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METHOD OF INCREASING CHEMOTHERAPY SENSITIVITY IN LEUKEMIA USING BET INHIBITOR

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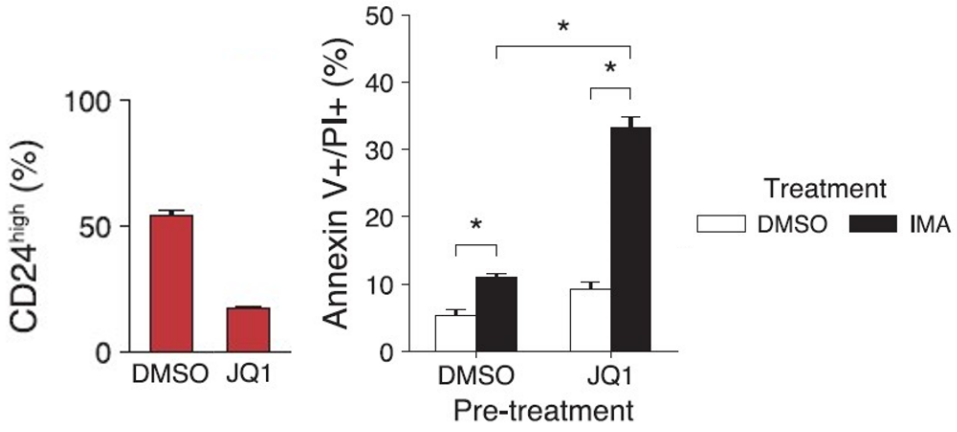
Technology Description

Researchers in Robi Mitra's lab at Washington University in St. Louis have developed a method to increase the sensitivity of leukemias to chemotherapy by pre-treatment with a BET inhibitor. BET inhibitors convert stem-like leukemia cells to a more differentiated state that is more susceptible to standard chemotherapeutics like imatinib. As the persistence of these stem-like leukemia cells frequently drives chemotherapy resistance, pre-treatment with BET inhibitors would increase the efficacy of overall treatment.



Pre-treatment with JQ1 (BET inhibitor) decreases fraction of CD24^{hi} and increases efficacy of imatinib treatment

Stage of Research

The inventors showed that pre-treatment of leukemia cells *in vitro* with a BET inhibitor (JQ1) reduced the number of cells in a stem-like state (CD24^{hi}) and increased the potency of standard chemotherapeutic drugs like imatinib. They are following up on the initial proof-of-concept work with *in vivo* mouse studies.

Publications

- Moudgil A, Wilkinson MN, Chen X, He J, … & Mitra RD. (2020). Self-reporting transposons enable simultaneous readout of gene expression and transcription factor binding in single cells. *Cell,* 182:1-17.
- Cammack AJ, Moudgil A, Chen J, Vasek MJ, … & Dougherty JD. (2020). A viral toolkit for recording transcription factor-DNA interactions in live mouse tissue. *PNAS*, 117(18): 10004-10014.

Applications

- Treatment of leukemias in children and adults
- Potentially applicable to other cancers where the stem-like cell state is more resistant to chemotherapeutics

Key Advantages

- Increased efficacy of chemotherapies
- Utilizes existing drug classes

Patents: Pending

Related Web Links: Mitra Profile & Lab