



Peripheral Blood Immune Landscape and NXPE3 as a Novel Biomarker for Hypertensive Intracerebral Hemorrhage Risk Prediction and Targeted Therapy

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Introduction

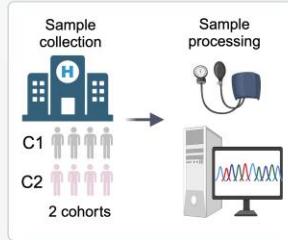
- ❑ Hypertensive intracerebral hemorrhage (ICH) has a high incidence and mortality rate.
- ❑ Currently, there is still a significant gap in the early identification and prediction of ICH risk.
- ❑ Immune and inflammatory responses play a key role in the progression of ICH.

Highlights

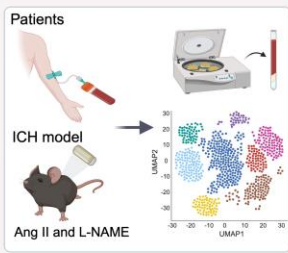


Transcriptome sequencing

Bulk-seq | 130 Peripheral blood samples from patients across cohort 1 and cohort 2

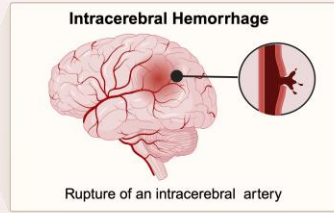


scRNA-seq | Peripheral blood samples from 13 patients and 6 mouse models

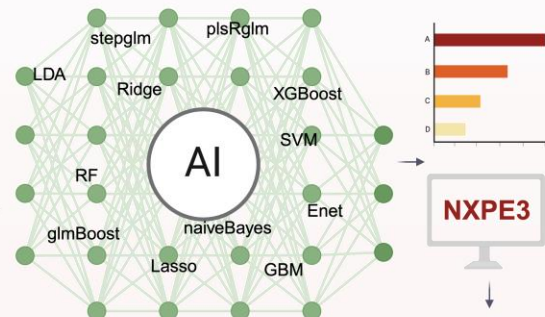


Hypertensive Intracerebral Hemorrhage

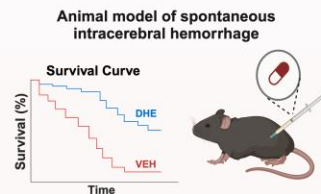
Immune Landscape and Prediction



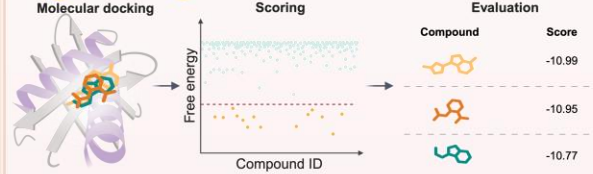
Biomarker Identification



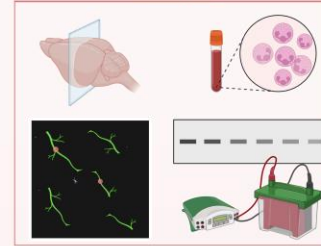
Experimental validation



Drug screening

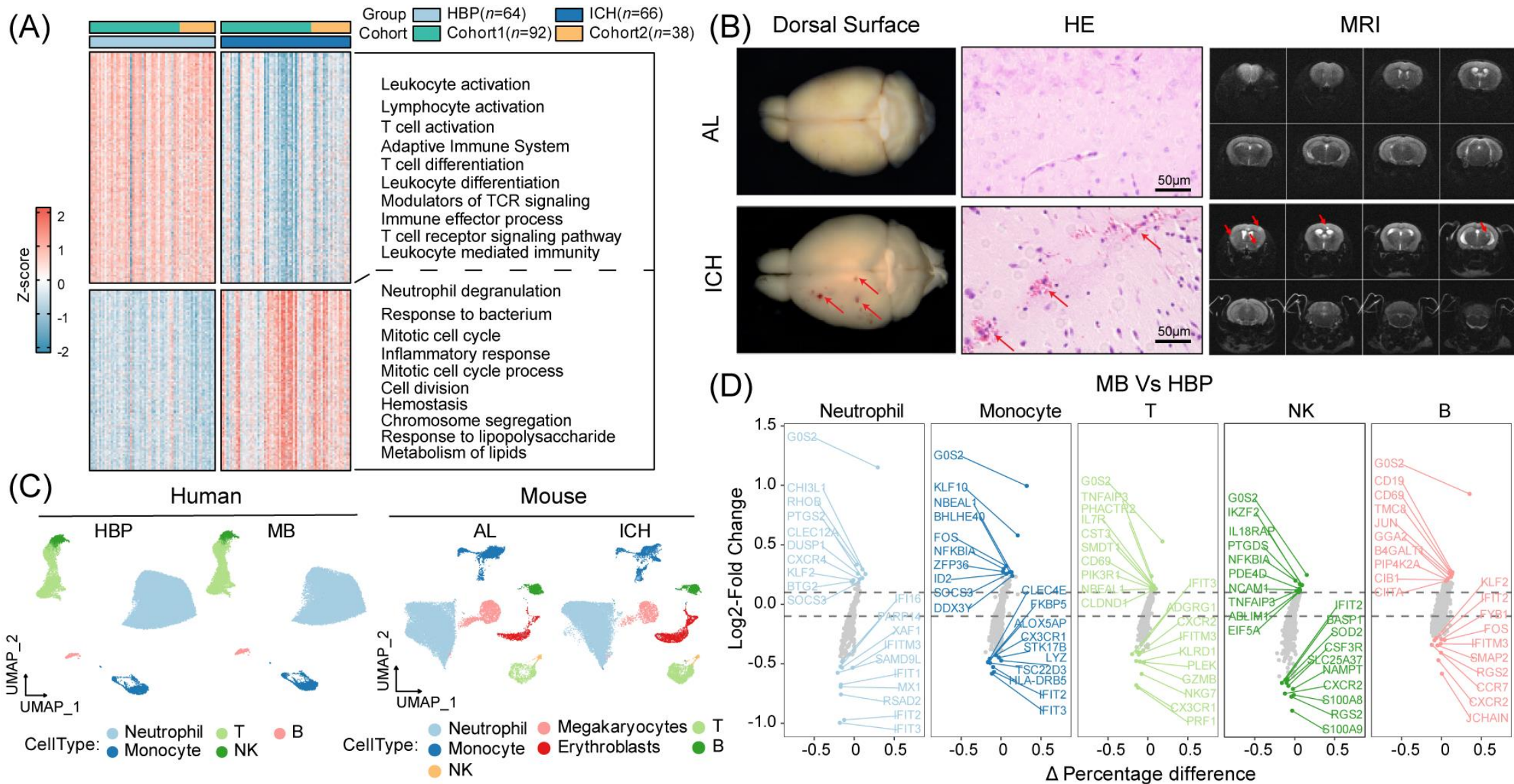


Phenotyping



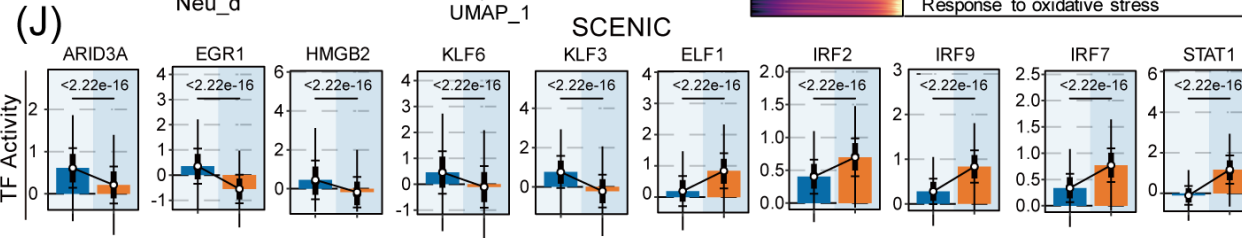
