The highly pure MPLA analog, 3D-PHAD®, provides a homogeneous synthetic equivalent for the 3-deacylated MPLA derived from bacterial LPS. While comparable to bacterial MPLA and other synthetic MPLA analogs at eliciting an immune response in a liposomal adjuvant system (see bar graph), 3D-PHAD® is less pyrogenic than its bacterial-derived mimic. Extensive preclinical testing with 3D-PHAD® demonstrated equivalency to PHAD®, and human trials have been scheduled for launch. 3D-PHAD® is protected under Pat No. 9,241,988. Licensing opportunities are available for vaccine or immunotherapy commercialization.

PHAD® is a synthetic structural analog of monophosphoryl Lipid A (MPLA) that has been shown to boost the immune system through activation of the toll-like receptor 4 (TLR4) resulting in production of proinflammatory cytokines and antigen-specific effector CD4+ and memory CD8+ T cells. Also referred to as GLA, this adjuvant has been administered to well over 1000 human subjects without serious adverse events. PHAD® is available in bulk quantities for vaccine development and commercial manufacturing.

The MPLA structural analog, 3D(6-acyl)-PHAD®, is the synthetic MPLA most closely related to the reported structure of MPLA Adjuvant used in GSK’s Adjuvant Systems AS01, AS02, and AS03. As with other synthetic MPLA analogs manufactured by Avanti, it is structurally homogeneous and highly purified, and mimics the TLR4 agonist activity of bacterial MPLA. Extensive preclinical testing with 3D-PHAD® demonstrated equivalency to PHAD®, and human trials have been scheduled for launch. 3D-PHAD® is protected under Pat No. 9,241,988. Licensing opportunities are available for vaccine or immunotherapy commercialization.

PHAD®-504 was designed as a synthetic structural analog of detoxified MPLA derived from E. coli lipopolysaccharide (LPS). It is structurally similar to PHAD®, differing only in the length of a single fatty acid chain. As expected, the activity of PHAD®-504 is quite similar to that of PHAD®, making the two products interchangeable as adjuvants in vaccine or immunotherapy formulations.

The MPLA structural analog, 3D(6-acyl)-PHAD®, is the synthetic MPLA most closely related to the reported structure of MPLA Adjuvant used in GSK’s Adjuvant Systems AS01, AS02, and AS03. As with other synthetic MPLA analogs manufactured by Avanti, it is structurally homogeneous and highly purified, and mimics the TLR4 agonist activity of bacterial MPLA. Patent pending on 3D(6-acyl)-PHAD®.

Avanti manufactures monophosphoryl Lipid A (MPLA) by hydrolysis of endotoxin lipopolysaccharide (LPS) isolated from Salmonella minnesota R595. MPLA is purified from the hydrolysate and contains a mixture of structural analogs containing differing numbers of fatty acids and positional isomers. The detoxified MPLA acts as a toll-like receptor 4 (TLR4) agonist, and hydrolysis of the LPS to yield MPLA retains the activity of stimulating the adaptive immune response while eliminating many of the pro-inflammatory side effects experienced with LPS.

Data kindly provided by Dr. Carl R. Alving, Walter Reed Army Institute of Research.
TB Vaccine Trehalose Dibehenate (TDB)

Incorporation of the glycolipid triheptanoylgllycerol (THG) into cationic liposomes composed of the quaternary ammonium compound dimethyldioctadecylammonium (DDA) produces an adjuvant system which induces a powerful cell-mediated immune response and a strong antibody response, desirable for a high number of disease targets.

TB Vaccine DDA

Is your immunotherapy or vaccine program spending valuable time and resources on adjuvant formulation development? With nearly 100 years of combined experience formulating lipids, Avanti can support your formulation development activities. We offer formulation services for both pre-clinical and clinical development using our own cGMP manufactured lipids. Batches can be scaled from a few milliliters to >100 liters to accommodate your stage of clinical development. We work closely with your packaging group throughout the process to ensure we provide material suitable for aseptic fill/finish in your final dosage form. When you are ready for commercialization, Avanti can work in partnership with your CMO to provide a seamless transfer of the formulation for scale-up and manufacturing.

Adjuvant Formulations

Vaccine adjuvants using heterogeneous monophosphoryl lipid A (MPL) derived from Salmonella minnesota R595 have proven to be safe and effective at inducing Th-1 type immune responses to heterologous proteins in animal and human vaccines. Avanti revolutionized immunotherapy and vaccine development with the introduction of Synthetic MPL derivatives and adjuvant systems. Avanti now manufactures multiple synthetic analogs of MPL containing a single molecular species that are as effective and safe at inducing an immune response as their natural product predecessor. PHAD®, 3D-PHAD®, and 3D(6A)-PHAD® are manufactured according to cGMP guidelines and are available in bulk quantities for your clinical trials. Licensing opportunities are available for your field of use. Contact adjuvant@avantilipids.com for more information.

3D-PHAD®, Pat No. 9,241,988


