

expression and to detect changes during infection, blood samples of an adult female and male harbour porpoise living in the Fjord & Baelt center in Kerteminde (DK) were investigated. EDTA-blood samples taken in July, September, and December 2003 and in February, March, and May 2004 were investigated. Both animals developed health problems during this period and were occasionally treated with antibiotics. Expression of Interleukin-(IL)-1 β , IL-2, -4, -6, -8, -10, tumour necrosis factor-(TNF)- α , transforming growth factor-(TGF)- β and of the acute phase proteins Haptoglobin and C-reactive Protein were analysed using real time RT-PCR. The female harbour porpoise showed highest cytokine and Haptoglobin mRNA levels in February and May, whereas the male showed highest values in March, which paralleled an increase in white blood cells. IL-6, an early marker of inflammation, increased in July blood samples of both animals and in the September and February samples of the male. Expressions of the pro-inflammatory cytokines IL-1 β , IL-8, and TNF α , the Th1-cytokine IL-2 as well as of IL-10 were correlated to one another ($p < 0.05$). Furthermore, expressions of these cytokines also correlated between subjects ($p < 0.05$). Both animals showed an increase of the pro-inflammatory cytokines, the Th1-cytokine IL-2 as well as of IL-10 in December, March, and May. Furthermore, an obvious increase of Th2 and Th3 cytokines IL-4 and TGF β in September and February was observed. These findings point at inflammatory incidences and appropriate immune responses in December, March, and May, respectively. In September and February a controlling of excessive immune response or impairment of immune system existed. These findings indicate that the proportions of Th1 to Th2 and Th3 cytokines seem to be helpful in analyzing the function of the immune response and thus the health status of marine mammals.

MD-10

INTRACYTOPLASMIC EOSINOPHILIC GLOBULES IN HEPATOCYTES OF STRANDED CETACEANS IN THE CANARY ISLANDS

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The presence in hepatocytes of intracytoplasmic inclusions has been described both in human and in veterinary medicine, being associated to different agents and pathogenic mechanisms. In cetaceans, the presence of this type of globules has been frequently described in animals stranded individual or massively. For the accomplishment of this work, samples of liver, corresponding to 108

cetaceans of 17 different species, stranded in the Canary Islands had been studied. In the cytoplasm of hepatocytes of 58 animals of 12 species, hyalines eosinophilic globules were observed, with a size between 4 and 20 μm . In 49 out of the 58 livers showing those inclusions, histochemical (Pas-diastrase) and immunocytochemical (detection of alpha-1-antitrypsine) techniques were performed on formaline-fixed, paraffin-embedded sections. The results showed 26 positive livers to both techniques, 22 of which were associated with hepatic congestion, 10 were just PAS diastase positive, 6 only α -1-AT positive and 7 negative to both staining procedures. In the present study, the acute hepatic congestion was observed in 53% of the α -1-AT positive animals. The origin of these intracellular changes is probably related to hemodynamic phenomena suffered by the cetaceans stranded alive, in addition to hyperthermia and/or other factors which may induce the production and storage of α -1-AT and as other acute phase proteins (under current study) in the hepatocytes.

MD-11

METAL INTAKE WITH FOOD – ELEMENT DISTRIBUTION IN BLOOD OF FREE RANGING SEALS

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Marine mammals are exposed to metals predominately through their position in the food web. The accumulation in tissues is already perceived. Toxicological studies of living animals are rarely causing by limited choice of sample types and quantity. Often sampling is restricted to blood. In our study whole blood levels of 20 elements reflect the actual metal body burden of living seals in the North Sea. Fresh whole blood samples from 26 harbour seals (*Phoca vitulina*) caught at the German and Danish Wadden Sea were analyzed. Samples were collected in special Lithium Heparin monovettes for metal analysis during 6 campaigns 2003 and 2004. Measurements were performed by 3 different analytical methods: 1) Be, Al, Cr, Mn, Co, Ni, Mo, Pd, Ag, Cd, Sn, Pt, and Pb by inductively coupled plasma-mass spectrometry (ICP-MS); 2) Fe, Cu, Zn, As, Se and Au by total-X-ray-fluorescence spectrometry (TXRF); 3) Ti by high resolution sector field ICP-MS. The median concentrations and range values of all elements will be shown. Appropriate amounts and ratio of essential and non-essential trace elements as well as geographical differences were discussed. In addition, the element distribution patterns provide information to the health status of these animals. In combination with the detection of metal-specific hypersensitivities it can be used for a monitoring of metal pollution and their hazardous impact on marine mammals.

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