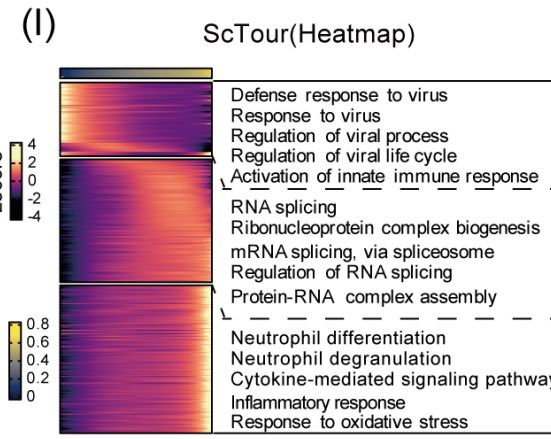
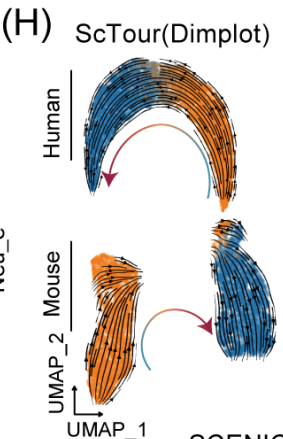
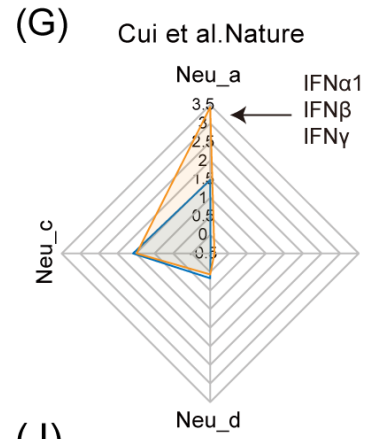
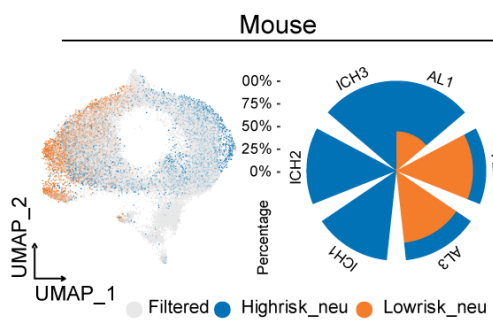
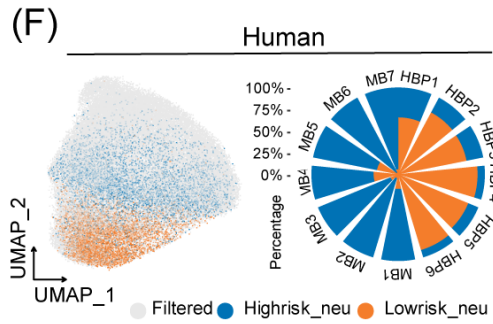
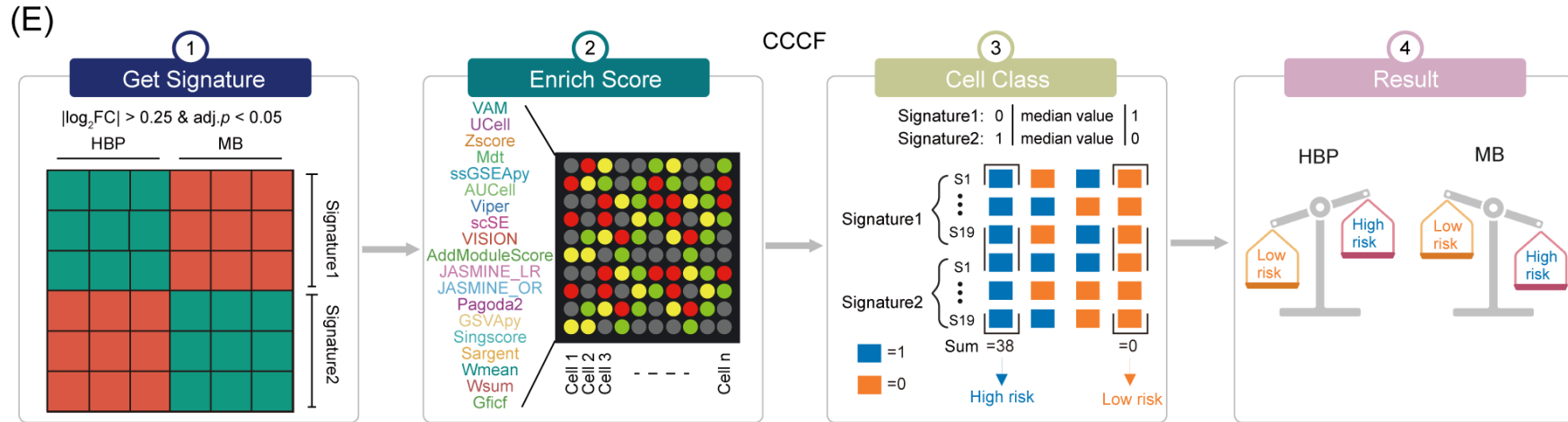
- ❑ Analyzing immune dysregulation in ICH patients
- ❑ Constructing an ICH risk prediction model and identifying NXPE3 as a potential therapeutic target
- ❑ Demonstrating that Dihydroergotamine (DHE) has a strong binding affinity with NXPE3
- ❑ Validating that DHE can reduce the incidence of spontaneous ICH and regulate immune-inflammatory responses

