Targeting Nuclear Envelope Repair Cancer Discovery

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Targeting Nuclear Envelope Repair Cancer

Migrating cancer cells undergo repeated rupture of the protective nuclear envelope as they squeeze through small spaces in the surrounding tissue, compromising genomic integrity. Inhibiting both general DNA repair and the mechanism that seals these tears may enhance cell death and curb metastasis.

Targeting Nuclear Envelope Repair | Cancer Discovery

targeting nuclear Envelope repair Two recent studies—from Cornell University in Ithaca, NY, and Institut Curie in Paris, France—have shown that migrating cancer cells undergo repeated rupturing of the nuclear envelope (NE) as they

squeeze through tiny pores in the surrounding connective tissue. Blocking the efficient repair of these

Targeting Nuclear Envelope Repair - Cancer Discovery

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spaces in the surrounding tissue, compromising genomic integrity. Inhibiting both general DNA repair and the mechanism that seals these tears may enhance cell death and curb metastasis.

Targeting Nuclear Envelope Repair.

However, Raab et al. and Denais et al.

show that migrating immune and cancer cells experience frequent and transitory nuclear envelope ruptures when they move through tight spaces (see the...

Nuclear envelope rupture and repair during cancer cell ...

Nuclear envelope rupture and repair during cancer cell migration.

minimallevelsduringthemalaria parasiteblood phase, which relies solely on aerobic glycolysis...

Nuclear envelope rupture and repair during cancer cell ...

For example, targeting factors necessary for nuclear membrane repair could prevent some cancer cells from

surviving migration." The study suggests that while BAF facilitates the repair of large membrane ruptures, in part by recruiting transmembrane nuclear envelope proteins, while small ruptures are repaired by a BAF-independent mechanism.

A (BAF)ling story of nuclear

envelope repair

Nuclear envelope rupture and repair during cancer cell migration During cancer metastasis, tumor cells penetrate tissues through tight interstitial spaces, which requires extensive deformation of the cell and its nucleus. Here, we investigated mammalian tumor cell migration in confining

microenvironments in vitro and in vivo.

Nuclear envelope rupture and repair during cancer cell ...

Nuclear morphology is often altered in cancer. Irregularity in nuclear contours is a feature used by pathologists in diagnostic cytology. The nuclear envelope provides a specialized ...

The nuclear envelope environment and its cancer ...

Targeting nuclear EGFR via the selective COX-2 Inhibitor Celecoxib. The COX-2 inhibitor Celecoxib has demonstrated radiosensitizing effects in various tumors [64, 65]. Interestingly, anti-tumor effects of Celecoxib treatment have been

observed in cell lines that did not express COX-2 to a high degree [66, 67].

Nuclear EGFR as a Molecular Target in Cancer

The NE is an important target of the apoptotic machinery. Caspase-dependent targeting of the nuclear envelope increases nuclear envelope

permeability to cytosolic apoptogenic factors, which then...

The nuclear envelope: target and mediator of the apoptotic ...

Several malignancies, including lung cancer, feature overexpression of these nuclear transport receptors. Pharmacologic targeting of this process

has demonstrated antitumor efficacy. In this review article, we describe the mechanism, function, and therapeutic targeting of nuclear transport, with particular focus on application in lung cancer.

Therapeutic Targeting of Nuclear Export Inhibition in Lung ...

Nuclear envelopes of breast cancer cells rupture when the cells migrate through a microfluidic device. Green fluorescent protein spills from the ruptured nucleus into the cytoplasm, then is reimported into the nucleus once the nuclear envelope has been restored. Rachel Gilbert, Lammerding Lab, Cornell University.

Migration creates cancer cell vulnerabilities | National ...

While NE rupture, and resulting genomic instability, may promote cancer progression, it may also represent a particular weakness of metastatic cancer cells and an opportunity to develop novel anti-metastatic drugs by

specifically targeting these cells, for example, by blocking NE repair and inhibiting DNA damage repair.

Nuclear envelope rupture and repair during cancer cell ...

So if we can block the mechanisms that allow them to repair themselves, then we potentially could target metastatic

cancer cells." In a study published in the journal Science, researchers analyzed 2 factors in the cellular migration process, focusing on the cell's damaged DNA and the rupturing of the nuclear envelope.

Cancer Cell Repair Mechanism May Lead to New Treatments

A new study led by Cornell University

engineers finds that cancer cells have a resilient ability to repair themselves, but the nuclear deformation and rupture can compromise the genomic integrity...

Cancer cells show resilient nuclear rupture repair, but ...

Cell migration through tight spaces can induce substantial deformations of the

nucleus and cause nuclear envelope (NE) rupture, resulting in uncontrolled exchange of nuclear and cytosolic proteins. These events can cause DNA damage and, in severe cases, nuclear fragmentation, challenging the integri ...

Consequences of a tight squeeze: Nuclear envelope rupture ...

A cancer cell that squeezes through a constricted space undergoes deformation and, occasionally, rupture of the nuclear envelope, which can have consequences on the cell's genomic integrity. Because they have narrow bodies and no collarbones, mice are able to squeeze through holes as small as a quarter-inch in diameter.

Cancer cells' ability to self-repair may spawn new ...

Thus the survival of cells migrating through confined environments appears to depend on efficient nuclear envelope and DNA repair machineries. Aberrant nuclear envelope breakdown has also been observed in laminopathies and in

cancer cells leading to mislocalization of cellular proteins, the formation of micronuclei and genomic instability.