

# Vaccination against *Streptococcus pneumoniae* induces IgM antibodies against oxidized LDL in mouse, but Prevenar vaccination does not in man

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## Introduction

Oxidized low-density lipoprotein (oxLDL) plays an important role in the formation of atherosclerosis, driving the recruitment and activation of macrophages in the vessel wall after which they progress into foam cells. High levels of IgM autoantibodies against oxLDL have been reported to ameliorate the atherosclerosis progression, most likely by preventing the uptake of oxLDL by macrophages. Previous studies reported that immunization of mice with pneumococcal extracts induced anti-phosphorylcholine IgM antibodies that are cross-reactive to oxLDL. In addition, pneumococcal immunization reduced atherosclerosis in an LDL receptor knockout mouse model.

## Aim

A clinical study was performed to investigate whether pneumococcal vaccination induces cross-reactive atheroprotective anti-oxLDL IgM in man, potentially via oxidation-specific epitope phosphorylcholine (PC).

## Conclusions

The robust induction of cross-reactive IgM to oxLDL and PC as seen in mice, is not observed in human.

Possible explanations:

- Phosphorylcholine content too low in Prevenar;
- Suboptimal vaccination regimen;
- Translation from mice to man invalid.

## Methods

24 healthy male volunteers received 1, 2 or 3 vaccinations with Prevenar-13, or placebo (figure 1).

