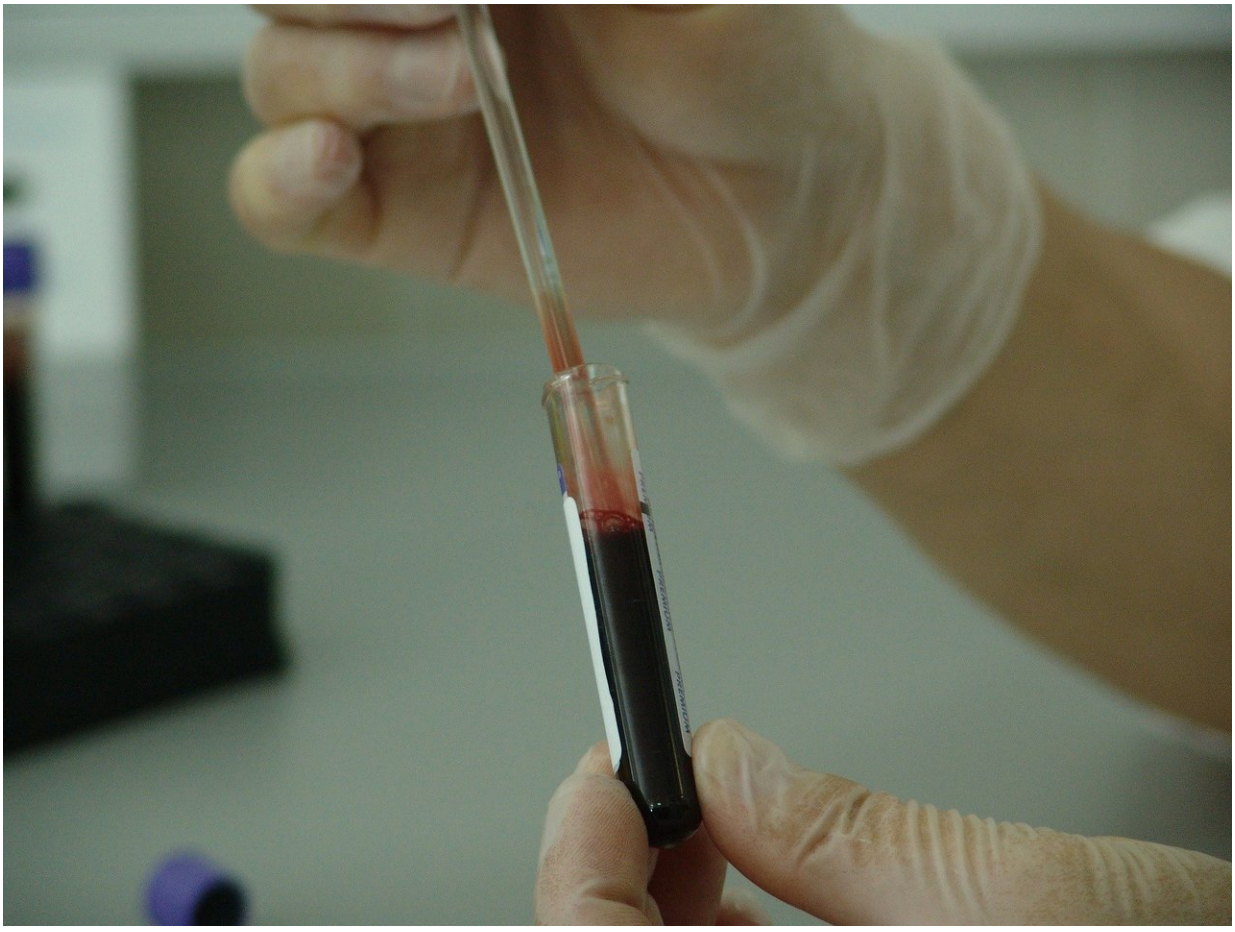
Study identifies a novel oncogene for most common types of blood cancer

May 27 2019



Credit: CC0 Public Domain

Miguel Gallardo, researcher and coordinator of the H12O-CNIO

Haematological Malignancies Clinical Research Unit headed by Joaquín Martínez at the Spanish National Cancer Research Centre (CNIO), has participated in a study that revealed that hnRNP K overexpression may cause B-cell lymphomas, the most common types of blood cancer. The finding that this tumour suppressor gene may also cause cancer may lead to new methods for assessing patients and to the development of novel therapeutic approaches. The findings of the study, led by Sean Post, associate professor of Leukaemia at MD Anderson, were published in the *Journal of the National Cancer Institute* (*JNCI*). Besides CNIO, the University Hospital 12 de Octubre and Complutense University of Madrid also participated in the study.

B lymphocytes are a type of white blood cells that develop in the bone marrow. They produce antibodies used by the immune system to neutralise pathogenic microorganisms. The different types of lymphomas affecting these types of blood cells are the most frequent blood cancers. Their prognosis and treatments depend on the cancer type and stage, since B-cell lymphomas may be slow-growing (malignant) or fast-growing (highly malignant).

Miguel Gallardo was the scientist who characterised hnRNP K as a tumour suppressor gene. His findings were published in *Cancer Cell* when he was a postdoctoral fellow at MD Anderson. It was already known that hnRNP K regulates a multitude of cellular processes, and that both its overexpression and underexpression are involved in disease development. Elevated expression of hnRNP K had also been observed in patients with high-grade solid tumours. The tumour-promoting function of hnRNP K was confirmed for B-cell lymphomas in the study published in *JNCI*. Gallardo is co-first author alongside Prerna Malaney, postdoctoral fellow at MD Anderson.

"Overexpression of hnRNP K is often associated with poor recovery and low survival rates," says Gallardo. "This was confirmed by findings that

overexpression of hnRNP K in transgenic mice resulted in development of lymphoma and reduced survival."

The study team found that the oncogenic potential of hnRNP K stems from its ability to regulate a common oncogene called MYC, which is often linked to blood cancer. The study results indicated that hnRNP K is an oncogene when overexpressed and represents a novel mechanism for c-MYC activation that is different from those observed in other tumour types thus far. Lymphoma patients might benefit from more personalised therapies based on targeting hnRNP K or c-MYC. In this regard, the H12O-CNIO Haematological Malignancies Clinical Research Unit is actively collaborating with other researchers at CNIO working on the development of new hnRNP K modulators for future clinical use. These researchers are Inés Muñoz, Ramón Campos-Olivas and Sonia Martínez, from the Crystallography and Protein Engineering Unit, the Spectroscopy and NMR Unit, and the Medical Chemistry Section, respectively.

More information: Miguel Gallardo et al, Uncovering the role of hnRNP K, an RNA-binding protein, in B-cell lymphomas, *JNCI: Journal of the National Cancer Institute* (2019). DOI: 10.1093/jnci/djz078

Provided by The Spanish National Cancer Research Centre