Stress hormone is key factor in failure of immune system to prevent leukemia

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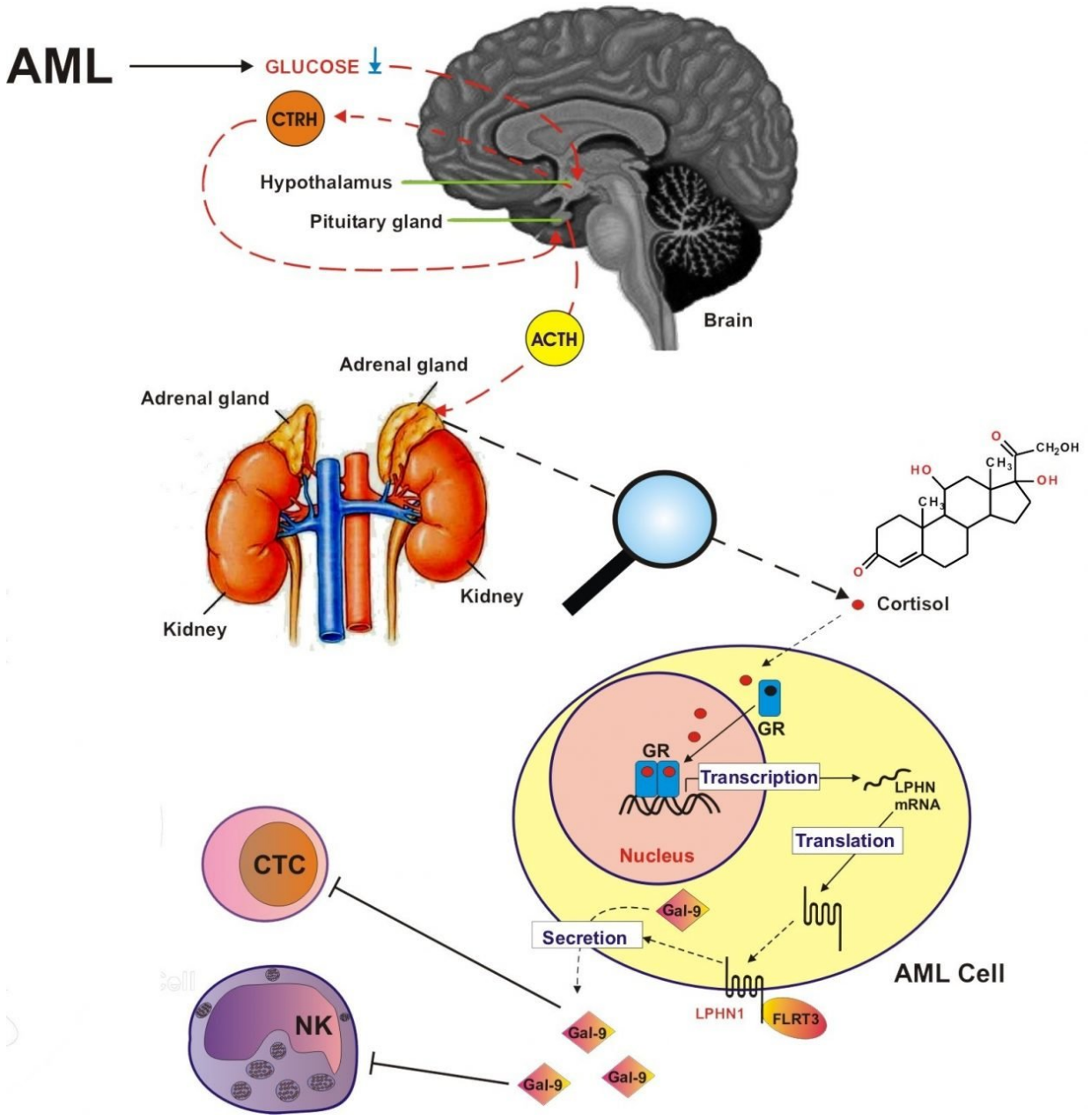

Credit: University of Kent

The human stress hormone cortisol has been identified by scientists at the University of Kent as a key factor when the immune system fails to prevent leukemia taking hold.

A team led by Dr. Vadim Sumbayev, of the University's Medway School of Pharmacy, found for the first time that blood/bone marrow cancer—acute myeloid leukemia (AML) - cells evade the anti-cancer activity of the human immune system by employing the human hormone cortisol.

The study of the causes of AML—the most severe blood/bone marrow cancer—demonstrated that AML cells employ a unique pathway to progress the disease, using functional systems of the human body to both support their survival and also reduce the anticancer activities of immune cells.

They do this by using cortisol to force the release of a protein, latrophilin 1. This in turn causes the secretion of another protein, galectin-9, which suppresses the body's natural anti-cancer immune mechanism.

Dr. Sumbayev's team, working with researchers from two German universities and the UK's Diamond Light Source facility, found that although healthy human white blood cells are not affected by cortisol they become capable of releasing latrophilin 1 when malignant transformation takes place.

Malignant AML cells then use cortisol to increase the release of latrophilin 1 so that they can use it to avoid the immune system.

The study concluded that galectin-9, as well as a natural binding partner of latrophilin 1—known as FLRT3—which are both present in human blood plasma, are the most promising targets for future anti-AML immune therapy.

Dr. Sumbayev said: "For the first time, we can identify a possible future pathway to develop an effective new therapy using the body's natural immune mechanisms. We have discovered a new fundamental biochemical mechanism within the human body that allows AML cells to employ physiological systems to survive and escape immune attack."

The study, entitled Cortisol facilitates the immune escape of human acute myeloid leukemia cells by inducing latrophilin 1 expression (Svetlana Sakhnevych, Inna Yasinska, Alison Bratt, Ouafa Benlaouer, Isabel Gonçalves Silva, Yuri Ushkaryov, Vadim Sumbayev, all Medway School of Pharmacy, universities of Kent and Greenwich; Rohannah Hussain, Giuliano Siligardi, Diamond Light Source; Walter Fiedler, Jasmin Wellbrock, Hubertus Wald University; Bernhard Gibbs, University of Oldenburg) is published in the journal *Cellular and Molecular Immunology*.

More information: Svetlana S. Sakhnevych et al, Cortisol facilitates the immune escape of human acute myeloid leukemia cells by inducing latrophilin 1 expression, *Cellular & Molecular Immunology* (2018). DOI: 10.1038/s41423-018-0053-8

Provided by University of Kent