

Radiobiology research at SCAPA - PoPLaR

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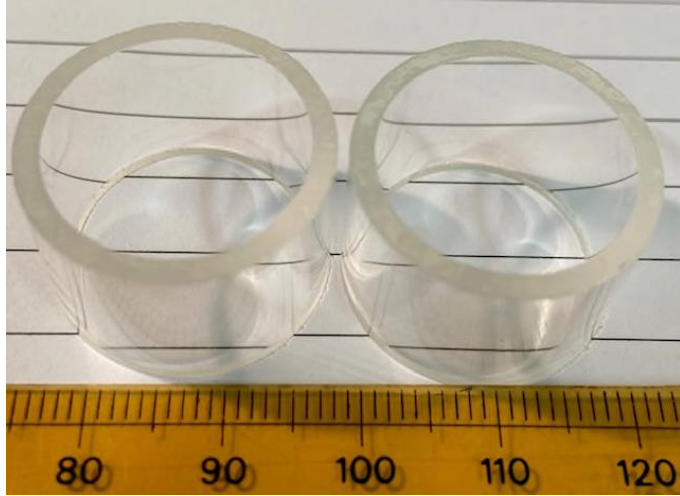


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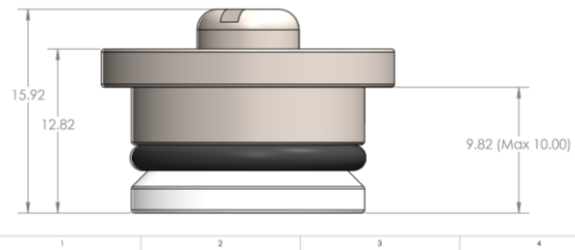


Radiobiology Set up at SCAPA

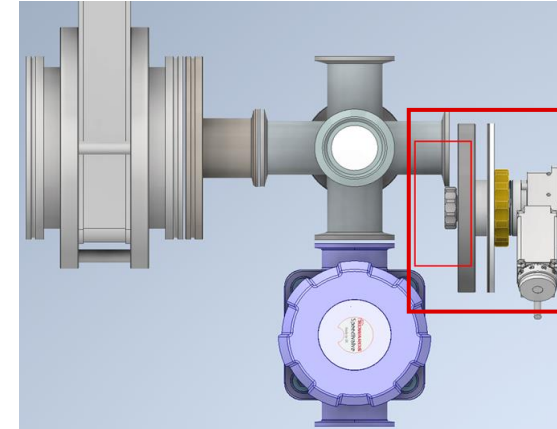
~10 MeV – grow cells on 2.5 μ M Mylar in glass rings



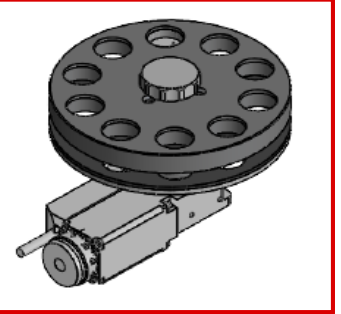
Internal diameter – 18.5 mm
Outer diameter – 22.5 mm



Sealable lids



Glass ring holder



Leave a slot free for dosimetry?

CONV - 0.1Gy per pulse separated by 1 sec = **6Gy/min**

ULTRA-HIGH - 1-3Gy/pulse (2ns) = 0.5-1.5 GGy/sec (**$\sim 10^9$ Gy/s**)

