

Cover illustration:

The nucleus of a human fibroblast cell (stained in red and about $15\mu\text{m}$ in diameter) is irradiated at the GSI microbeam facility, which allows irradiating of an individual cell with a given number of ions and with a spatial resolution of one micrometer. This is demonstrated here by delivering helium ions in a geometrical pattern representing the letters 'G S I'.

The actual positions of the ions are visualized by confocal microscopy on the basis of the biological response of the cell. This is achieved by staining a protein involved in the DNA damage repair, 53BP1, which accumulates at the position of the ion induced damage (bright yellow spots). For comparison, the intended targeted positions are indicated by yellow circles. At each of the 45 positions, four helium ions at 4.8 MeV/u were delivered. [See page 22/RADBIOPH-18 of this report.]