

DNA複製による放射線損傷の固定とその効果

著者	二階堂 修
著者別表示	Nikaido Osamu
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Expression and fixation of ultraviolet light-induced DNA damage through cell cycle progression of human cells in culture.

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Research Institution

Faculty of Pharmaceutical Sciences, Kanazawa University

Principal Investigator

NIKAIDO Osamu Faculty of Pharmaceutical Sciences, Kanazawa University, 薬学部, 教授 (60019669)

Co-Investigator(Kenkyū-buntansha)

MATSUNAGA Tsukasa Faculty of Pharmaceutical Sciences, Kanazawa University, 薬学部, 教務職員 (60192340)

SUZUKI Fumio Faculty of Pharmaceutical Sciences, Kanazawa University, 薬学部, 助教授 (10019672)

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Research Abstract

Previously we reported that the cells irradiated with ultraviolet (UV) light at S phase revealed the highest transformation and mutation frequencies over various cell phases. In order to understand the mechanisms underlying these high frequencies, we developed an immunological method allowing us to follow the excision kinetics of UV-damage in single cells. Consequently, we established two monoclonal antibodies differentially recognizing each specified UV-damage.

At first, the hybridomas between spleen cells from a mouse immunized with UV-DNA and myeloma cells were screened in their binding to UV-DNA and a hybridoma producing antibody against (6-4) photoproduct in DNA was isolated. A further characterization of the antibody, 64M-1 revealed that it recognizes

(6-4) photoproduct of thymine-thymine or thymine-cytosine sequence in UV-DNA.

Secondary, by the fusion between the spleen cells from a mouse immunized with 313 nm UV-DNA in the presence of acetophenone, a hybridoma secreting antibody directed against thymine-thymine dimer was isolated. The antibody TDM-1 bond to DNA irradiated with 313 nm UV in the presence of acetophenone and to UV-irradiated oligo(dT)₈.

The excision of (6-4) photoproduct and thymine dimer in UV-irradiated normal human, xeroderma pigmentosum(XP) and its variant (XPV) cells were compared by the enzyme linked immunosorbent assay(ELISA) using two monoclonal antibodies. The results obtained so far indicate that (1) (6-4) photoproduct was excised from DNA faster than thymine dimer in normal cells, (2) XP cells excised neither (6-4) photoproduct nor thymine dimer, and (3) XP cell were deficient in the excision of (6-4) photoproduct but proficient in the excision repair of thymine dimer. The defective repair of (6-4) photoproduct in XPV cell may explain their highly mutable and transformable nature.

The labelling of the 64M-1 and TDM-1 antibodies with radioisotopes or fluorescence dyes made it possible to reace the excision kinetics of (6-4) photoproduct and thymine dimer in single cell. The experiment to follow the excision kinetics of such damage given at S phase in a cell through various phases is now in progress.▲ Less

Research Products (11 results)

All Other

All Publications (11 results)

[Publications] 松永 司,二階堂 修: トキシコロジフォーラム. 9. 419-427 (1986) ▼

[Publications] T.Mizuno,T.Matsunaga and O.Nikaido,: Photomed. Photobiol.9. (1988) ▼

[Publications] 鈴木 文男: 放射線科学. 31. 39-43 (1988) ▼

[Publications] T.Mori,T.Matsunaga T.Hirose and O.Nikaido: Mutation Research. ▼

[Publications] K.Suzuki,F.Suzuki M.Watanabe and O.: Cancer Research. ▼

[Publications] K.Suzuki,F.Suzuki,M.Watanabe and O.Nikaido: Cancer Research. ▼

[Publications] Tsukasa Matsunaga and Osamu Nikaido: "A monoclonal antibody recognizing (6-4) photoproduct in ultraviolet lightinduced DNA damage in human cells (In Japanese)" Toxicology Forum. 9. 419-427 (1986) ▼

[Publications] Terumi Mizuno, Tsukasa Matsunaga and Osamu Nikaido: "Establishment and characterization of a monoclonal antibody directed against thymine dimers in DNA." Photomedicine and Photobiology. 9. In press. (1988) ▼

[Publications] Fumio Suzuki: "Radiation oncogenesis: its multistep nature." Houshasen Kagaku (In Japanese). 31. 39-43 (1988) ▼

[Publications] Toshio Mori, Tsukasa Matsunaga, Tohoru Hirose and Osamu Nikaido,: "Establishment of a monclonal antibody recognizing ultraviolet lightinduced (6-4) photoproduct." Submitted to Mutation Research. ▼

[Publications] Keiji Suzuki, Fumio Suzuki, Masami Watanabe and Osamu Nikaido,: "Multistep nature of X-ray induced neoplastic transformation. 1. Stepwise changes in karyotypes." Submitted to Cancer Research. ▼

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-61440091/614400911987kenkyu_seika_hokoku_

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