



Radiobiology / Radiopharmacy / Radiochemistry

Índice/Index

Números anteriores
Back issues

Enviar colaboraciones
Instructions to authors

Sitios de interés
Links



<p>Suzuki, M. F.^[1]; da Silva, M. A.^[1]; Caldeira, J. S.^[2]; Colturato, M. T.^[2]; Araújo, E. B.^[2]; Bartolini, P.^[1]; Okazaki, K.^[1]</p>
<p>^[1] Molecular Biology Center, IPEN - CNEN/SP, São Paulo - SP, Brazil^[2] Radiopharmacy Center, IPEN - CNEN/SP, São Paulo - SP, Brazil</p>
<p>Correspondencia:</p> <p>Miriam F. Suzuki E-mail:mfsuzuki@ipen.br Fono: XX11-3816-9238</p> <p>María T. Colturato E-mail: mtcolturato@ipen.br Fono:(11)9628-4623</p>
<p>Cita/Reference:</p> <p>Suzuki, M. F.; da Silva, M. A.; Caldeira, J. S. et al. Induction of micronucleus by [DOTA, Tyr3]octreotate labeled with ¹³¹I and ¹⁷⁷Lu in peripheral blood lymphocytes IN VITRO. Alasbimn Journal 7(27): January 2005</p>

Induction of micronucleus by [DOTA, Tyr3]octreotate labeled with ¹³¹I and ¹⁷⁷Lu in peripheral blood lymphocytes IN VITRO

The use of radiolabeled somatostatin analogue is of great interest in nuclear medicine for diagnostic and therapy of neuroendocrine tumors. A somatostatin analogue [DOTA, Tyr3]octreotate has been used because of its high affinity for somatostatin subtype receptors sstr2 and sstr5. The pharmacokinetic study showed that the blood clearance is rapid and only 9% of the intravenous injected activity remains in blood after one hour. In this study, we evaluated the cytogenetic damage in peripheral blood lymphocytes of healthy donors exposed to different radioactive concentration of [DOTA, Tyr3]octreotate labeled with ¹³¹I (n=3) and ¹⁷⁷Lu (n=2), range between 600 and 4700 kBq/mL, that correspond to an injected activity of 3.1 to 24.4 GBq (83 to 660 mCi) in a reference man with 70kg weight. ¹³¹I emits gamma rays with 365 and 637 keV and beta particles of Emax 495 keV with a physical half-life of 8.1d and ¹⁷⁷Lu emits gamma rays with 113 and 208 keV and beta particles of Emax 600 keV with a physical half-life of 6.7d. Cytokinesis-block micronucleus (MN) assay was applied in total peripheral blood cells after one hour of exposure at 37°C, washing three times with RPMI 1640 medium to remove labeled octreotate. The results obtained indicated significant correlations between radioactive concentrations (X) and the frequency of micronuclei in binucleated cells (Y) (P<0.05). The equation for [¹³¹I-DOTA, Tyr3] octreotate was $Y = (0.01841 \pm 0.002880) + (0.9946 \pm 0.1452) 10^{-5} X$ and for [¹⁷⁷Lu-DOTA, Tyr3]octreotate was $Y = (0.01641 \pm 0.001641) + (0.5404 \pm 0.04642) 10^{-5} X$. Comparing the slopes (Y = a + bD), [DOTA, Tyr3] octreotate labeled with ¹³¹I was more damaging than that labeled with

10763

¹⁷⁷Lu (P<0.05). One of the limiting factors in radionuclide therapy is the dose absorbed by normal tissues. The higher genotoxic effect in lymphocytes exposed to ¹³¹I compared to ¹⁷⁷Lu could be the consequence of differences in ionization field caused by gamma and beta particles. The dose-response curve allowed us to measure the genotoxicity of these compounds in peripheral blood lymphocytes and will help us to check the absorbed dose in peripheral blood of patients, analyzing the MN frequency before and after treatment.

Preparation and evaluation of the biodistribution of technetium-99m substituted ethylenediamine complex | ¹³¹I-Vasoactive Intestinal Peptide ([¹³¹I]VIP) for Receptor Scintigraphy in Oncology. Comparative Biological Distribution Studies in Normal and Tumour Animals | Preparation and quality control of ¹³¹I-MB (Methylene Blue) | Synthesis of 2-[¹⁸F] fluor-2 deoxy-D-glucose (18F-FDG) | Labeling of DOTA-Tyr3-octreotate with ¹⁷⁷Lu: stability and biodistribution study | Exposure to radiation of nursing assistants during iodine therapy in a period of eleven years | Cytogenetic effects of ¹³¹I administered with recombinant human thyrotropin hormone (rec-hTSH) on blood lymphocyte of Wistar rat | Induction of micronucleus by [DOTA, Tyr3]octreotate labeled with ¹³¹I and ¹⁷⁷Lu in peripheral blood lymphocytes IN VITRO |