

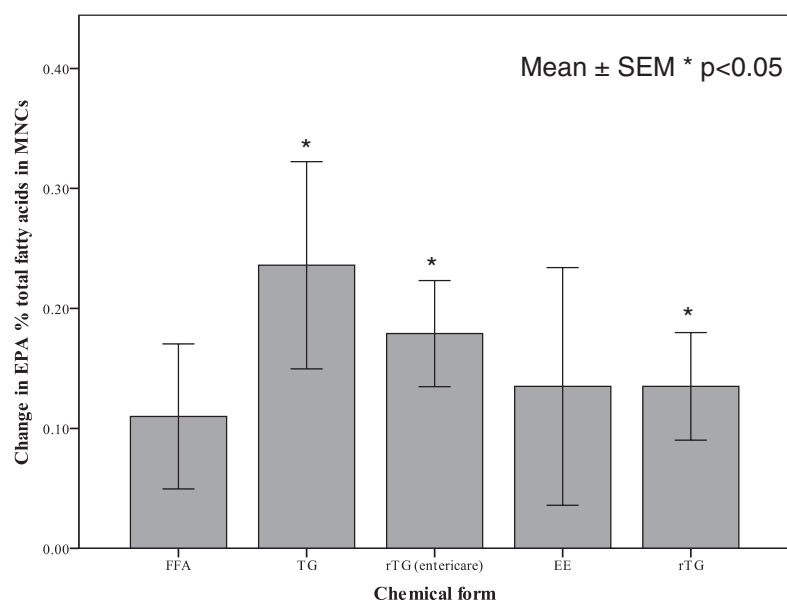
## Rapid incorporation of omega-3 fatty acids into blood mononuclear cells

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The omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are known to influence inflammation and immunity<sup>(1)</sup>. The effects seen have been related to increased incorporation of these fatty acids into the membranes of the cells involved<sup>(2)</sup>. This incorporation has been typically studied over a time course of weeks to months<sup>(3)</sup>, although recent studies reveal appearance of EPA and DHA in human blood mononuclear cells (MNCs) within a few days of increased intake<sup>(4)</sup>. Here we investigate whether there is an increased content of EPA and DHA in MNCs 6 hours following consumption of the fatty acids and whether the chemical formulation of the omega-3 fatty acids matters.

Healthy male volunteers ( $n$  10) aged 18–40 y were recruited into a double blinded cross-over trial. Each recruit consumed EPA and DHA in the 5 different chemical forms (“natural” triacylglycerol (TG), reconstituted TG (rTG), enterically-coated reconstituted TG (rTG entericare), ethyl ester (EE), free fatty acid (FFA)) on 5 post-prandial study days each at least 2 weeks apart. The supplements were taken in random order. At each clinic visit the fasted recruits were cannulated, baseline blood samples collected, and a standard breakfast consumed along with the supplement. All supplements provided 1.1 g EPA and 0.4 g DHA. Blood samples were collected at baseline and at 6 hours. MNCs were isolated using a Histopaque-Ficoll gradient. Incorporation of EPA and DHA into MNCs was assessed by gas chromatography.



MNC EPA increased from baseline to 6 hours with all formulations of omega-3 fatty acids (see Figure). EPA was significantly higher at 6 hours than at baseline after ingesting TG, rTG and rTG (entericare) forms (all  $p < 0.05$ ). However, the change in MNC EPA over 6 hours did not differ among formulations. MNC DHA did not differ between baseline and 6 hours.

EPA is rapidly incorporated into immune cells in humans. The exact formation of the omega-3 supplement may influence this rapid incorporation, although the differences between formulations are small. Immune function could be modified by omega-3 fatty acids more quickly than previously thought.

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