

The Laser-hybrid Accelerator for Radiobiological Applications (LhARA)

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The 'Laser-hybrid Accelerator for Radiobiological Applications', LhARA, is conceived as a novel, uniquely flexible facility dedicated to the study of radiobiology. The technologies that will be demonstrated in LhARA have the potential to allow particle-beam therapy to be delivered in a completely new regime, combining a variety of ion species in a single treatment fraction and exploiting ultra-high dose rates. LhARA will be a hybrid accelerator system in which laser interactions drive the creation of a large flux of protons or light ions that are captured using a plasma lens and formed into a beam. Serving the Ion Therapy Research Facility (ITRF), the laser-hybrid approach will allow the exploration of the vast "terra incognita" of the mechanisms by which the biological response is modulated by the physical characteristics of the beam. I will describe the motivation for LhARA, present the status of its development and summarise the programme upon which the LhARA consortium has embarked to drive a step-change in clinical capability.