Initial radiobiology experiments at SCAPA

HeLa and FaDu cell lines

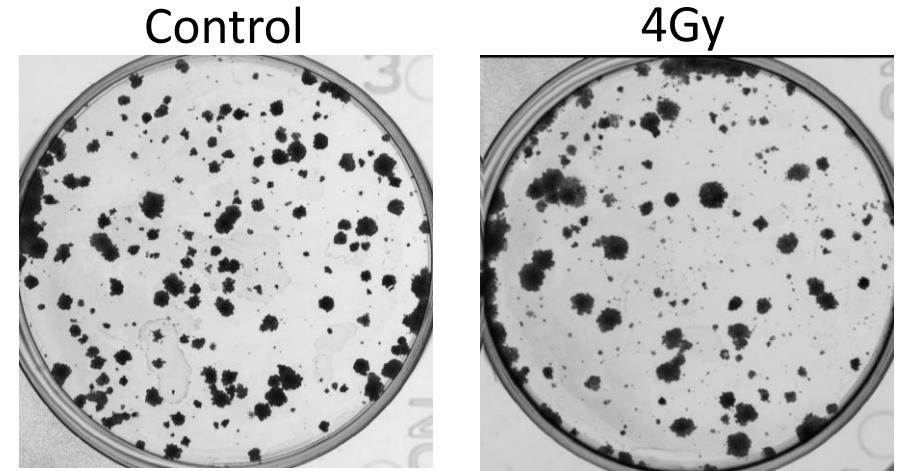
Clonogenic assays

ULTRA-HIGH – 1, 2, 3Gy – in triplicate

CONV – 1, 2, 3, 4, 6, 8Gy – in triplicate

54 dishes to irradiate per experiment

Need at least 3 independent biological repeats



Timeline:

1. Thaw and culture cells at least one week before
2. Seed cells the day before (PM) irradiation (AM)
3. Stain colonies **7-10days** later (SCAPA) and analyse (Birmingham) – **Results in ~2 weeks**
4. Initial session – can do two consecutive days (two independent repeats) but won't know if any alterations needs to be made until staining
5. Would need to do 2-3 more repeats in the next session – based on initial results

Initial radiobiology experiments at SCAPA

DNA repair foci analysis

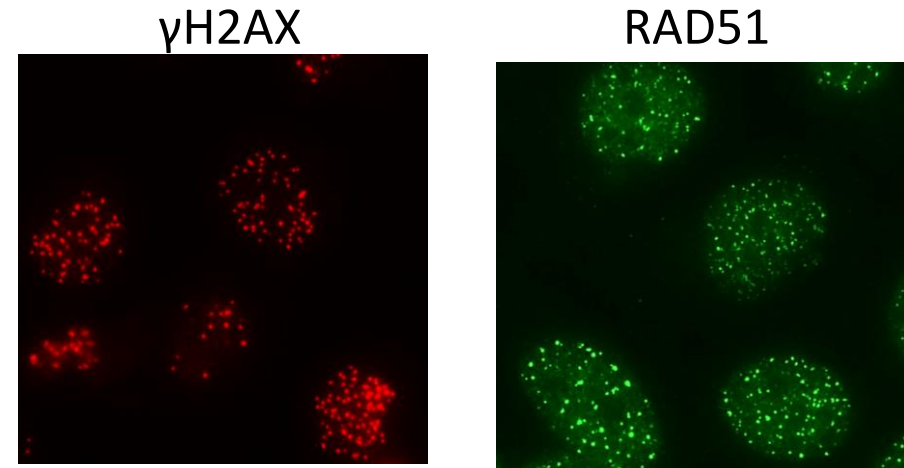
CONV 3Gy (?) – 1, 4, 8, 24 hr – in duplicate

ULTRA-HIGH 3Gy (?) – 1, 4, 8, 24 hr – in duplicate

32 dishes to irradiate per experiment

Need at least 3 independent biological repeats

Cells need to be fixed at certain timepoints (SCAPA) but can be processed later (Birmingham) – **Results in ~1 week**



DNA repair Comet analysis

CONV – 3Gy (?) – in duplicate

ULTRA-HIGH – 3Gy (?) – in duplicate

8 dishes to irradiate per experiment

Need at least 3 independent biological repeats

Requires immediate sample processing (SCAPA):

Embed cells on microscope slides, lyse (across different timepoints - 0, 0.5, 1, 2, 4 hr) and run electrophoresis

Staining and analysis can be done later (Birmingham) – **Results in ~1 week**

