

Nutraceutical potential of β -cryptoxanthin-rich persimmon extract: Insights into lipid regulation and anti-inflammatory action



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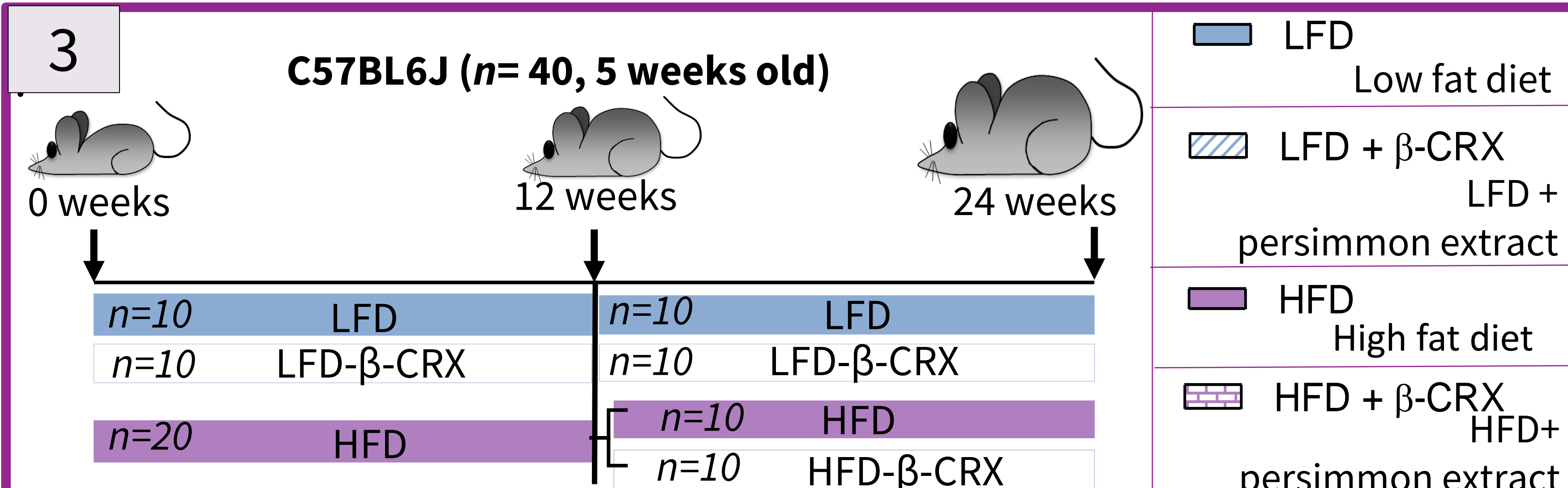
1 Background:

Several studies have underscored a strong correlation between a reduced incidence of pathologies and consumption of a diet rich in fruit and vegetable, which serve as bioactive compounds reservoirs. Carotenoids are bioactive compounds that might play a key role in modulating and potentially preventing pathologies and symptoms of important diseases. Metabolic disorders involve a series of consequences that decrease the life quality of the population. These conditions might be modulated and potentially prevented by the consumption of carotenoid-rich products.

2 Aim:

To explore the anti-obesity and anti-inflammatory effect of carotenoids from persimmon by-products in high-fat diet *in vivo* models, to determine their application as potential nutraceuticals.

