper consist of interviews and written materials. The interviews of riding horse owners, all female, were conducted in Eastern Finland in 2007. The written materials used are magazine articles from the magazine Hevoset ja Ratsastus (Horses and Riding) from the year 2008 and internet-discussions from the discussion forum Hevostalli.net (Horse stables) from 2008 to 2009. The data were analyzed using discourse analysis and content analysis.

The conceptions of equine welfare are highly controversial. This is especially visible in relation to nature as either generating welfare or posing a welfare risk. Animals are naturalized by constructing them primarily as part of nature, which reflects both the role of science and the tendency to romanticize nature. The opposing views are primarily based on seeing the horse as a hybrid between nature and culture and fully dependent on humans reflecting the role of domestic animals as part of human culture. The tendency to anthropomorphize animals is common, but in the data it is often seen as a negative phenomenon. However, drawing the line between anthropomorphism and verbalizing the animal's subjective viewpoint can be difficult. Furthermore, each of the three interpretations of equine welfare pose risks to the animals' wellbeing.

"Interdisciplinary communication"

5th October 2011
at University of Helsinki City Centre campus, Unioninkatu 34, 3rd floor, Auditorium XIV

PROGRAMME

9.15-9.45	Opening and presentation of ANIWEL graduate school, prof Outi Vainio, University of Helsinki
9.45-10.45	Dogs as a model in comparative behavioral research, PhD Jozsef Topal, Hungarian Academy of Sciences
10.45-11.15	*Coffee*
11.15- 12.15	Consumer perceptions and animal welfare in Finland, prof Pekka Jokinen, University of Eastern Finland
12.15-13.15	*Lunch on one´s own expense*
13.15-14.15	Research communication with a non-specialist, prof Mikael Fogelholm, University of Helsinki
14.15-14.35	ANIWEL PhD presentation: Contrast-enhanced ultrasound (CEUS) in cats, Merja Leinonen
14.35-14.50	ANIWEL student presentations á 15 min
	Preclinical studies of genetically modified oncolytic vaccinia virus for the treatment of canine and feline solid tumors, Karoliina Autio
14.50-15.20	*Coffee*
15.20-16.35	ANIWEL student presentations continue (Auditorium XII)
15.20-15.35	Canine kidney perfusion after dexmedetomidine with or without MK-467, a peripheral alpha-2-adrenoceptor antagonist, using quantitative contrast-enhanced ultrasound method, Flavia Restitutti
15.35-15.50	Preliminary observations of a novel canine probiotic, Susanna Peiponen
15.50-16.05	Body weights and survival of diet board fed rats in a simulated two-year safety study, Sakari Laaksonen
16.05-16.20	Tail biting alters feeding behavior of victim pigs, Elina Viitasaari
16.20-16.35	Conceptions of Equine Welfare, Nora Schuurman
16.35-16.40	Selection of student member to ANIWEL board
16.40-18.30	*Vine and snacks in Teacher´s Lounge at the 2nd floor of the same building*