

Progress on the Conceptual Design of the Laser-hybrid Accelerator for Radiobiological Applications (LhARA).

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On behalf of the LhARA collaboration

LhARA is a proposed novel facility capable of delivering high intensity beams of protons and ions that enables radiobiological research to be carried out in completely new regimes. A two-stage facility, the first stage utilizes laser-target acceleration to produce proton bunches of energies up to 15 MeV which are delivered to an *in vitro* end station. The second stage will accelerate protons in an FFA ring up to 127 MeV which are subsequently delivered to either an *in vivo* end station or a second *in vitro* end station. The technologies demonstrated in LhARA have the potential to be developed for use in future hadron-therapy facilities and will be capable of delivering a wide variety of time structures and spatial configurations at instantaneous dose rates up to and significantly beyond the ultra-high dose rate FLASH regime. We present here the conceptual design of LhARA as well as the most recent progress toward the technical design of the accelerator.