3



4 Results:

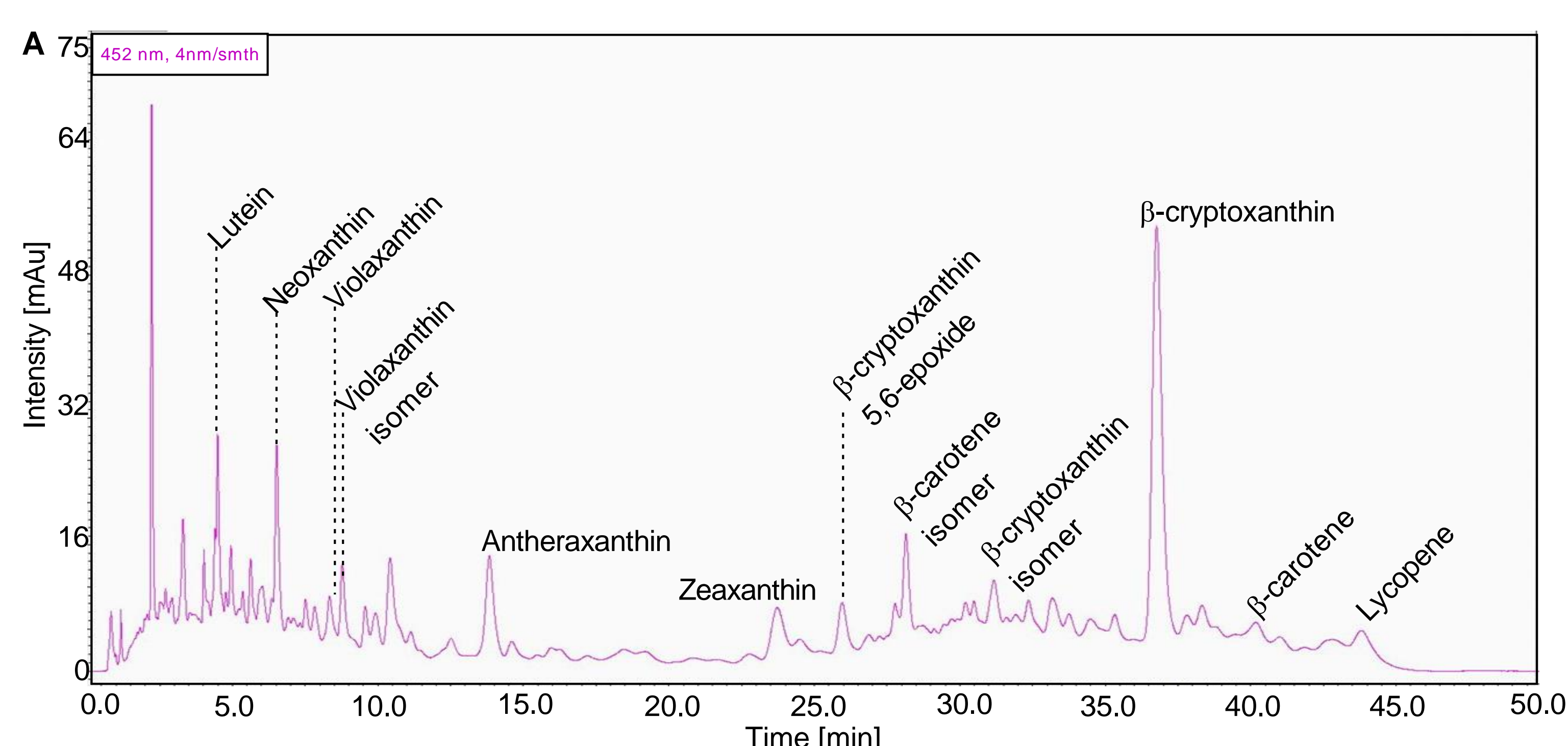


Figure 1. (A) Representative chromatogram of PSCE with main carotenoids identified.

