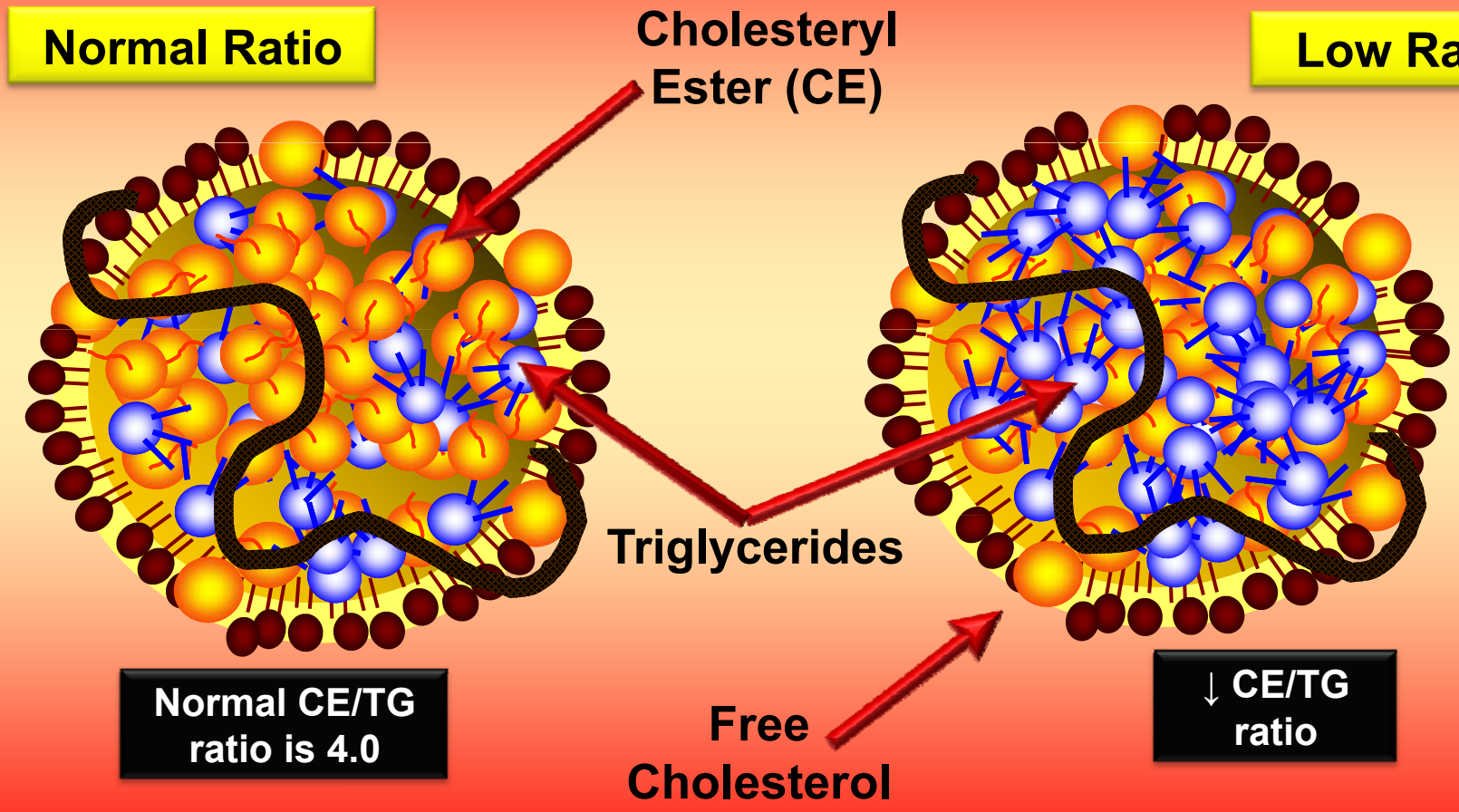
The Ludwigshafen Risk and Cardiovascular Health Study: LDL-TG

- 739 subjects with stable angiographic CAD and 570 matched control subjects in which CAD had been ruled out by angiography and not taking lipid medication
- The association of LDL triglycerides (LDL-TGs) (odds ratio [OR], 1.30; 95% CI, 1.19 to 1.43; P< 0.001) with CAD was stronger than that of LDL-C (OR, 1.10; 95% CI, 1.00 to 1.21; P=0.047).
- In subjects with high LDL-TG, LDLs were depleted of cholesteryl esters (CEs), and VLDLs, IDLs, and dense LDLs were significantly elevated.
- The predictive value of LDL-TG for CAD was independent of LDL-C.