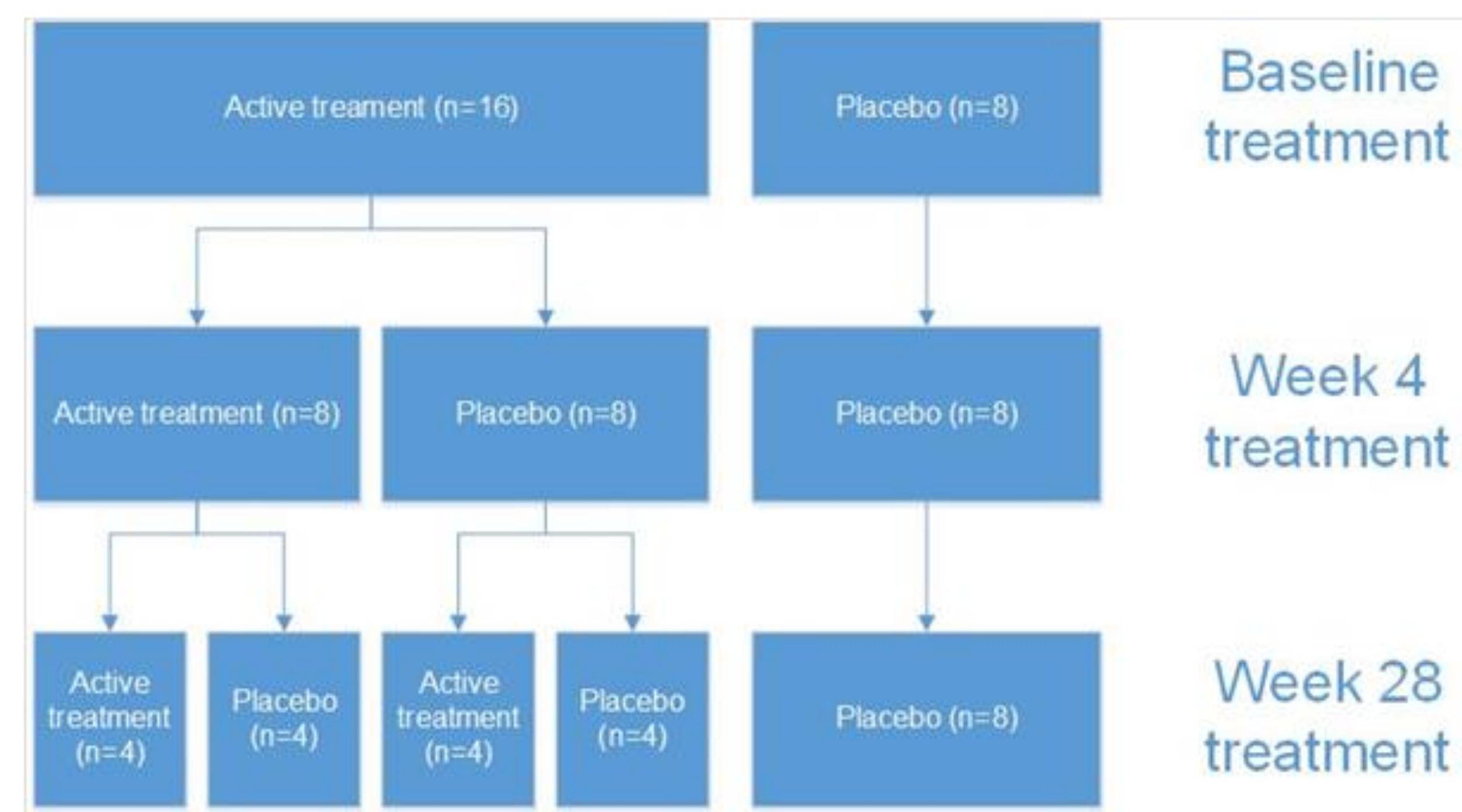


Figure 1: dosing regimen

## Results