Results



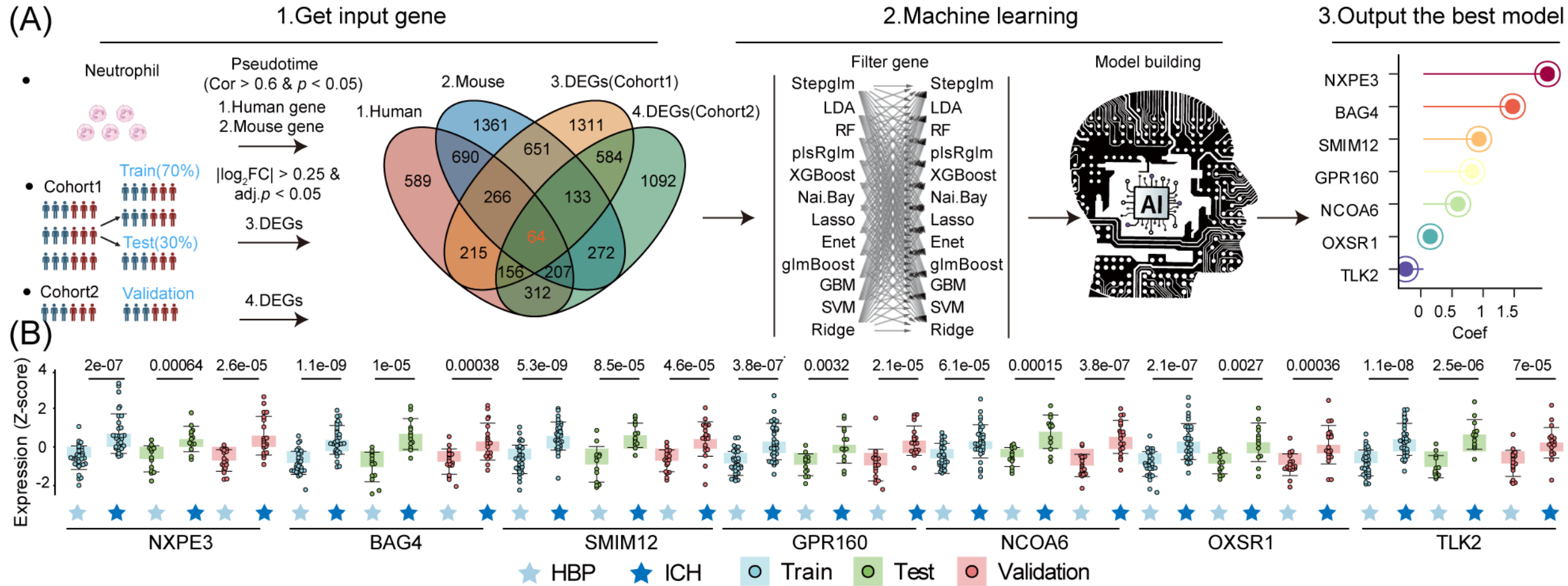
Peripheral blood immune cell profiling and transcriptional disturbances

