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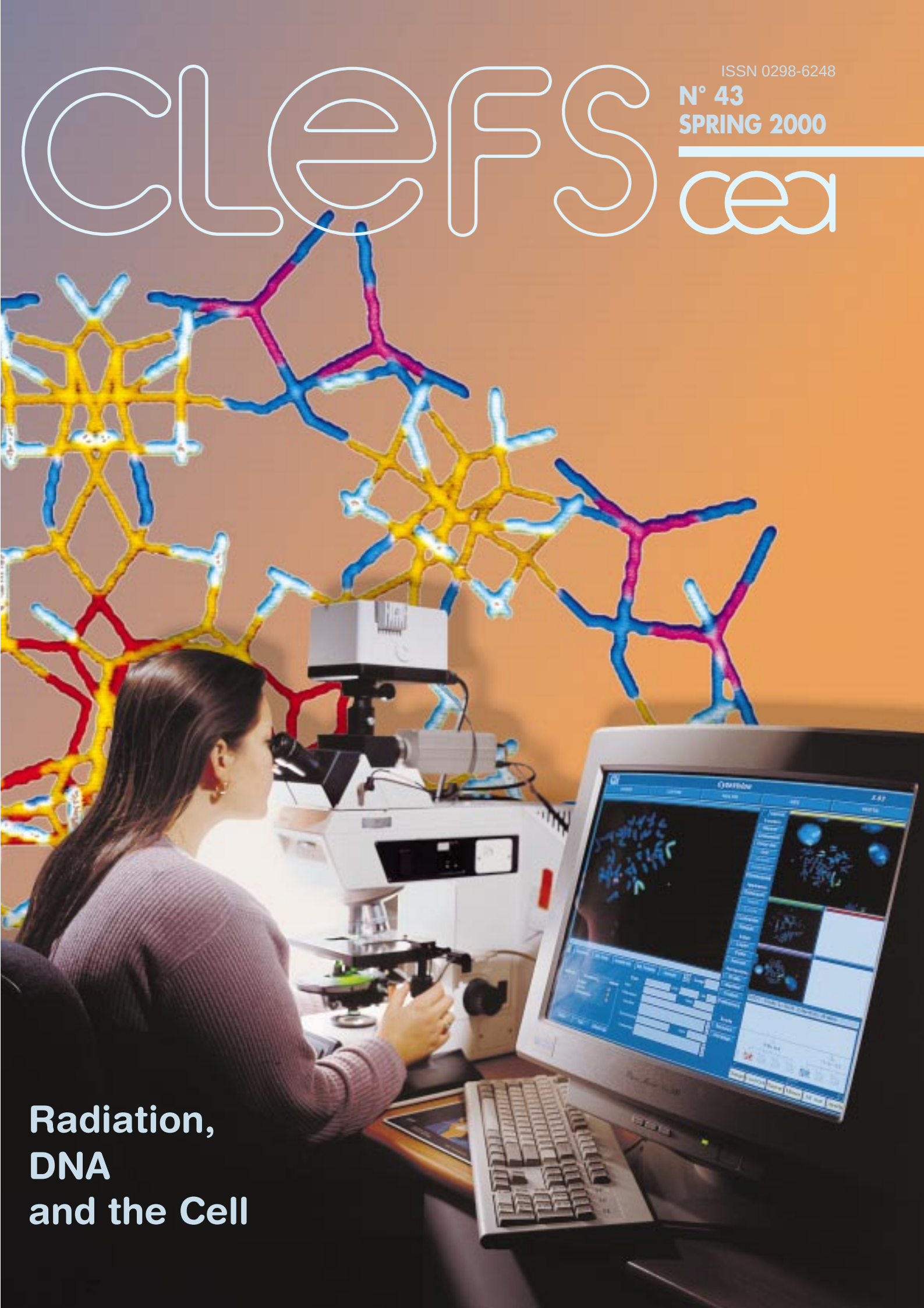

Radiation, DNA and the Cell

Editorial

The fresh impetus enjoyed by research in the field of radiobiology over the last few years, especially in France, is reason enough to review the state of knowledge concerning the action of ionizing radiation on living matter. Such a review is the purpose of this issue of *Clefs CEA*, in which we present a sum of sound scientific information on this topic. It shows how researchers at CEA (which has been assigned a pilot mission by the public authorities), in close collaboration with those of other research bodies and academia, are making an active contribution to achieving a fuller and deeper understanding of how radiation acts on DNA, the cell and tissues.

The basis on which this issue is organized is the timescale that characterizes the biological action of radiation and the reactions of the organism. The first part thus deals with the initial events at the DNA and cell levels, which take place in a tiny fraction of a second. The second part focuses on the response of the organism in the seconds, minutes and hours that follow. The third part looks at the events that, on a scale of years or even generations, can ensue from faults in the mechanisms that in the vast majority of cases allow damage to be repaired, or at least elimination of cells that are too badly impaired.

A last more general contribution describes how an international body like the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), whose job it is to evaluate the health impact of ionizing radiation, has organized the integration of progress in scientific research. Though all may not yet be known in fine detail, experts are able to provide authorities with the best available scientific basis on which to draw up standards with wide safety margins to ensure the protection of workers and the general public.

The concepts used in biology are highly specific and often unfamiliar. This issue therefore includes material intended to make the reading easier, including boxes in which basic notions are explained, and a glossary. Some readers will not need them; we hope others will find them helpful.

In both its form and content this issue of *Clefs CEA* is the first of a series, each one of which will present the work and results of CEA on a strategic scientific or technological topic, and the context in which the work is conducted and the results achieved. The next issue will present a panorama of the contributions made by our organization to new energy technologies.

Anne-Marie Birac

Chief Editor

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75752 Paris Cedex 15 (France)
Tel.: 33.1.40.56.10.00

CEA on Internet:
http://www.cea.fr

Contributors to this issue:
Dr. Anne Flüry-Hérard, Dr. Jean-Michel Giraud,
Christine Jimonet, Philippe Voisin,
Christian de Rouffignac

Responsible Publisher
Jean-Louis Chambon

Chief Editor
Anne-Marie Birac

Assistant Editors
Martine Trocellier
Bernard Bouquin

Illustrations
Florence Klotz

Secretarial Office
Marceline Pac

Subscriptions
Subscription to *Clefs CEA* is free.
Requests should be addressed preferably by fax to:
CEA/Direction de la communication
et des affaires publiques
Abonnements *Clefs CEA*
31 - 33, rue de la Fédération
75752 Paris Cedex 15 (France)
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(words appearing in boxes and in the glossary are respectively printed in red or in blue in corresponding texts at their first occurrence)

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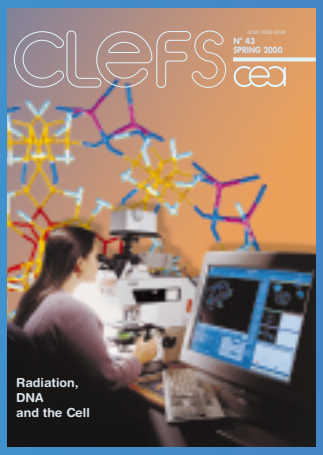

The fundamental and technical progress of recent years in human genetics and molecular biology have made major advances possible in radiobiological research. Here: a cytoviewing apparatus processing images of genetic material obtained by fluorescence, on a background of a transverse section of a DNA.

In the next issue:

- *NEW ENERGY TECHNOLOGIES*