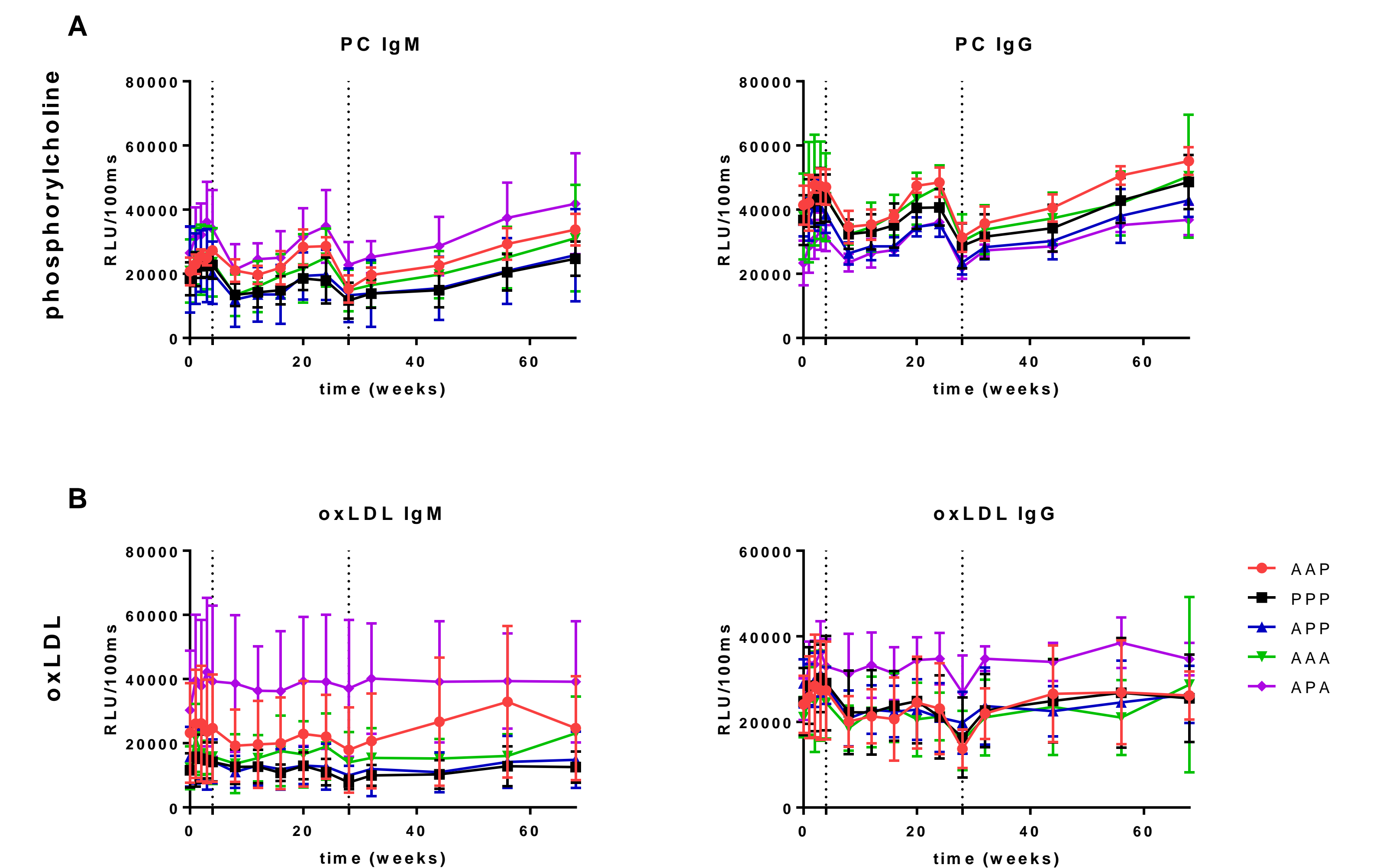
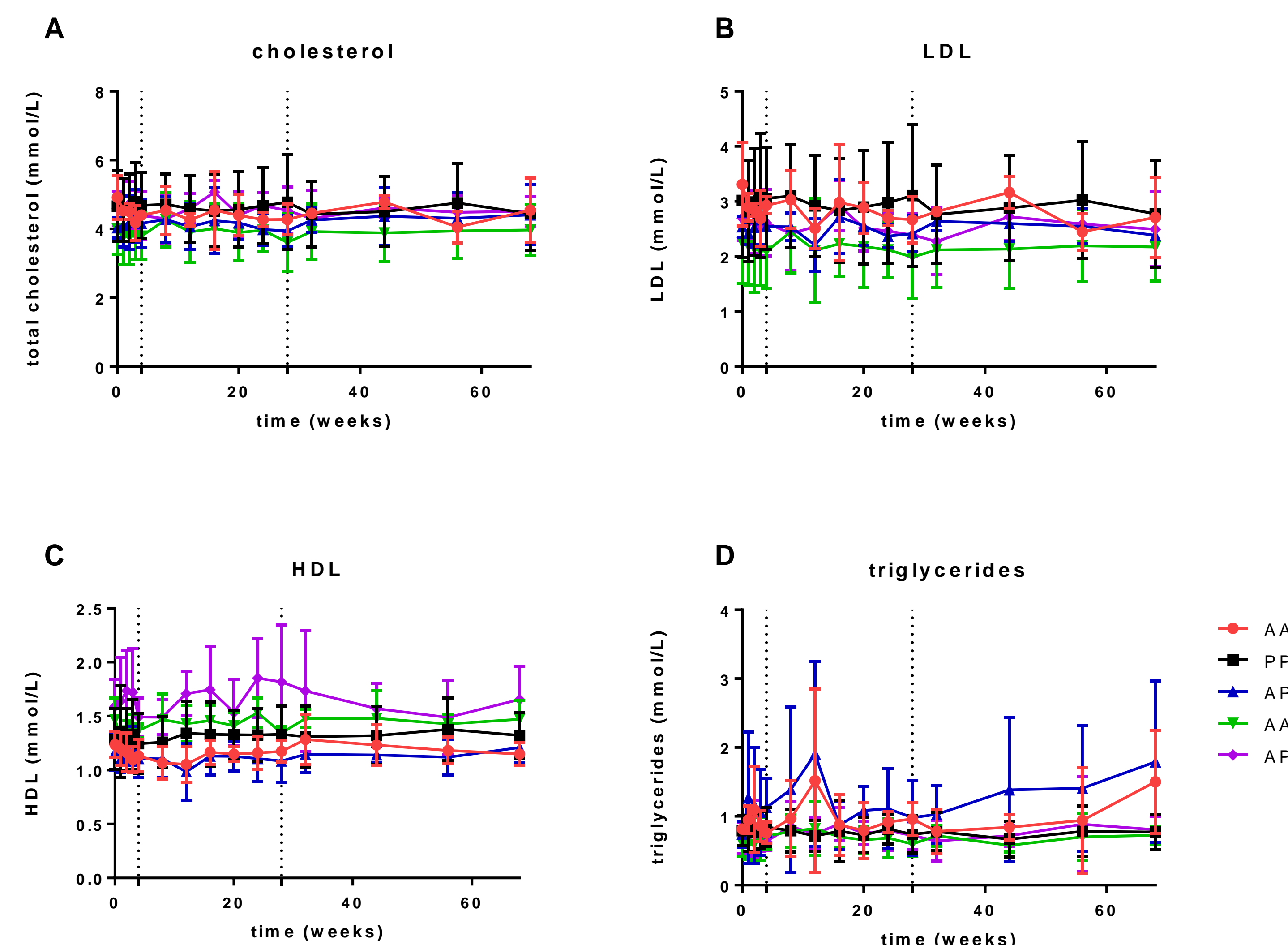


