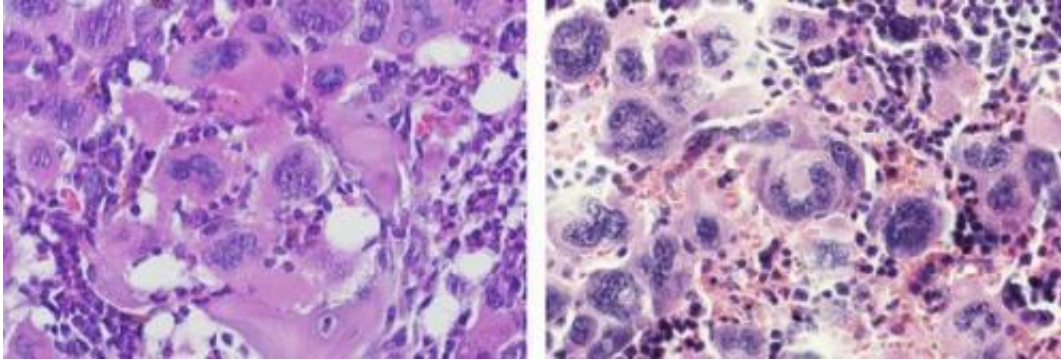


# 'JAKing' up blood cancers, one cell at a time

October 6 2014

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Eight months after transplantation of a single mutated cell, the bone marrow (left) and spleen (right) of a previously healthy mouse display a full-blown type of blood cancer characterized by overproduction of blood clot-forming cells. Credit: Lundberg et al., 2014

A solitary cell containing a unique abnormality can result in certain types of blood cancers known as myeloproliferative neoplasms (MPN), according to a study published in *The Journal of Experimental Medicine*.

MPNs are rare types of cancer where the [bone marrow](#) makes too many cells that clog up the works and thicken the blood, potentially causing bleeding problems, [heart attack](#), or even stroke. In 80% of MPNs, there is a mutation in a protein called JAK2, an important molecule that triggers other proteins and facilitates many cellular functions. This is one altered protein, referred to as JAK2-V617F that—among others—appears to be responsible for causing cancer cells to propagate.

By taking a single blood-generating stem cell isolated from malignant MPNs and transplanting it into healthy mice, researchers in Switzerland show that this lone cell with the mutated JAK2 protein can develop into a full-blown MPN. The resulting MPNs, in turn, also bear the JAK2 mutation. In addition, this group of scientists showed that cells in the MPNs with JAK2-V617F have the ability to renew themselves and increase their numbers.

Attempts to recapitulate this type of single-cell MPN initiation in mice have not been successful in the past. The results from this study open up exciting new opportunities to examine single JAK2-V617F mutant cells and follow tumor initiation and progression of human MPN cancers.

**More information:** Lundberg, P., et al. 2014. *J. Exp. Med.* [DOI: 10.1084/jem.20131371](https://doi.org/10.1084/jem.20131371)

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