GERMAN CANCER RESEARCH CENTER
IN THE HELMHOLTZ ASSOCIATION

50 Years – Research for
A Life Without Cancer

Office of
Technology Transfer

TECHNOLOGY OFFER

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Title	**Iron Chelators in Tumor Therapy**
P-No.	**1361**
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Technology Summary	The Technology represent a pharmaceutically compatible iron chelator or a pro-drug thereof for use in treating and/or preventing cancer in a patient suspected or known to comprise hypoxic cancer cells, and use in treatment and/or prevention of a human papillomavirus (HPV) related lesion. The technology further allows the use of an iron chelator or prodrug thereof for inducing senescence in a cancer cell, preferably a hypoxic cancer cell; and to a method for inducing an irreversible proliferation arrest in cancer cells comprising a) contacting said cancer cells with an iron chelator or prodrug thereof and, thereby, b) inducing an irreversible proliferation arrest in said cancer cells.
Detailed Technology Description	A common dogma of cancer physiology is that cancer cells exhibit higher intracellular iron levels than normal cells, which is believed to facilitate both initiation and growth of a tumor. On the one hand, via the Fenton reaction, intracellular iron induces the production of reactive oxygen species and therefore increased iron levels can facilitate the initiation of a tumor. On the other hand, cancer cells strongly depend on the activity of the iron dependent enzyme ribonucleotide reductase, which is necessary for DNA synthesis and thus proliferation. Also, other iron-dependent enzymes have been implicated in the cancer-promoting effect of iron, e.g. Deoxyhypusine Hydroxylase or Wnt-Signaling. In tumors, frequently very low oxygen concentrations are present due to abnormalities of

tumor microvasculature and diffusion limitations; e.g. in cervical cancer, the median oxygen concentration is about 1.2%. Notably, although in hypoxic areas of cervical cancer E6 and E7 are repressed, cancer cells do not undergo efficient senescence, since the mTOR pathway necessary for senescence is impaired. Another obstacle in targeting hypoxic areas of cancer is that the resistance of cancer cells towards chemotherapy (CT) or radiotherapy (RT) increases with decreasing oxygen concentrations. Thus, efficient CT and RT are limited to tumor sections with good oxygen supply.

Ciclopirox (CPX) is clinically used as a topical antifungal agent to treat mycoses of the skin and nails. Although its exact mechanism of action is unclear, it is known to chelate intracellular iron and anti-tumor properties have been reported. There is, thus, a need in the art for improved methods for treating tumors, in particular tumors having hypoxic sections in which chemotherapy and radiotherapy are ineffective. Our technology provides means and methods to comply with the aforementioned needs.

Tags or Keywords **Iron chelator, HPV, tumor therapy**

Technology Benefit Iron chelator in tumor therapy

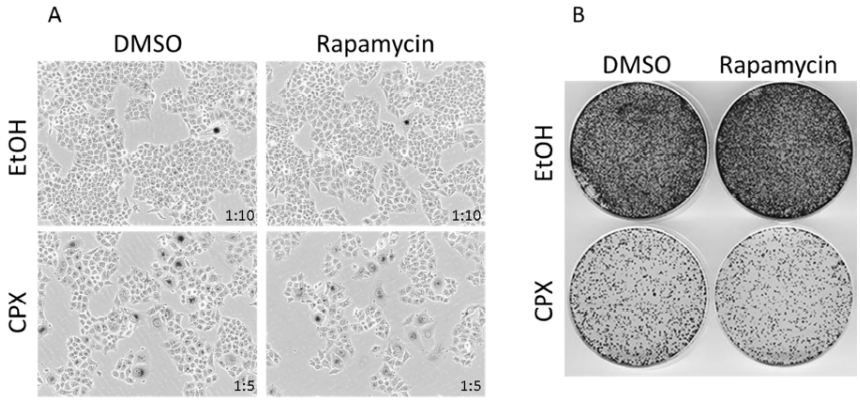
Technology Applications Pharmaceutical composition, therapy, oncology, HPV lesions

Technology page URL https://www.dkfz.de/en/techtrans/availabletechnologies/index.html

TTO homepage URL

Link https://www.dkfz.de/en/techtrans/

Thumpnail images



Patents

Patent Number	Title	Link
EP AZ 17203391.2	Iron Chelators in Tumor Therapy	
Issue Date	**Publication Date**	**Application Date**
		November 23, 2017

Additional Fields

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