

## 14. An irradiation facility with a horizontal beam for radiobiological studies

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A facility with a horizontal beam for radiobiological experiments with heavy ions has been designed and constructed at the Heavy Ion Laboratory in Warsaw University[1]. The facility is optimal to investigate the radiobiological effects of charged heavy particles on a cellular or molecular level as the plateau of the Bragg curve as well as in the Bragg peak. The passive beam spread out by a thin scattering foil provides a homogeneous irradiation field over an area of at least  $1 \times 1 \text{ cm}^2$ . For in vitro irradiation of biological samples the passive beam spreading combined with the x-y mechanical scanning of the irradiated sample was found to be an optimum solution. Using x-y step motor, the homogenous beam of ions with the energy loss range in the cells varied from  $1 \text{ MeV}/\mu\text{m}$  to  $200 \text{ keV}/\mu\text{m}$  is able to cover a 6 cm in diameter Petri dish that holds the biological samples. Moreover on-line fluence monitoring based on single-particle counting is performed to determine the dose absorbed by cells. Data acquisition system for dosimetry and ion monitoring based on a personal computer was also designed.

### References

[1] J. Czub, D. Banaś, J. Braziewicz, J. Choiński, M. Jaskóła, A. Korman, Z. Szefliński, A. Wójcik, Radiation Protection Dosimetry (2006), doi:10.1093/rpd/ncl518.