

ESSR Journal Club

Covered Article: “Exercise and the Tumor Microenvironment: Potential Therapeutic Implications” by Jennifer M. Wiggins, Alexander B. Opoku-Acheampong, Dryden R. Baumfalk, Dietmar W. Siemann, Bradley J. Behnke. *Exercise and Sport Sciences Reviews*. 46(1), January 2018.

1. In general terms, how does the tumor vasculature contribute to therapeutic resistance?
2. What two types of hypoxia arise in tumors? Explain the different molecular consequences of each one.
3. How does hypoxia influence the immune cells that infiltrate the tumor? What type of microenvironment does this produce?
4. Using the mean arterial pressure (MAP) equation, explain how pharmacological approaches have attempted to modulate tumor oxygenation. Why have these approaches not been successful?
5. Describe how normal vessels regulate blood flow and explain how the neoplastic vasculature differs in structure and function. How is tumor blood flow affected by exercise?
6. Use Ohm’s law to explain how partially collapsed vessels may influence vascular resistance and blood flow during exercise.
7. Preclinical models have shown an increase in perfused vessels that have correlated with a reduction in hypoxia during exercise. Explain how chronic exercise may produce a more sustained response.
8. How does moderate and high intensity exercise influence the immune system? What are the consequences of these different exercise intensities for individuals with cancer?
9. Explain why results obtained from experiments with ectopic tumors may not reflect how blood flow is distributed during exercise in a spontaneous model or orthotopic injection of the same type of tumor.
10. How can exercise benefit cancer patients? What factors need to be considered when designing a translational study?