

## BIOMARKERS

## Cholesterol efflux capacity—inverse association with incident cardiovascular disease

Reverse cholesterol transport—the movement of cholesterol from peripheral tissues to the liver for secretion—is believed to contribute to protection from atherosclerosis. A new study shows that HDL cholesterol efflux capacity—a marker that characterizes a key step in the process of reverse cholesterol transport—is inversely associated with the incidence of atherosclerotic cardiovascular events.

The Dallas Heart Study, a multiethnic, population-based cohort study, included 2,924 participants aged 30–65 years with no history of cardiovascular disease. Blood was collected at baseline from all participants and levels of plasma lipids, including HDL cholesterol, were measured. Cholesterol efflux capacity was quantified by measuring the efflux of fluorescently labelled cholesterol from J774 macrophages to plasma depleted in apolipoprotein B that was isolated from the study participants. The participants were monitored

(median follow-up 9.4 years) until the primary end point—atherosclerotic cardiovascular disease, defined as nonfatal myocardial infarction, nonfatal stroke, coronary revascularization or death from cardiovascular causes—was reached.

In fully adjusted analysis, which included assessment of traditional risk factors, HDL cholesterol level and HDL particle concentration, the researchers noted an incremental inverse association between increasing quartiles of cholesterol efflux capacity and incident cardiovascular disease; cardiovascular risk was 67% lower in the highest quartile than in the lowest quartile (HR 0.33, 95% CI 0.19–0.55). Although baseline levels of HDL cholesterol were associated with traditional risk factors for cardiovascular disease, they were not associated with incident cardiovascular events. By contrast, cholesterol efflux capacity was only minimally associated with traditional

risk factors. “This finding may be due to the young age of our study sample (median age 42 years) and the exclusion of participants with cardiovascular disease, or it may indicate that cholesterol efflux capacity reflects a biological process not captured by traditional risk factors,” explain the authors in their report.

Overall, the findings highlight the potential of using markers of HDL function, rather than HDL levels *per se*, as biomarkers of cardiovascular risk.

David Holmes

**Original article** Rohatgi, A. *et al.* HDL cholesterol efflux capacity and incident cardiovascular events. *N. Engl. J. Med.* doi:10.1056/NEJMoa1409065

