

**UNIVERSITI TEKNOLOGI MARA**

**IN VITRO FREE RADICAL FORMATION  
FOLLOWING EXPOSURE TO  
TECHNETIUM-99M ( $^{99m}\text{Tc}$ )**

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## ABSTRACT

This study is about the formation of free radical following exposure to technetium-99m ( $^{99m}\text{Tc}$ ). The objectives are to assess the presence of free radical following administration of  $^{99m}\text{Tc}$ -HMPAO and also to assess the optimum time and activity to induce the free radical formation. This  $^{99m}\text{Tc}$  will irradiate and produce the free radical known as auger electrons.

The method that used in this study is as follow. The  $^{99m}\text{Tc}$  is produced by the  $^{99m}\text{Tc}$  generator. Then it must undergo the radionuclide purity test to measure the purity of  $^{99m}\text{Tc}$  by the generator. After that, the  $^{99m}\text{Tc}$  is form a complex with the Hexamethylpropyleneamine oxime (HMPAO). The amount of complex that formed was measured to get the purity standard. Then, the complex will be labelled into the cell and the percentage uptake of complex by cell will be recorded. The last stage of this experiment is the thiobarbituric acid reactive substance. This test is done to detect the presence of free radical that form in the cell by using the malondialdehyde (MDA) standard curve.

As the conclusion, as the concentration of MDA is low, the production of free radical is also low. Thus, the cell that will be killed by the free radical is less. For further study, the time exposure and the concentration of  $^{99m}\text{Tc}$  solution must be widened to get more efficient result.