

A post-doctoral position is available at CEA Grenoble, France,

Laboratory « Damage to Nucleic Acid »

A 2-years post-doctoral position is opened ASAP in the laboratory « Damage to Nucleic Acid », CEA-Grenoble France (one of the world-leading group in the field of DNA damage) to be involved in a project dealing with one photon ionization of DNA, supported by the French Research Agency.

The loss of an electron from DNA is one of the primary events leading to damage of the genetic code. It is known to occur through photosensitized processes involving other cellular components as mediators or by the direct effect of ionizing radiation. Yet, electron ejection can also take place following absorption of a single UV photon, provided that its energy is sufficiently high. In the case of DNA bases, this process has been extensively studied for excitation up to ca. 200 nm. However, a few studies have shown that electron ejection from DNA can be triggered by photons corresponding to the lowest absorption band peaking around 260 nm with a weak intensity tail till 400 nm. Thus, the UVA and UVB components of the solar light reaching the surface of the Earth could behave as direct oxidants, in addition to their ability to produce free radicals in cells, and to induce dimerisation of pyrimidine bases in DNA. Consequently, understanding the detailed mechanism(s) of the UVA and UVB action on DNA is an important public health issue and requires ground-breaking fundamental research.

The objective of the present project is to study the factors that govern one-photon ionization of DNA in aqueous solution and describe successive events leading to the formation of final products. To this end, the three involved partners will use a combined experimental and theoretical approach based on (i) steady-state and time-resolved absorption spectroscopy, (ii) chromatographic quantification of final products and (iii) quantum chemistry methods. Work will be performed with single and double strands. As guanine runs are known to have the lowest ionization potential among the DNA bases and are encountered in DNA telomeric sequences, we will also focus on guanine quadruplexes.

The candidate should have a background in organic chemistry with knowledge in analytical chemistry and/or photobiology. To be eligible the candidate must not have lived in France for more than 12 months in the last three years.

Please send detailed CV and motivation letter to Dr Jean-Luc Ravanat (jravanat@cea.fr)