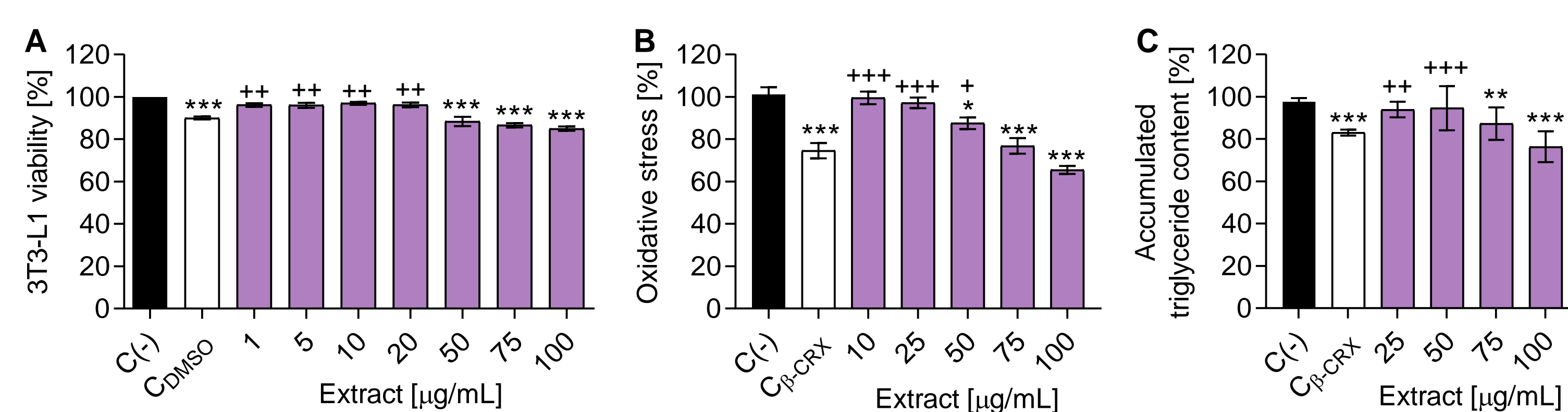


Figure 3. (A) Cell viability, (B) intracellular ROS and (C) intracellular triglyceride accumulation in 3T3-L1 adipocytes treated with PSCE. Untreated adipocytes in high-glucose DMEM (C (-)) and a pure form of β -CRX (C β -CRX) were included as negative and positive controls, respectively. Results were compared to C(-) (***P < 0.001, **P < 0.01, *P < 0.05; with one-way ANOVA with Dunnett's post hoc test) and to CDMO or C β -CRX (+++P < 0.001, ++P < 0.01, +P < 0.05; with one-way ANOVA with Dunnett's post hoc test). Mean \pm standard deviation (n = 3).

