

COLLISIONS BETWEEN PROTONS AND BIOMOLECULES: ELECTRON EMISSION AND MOLECULAR FRAGMENTATION

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Damages induced by ionizing radiation can directly be linked to alteration of the DNA molecule. In this work, we have investigated interactions between protons and phase gas pyrimidic bases (uracil, cytosine and thymine) in the 25-100 keV energy range, the latest collision energy corresponding to the formation of the Bragg peak in biological medium. We have considered:

- i) direct effects on bases such as ionization and fragmentation studied by coincidence time of flight techniques [1]
- ii) secondary electron emission. During the interaction, electrons are also emitted which can also interact with the neighbouring molecules and be responsible for other damages depending on their kinetic energy [2, 3]. The electron spectra (see figure 1) show the importance of low energy electrons.

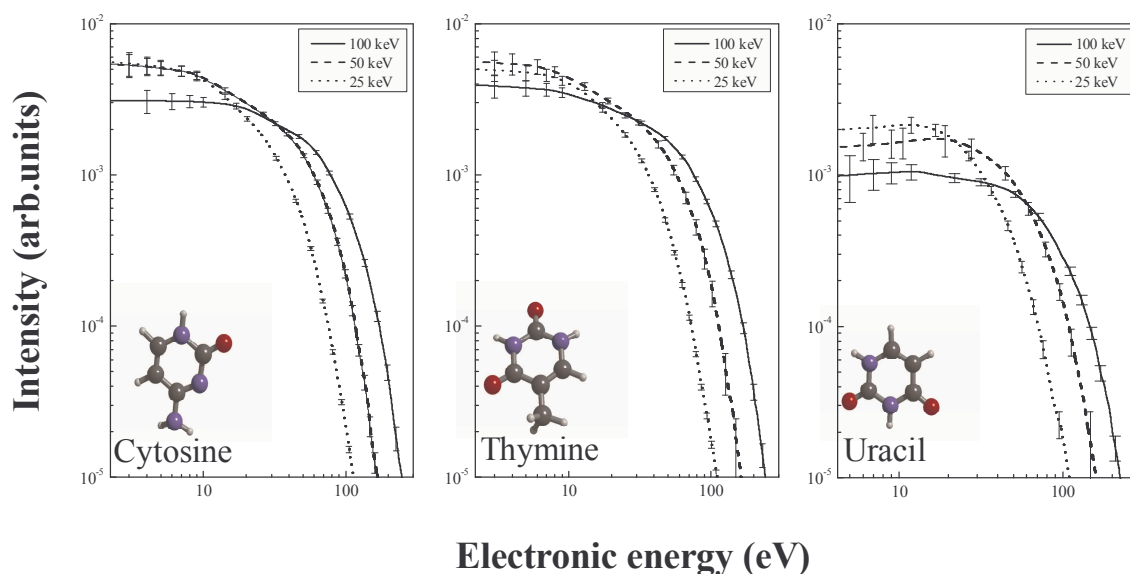


Figure 1: Electron spectra measured in H^+ + bases collisions observed at 35° with respect to the beam

References:

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2. Boudaïffa, B. et al. 2000 Science **287** 1658-60
3. Hanel, G. et al. 2003 Phys. Rev. Lett. **90** 188104