

# **A quantitative method for determining the biodistribution of alpha radionuclides using whole-body cryosectioning and alpha-track autoradiography**

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**Body of Abstract:** Information on the tissue distribution of incorporated radionuclides may be obtained by means of autoradiography. Photographic films or storage phosphor imaging screens have been the material of choice for recording the distribution of radioactivity from gamma/beta emitters within whole-body cryosections. A solid-state nuclear track detector (as CR-39) is used for the autoradiography studies with alpha particles; it has been demonstrated that solid track detector autoradiography performed on thick sample is potentially an easy procedure for visualising both the dose distribution and the location of alpha emitters. The aim of this study was to investigate the application of alpha-track autoradiography for the quantification of the biological distribution of uranium in rat whole-body cryosections. After administration of the radionuclide, the animals were sacrificed at time intervals determined from biokinetic data and whole-body sections were obtained by cryomicrotomy. Each section was mounted on CR-39 plastic slides and exposed for alpha-track autoradiography. Quantification of the autoradiograph was accomplished by exposing a series of radioactive standards (prepared from rat liver) along with study samples on the same CR-39 plastic slide to relate the track density to the amount of radioactivity.