Mitochondrial Transplantation Modulated Tumor Microenvironment in Triple-Negative Breast Cancer with Chemotherapy

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**Purpose**

The transplantation of membrane-fused mitochondria within the tumor, referred to as P-Mito and generated via Pep-1 conjugation, shows promise in breast cancer therapy. Its mechanism of action involves modifying the Tumor microenvironment and augmenting immune cell infiltration. Further investigation is necessary to ascertain if this mechanism contributes to the observed synergy with doxorubicin (Dox)-assisted chemotherapy, enhancing breast cancer treatment and impacting the tumor immune microenvironment (TIME).

**Materials and Methods**

Our study utilized immunohistochemical staining and serum cytokine multiplex analysis on post-treatment samples from mice with triple-negative breast cancer xenografts.

Results:

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It revealed that P-Mito magnified Dox-induced rises in PD-L1 and CD4 expression while diminishing alpha-SMA levels. Concurrent treatment with P-Mito notably increased IFN-γ and IL-12 levels, counteracting Dox-induced reductions in IL1-a expression. Additionally, P-Mito co-treatment intensified perforin-mediated tumor cell death.

**Conclusion**

These findings reflect the potential of P-Mito transplantation in modulating the TIME, yet its supportive role in immune cell therapy requires further validation.