Results



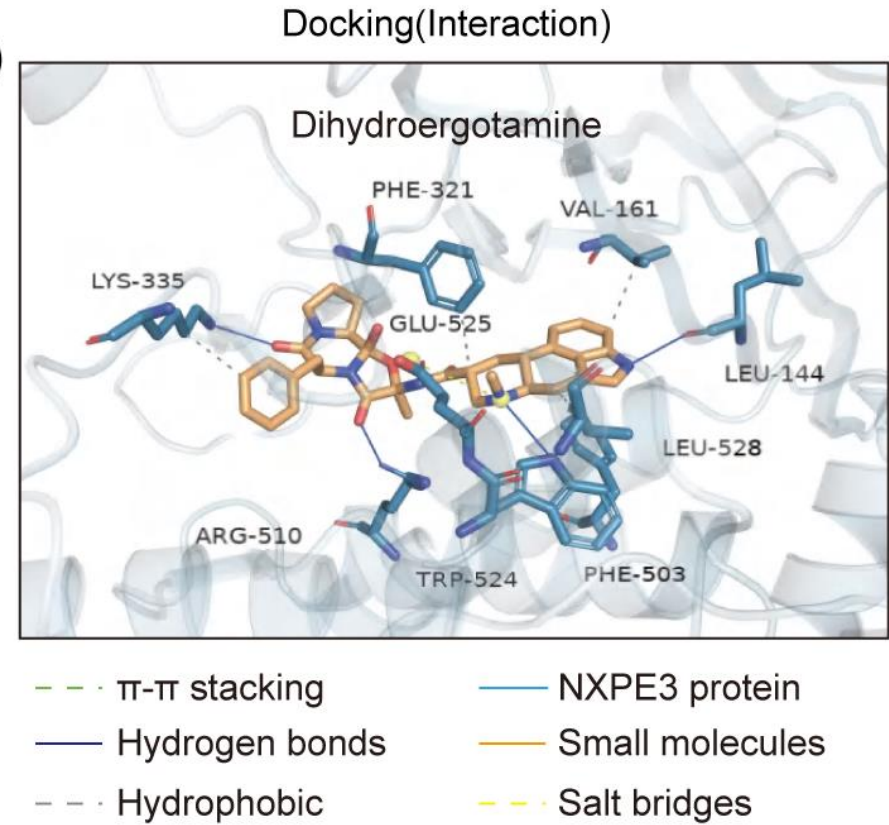
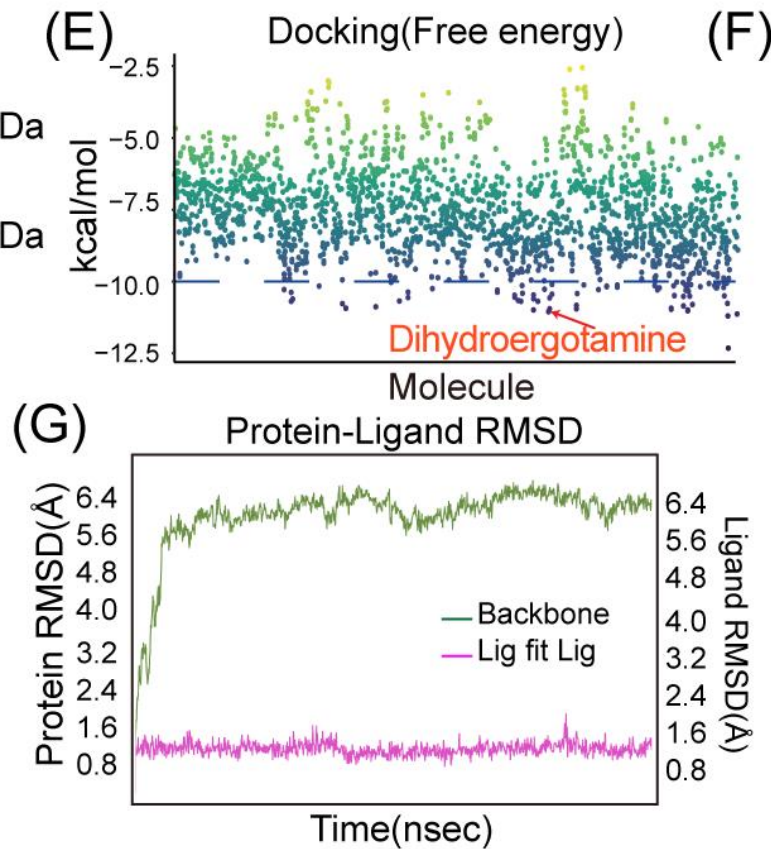
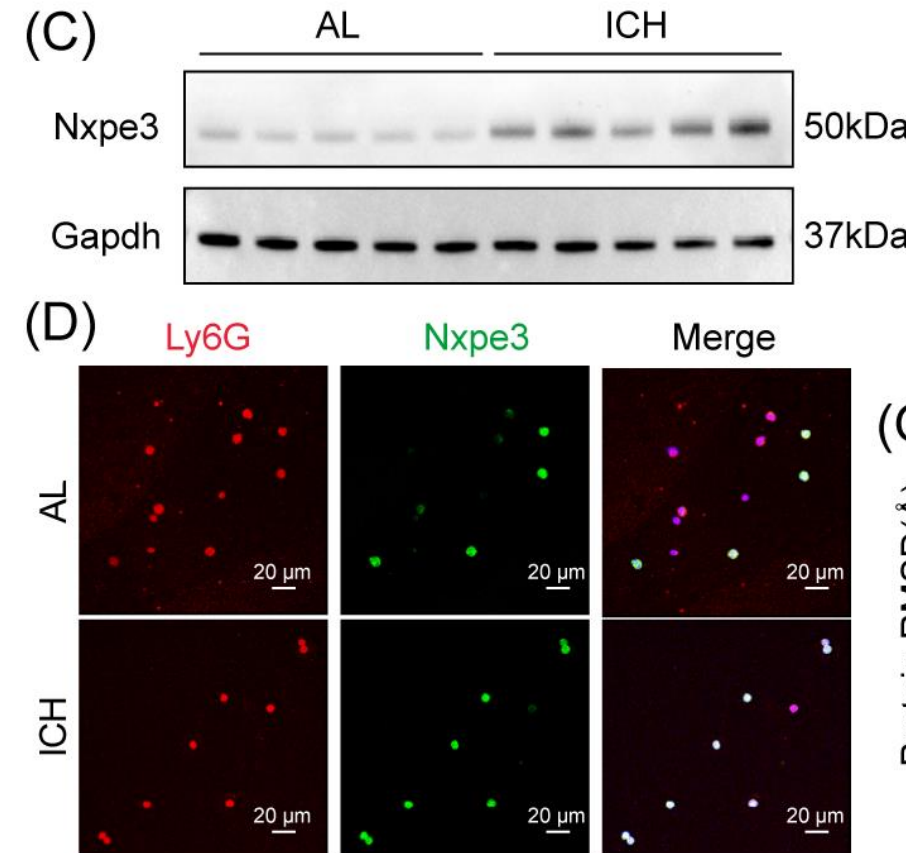
An integrated cell classification framework was used to identify high-risk neutrophils associated with the ICH phenotype