Figure 3: phosphorylcholine (A) and oxLDL (B) IgM (left) and IgG (right) after vaccination. A = active, P = placebo. Vertical bars represent vaccinations.

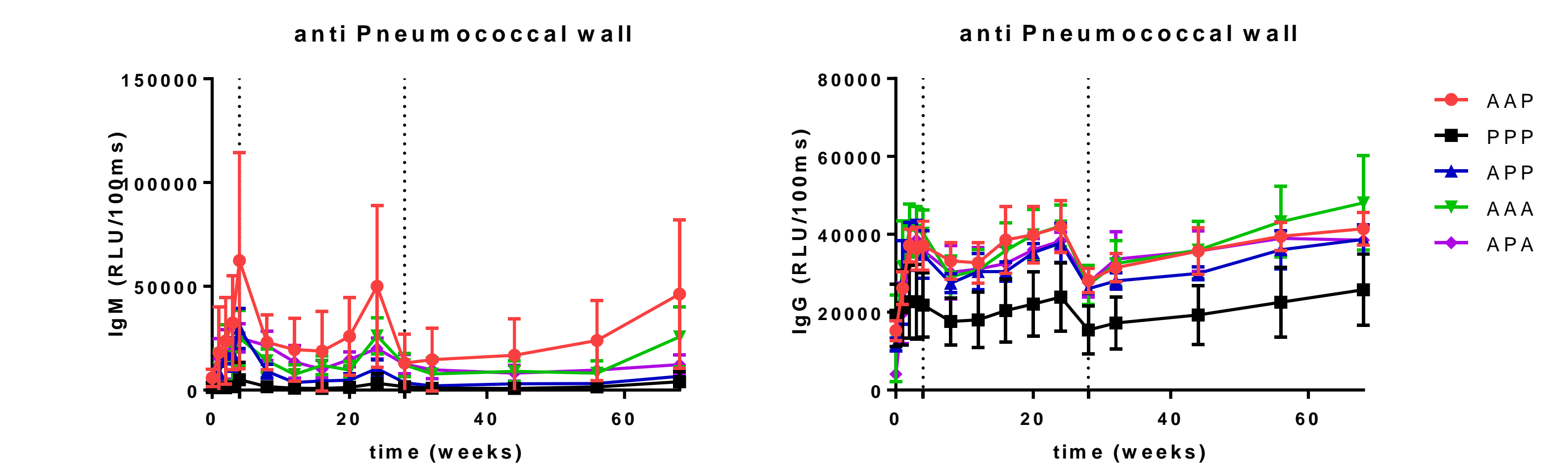


Figure 4: pneumococcal IgM (left) and IgG (right) after vaccination. A = active, P = placebo. Vertical bars represent vaccinations.

Figure 2: cholesterol (A), LDL (B), HDL (C) and triglycerides (D) levels after vaccination. A = active, P = placebo. Vertical bars represent vaccinations.

