Title:	Effect of Physical Activity on Tumor Growth in Mice: Molecular Analysis
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Abstract:	Recent laboratory experiments have shown that the modality of physical activity, whether voluntary wheel running or treadmill training, can impact tumor growth in mice. In pancreatic cancer, while treadmill training did not significantly reduce tumor size, mice engaged in voluntary wheel running displayed a notable decrease. However, the underlying molecular mechanisms driving this effect remain unknown. Thus, the primary objective of this project is to investigate signaling pathways associated with proliferation, apoptosis, vascularization, metabolism, and immunity in tumor samples from different groups of mice. Additionally, it was observed that mice with voluntary wheel running not only experienced reduced tumor size but also less cachexia, while mice with treadmill training exhibited larger tumors and higher levels of cachexia, suggesting a potential correlation between tumor size reduction and attenuation of cachexia. This study aims to explore the role of physical activity modalities in reducing tumor growth in mice with pancreatic cancer by utilizing quantitative PCR for gene expression analysis, Western blot analysis for cancer-related protein levels, and image analysis for UCP1 staining in adipose tissue samples to investigate the potential association between cancer and cachexia. Results indicate that treadmill training led to more alterations in gene expressions, majorly in metabolism genes, compared to voluntary wheel running. Despite differences in tumor size and cachexia reduction, treadmill training still influenced molecular pathways linked to metabolism and energy regulation in cancer progression. Overall, voluntary wheel running and treadmill training-induced distinct effects on tumor size, emphasizing the importance of considering the nature of physical activity in cancer management strategies and offering potential insights into therapeutic approaches targeting cancer.
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