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Thu-Af-Spec1-05: [Panel 3] Superconductivity Solutions for Vanquishing Cancer

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Eradicating cancer and improving cancer treatment have been ongoing challenges for decades, resulting in the loss of millions of lives. However, the development of innovative cancer therapies enabled by high-temperature superconducting (HTS) materials offers renewed hope for potentially eradicating this devastating disease within our lifetime.

Current radiation oncology methods require significant irradiation of healthy tissue to administer the necessary radiation dose to target tumors, which poses life-threatening risks. Moreover, the construction of medical beamlines and patient treatment vaults demand multi-billion-dollar investments, leading to limited patient throughput and staggering capital and operational expenses.

New partnerships are emerging between dedicated medical system providers, superconductivity materials and service suppliers, and end users. An example of such collaboration is the initiative led by Empyrean Medical Systems, which includes the MagCorp, Mayo Clinic, MD Anderson Cancer Center, and Moffitt Cancer Center.

Advancements in HTS technology have created large-bore superconducting magnets capable of manipulating and conditioning charged particle beams. This progress opens new possibilities for delivering radiation to patients, minimizing damage to healthy tissues while delivering lethal doses of radiation solely to target tumors.

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