HARMONY ALLIANCE

Bigdataforbloodcancer
Revolutionizing the use of big data in Hematologic Malignancies research
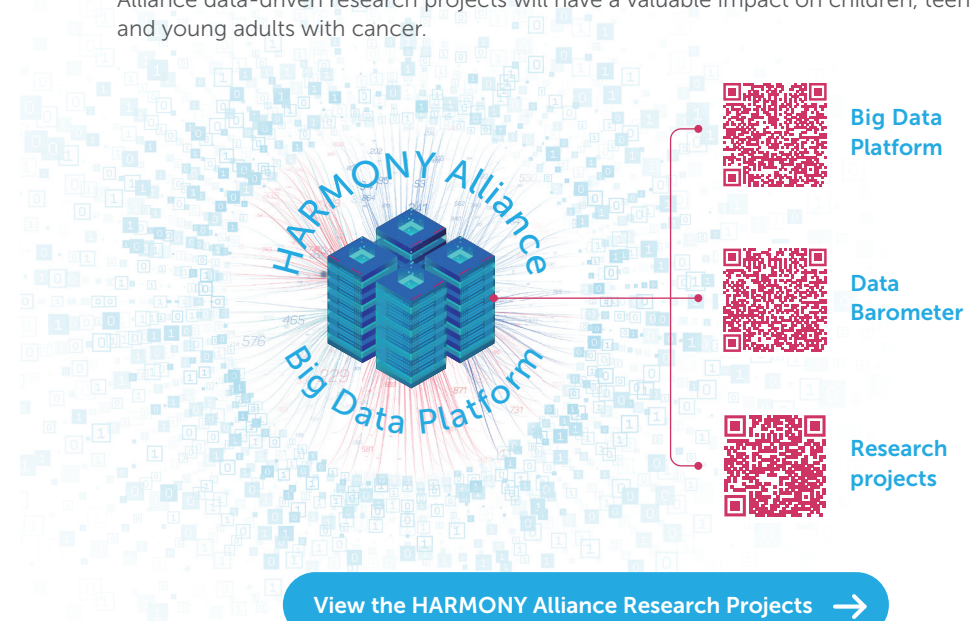
Data innovation in hematology
Big Data, machine learning, artificial intelligence, synthetic data – holds tremendous promises for advancing childhood cancer research.

When the HARMONY Alliance started in 2017, the hematology community was embarking on a journey towards embracing data sharing and recognizing the transformative power of big data. HARMONY set a crucial milestone when this endeavor was only starting. By laying the foundation for future collaborations, advancements, and discoveries that would incorporate state-of-the-art technologies in the field of hematology, HARMONY is making its contribution to improve the understanding and treatment of blood disorders. Now, just seven years later with 128 partners from 28 countries, we have transformed both the sharing and use of data. We have developed the Big Data Platform with a data lake that has identified over 179,000 patient records. All data is protected using a unique anonymization and security process.

In more than 33 research projects, groundbreaking research is being carried out with the help of advanced customized data analytic services, including AI modelling.

The EU grant phase (European Commission's Innovative Health Initiative, IHI) that made this possible has ended per March 2024. Thanks to the strong commitment and drive of our Partners and Associated Members, we have the unique opportunity to continue our work as a non-profit, collaborative research foundation. The HARMONY Alliance Foundation will build upon the achievements of the HARMONY Alliance (HARMONY and HARMONY PLUS).

HARMONY ALLIANCE FOUNDATION

Answering key outstanding questions

In recent decades, diagnosis and treatment of Hematologic Malignancies have substantially improved, but many remain incurable. The key outstanding questions in blood cancer research can only be answered by studying large numbers of patients. Therefore, the HARMONY Alliance has developed a unique research infrastructure to facilitate Big Data research in the field of Hematologic Malignancies (HM). Young Pediatric HM patients, children with blood cancer, still have their lives ahead of them. HARMONY Alliance data-driven research projects will have a valuable impact on children, teenagers and young adults with cancer.

HARMONY Alliance Big Data Platform

Big Data Platform

Data Barometer

Research projects

View the HARMONY Alliance Research Projects →

harmony-alliance.eu

imi innovative medicines initiative | efpia

Pediatric HM | ALL data-driven research projects

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Use of Big Data to improve outcomes for patients with Acute Lymphoblastic Leukemia

Research challenge:
To generate sufficient data from patients with ALL within the HARMONY Big Data Platform to enable a thorough analysis of potential biomarkers associated with prognosis and their interaction with treatment outcomes. The initiation and progression of Acute Lymphoblastic Leukemia (ALL) is regulated by a wide spectrum of chromosomal and genetic abnormalities. Despite excellent prognosis in children and young adults with ALL, the situation in older adults (>25 years) is more challenging and there is a need to improve the risk stratification algorithms to optimize patient treatment and outcomes.

Results published by researchers of the HARMONY Alliance in **Nature Leukemia**

Exploring the prognostic significance of minimal residual disease (MRD) in children with ALL

Research challenge:
Quantification of minimal residual disease (MRD) is a cornerstone of treatment response assessment and risk stratification in acute lymphoblastic leukemia (ALL), and the prognostic impact of MRD at different time points has been investigated across many therapeutic protocols. However, at present, there remains a lack of established prognostic biomarkers for risk stratification, especially in T-ALL, which reflect the underlying disease burden. Additionally, apart from absolute MRD values, the combined evaluation of MRD, and the analysis of log reduction rates between different time points, reflecting the different blast clearance kinetics and possibly different underlying biology, is still an issue that has not been addressed and fully evaluated. This study aims to determine whether the combination of MRD values, and evaluation of the leukemia burden decrease by log-reduction rates, may provide a new tool for predicting relapse and patient outcomes in both B-cell and T-cell ALL.

Harnessing the Power of Big Data to Predict Outcomes Post-Stem Cell Transplant in ALL

Research challenge:
Stem cell transplant (SCT) is a key approach to treating acute lymphoblastic leukemia (ALL) but estimating and predicting survival and other outcomes post-SCT remains difficult, particularly for patients with relapsed/refractory (R/R) disease. Current datasets are sporadic and variable, tend to focus on de novo rather than R/R ALL and often contain clinical information that is decades old.

Exploring treatment patterns and outcomes in B-ALL patients

Research challenge:
Older adults (>55 years) represent an important part of the overall B-precursor acute lymphoblastic leukemia (B-ALL) patient population, however, only limited data are currently available on prognosis and treatment outcomes. Because existing datasets are sporadic and variable, it can be difficult for physicians to make optimal clinical management decisions for their older B-ALL patients.

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