

High cholesterol levels affect mobilization of cells from the bone marrow

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Increased cholesterol levels are being increasingly recognised as risk factors for the onset and progression of several cancers. Now researchers in Portugal show that high levels of cholesterol can affect the microenvironment of the bone marrow, so that more cells move from the bone marrow to peripheral, circulating blood. These findings, by Sergio Dias and his team, an external group of the Instituto Gulbenkian de Ciencia, have implications for transplantation and further understanding bone marrow malignancies, are to appear in the next issue of the journal *Blood*.

Progenitors of blood cells develop in the [bone marrow](#), where they mature in specific microenvironments, called niches, before exiting into peripheral blood, in a highly controlled fashion. It is well established that external stimuli affect these niches and therefore the production of mature blood cells. For example, patients with high cholesterol levels ([hypercholesterolemia](#)) have more peripheral blood cells and increased platelet levels (thrombocytosis). Working at the Portuguese Institute of Oncology Francisco Gentil, in Lisbon, the Neoangiogenesis group used a [mouse model](#) of hypercholesterolemia to show that cholesterol interferes with the bone marrow niche equilibrium, thus leading to increased exit from the bone marrow niche to the peripheral circulation.

These finding may have implications for transplants and bone marrow malignances. As Sérgio Dias points out "It is the first time, as far as we are aware, that cholesterol is directly linked to mobilisation of cells in the bone marrow. In a transplant setting, we believe patients with high

cholesterol may be less 'receptive', since more blood cells exit to the peripheral vessels. Therefore drugs that modulate cholesterol levels may have beneficial effects also in a transplant setting."

"Furthermore, as cholesterol empties cells from the bone marrow microenvironment, we envisage that it may create more space for malignant leukaemia cells to come into the bone marrow, thus favoring acute leukaemia expansion and spread to secondary organs", this group leader adds.

Provided by Instituto Gulbenkian de Ciencia

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