Development of a sensitive radioimmunoassay for IGF-I determination in samples from blood plasma and cell-conditioned medium

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This paper describes the development of a versatile non-equilibrium RIA for measurement of IGF-I concentrations in animal samples obtained from both *in vivo* and *in vitro* sources. Assay parameters for this IFG-I RIA indicated that the assay is accurate (96.2% of IGF-I recovery), precise (intra- and interassay coefficients of variation < 10 and 16%, resp.) and sensitive (0.1 ng/ml at the 95% confidence limit). Determination of IGF-I concentration in blood plasma of sheep and nutria, serum of adult goat and bovine fetuses, as well as in bovine and nutria granulosa cell-conditioned medium demonstrated the validity of this assay system. From the results, we conclude that this IGF-I assay will be useful for analysis of samples obtained from *in vivo* or *in vitro* systems.

Veterinarni Medician 44: 3, pp. 71-78, 1999. 4 tables, 3 figs., 25 refs. In CZECH, Su. ENGL. Authors' abstract.

Coypu *(Myocastor coypus*) as a meat resource: heterotic and maternal effects on growth traits

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The coypu (*Myocastor coypus*) is an aquatic rodent usually bred for fur production. Fluctuations in fur prices have led to coypu meat being considered as a resource on commercial farms. This contributes to the diversification of agro-ecosystems. To characterize coypu as a meat resource, maternal and heterotic effects on birth weight, weaning weight, slaughter weight, number of days required to attain a weaning weight of 1 kg, and on two parameters of the Gompertz growth curve (asymptotic weight and maturing rate) were studied. Eight males and eight females of Standard (S) and Cognac (C) genotypes and of their reciprocal crosses (C X S) and (S X C), where the first letter denotes the paternal genotype, were used. Significant genotype, sex and (genotype X sex) interaction effects were evident for most traits. S animals were lighter than C at all ages. Hybrids with C mothers were heavier than their reciprocals. Maternal effects on the parameters of the growth curve were observed only in females. Heterotic effects were extremely significant. Favourable heterotic effects in immature animals were explained by a change in the F_1 growth pattern. Males showed a dominant deviation towards low asymptotic weights and overdominance for high maturing rate. Females showed partial dominance of high asymptotic weight and overdominance for high maturing rate. This association of genetic effects would justify a productive system based on a terminal cross using C females and S males because of the higher maturing rate of both hybrids and the maternal effect of C genotype, a combination that allows higher weights at the usual slaughter age (6 months) or butchering of animals at earlier ages.

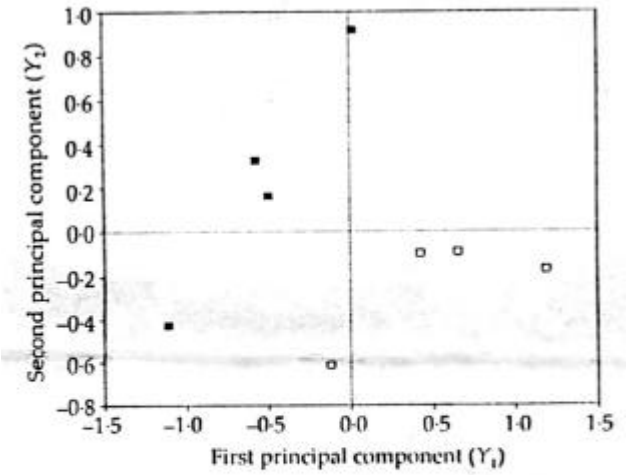

Figure 2 Partitioning of the scatterplot for the first two principal components (Y_1: X-axis and Y_2: Y-axis) in a multivariate analysis of growth traits in two coypu *(Myocastor coypus)* genotypes (■), and in their reciprocal hybrids (□). From left to right: S♀, S♂, C♀, CxS♀, C♂, CxS♂, SxC♀, and SxC♂.

Animal Science 68, pp. 635-640, 1999. 3 tables, 2 figs., 12 refs. Authors' abstract.

Hematological examinations of the ferret (*Mustela putorius* furo)

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In this study of hematological examinations in 100 clinically healthy ferrets, blood collection technique, the range of application of automatic analys-

ing systems and hematological standard values are discussed. The blood was collected from the Vena cephalica without sedation. The hematology systems put into use were the Technicon H*1and the Celltek MEK-6108G. The manual methods included leukocyte count with the counting chamber procedure, determination of hematocrits using the microhematocrit method and manual leukocyte differentiation using three different stainings. For the complete blood cell count a good correlation of all methods could be determined. For the differential blood cell count the correlation between the results of the Technicon H*1 and the manual results was not satisfactory. The determination of the reference values for the complete blood cell count came out of the results of the Technicon H*1. The reference values for the differential blood cell count resulted from the manual evaluation of the Pappenheim stained blood smear. Due to this examination the hematological standard values for the ferret were more precise.

