

Niacin's role in maintaining good cholesterol

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A research team has uncovered the likely target of niacin (vitamin B3) in the liver, which should provide a clearer picture of how this vitamin helps maintain adequate HDL-cholesterol levels in the blood and thus lower the risk of heart disease.

While niacin can increase plasma HDL levels, the mechanism of how it works has been mysterious, although it's believed that niacin does not actually increase HDL production. Recent work had uncovered that a component of ATP synthase (the protein that makes ATP) is present on the surface of liver cells, and this subunit known as the 'beta chain' can take up HDL.

Now, Moti Kashyap and colleagues found that this beta chain is the basis of niacin's effect. They added niacin to samples of human liver cells and found that treatment reduced the presence of Beta chain on the cell surface by ~27%, and as a result HDL uptake was reduced by ~35%. In comparison, nicotinamide, a related molecule with no clinical benefit, had far weaker effects.

These results indicate niacin hinders the liver from removing HDL from the blood, thus maintaining high plasma HDL levels. Importantly, niacin does not affect another major pathway known as "Reverse Cholesterol Transport." Therefore, it maintains HDL levels while still allowing the removal of other cholesterol types, explaining why niacin is especially beneficial.

The work also identifies a new drug target, as no other drug in currently

known to raise HDL by inhibiting the surface expression of the beta chain of ATP synthase.

Source: American Society for Biochemistry and Molecular Biology

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