KORTUC Related Reference List:

Clinical Trial

Nimalasena S, *et al*. Intratumoral hydrogen peroxide with radiation therapy in locally advanced breast cancer: Results from a Phase 1 clinical trial. Int J Radiat Oncol Biol Phys. 2020 Nov; 15 108(4): 1019-1029

Clinical Research

Tsuzuki A, *et al.* Evaluation of changes in tumor shadows and micocalcifications on mammography following KORTUC II, a new radiosensitization treatment without any surgical procedure for elderly patients with stage I and II breast cancer. Cancers (Basel). 2011 Sep; 3(3): 3496-3505

Yaogawa S, *et al.* Serial assessment of therapeutic response to new radiosensitization treatment Kochi Oxydol-Radiation Therapy for Unresectable Carcinomas, Type II (KORTUC II), in patients with stage I/II breast cancer using breast contrast-enhanced magnetic resonance imaging. Cancers (Basel). 2015 Dec; 8(1)

Hayashi N, *et al.* Computed tomography demonstration of the production of oxygen gas following intratumoral injection of a new radiosensitizer (KORTUC) for patients with breast cancer – Is intratumoral injection not an ideal approach to solve the major problem of tumor hypoxia in radiotherapy? Cancers (Basel). 2016 Apr; 8(4): 43

Nimalasena S, *et al.* Tumour reoxygenation after intratumoural hydrogen peroxide (KORTUC) injection: a novel approach to enhance radiosensitivity. BJC Rep. 2024 Oct 8;2(1):78. doi: 10.1038/s44276-024-00098-y.

Clinical Experience

Ogawa Y, *et al.* New radiosensitization treatment (KORTUC I) using hydrogen peroxide solution-soaked gauze bolus for unresectable and superficially exposed neoplasms. Oncol Rep. 2008 June; 19(6): 1389-1394

Ogawa Y, *et al.* Phase I study of a new radiosensitizer containing hydrogen peroxide and sodium hyaluronate for topical tumor injection: A new enzyme targeting radiosensitization treatment Kochi Oxydol-Radiation Therapy for Unresectable Carcinomas, Type II (KORTUC II). Int J Oncol. 2009 Mar; 34(3): 609-618

Hitomi J, *et al.* Non-surgical therapy and radiologic assessment of stage I breast cancer treatment with novel enzyme-targeting radiosensitization – Kochi Oxydol-Radiation Therapy for Unresectable Carcinomas, Type II (KORTUC II). Exp Ther Med. 2010 Sep; 1(5): 769-775

Miyatake K, *et al.* Non-surgical care for locally advanced breast cancer: Radiologically assessed therapeutic outcome of a new enzyme-targeting radiosensitization treatment, Kochi Oxydol-Radiation Therapy for Unresectable Carcinomas, Type II (KORTUC II) with systemic chemotherapy. Oncol Rep. 2010 Nov; 24(5) Sep: 1161-1168

Ogawa Y, *et al.* Safety and effectiveness of a new enzyme-targeting radiosensitization treatment (KORTUC II) for intratumoral injection for low-LET radioresistant tumors. Int J Oncol. 2011 Sep; 39(3): 553-560

Aoyama N, *et al.* Therapeutic response to a new enzyme-targeting radiosensitization treatment (KORTUC-SC) for patients with chemotherapy resistant supraclavicular lymph node metastasis. J Cancer Res & Ther. 2013 Oct; 1(9): 215-219

Nishioka A, *et al.* Safety and efficacy of image-guided enzyme-targeting radiosensitization and intraoperative radiotherapy for locally advanced unresectable pancreatic cancer. Oncol Lett. 2014 Jul; 8(1): 404-408

Ogawa Y, *et al.* Non-surgical breast-conserving treatment (KORTUC-BCT) using a new radiosensitization method (KORTUC II) for patients with stage I or II breast cancer. Cancers (Basel). 2015 Nov; 7(4): 2277-2289

Aoyama N, *et al.* Possible adverse events of non-surgical breast-conserving treatment (KORTUC-BCT) using a new radiosensitization method (KORTUC II) for patients with stage I and II breast cancer. Cancer Res & Oncol. 2016 ; 2(2): 014

Aoyama N, *et al.* Therapeutic response to a novel enzyme-targeting radiosensitization treatment (Kochi Oxydol-Radiation Therapy for Unresectable Carcinomas) in patients with recurrent breast cancer. Oncol Lett. 2016 Jul; 12(1): 29-34

Aoyama N, *et al.* Therapeutic response to a novel enzyme-targeting radiosensitization treatment (KORTUC II) for residual lesions in patients with stage IV breast cancer, following induction

chemotherapy with epirubicin and cyclophosphamide or taxane. Oncol Lett. 2017 Jan; 13(1): 69-76

