

Body size, cell size and Peto's paradox

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Abstract

Carcinogenesis is one of the leading health concerns afflicting presumably every single animal species, including humans. Currently, cancer research expands considerably beyond medicine, becoming a focus in other branches of natural science. Accumulating evidence suggests that a proportional scale of tumor deaths involves domestic and wild animals and poses economical or conservation threats to many species. Therefore, understanding the genetic and physiological mechanisms of cancer initiation and its progression is essential for our future action and contingent prevention. From this perspective, I used an evolutionary-based approach to re-evaluate the baseline for debate around Peto's paradox. I discuss in detail an effect of body mass in cancer research and the importance of cell size in consideration of body architecture; and finally, I note the necessity of broader ecological attempt in studies of carcinogenesis. The weak points and limitations of theoretical modeling or indirect reasoning based on intraspecific, comparative studies are highlighted. The novelty of the approach proposed therein lies in intraspecies testing of the effect of differentiation of cell size/number on the probability of carcinogenesis while controlling for the confounding effect of body mass/size.

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