Print this Page for Your Records Close Window

Control/Tracking Number: 2016-S-670-EANM
Activity: Scientific Programme
Current Date/Time: 4/25/2016 2:30:07 AM

Quantitative imaging of cell viability after graft in stroke rodent model with [^{18}F]-FHBG

Author Block: A. SALABERT[1,2], L. Vaysse[1], M. Beaurain[1], M. Alonso[2], J. Besombes[1], I. Loubinoux[1], M. Tafani[1,2], P. Payoux[1,3];
[1]INSERM U1214, Toulouse, FRANCE, [2]University hospital, Radiopharmacy unit, Toulouse, FRANCE, [3]University hospital, Nuclear medecine unit, Toulouse, FRANCE.

Abstract:
Aim :
Cell transplantation therapy is an innovative therapeutic approach particularly in neurology to compensate the neural loss after stroke. We propose a molecular imaging approach to study cell viability with a gene encoding a thymidine kinase (HSV1-tk) and ([^{18}F]-FHBG) as a reporter probe to image the expression of this enzyme. HSV1-tk phosphorylates radiotracer in its monophosphate form leading to intracellular accumulation.
Materials and methods:
We performed an incubation of 5 million of Neuro2a cells with 5, 55 MBq of [^{18}F]-FHBG during 3 hours. After incubation, we realised 2 calibration ranges of 10 000 to 3 000 000 cells. One was counted in a gamma counter and the other was analysed by PET camera. We used a model of acute brain lesion in rat to test graft procedure. Brain lesion was induced by stereotaxic injection of malonate 3M (5µL). 15 days after the surgery, we performed a stereotaxic graft with different quantity of cells into brain lesion. Image acquisition of whole rat was performed during 15 min in PET-CT. Data analysis was performed with homemade software (Sisyphe) on co-registered image. We tested the correlation between quantitative analysis of brain signal and amount of cells. We performed an analysis of the graft injection quality comparing localisation of ROIs and localisation of signal with scan anatomical data.
Results
[^{18}F]-FHBG uptake rate was 2.61%+/-0.8. (n = 9). We observed no significant difference (p=0, 75, n= 6) between signal on gamma counter and PET (Bq). We noted on lesion model a typical alteration of motor function on forelimbs 2 days after malonate injection. We observed a linear correlation between PET signal in rat brain and number of grafted cells (r = 0.996, p <0.00001, n =18). Scalp attenuation was insignificant. These acquisitions allowed the observation of quality of stereotaxic injection. We noticed three types of injection variability: reflux in CSF cisterna, cell reflux on the scalp and

parenchymal diffusion if the lesion was too small.
Conclusion
We proved that we can quantify the number of grafted cells and check the quality of the injection of these cells in vivo in a rat model of stroke through the use of molecular imaging with [^{18}F]-FHBG. We plan to use this tracer to achieve a longitudinal follow up of a graft to quantify cell viability several weeks after injection. The repeated, non-invasive tracking of grafted cells will accelerate the development of effective stem cell therapy in stroke.
:

Author Disclosure Information:

A. Salabert: None.
Topic (Complete): 507 Data Analysis & Quantification
Disclosures (Complete):
I or one of my co-authors hold a position as an employee, consultant, assessor or advisor for a pharmaceutical, device or biotechnology company. If yes, please specify name/position/company, if not please state "Nothing to disclose" : Nothing to disclose
I or one of my co-authors receive support from a pharmaceutical, device or biotechnology company. If yes, please specify name/position/company/which project and whether support is in kind or monetary. If not, please state "Nothing to disclose". : Nothing to disclose
I or one of my co-authors hold property rights/patents for (radio)pharmaceuticals, medical devices or medical consulting firms. If yes, please specify name/position /company, if not please state : Nothing to disclose
I or one of my co-authors have written articles for (radio)pharmaceutical, med. device, biotechnology or consulting companies during the last 5 yrs. If yes, specify name/position/company/article/journal & co-authors.If not state "Nothing to disclose" : Nothing to disclose
I herewith declare, that I submitted all relevant information above to the best of my knowledge : True

Additional (Complete):
I agree: Yes
I agree: Yes

Awards, Biology Track, ISTARD WS (Complete):
EANM Eckert & Ziegler Abstract Award : True
Date of birth (ddmmyyyy) : 26041982

Presentation Preference (Complete): Oral or Poster
Status: Complete

European Association of Nuclear Medicine
Schmalzhofgasse 26, 1060 Vienna, Austria
Phone +43-(0)1-890 44 27, Fax +43-(0)1-890 44 27-9
E-mail: a.felser@eanm.org

Leave OASIS Feedback