Aoyama N, *et al.* Therapeutic results of an enzyme-targeting radiosensitization treatment, Kochi Oxydol-Radiation Therapy for Unresectable Carcinomas, in patients with stage I primary breast cancer, Oncol Lett. 2017 Jun; 13(6): 4741-4747

Shibamoto Y, *et al.* Definitive radiotherapy with SBRT or IMRT boost for breast cancer : Excellent local control and cosmetic outcome. Technol Cancer Res Treat. 2018 Aug; 17: 1-7
Mio Nakata, *et al.* High-dose-rate interstitial brachytherapy with hypoxic radiosensitizer KORTUC II for unresectable pelvic sidewall recurrence of uterine cervical cancer: a case report. J Contemp Brachytherapy. 2020 Dec;12(6):606-611. DOI: 10.5114/jcb.2020.101695

Shiro Obata, *et al.* Actual practice of Kochi oxydol radiation therapy for unresectable carcinomas by intra-tumoral administration of hydrogen peroxide as a radiosensitizer. Mol Clin Oncol. 2022 Mar;16(3):68.

Shimbo T, *et al.* KORTUC, a novel hydrogen peroxide-based radiosensitizer for the enhancement of brachytherapy in patients with unresectable recurrent uterine cervical cancer. Oncol Lett. 2023 Jul 20;26(3):378. doi: 10.3892/ol.2023.

Basic Research (Cellular Level)

Ogawa Y, *et al.* Mechanism of apoptotic resistance of human osteosarcoma cell line, HS-Os-1, against irradiation. Int J Mol Med. 2003 Oct; 12(4): 453-458

Ogawa Y, *et al.* Apoptotic-resistance of the human osteosarcoma cell line HS-Os-1 to irradiation is converted to apoptotic-susceptibility by hydrogen peroxide: a potent role of hydrogen peroxide as a new radiosensitizer. Int J Mol Med. 2003 Dec; 12(6):845-850

Ogawa Y, *et al.* Reactive oxygen species-producing site in radiation-induced apoptosis of human peripheral T cells: Involvement of lysosomal membrane destabilization. Int J Mol Med. 2004 Jan; 13(1): 69-73

Ogawa Y, *et al.* Comparison of radiation-induced reactive oxygen species formation in adult articular chondrocytes and that in human peripheral T cells: Possible implication in radiosensitivity. Int J Mol Med. 2003 Apr; 11(4): 455-459

Kariya S, *et al.* Combination treatment of hydrogen peroxide and X-rays induces apoptosis in human prostate cancer PC-3 cells. Int J Radiat Oncol Bio Phys. 2009 Oct; 75(2): 449-454

Fang Y. Hydrogen peroxide enhances radiation-induced apoptosis and inhibition of melanoma cell proliferation. Anticancer Res. 2013 May; 33(5): 1799-1807

Fujita S, *et al.* Apoptotic induction mechanism of X-ray irradiation combined with hydrogen peroxide. Radiat Environ & Med. 2019 Apr; 8(2): 85-93

Abbasi A, *et al.* Hyaluronic acid optimises therapeutic effects of hydrogen peroxide-induced oxidative stress on breast cancer. J Cellular Physiol. 2021 Feb; 236(2): 1494-1514

Basic Research (Animal Model)

Tokuhiro S, *et al.* Development a novel enzyme-targeting radiosensitizer (KORTUC) containing hydrogen peroxide for intratumoral injection for patients with low linear energy transfer radioresistant neoplasms. Oncol Lett. 2010 Nov; 1(6): 1025-1028

Akima N, *et al.* New enzyme-targeting radiosensitizer (KORTUC) containing hydrogen peroxide & sodium hyaluronate for intra-tumoral injection using mice transplanted with SCCVII tumor. Int J Cancer Res Clin Oncol. 2016 Mar; 3(2): 048

Morita-Tokuhiro S, *et al.* Development of a novel enzyme-targeting radiosensitizer (New KORTUC) using a gelatin-based hydrogen instead of a sodium hyaluronate. Cancers (Basel). 2016 Jan; 8(1)

Takaoka T, *et al.* Biological effects of hydrogen peroxide administered intratumorally with or without irradiation in murine tumors. Cancer Sci. 2017 Sep; 108(9): 1787-1792

Iwashita T, *et al.* Endoscopic ultrasound-guided fine needle injection of hydrogen peroxide into the pancreas: Feasibility and tolerability study using survival porcine model. Ultrasound Med Sci. 2019 Feb; 45(2): 579-585

Kemmotsu N, *et al.* Combination therapy with hydrogen peroxide and irradiation promotes an abscopal effect in mouse models. Cancer Sci. 2023 Oct;114(10):3848-3856. doi: 10.1111/cas.15911.

Review

Ogawa Y. Paradigm shift in radiation biology/radiation oncology – Exploitation of the “H2O2” effect for radiotherapy using Low-LET (Linear energy transfer) radiation such as X-rays and high-energy electrons. Cancers. 2016 Feb; 8(3):28