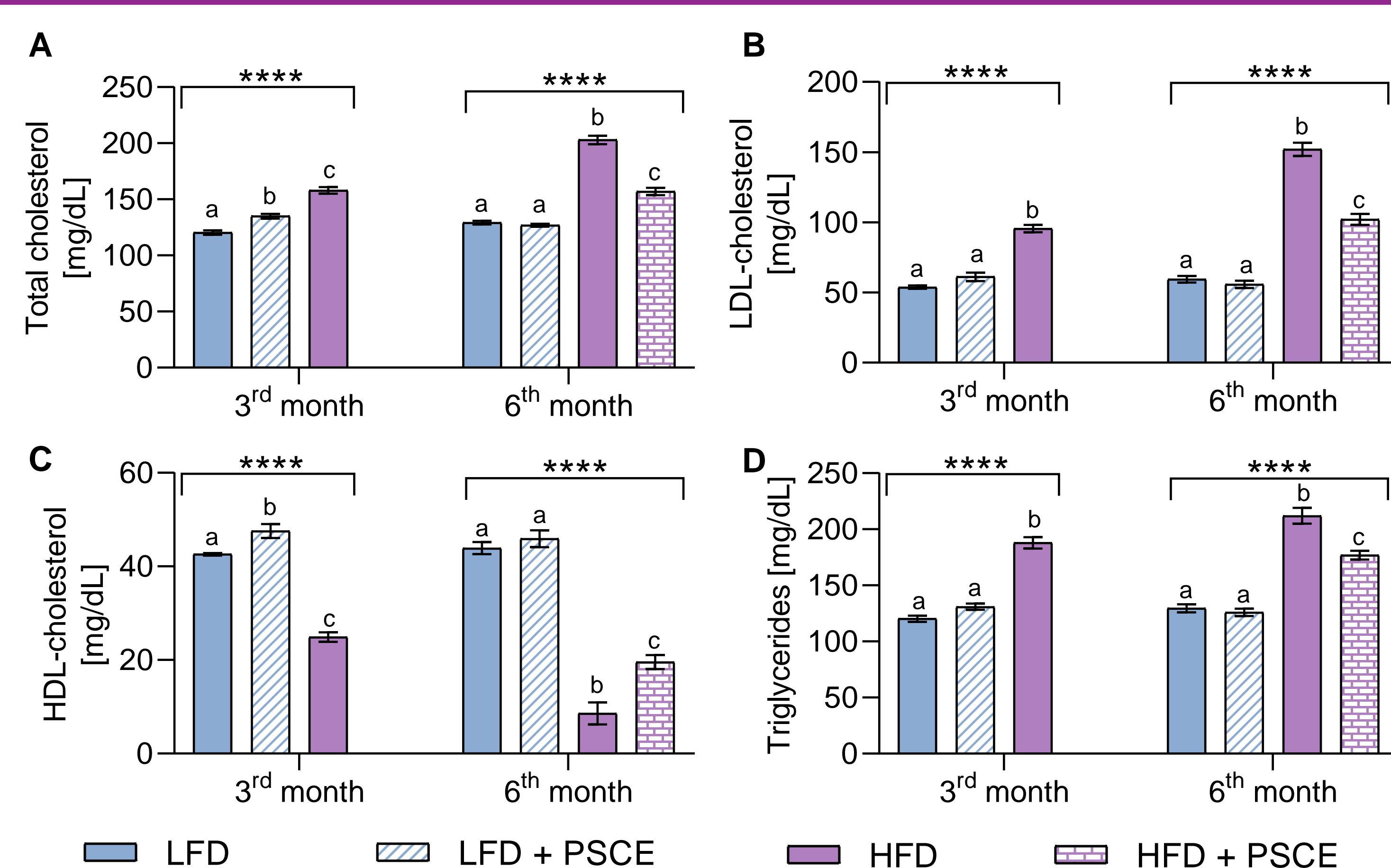


Figure 2. Changes in (A) total cholesterol, (B) HDL-cholesterol, (D) LDL-cholesterol and (E) triglycerides, in mice at the third and sixth month supplemented with LFD, HFD, LFD+PSCE and HFD+PSCE. Mean \pm SEM (n = 10). Data were analysed using one-way ANOVA followed by Tukey's post hoc test at 3 and 6 months; ****P < 0.0001. Different letters denote significant differences among groups.