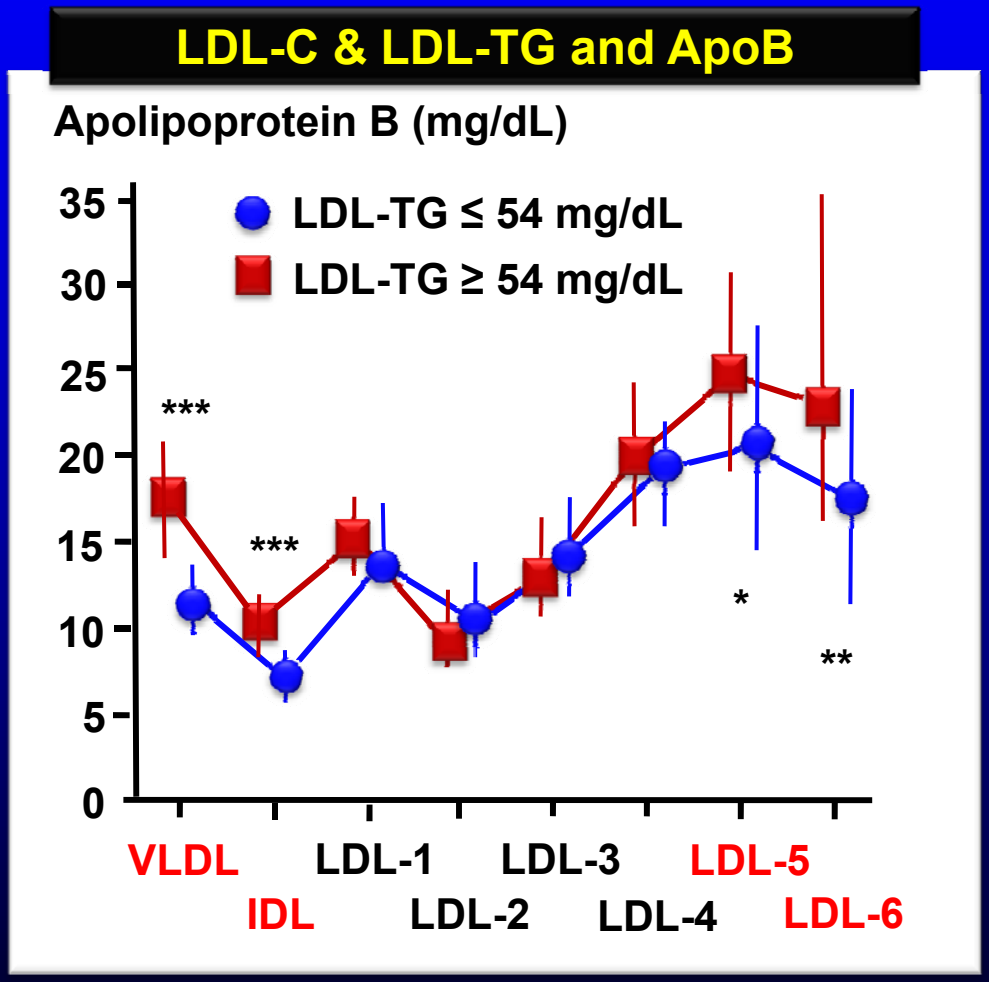
Marz W et al. Circulation. 2004;110:3068-3074

LDL Particle Composition

LDL Particle CE/TG composition differences



The Ludwigshafen Risk and Cardiovascular Health Study



Median (25th and 75th percentile) concentrations of apoB in lipoprotein subfractions in 114 patients with elevated fasting glucose, impaired glucose tolerance, or T2DM having LDL-TG ≤ 54.4 mg/dL (n57, circles) or LDL-TG ≥ 54.4 mg/dL (n57, squares). *P0.05 (Mann-Whitney U test).

Subjects with LDL-TGs above the median had significantly higher concentrations of VLDL, IDL, and dense LDL (LDL-5 and LDL-6).

