

## Ultra high dose rate (35Gy/sec) radiation does not spare the normal tissue in cardiac and splenic models of lymphopenia and gastrointestinal syndrome

Bhanu Prasad Venkatesulu<sup>1a</sup> MD, Amrish Sharma<sup>1a</sup> PhD, Julianne M. Pollard-Larkin<sup>3</sup> PhD, Ramaswamy Sadagopan<sup>3</sup> MS, Jessica Symons<sup>1,4</sup> BS, Shinya Neri<sup>1</sup> MD PhD, Pankaj K Singh<sup>1</sup> PhD, Ramesh Tailor<sup>3</sup> PhD, Steven Hsesheng Lin<sup>1,2,4,\*</sup> MD PhD, Sunil Krishnan<sup>1,2,4,\*</sup> MD

Departments of Experimental Radiation Oncology<sup>1</sup> and Radiation Oncology<sup>2</sup>, Department of Radiation Physics<sup>3</sup> University of Texas MD Anderson Cancer Center, Houston, Texas, and The University of Texas MD Anderson Cancer Center-UT Health Graduate School of Biomedical Sciences<sup>4</sup>, Houston, Texas, USA

\*Corresponding authors: Sunil Krishnan, MD, FACP, FASTRO, Department of Radiation Oncology, Unit 097, Y6.6006a, The University of Texas MD Anderson Cancer Center, 1515 Holcombe Blvd. Houston, TX USA 77030. Tel 713-563-2377; Fax 713-745-2186; E-mail: [krishnan.sunil@mayo.edu](mailto:krishnan.sunil@mayo.edu); Steven H. Lin MD PhD, The University of Texas MD Anderson Cancer Center, 1515 Holcombe Blvd., Houston, TX 77030. Phone: 713-563-8490; Fax: 713-563-2366; E-mail: [shlin@mdanderson.org](mailto:shlin@mdanderson.org).

<sup>a</sup>These authors contributed equally to the manuscript.

### Supplementary Figure legends:

#### Figure 1

(A) The experimental ultra-high dose-rate linear accelerator. (B) The experimental set-up for splenic irradiation with ultra-high dose rate RT wherein a lead shield is placed just above level of the mirror inside the gantry head and a 2 cm aperture directs the beam to the spleen of mice. (C) The experimental set-up for splenic irradiation with conventional dose rate RT wherein a lead shield is placed in the electron cone head and a 2 cm aperture directs the beam to the spleen of mice. (D) The experimental set-up for cardiac irradiation with ultra-high dose rate RT wherein a lead shield is placed just above level of the mirror inside the gantry head and a 2 cm aperture directs the radiation to the heart of mice. (E) The experimental set-up for cardiac irradiation with conventional dose rate RT wherein a lead shield is placed in the electron cone head and a 2 cm aperture directs the radiation to the heart of mice.

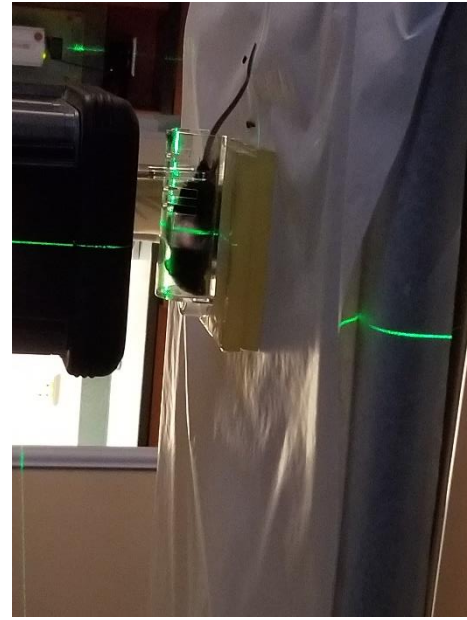
a



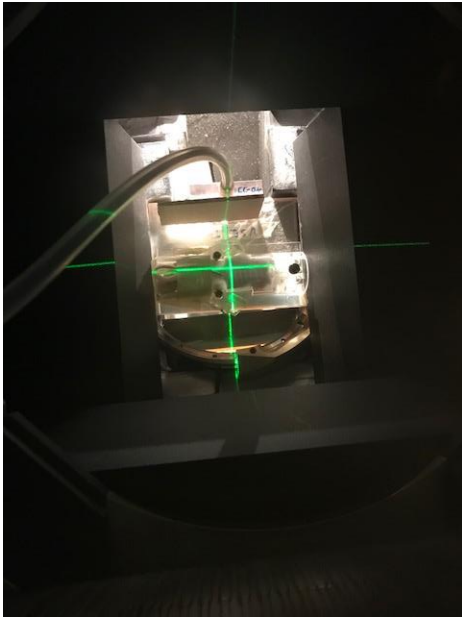
b



c



d



e

