by MRI, and images clearly show a remarkable decrease of T2 relaxation time values as expected. These results confirmed that the targeted tumor cells internalize and accumulate the novel T2 contrast agent.
Conclusion: Based on the results, it can be established that the primary tumor and the metastasis could be visualized and fusion images of PET and MRI results could be made. The development of this contrast agent opens many opportunities for localization and early diagnosis of solid tumors.
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PET/CT IMAGING IN DOGS AND CATS — THE FEASIBILITY AND RADIOTOXICOLOGICAL ASPECTS

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Background: In this study we present an overview of the impact and advantages of PET/CT fusion imaging in the practice of veterinary oncology. FDG-PET imaging is useful and essential in disease staging, monitoring response to treatment, planning and choosing appropriate therapies, detecting recurrence and predicting prognosis.
Material and methods: Between December 2009 and February 2011 75 PET/CT examinations were performed in 60 referred client-owned dogs and cats in the Department of Nuclear Medicine, University of Debrecen. Pets were sedated and injected iv. with 18F-fluoro-deoxy-glucose (FDG) 15 MBq/bwkg and one hour later after the injection whole body fusion images were taken. We also collected blood samples from patients to check the haematological and biochemical parameters.
Results: A number of neoplastic diseases have been recognised in this study; include soft tissue sarcoma (16%), mastocytoma (11%), mammary tumours (10%), osteosarcoma (11%), lymphoma (3%) and squamous cell carcinoma (25%). In 6 cases we performed follow-up examinations to monitor response to treatment or to detect recurrence. Meanwhile the applied method proved to be well-tolerated in even late stage diseases.
Conclusion: This diagnostic imaging technique is non-invasive and provides important information to veterinary clinicians and biomedical researchers. The relatively high incidence rate of some cancers, similar biological behaviour, large body size, comparable response to chemotherapeutic agents, shorter overall lifespan and shorter latency period are the factors that contribute to the advantages of the companion animals as a model for human neoplastic diseases.
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TC-99M LABELED SELF-ASSEMBLED BIOPOLYMER BASED NANOPARTICLES FOR IMAGING RECEPTOR MEDIATED UPTAKE AND APPLICATION IN TUMOR DIAGNOSIS

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Background: A new biocompatible and biodegradable self-assembling nanoparticulate product was investigated as a potential new SPECT imaging agent. Previously this new polyelectrolyte was investigated as a novel nanoscale drug carrier system and then presented as a new folate receptor targeting MRI contrast agent. In present study we examined possibility of application of these nanoparticles in SPECT imaging of folate receptor overexpressing tumors using technetium-99m. The aim of our preliminary *in vitro* and *in vivo* examinations was to verify that nanoparticles can labeled and followed up with Tc-99m with appropriate radiochemical stability, and they show the proper distribution according to their particle size and stability.
Material and methods: Nanoparticles with a hydrodynamic size of 150 nm were prepared by self assembly. Particle sizes were measured by dynamic light scattering (Malvern Zetasizer Nano, Malvern Instruments) before and after labeling. SnCl2 was used to reduction of 900 MBq [Tc-99m] pertechnetate solution for labeling in 3 ml total volume. *In vitro* radiochemical purity was examined by thin layer chromatography (ITLC-SG developed in MEK and saline) up to 24 hours after labeling. Biodistribution values were determined by scintigraphic imaging studies in healthy Beagle dogs and Wistar rats. Images were taken by gamma camera at several times and organ uptakes were estimated by quantitative ROI analysis.
Results: Radiolabeled products showed high degree and durable labeling efficiency (99%) during 24h *in vitro* radiochemical stability follow-up. *In vitro* measured particle size distributions were stable before and after the labeling up to 24h. The *in vivo* biodistribution examinations of nanoparticles had close correlation to earlier described products which have similar particle size distributions. Images and calculated injected dose percentage values validated that *in vivo* radiolabeling efficiency and particle diameters were relative stable and constant after IV application. In the Beagle dogs and Wistar rats the injected labeled compound showed retained blood-background, liver, kidneys, urinary bladder and slight bone-marrow uptake was seen in the scans.
Conclusions: Our preliminary examinations verified that the self assembled nanoparticles are able to label and follow-up using technetium-99m isotope and gamma-camera. In our further examinations Tc-99m-radiolabeled nanoparticles were followed-up in folate receptor overexpressing tumor cell lines in biological experiments.
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SYNTHESIS OF FLUORINE-18 LABELED RHODAMINE B: A POTENTIAL PET MYOCARDIAL PERFUSION IMAGING AGENT

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Background: There is considerable interest in developing an 18F-labeled PET myocardial perfusion agent. Rhodamine dyes share several properties with 99mTc-MIBI, the most commonly used single-photon myocardial perfusion agent, suggesting that an 18F-labeled rhodamine dye might prove useful for this application. In addition being lipophilic cation, like 99mTc-MIBI, rhodamine dyes are known to accumulate in the myocardium and are substrates for Pgp, the protein implicated in MDR1 multidrug resistance. Fluorine-18-labeled rhodamine B was developed as a potential positron emission tomography (PET) tracer for the evaluation of myocardial perfusion.
Material and methods: Rhodamine B was chosen as the prototype compound for development of the synthesis because the ethyl substituents on the amine moieties of rhodamine B protect them from side reactions, thus eliminating the need to include (and subsequently remove) protecting groups. The 2'-[18F] fluoroethyl ester of rhodamine B was synthesized by heating rhodamine B lactone with [18F] fluoroethyltosylate in 1-butyl-3-methylimidazolium tetrafluoroborate at 165°C for 15 min. [18F] fluoroethyltosylate was prepared by the reaction of ethyleneglycol ditosylate with Kryptofix 2.2.2, K2CO3, and [18F] in acetonitrile for 5 min at 80°C. The internal and the final product were purified by semi-preparative HPLC.
Results: We produced the 2'-[18F] fluoroethylester in > 98% radiochemical purity and a total synthesis time of 150 min.