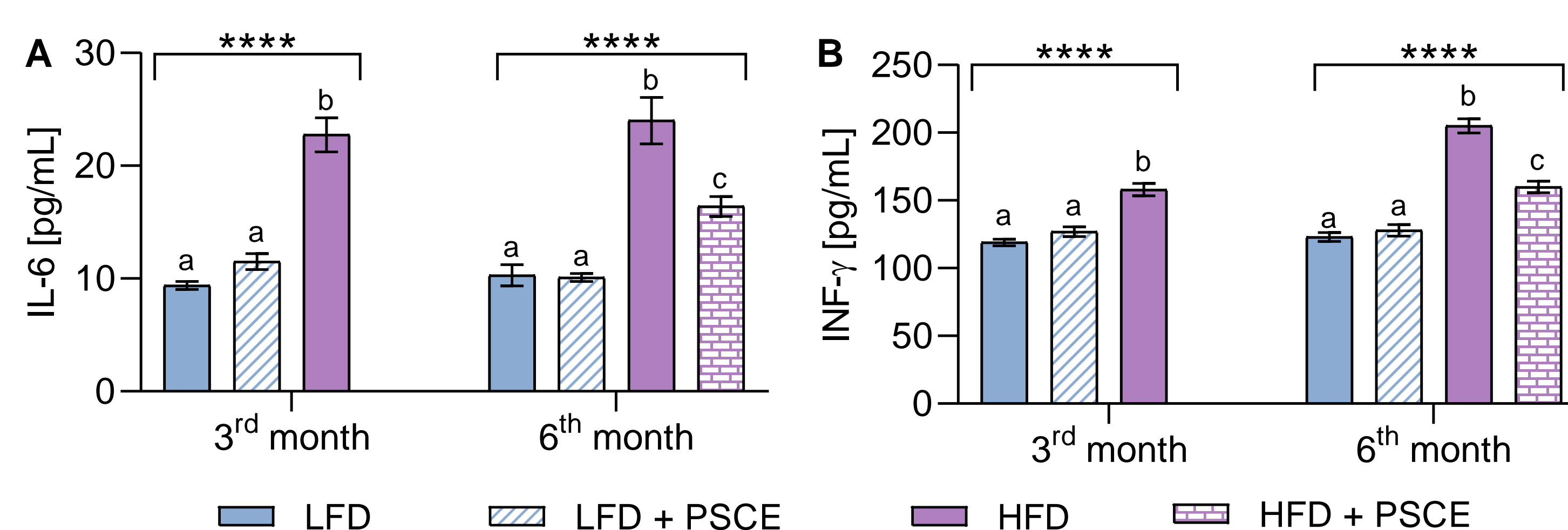


Figure 4. Changes in (A) IL-6 and (B) IFN- γ at the third and sixth month of mice fed with LFD, HFD, LFD+ PSCE and HFD+PSCE the last 3 months. Mean \pm SEM (n = 10) (One-way ANOVA followed by Tukey's post hoc test at 3 and 6 months; ****P < 0.0001). Different letters denote significant differences among groups.

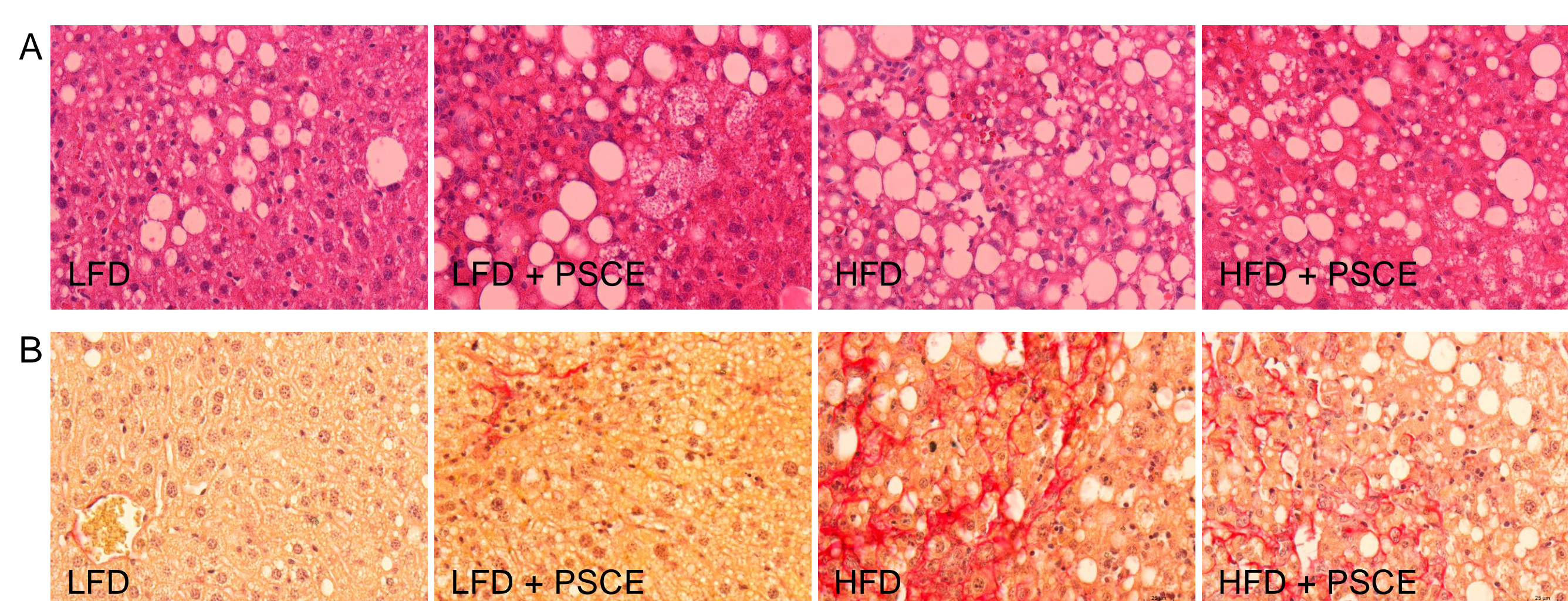


Figure 5. Representative micrographs of liver sections stained with (A) H&E or (B) Sirius Red. Image resolution x40 is shown.