Kleintierpraxis, 44, pp. 673-681, 1999. In GERM. Only summary received. Authors' summary.

Long-term exposure of hypothalamic explants to melatonin alters the release of gonadotrophin releasing hormone and the density of melatonin binding sites in the pars tuberalis of the male mink (*Mustela vison*)

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To investigate the action of melatonin on the reproductive system, the effect of prolonged versus short-term exposure to melatonin on the release of gonadotrophin releasing hormone (GnRH) was examined in hypothalamic explants of male mink sacrificed in July, September or November. Mediobasal hypothalamic (MBH) explants including the pars tuberalis (PT) were incubated for 1 night with or without melatonin (10(-8) M) for 8 hr or 16 hr and the release of GnRH was then measured. The next day, the explants were incubated further but in a melatonin free buffer, and the release of GnRH was measured with increasing time. Half of the July and September explants had melatonin binding sites quantified by autoradiography. In November, a 16-hr exposure to melatonin induced a significant increase in the release of GnRH during the night, compared with control or 8-hr melatonin exposure. This increase persisted for at least 45 min after the withdrawal of melatonin, suggesting a stimulatory effect of melatonin on the synthesis of GnRH; this effect was apparent in July, September and November. In September, the density of melatonin binding in the PT was significantly lower in the explants incubated for 16 hr with melatonin, compared with those incubated for 8 hr. Thus, in vitro, a long exposure to melatonin, mimicking a single long night, stimulates the release and synthesis of GnRH in parallel with a decrease in the density of melatonin binding in the PT. These effects seem to depend heavily on the duration of exposure to melatonin.

Journal of Pineal Research, pp. 17-27, 1999. Only abstract received. Authors' abstract.

Role of prolactin in regulating the onset of winter fur coat in mink (*Mustela vison*): A reconsideration

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The objectives of this study were to determine: (1) if the onset of winter hair growth (anagen) in mink could be delayed or inhibited by elevating endogenous PRL concentrations; (2) if bilaterally adrenalectomy (ADX)-induced winter anagen occurs concomitantly with a reduction in serum PRL concentrations, and (3) if exogenous dehydroepiandrosterone (DHEA), an adrenal steroid or Delta (5) -DIOL (a peripherally produced metabolite of DHEA), would delay or inhibit the onset of winter anagen. During early July, while in the resting (telogen) stage of the hair growth cycle, mink were treated with slow release implants containing haloperidol (HAL, a dopaminergic antagonist), melatonin (MEL), deoxycorticosterone (DOC), DHEA and Delta (5) -DIOL. In addition, mink were ADX'd and supplemented with DOC and DHEA. MEL reduced PRL levels to basal levels and induced winter anagen 7 weeks earlier than controls. Surprisingly, HAL initiated winter anagen 7 weeks earlier than controls ($P<0.05$), although serum PRL levels were not different between the two groups. Mink that were ADX'd or ADX + DHEA-treated exhibited winter anagen 6 weeks earlier than control ($P<0.05$), but serum PRL concentrations were not different

between the three groups. The administration of DHEA or Delta(5) -DIOL to mink with intact adrenals had no effect on the time of onset of winter anagen or serum PRL levels. Our findings suggest that a reduction in circulating PRL levels is not essential for onset of winter anagen in the mink and that the apparent inhibitory effects of the adrenal glands on initiation of winter anagen is not mediated through DHEA or its metabolite Delta(5) -DIOL.

J. Exp. Zool. 284, pp. 437-444, 1999. Only abstract received. Authors' abstract.

Effect of zeranol on the maturation of the fur of the chinchilla (*Eryomis laniger*)

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The study was carried out between June and September. 33 unmated females, aged 12-24 months, 60 males aged 12-18 months and 29 reproductive males aged 24-48 months were used. Half of the animals were implanted s.c. with 12 mg zeranol. Animals were visually inspected every 2 weeks and the furs were obtained when the 3 colour stripes of the fur were at the same level all over the body surface and the fur was considered mature. Fur maturation percentage was 84, 94 and 50% for males, young females and adult females, respectively, for implanted animals, and 20, 38 and 13% in controls. There were significant differences between males and females, between younger and older animals and between treated and untreated animals.

Veterinaria Mexico, 30 (1), pp. 63-66, 1999, 18 refs. In SPAIN. Only summary received. Authors' summary.

