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Knocking the Sox off cancer and lymphatic disorders

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(PhysOrg.com) -- Researchers have identified a gene critical for the development of the lymphatic system in a discovery that will have implications for treatment of cancer and lymphatic disorders and other diseases.

The team, led by Professor Peter Koopman and Dr Mathias François from the Institute for Molecular Bioscience at The University of Queensland (UQ), found that a single gene - Sox18 - triggers the development of the lymphatic vessels.

"The rate at which new lymphatic vessels can form is thought to be one of the key factors in determining how quickly a tumour can spread and thus how severely a patient will be affected by cancer," Professor Koopman said.

"The lymphatic vessels also play a central role in maintaining fluid balance in the body and carrying infection-fighting white blood cells, so greater knowledge about the lymphatic system can offer insights and suggest therapies for a range of diseases."

The team made the discovery, reported today (Monday, October 20) in leading science journal *Nature*, by examining mice in which Sox18 had been inactivated. They found that the development of lymphatic vessels was massively disrupted.

"We suspected Sox18 might play a critical role in lymphatic vessel

formation after observing that mice with one inactivated copy of the gene displayed similar symptoms to humans with a genetic condition that affects the lymphatic system, known as HLT," Professor Koopman said.

"It turns out that Sox18 has a much more important role than we first thought – in fact, it's the master controller of lymphatic vessel development."

The team will now focus on finding genes regulated by Sox18 and determining how this regulation occurs, which may suggest ways of promoting or preventing lymphatic vessel formation.

"If we know how to prevent lymphatic vessels from forming, then we will be a lot closer to halting the spread of tumours through the body. Conversely, if we know how to stimulate the formation of these vessels, then it might be possible to treat diseases such as lymphedema," Professor Koopman said.

Lymphedema occurs when the lymphatic vasculature is impaired, causing a build-up of fluid in part of the body, which leads to painful and dangerous swelling of that body part, and, if left untreated, deformity.

The discovery was the result of three years of research by an international team of scientists from Australia, Italy and Hong Kong, led by UQ and supported by a number of organisations including the Australian Cancer Research Foundation, the National Health and Medical Research Council of Australia, the Heart Foundation of Australia, and the Australian Research Council.

Provided by UQ