P-047

In vivo Imaging of Rat Glioma using the TSPO-ligand [^{18}F]DPA-714

Winkeler A. [(1)], Boisgard R. [(1)], Dubois A. [(1)], Awde A. [(1)], Zheng J. [(1)], Ciobanu L. [(2)], Siquier-Pernet K. [(1)], Jego B. [(1)], Dollé F. [(1)], Tavitian B. [(1)].

[(1)] CEA\DSV\I2BM\SHFJ, Orsay, France
[(2)] roSpinCEA\DSV\I2BM\NeuroSpin,France

alexandra.winkeler@cea.fr

Introduction: In the last years there has been an enormous increase in the development of radioligands targeted against the translocator protein TSPO (18 kDa). TSPO expression is nearly absent in the intact CNS parenchyma but increases rapidly upon inflammation in activated microglia and serves as a biomarker for imaging cerebral inflammation (1). In addition, TSPO has also been reported to be over-expressed in a number of cancer cell lines (2, 3) and human tumours including glioma (4). Here, we investigated the use of the PET-radioligand [^{18}F]DPA-714 (5) as new marker to image glioma *in vivo*.

Methods: 9L rat glioma cells have been stereotactically implanted in the striatum of Fisher, Wistar and Sprague Dawley rats. Dynamic [^{18}F]DPA-714 PET imaging was performed 11-14 days after implantation. The injected dosed was 1.24 ± 0.30 mCi (mean + std). T2w-MRI and/or [^{11}C]Methionine PET were acquired prior to the [^{18}F]DPA-714 PET imaging session in order to monitor tumor growth. The [^{18}F]DPA-714 PET images were then co-registered to the corresponding MRI. For quantitative analysis a volume-of-interest (VOI) analysis was performed on both the kinetic and summed image data sets. In addition, the expression of TSPO 9L rat glioma cells was investigated using Western Blot.

Results: 9L glioma tumors grown in Fisher (n=5), Wistar (n=4) and Sprague Dawley (n=6) rats were imaged by [^{18}F]DPA-714 PET. Tumors grown in Fisher and Wistar rats were also monitored by MRI. All rats showed significant [^{18}F]DPA-714 PET accumulation at the site of tumor implantation compared to the contralateral site. Tthe %ID/cc in Fisher, Wistar and Sprague Dawley rats is listed in the following table:

	control (mean±std)	tumor (mean±std)
Fisher	0.15 ± 0.02%	0.49 ± 0.05%
Wistar	0.13 ± 0.06%	0.35 ± 0.09%
Sprague Dawley	0.11 ± 0.05%	0.26 ± 0.06%

TSPO expression was confirmed by Western Blot in 9L cells *in vitro* and by immunohistochemistry *ex vivo*.

Conclusions: This study demonstrated the feasibility of using the TSPO-radioligand [^{18}F]DPA-714 to characterize 9L glioma *in vivo* in different rat models with PET imaging. [^{18}F]DPA-714 therefore has the potential to become a promising radiotracer to image human glioma.

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