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Laser immunotherapy for metastatic cancer treatment

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Cancer has been a leading cause of death since the beginning of human history. Various therapies have been developed, yet cancer remains to be one of the biggest medical challenges for researchers and practitioners. In an attempt to target the root cause of cancer, we developed laser immunotherapy (LIT). LIT aims at eradicating cancers by enlisting the help of the host immune system through a local intervention. It uses the combination of laser phototherapy and immunotherapy to induce tumor-specific immune responses. In our pre-clinical and preliminary clinical studies, LIT is shown to be highly effective against metastatic tumors. The experimental results indicated a systemic, long-term anti-tumor immunological response induced by LIT, using the entire tumor cell as the sources of tumor antigens, based on the principle of *in situ* autologous whole-cell cancer vaccination. To further improve LIT, we developed laser-nanotechnology-based novel therapy using immunologically modified nanotubes to provide synergistic, synchronized photothermal and immunological interactions for cancer treatment.

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