New Research Discovers How Ahiflower® Oil Helps Fuel Healthy Brain Development

Study reveals how C18 omega-3s promote energy metabolism and growth in the developing brain in parenteral nutrition

Ahiflower® (Buglossoides arvensis) oil

WINSTON SALEM, NC, UNITED STATES, June 29, 2026 /EINPresswire.com/ -- Every year, millions of pre-term infants and neonates around the world survive on parenteral nutrition (PN) therapies. One of the recognized challenges of conventional PN emulsions is a well-known propensity for impaired immunity leading to systemic inflammation that negatively impacts early brain development. This in turn negatively affects cognitive development and lifetime neurological health trajectories.

PN, which delivers all nutrients intravenously when the GI tract is too immature or impaired to take in nutrition orally, is often used in the most vulnerable patients, including critically ill individuals, premature infants, and neonates who cannot consume or digest food normally. Lipid emulsions are an essential component of these life-saving nutritional therapies as they provide essential fatty acids and dense calories without fluid overload.

New research published in Current Developments in Nutrition provides groundbreaking insight into how a novel plant-based lipid emulsion containing Ahiflower® oil (Vegaven®) used in PN supports critical metabolic and developmental processes in the neonatal brain. The study demonstrates that provision of shorter-chain omega-3 and omega-6 fatty acids, namely ALA, SDA, and GLA in Ahiflower® oil, prevent neuroinflammation in PN caused by lipopolysaccharide (LPS) 'leakage' from the gut — thereby promoting energy metabolism and growth signaling critical to the developing neonatal brain. The new study's evidence is groundbreaking because

the lipid emulsion containing Ahiflower® oil (Vegaven®) completely reversed the adverse effects of a conventional PN emulsion.

Dr. Michael Zaugg and Dr. Eliana Lucchinetti, researchers at the University of Alberta, developed the novel intravenous lipid emulsion Vegaven® and compared it with SMOFlipid®, the currently recommended and standard-of-care lipid emulsion containing fish oil. Using a neonatal piglet model that closely mimics human neonatal brain development, the researchers uncovered the underlying mechanisms by which plant-derived shorter-chain omega-3 fatty acids support brain health and development.

“Our findings go beyond simply measuring fatty acid levels in the brain,” said Dr. Michael Zaugg. “We measured fundamental growth signaling pathways in the developing brain, specifically related to insulin and insulin-like growth factor, and further determined the supply of energy fuels to the growing brain in PN with Vegaven® versus SMOFlipid®. These measurements show that PN with Vegaven® provides significantly more energy substrates to the developing brain, keeping it metabolically active and supporting neurodevelopment by activation of key transcription factors. In contrast, fish oil-based SMOFlipid® leads to “energy stress”, which promotes detrimental catabolic events and inhibits growth.”

“This research represents an important step forward in understanding how Ahiflower® oil’s uniquely rich plant-derived fatty acids help in brain development,” said Greg Cumberford, Science Lead of Natures Crops International. “The physiological and sufficient formation of long-chain fatty acids DHA & ARA, critical for neonatal brain development from their shorter precursors, has obvious major advantages—without provoking trade-offs of whole-body inflammation and insulin resistance.”

Indeed, previous research from the same group showed that bioactive lipid mediators are generated from these precursors enhancing immunity and anabolic processes. These findings collectively suggest that plant-based Ahiflower® oil, nature’s richest source of omega-3, has strong whole-body anti-inflammatory, insulin-sensitizing benefits and readily supports the biological processes underlying healthy growth and neurological development. In summary, the new research expands the future toolkit available for clinical and specialized nutrition

applications.

“These discoveries reinforce the idea that gaps in omega-3 nutrition — whether critical as in PN or healthspan-related in dietary nutrition — can be readily met from plant-based omega-3 sources that complement marine omega-3 sources," said Cumberford. "By better understanding the unique biological activity of plant-derived omega-3s, we can help build a more resilient and sustainable omega-3 ecosystem.”

Dr. Zaugg will present this research and its significance for supporting neonatal brain development in PN applications at the Regenerate Symposium in Halifax, Nova Scotia on September 17th.

About Natures Crops International
A manufacturer of specialty oils for dietary supplements, nutraceuticals, food, personal care and animal nutrition products, Natures Crops International (NCI) produces oils from the highest quality crops, produced by growers who follow strict management protocols for sustainability and identity preservation. NCI ensures the crops produced are grown, processed, packaged, and delivered in a safe, sustainable, traceable, and cost-competitive manner. The company has operations in Prince Edward Island, Canada and the United Kingdom, with headquarters in North Carolina. For more information, please write to info@naturescrops.com.

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