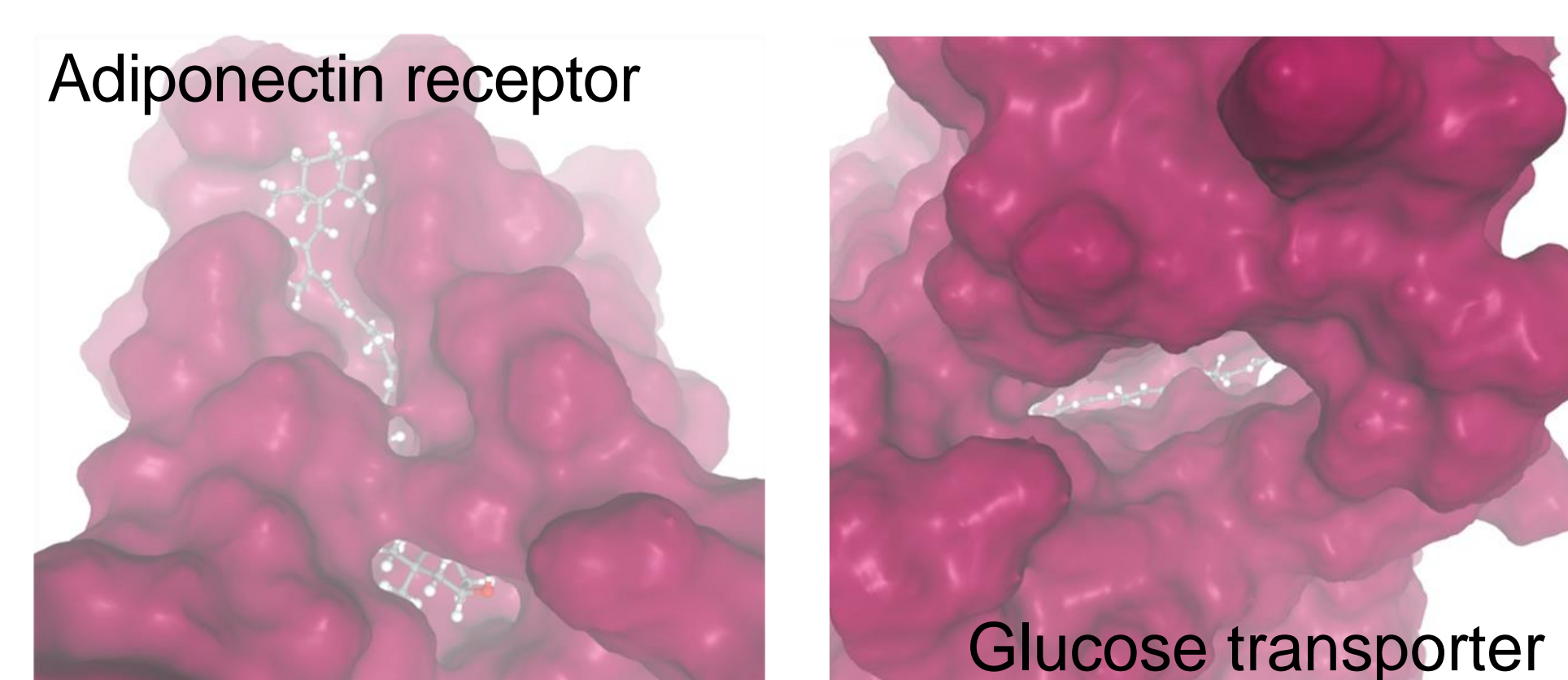


Figure 6. Three dimensional binding interaction of β -cryptoxanthin with the targets that showed the highest affinity scores.

5 Potential applications:

- Persimmon extract rich in carotenoids consumption reduced serum lipids
- Persimmon extract rich in carotenoids reduced serum pro-inflammatory cytokines and liver fibrosis.
- Persimmon extract rich in carotenoids showed potential to modulated the progression of parameters related with metabolic diseases.

Relevant literature:

- [10.3390/nu16152518](https://doi.org/10.3390/nu16152518)
- [10.1016/j.lwt.2021.113011](https://doi.org/10.1016/j.lwt.2021.113011)
- [10.1111/1462-2920.13047](https://doi.org/10.1111/1462-2920.13047)
- [10.1002/jsfa.70276](https://doi.org/10.1002/jsfa.70276)