Assessment of isoflurane-induced anesthesia in ferrets and rats

A, Imai, E.P. Steffey, T.B. Farver, J.E Ilkiw

Objective -- To characterize isoflurane (ISO)-induced anesthesia in ferrets and rats.

Animals – 8 ferrets (*Mustela putorius furo*) and 8 Sprague-Dawley rats.

Procedure -- Ferrets and rats were anesthetized in a similar manner, using ISO in oxygen. Minimum alveolar concentration 8MAC) was determined, using the tail-clamp method. Imeediately thereafter, assessments were recorded for 0.8, 1.0, 1.5, and 2.0 MAC (order randomized) of ISO.

Results – MAC of ISO was (mean ! SEM) 1.74!0.03 and 1.58!0.05% for ferrets and rats, respectively. Mean arterial blood pressure 8MAP) was 75.0!4.3 and 107.9!2.7 mm Hg at 0.8 MAC for ferrets and rats, respectively, and decreased in a parallel dose-dependent manner. Respiratory frequency decreased in rats as ISO dose increased, however, respiratory frequency increased in ferrets as ISO dose increased from 0.8 to 1.5 MAC but then decreased at 2.0 MAC. At 0.8 MAC, hypoventilaiton was much greater in ferrets (PaCO2 = 71.4 ! 3.5 mm Hg), compared with rats (PaCO2 = 57.7 ! 1.9 mm Hg). In both species, PaCO2 pregressively increased as anesthetic dose increased. Eyelid aperture of ferrets increased in a dose-dependent manner. Pupil diameter in ferrets and rats increased as ISO dose increased.

Conclusions and Clinical Relevance – The MAP and PaCO2 in ferrets and rats and eyelid aperture in ferrets consistently and predictably changed in response to changes in anesthetic dose of ISO. Magnitude of respiratory depression was greater in ferrets than rats. Changes in MAP and PaCO2 in ferrets and rats and eyelid aperture in ferrets are consistent guides to changes in depth of ISO-induced anesthesia.

American Journal of Veterinary Research, pp. 1577-1583, 1999. Only abstract received. Authors' abstract.

Expression of a dominant negative mutant of epidermal growth factor receptor in the epidermis of transgenic mice elicits striking alterations in hair follicle development and skin structure

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Transgenic mice expressing an epidermal growth factor receptor (EGFR) dominant negative mutant in teh basal layer of epidermis and outer root sheath of hair follicles were generated in order to analyse the role of the EGFR in vivo. Mice expressing the mutant receptor displayed short and waved pelage hair and curly whiskers during the first weeks of age, but subsequently pelage and vibrissa hairs became progressively sparser and atrophic. Eventually, most mice presented severe alopecia. Histological examination of the skin of transgenic mice showed marked alterations in the development of hair follicles, which failed to enter into the catagen stage. These alterations eventually led to necrosis and disappearance of the follicles, accompanied by strong infiltration of the skin with inflammatory elements. The interfollicular epidermis of these mice showed marked hyperplasia, expression of hyperproliferation-associated keratin K6 and increased 5-bromo-2-deoxyuridine incorporation. EGFR function was inhibited in transgenic skin keratinocytes, since in vivo and in vitro autophosphorylation of EGFR was almost completely abolishe don EGF.

EMBO Journal 14, 21, pp. 5216-5223, 1995. 44 refs. Only absract received. CAB-abstract.

Neural control of predatory aggression in wild and domesticated animals

E.M. Nikulina

The neural mechanisms of predatory aggression in laboratory animals were investigated in a variety of rodents and members of the order Carnivora. Experimental enhancment of brain serotonin (5-HT) blocked killing behaviour in rats, mice, mink and silver foxes, indicating that there is a 5-HT inhibiting mechanism of predatory aggression in animals of different species. Suppressed kilting behaviour, at least in some strains of mice, does noy depend for expression on the inhibitory effect of the brain 5-HT system, but is caused by the low tonus of the system activating predatory behaviour. Long-term satiation of mink increased the level of 5-hydroxyindole acetic acid in the lateral hypothalamus and amygdala and enhanced the latency of predatory aggression. It is suggested that 5-HT represents a dietary responsive endogenous factor regulating prdatory behaviour in carnivores. Selection of Norway rats over many generations for tamed behaviour towards man (domestication) leads to an increase in level and turnover of 5-HT in the midbrain and hypothalamus, but does not change predatory aggression. Substantially reduced defensive behaviour of domesticated rats is thus unconnected with the neural mechanism of predatory aggression.

Neuroscience and Biobehavioural Reviews 15: 4, pp. 545-547, 1991. Only Abstract received. Author's abstract.