Results



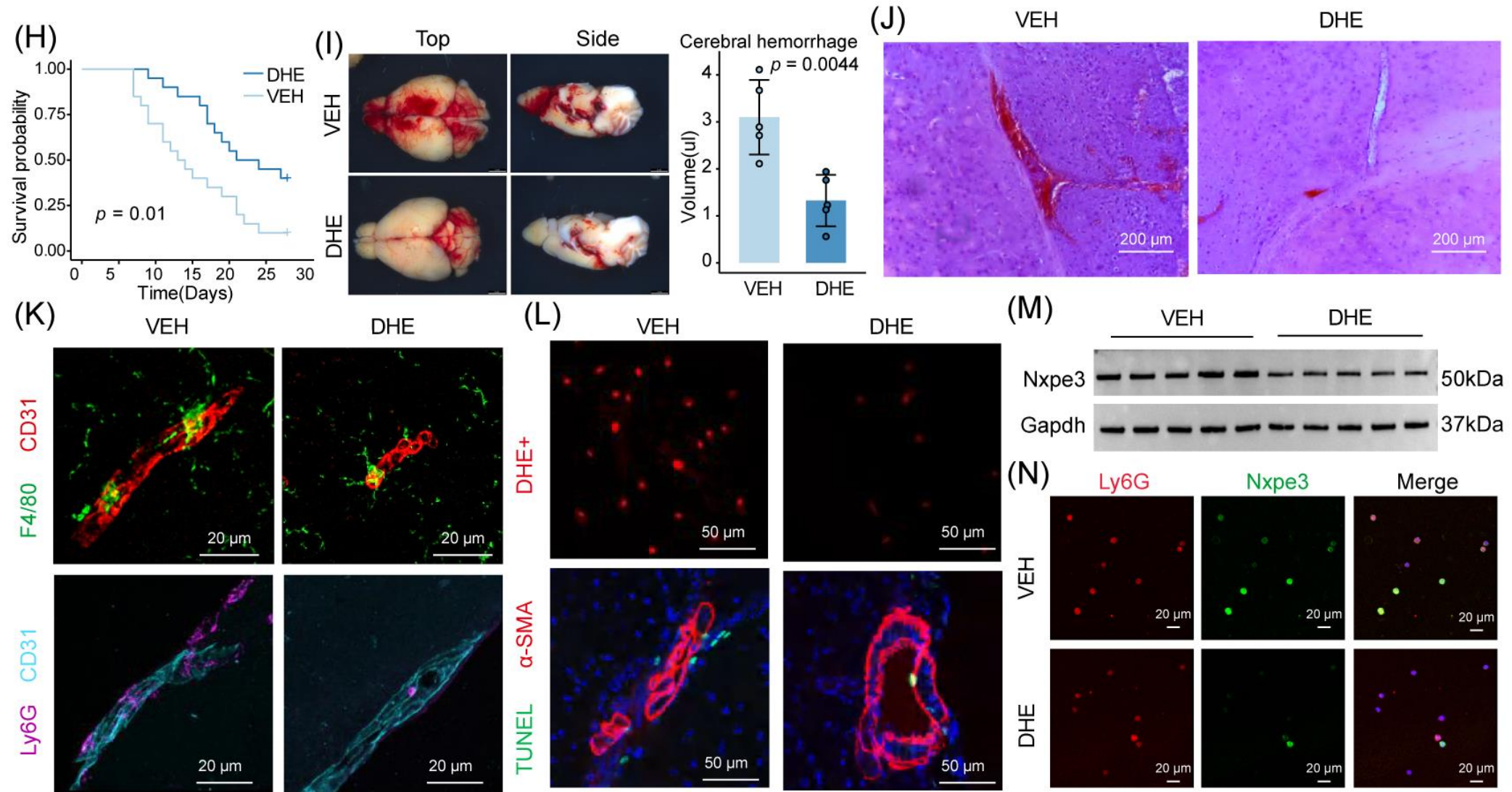
Multi-machine learning integration analysis was employed to establish the optimal ICH prediction model

Results



High-throughput molecular docking analysis and molecular dynamics simulations were used to screen small molecule compounds targeting NXPE3

Results



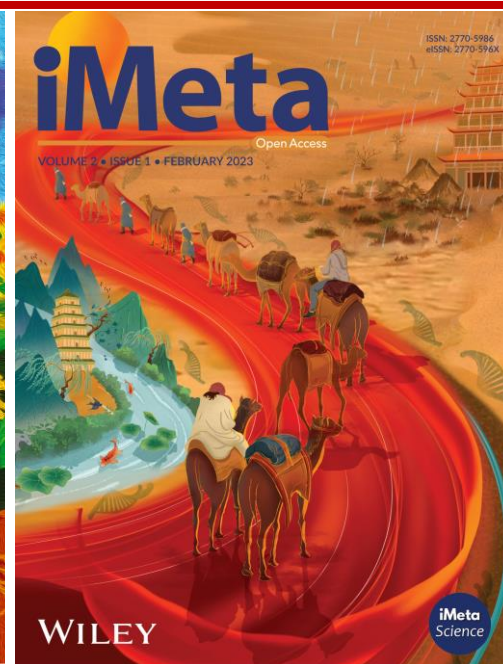
In vivo experiments in mouse models validated the therapeutic effects of DHE.



Summary




- ❑ NXPE3 is a promising biomarker for ICH patients
- ❑ DHE has a high affinity for NXPE3
- ❑ DHE can effectively alleviate the occurrence of intracerebral hemorrhage


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