All neurons utilize phospholipid precursors for the formation and maintenance of neuronal membranes. Phospholipids form the backbone of neuronal membranes and are required for membrane receptor and enzyme functions, with phosphatidylcholine (PC) being the most abundant membrane phospholipid. In rodents, it was previously shown that administration of choline, uridine, and docosahexaenoic acid (DHA), synergistically accelerate brain phospholipid synthesis by increasing the substrate-saturation of the enzymes that catalyze the rate limiting steps for the key intermediates in phospholipid synthesis (Wurtman, 2006).

The availability of sufficient amounts of these compounds systemically is affected by their nutritional intake and also by the intake of other specific nutrients that influence their synthesis, degradation or distribution in the body. Recently, we have shown the importance of dietary vitamins B\textsubscript{6}, B\textsubscript{12}, and folate for supporting choline status, most likely via their stimulatory effects on methylation capacity (van Wijk, in press). In addition to the effects on plasma choline we also observed that B-vitamins can increase plasma DHA levels, probably by increasing the flux of DHA from the liver to peripheral tissues as suggested by Panza (2009). We also found plasma DHA increasing effects of dietary phospholipids.

Hence, administration of supplemental amounts of dietary phospholipids or B-vitamins can increase the availability of circulating nutritional phospholipid precursors, i.e. DHA and choline, and therefore might promote phospholipid synthesis.