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https://www.gesundheitsindustrie-bw.de/en/article/press-release/knowledge-connector-better-clinical-decisions-molecular-precision-oncology

Knowledge Connector: better clinical decisions in molecular precision oncology

Researchers at the National Center for Tumor Diseases (NCT) Heidelberg and the German Cancer Research Center (DKFZ) have developed a digital tool that significantly accelerates and improves clinical decisions in molecular precision oncology. The Knowledge Connector enables the structured and standardized evaluation of very extensive molecular tumor profiles and makes them available for personalized therapy decisions faster than before. Developed in the DKFZ/NCT/DKTK MASTER program, the Knowledge Connector has been in use at several NCT locations and other leading oncology centers since 2022.

The National Center for Tumor Diseases (NCT) Heidelberg is a joint institution of the German Cancer Research Center (DKFZ), Heidelberg University Hospital (UKHD), Heidelberg University Medical Faculty, and Thoraxklinik Heidelberg.

The increasingly rapid and comprehensive molecular diagnostics based on "omics" data are creating a previously unknown level of detail in the characterization of tumors. The artificial word "omics" refers to the analysis of complex biological data sets, such as DNA, RNA, or proteins. The resulting very large amounts of data open up the possibility of additional individualized treatment approaches for patients.

At the same time, the enormous amounts of data pose a challenge for practitioners: they exceed the capacity of conventional evaluations and lead to a bottleneck in clinical decision-making. This is precisely where the Knowledge Connector comes in as a powerful IT solution for visualization and decision support in molecular precision oncology. It bundles and aggregates information, integrates current global expertise, and supports evidence-based analyses by molecular tumor boards.

Peter Horak, Department of Translational Medical Oncology at DKFZ and NCT Heidelberg, is one of the senior authors of the study. He says: "The Knowledge Connector allows us to quickly and reliably translate complex molecular profiles of patients into clinical treatment recommendations. This saves us crucial time in offering individually tailored therapies."

An interdisciplinary team developed the Knowledge Connector in the DKFZ/NCT/DKTK MASTER program. Specialists from molecular precision oncology, clinical care, bioinformatics, and IT were involved. The result is a digital tool that provides the relevant findings from the omics data sets in a compact, clear display.

The Knowledge Connector benefits from an active specialist community: they contribute their knowledge, while at the same time utilizing the constantly growing knowledge base, thus driving a cycle. This makes the system better and better and increases its acceptance among users. Lead author Daniel Hübschmann, head of the Computational Oncology working group at DKFZ and NCT Heidelberg, says: "From a bioinformatics perspective, the Knowledge Connector stands out because it not only integrates large amounts of data, but also structures, standardizes, and prepares it for reuse. With each case processed, our knowledge base grows and continues to gain value."

The Knowledge Connector has been in use since 2022 – starting at NCT Heidelberg and now also at the NCT locations in Dresden, Berlin, and WERA (Augsburg). The application is also being tested at the Comprehensive Cancer Center Hamburg. To date, more than 2,000 patient cases have been processed by the Knowledge Connector in the molecular tumor board.

Stefan Fröhling, Head of the Department of Translational Medical Oncology at the DKFZ and Managing Director at NCT Heidelberg, says: "With the Knowledge Connector, we have developed a tool that combines molecular diagnostics with IT solutions to create a powerful clinical decision-making aid. Its development was only possible thanks to a great deal of personal commitment and a joint effort." Following its successful launch, the team behind the Knowledge Connector aims to consolidate its further development with new staff and roll out the system throughout the NCT and the German Consortium for Translational Cancer Research (DKTK).

Publication:

Daniel Hübschmann, Simon Kreutzfeldt, Benjamin Roth, Katrin Glocker, Janine Schoop, Lena Oeser, Steffen Hausmann, Christian Koch, Sebastian Uhrig, Jennifer Hüllein, Barbara Hutter, Martina Fröhlich, Christoph E. Heilig, Maria-Veronica Teleanu, Daniel B. Lipka, Irina A. Kerle, Annika Baude, Katja Beck, Christoph Heining,

Hanno Glimm, Frank Ückert, Alexander Knurr, Stefan Fröhling, Peter Horak. Knowledge Connector: Decision support system for multiomics-based precision oncology. Nature Communications; https://doi.org/10.1038/s41467-026-68333-3

Press release

22-Jan-2026
Source: Deutsches Krebsforschungszentrum (DKFZ)

Further information

- German Cancer Research Center (DKFZ)