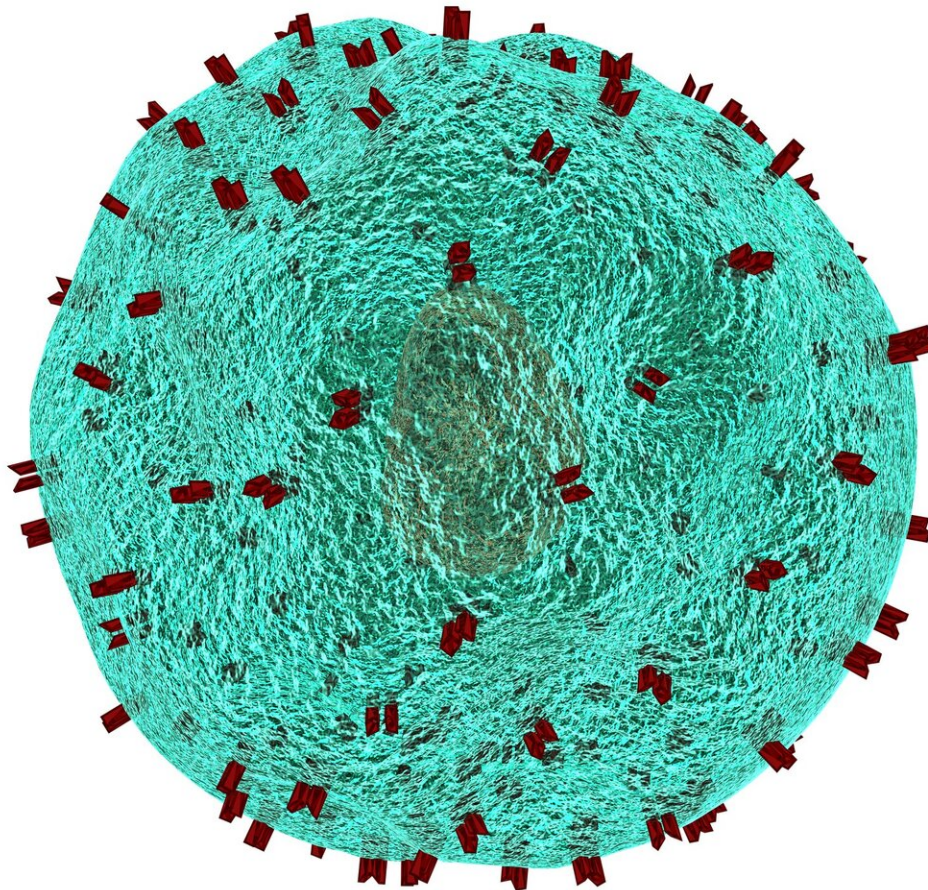


# Cells protect themselves against stress by keeping together

January 16 2020

---



Credit: CC0 Public Domain

Cell-to-cell contacts are necessary for the survival of human cells under protein-damaging conditions and stress. This was one of the conclusions made by a research team working under the leadership of Lea Sistonen, Professor in Cell and Molecular Biology at Åbo Akademi University. The results of their research were recently published in the *Cell Reports* journal.

The researchers were surprised by the findings because the molecules they studied are usually linked with other cellular functions.

"Our results show, for the first time, that the contacts between cells, known as [cell adhesion](#), are essential for cells to survive stress. The findings also suggest that impaired cell adhesion may sensitize cancer cells to drugs that damage cell proteins and cause stress," Sistonen explains.

The research project focused on heat shock factor 2 (HSF2), a specialized gene regulating protein, and its impact on cells' capacity to survive protein-damaging stress. Protein-damaging stress is caused by, for example, high temperatures, virus infections and certain anti-cancer medications.

The results showed that HSF2 contributes to protecting cells against stress by regulating those genes that mediate cell adhesion contacts.

The results were obtained by studying, among other things, how cancer cells respond to certain commonly used [anti-cancer drugs](#). Cancer cells with impaired cell adhesion contacts were significantly less successful in surviving the [drug treatment](#) than the cells showing intact cell adhesion.

"Cell-to-cell contacts are essential for normal tissue functioning and mechanisms. Cancer [cells](#) are known to utilize these contacts to form aggressive tumours and metastases. Our results show, indeed, that [cancer cells](#) become more vulnerable to drug treatment, when their cell contacts are weakened," says Sistonen.

"Cell adhesion contacts are mediated by proteins known as cadherins, which serve as the source of message chains regulating cell death, but understanding of the molecular basis for these processes calls for further research. Individual differences in these particular cell processes may partly explain why certain drugs work effectively for some patients but not for others."

**More information:** Jenny Joutsen et al, Heat Shock Factor 2 Protects against Proteotoxicity by Maintaining Cell-Cell Adhesion, *Cell Reports* (2020). [DOI: 10.1016/j.celrep.2019.12.037](https://doi.org/10.1016/j.celrep.2019.12.037)

Provided by Abo Akademi University

Citation: Cells protect themselves against stress by keeping together (2020, January 16) retrieved 19 April 2024 from <https://phys.org/news/2020-01-cells-stress.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.