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A kinetic-allometric approach to predicting tissue radionuclide concentrations for biota.
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Allometry, or the biology of scaling, is the study of size and its consequences. It has become a useful tool for comparative physiology. There are several allometric equations that relate body size to many parameters, including ingestion rate, lifespan, inhalation rate, home range and more. While these equations were originally derived from empirical observations, there is a growing body of evidence that these relationships have their origins in the dynamics of energy transport mechanisms. As part of an ongoing effort by the Department of Energy in developing generic methods for evaluating radiation dose to biota, we have examined the utility of applying allometric techniques to predicting radionuclide tissue concentration across a large range of terrestrial and riparian species of animals. This particular study examined 23 radionuclides. Initial investigations suggest that the allometric approach can provide a useful tool to derive limiting values of uptake and elimination factors for animals.

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