In contrast, buoyant LDL (LDL-1 and LDL-2) and intermediate LDL (LDL-3 and LDL-4) were not different

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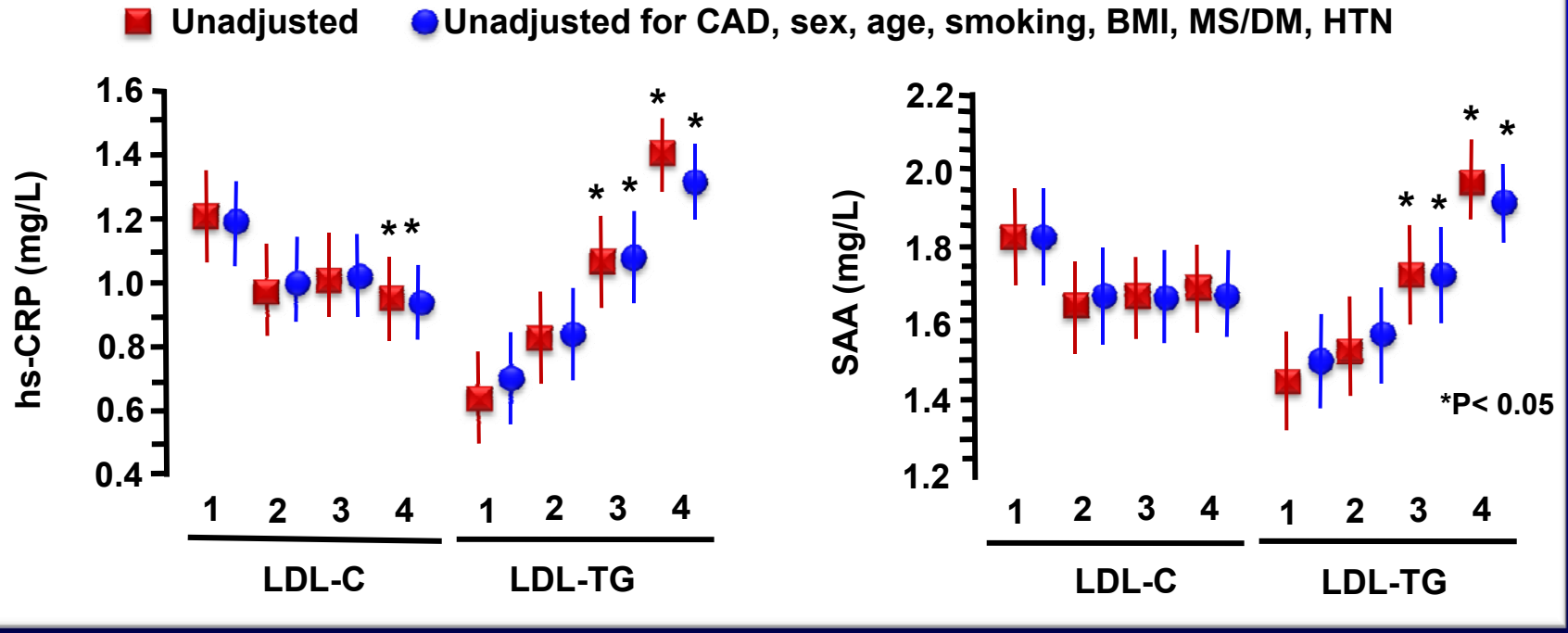
LDL-TG and Inflammatory Markers



Estimated marginal means (95% CI) of concentrations of CRP & SAA by quartiles of LDL-C and LDL-TG.

CRP, SAA, fibrinogen, and IL-6 increased in parallel to LDL-TG. This relationship was independent of conventional coronary risk factors. In contrast, SAA, fibrinogen, and IL-6 were not different across the quartiles of LDL-C, and CRP was significantly lower even in the highest quartile of LDL-C compared with the lowest quartile

