



POSTER PRESENTATION

Open Access

Sensitive detection and apoptotic cell death induction of adult T-cell leukemia/lymphoma (ATL) cells with photodynamic actions

Takashi Oka^{1*}, Hirofumi Fujita², Lamia Abd Al-Kader¹, Ichiro Murakami³, Atae Utsunomiya⁴, Tadashi Yoshino¹

From 16th International Conference on Human Retroviruses: HTLV and Related Viruses
Montreal, Canada. 26-30 June 2013

Adult T cell leukemia/lymphoma (ATL) is an aggressive malignant disease of CD4 positive T lymphocytes caused by infection with human T cell leukemia virus type I (HTLV-I). HTLV-1 causes ATL in 3-5% of infected individuals after a long latent period of 40 to 60 years. The acute and lymphoma types are aggressive ATL characterized by resistance to chemotherapy and a poor prognosis. Leukemia/lymphoma cells and rapidly proliferating cells preferentially accumulate endogenous photosensitizer protoporphyrin IX (PpIX) when supplemented with 5-aminolevulinic acid (ALA). Treatment with 1mM ALA for 48h induced 10 to 100 times accumulation of PpIX in ATL leukemic cell lines and HTLV-I (+) T cell lines than that in healthy PBMCs. Specific induction of apoptosis was observed after 10 min light exposure (28 mW/cm²) using Na-Li lamp in ATL leukemic cell lines and HTLV-I (+) T cell lines. ATL patient PBMC specimen showed strong accumulation of PpIX with the treatment of ALA compared to the healthy donor and HTLV-I carrier PBMCs, which could be useful for the diagnostic purposes and monitoring the patient status with high sensitivity. Photodynamic therapy is potentially hopeful treatment especially for lymphoma type ATL as a relatively selective, minimal or no scarring, non-invasive, safe, simultaneous and repeatable multiple lesions treatable modality.

Authors' details

¹Department of Pathology, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, Okayama, Japan.

²Department of Cytology and Histology, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, Okayama, Japan.

³Department of Molecular Pathology, Tottori University Medical School,

* Correspondence: oka@md.okayama-u.ac.jp

¹Department of Pathology, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, Okayama, Japan

Full list of author information is available at the end of the article

Yonago, Japan. ⁴Department of Hematology, Imamura Bun-in Hospital, Kagoshima, Japan.

Published: 7 January 2014

doi:10.1186/1742-4690-11-S1-P5

Cite this article as: Oka et al.: Sensitive detection and apoptotic cell death induction of adult T-cell leukemia/lymphoma (ATL) cells with photodynamic actions. *Retrovirology* 2014 **11**(Suppl 1):P5.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

