

# New PET/MRI Fusion Images of $^{74}\text{As}$ labelled Vatumimab<sup>®</sup> in Prostate Cancer bearing Rats

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**Introduction:** Anionic phospholipids, principally phosphatidylserine, become exposed on the external surface of viable vascular endothelial cells in tumors, possibly in response to oxidative stresses present in the tumor microenvironment [1,2]. A new chimeric IgG<sub>3</sub> monoclonal antibody, Vatumimab<sup>®</sup>, directed against anionic phospholipids was raised. A method for the labelling of antibodies with radioactive arsenic isotopes was developed [3] and the antibody was tested for its ability to localize to tumor vessels and imaging qualities with PET.

**Experimental:** Four R3227 Dunning prostate AT1 tumor bearing rats were injected with 10 MBq of  $^{74}\text{As}$ [SATA]ch3G4 in 500  $\mu\text{l}$  of PBS (pH 7.4, 1 mMol EDTA) in the tail vein. The animals were sedated using Isoflurane and imaged with a self-developed Small

Animal PET camera at 24, 48 and 72 h after injection. Coincident data were collected for the 511 keV gamma rays with a 250-750 keV window for 2 h. The images were reconstructed using a self-programmed 3D-reconstruction algorithm.

**Results and Conclusion:** Vatumimab<sup>®</sup> localizes specifically to anionic phospholipids on the surface of vascular endothelial cells in Dunning rat prostate tumors. The biomedical use of radioactive arsenic isotopes was demonstrated for the first time in a multi-modality molecular imaging approach *in vivo*.

## References:

- [1] Ran, S. et al., Cancer Research 62, 6132-6140, 2002
- [2] Ran, S. et al., Int. J. Rad. Oncol. 54, 1479, 2002
- [3] Jennewein, M. et al., Annual Report, 2003.

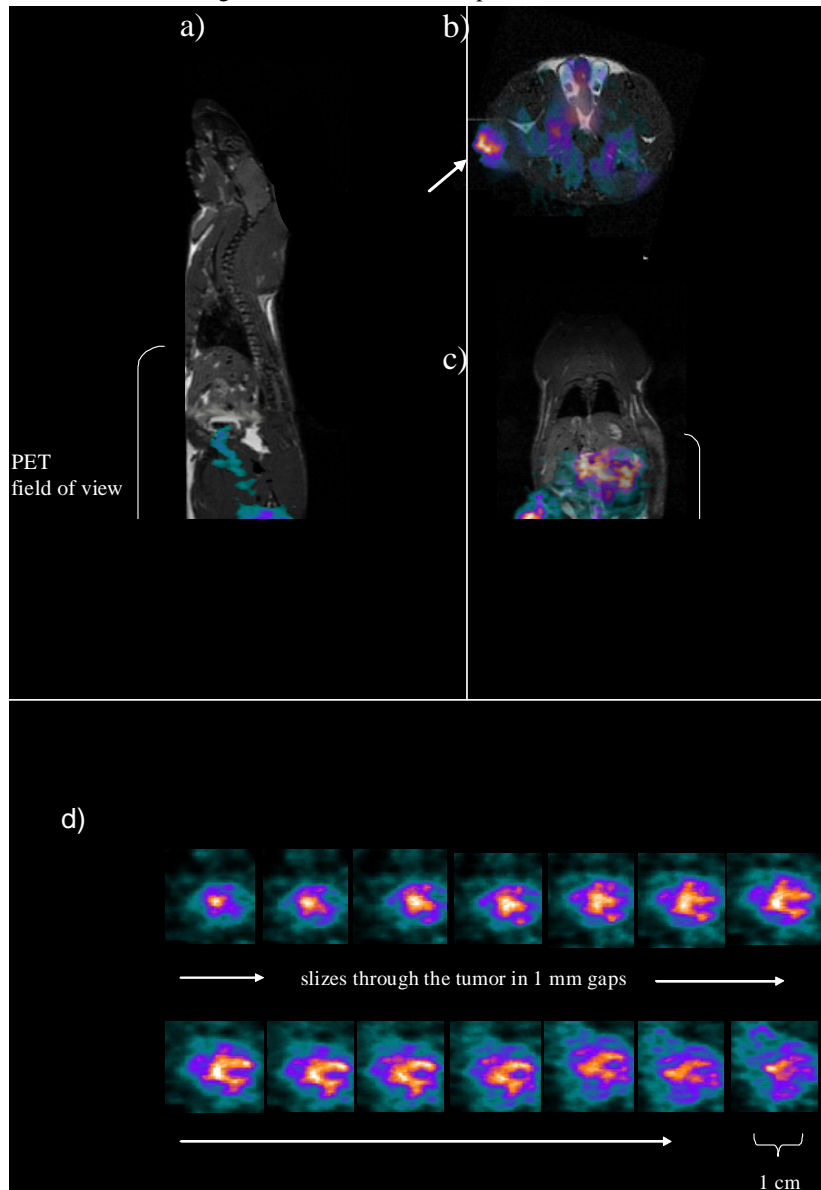


Fig. 1: Representative images obtained with a Small Animal PET camera 48 h after injection of 10 MBq of  $^{74}\text{As}$ [SATA]Vatumimab<sup>®</sup> in frontal, sagittal, and transversal orientation (a-c) and 1 mm slices through the tumor capsule (d)

Financial Support of the Böhringer Ingelheim Foundation is grateful acknowledged