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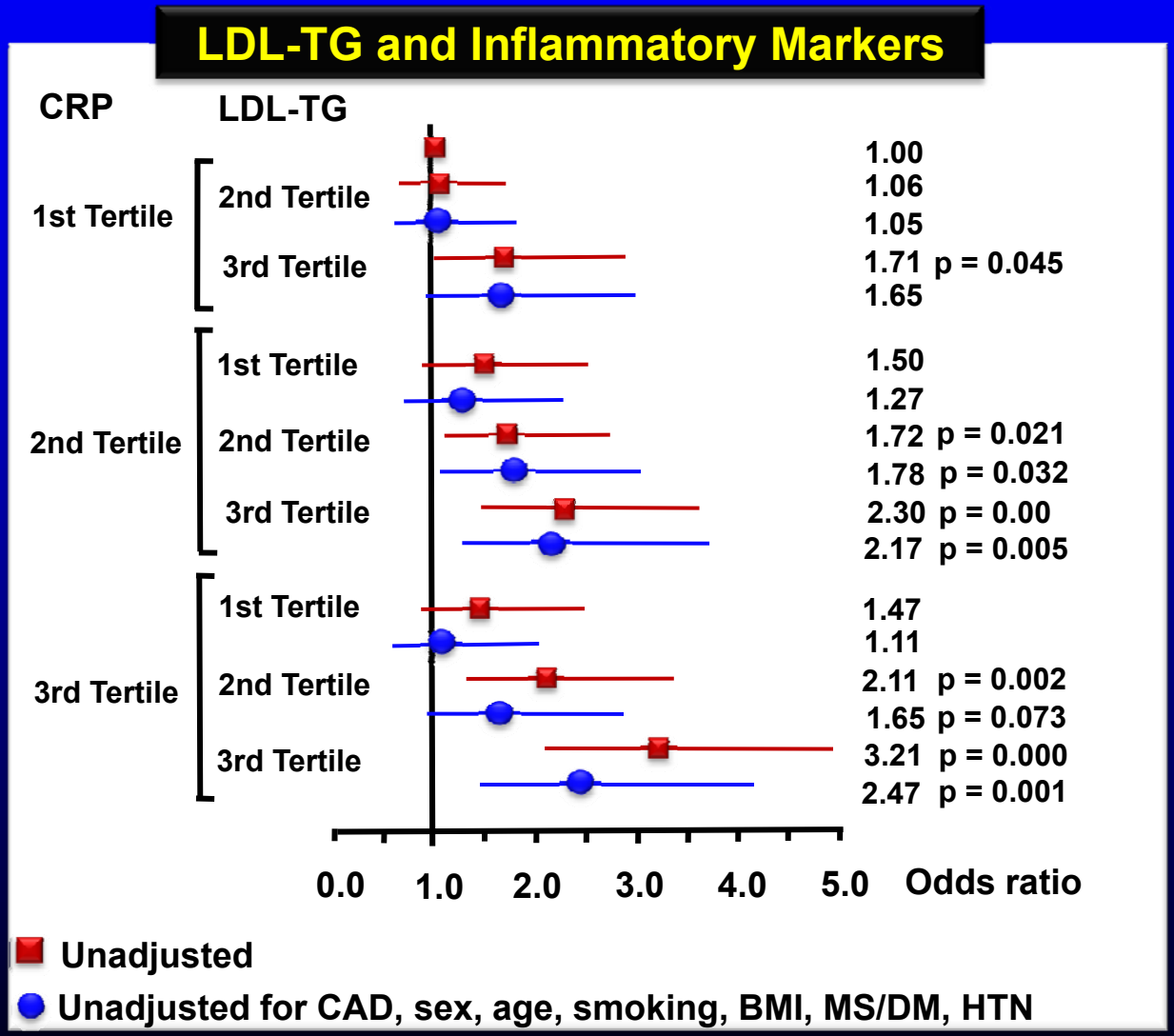
The Ludwigshafen Risk and Cardiovascular Health Study: LDL-TG



ORs (95% CI) for angiographic CAD by sensitive CRP and LDL-TG. CRP and LDL-TG were broken down into tertiles, and ORs were calculated for each resulting layer in reference to group with both CRP and LDL-TG in their lowest tertiles.

These findings suggest that LDL-TG, although positively related to systemic markers of inflammation, is an independent risk factor of CAD.

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The Ludwigshafen Risk and Cardiovascular Health Study: LDL-TG

- Alterations of LDL metabolism characterized by high LDL-TG are related to CAD, systemic low-grade inflammation, and vascular damage.
- High LDL-TGs are indicative of CE-depleted LDL, elevated IDL, and dense LDL.
- **LDL-TG may better reflect the atherogenic potential of LDL than LDL-C.**

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The Ludwigshafen Risk and Cardiovascular Health Study: LDL-TG

In conclusion, we show that disorders of LDL metabolism characterized by elevated LDL-TG rather than by elevated LDL-C may incite or promote vascular inflammation.

The determination of LDL-TG would thus add to LDL-C in predicting CAD.

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