

More than (Phospho) Lipids

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More than Lipids

Solutions for the entire product cycle: Research to Commercialization.

- **Research Products**
Highest Purity Lipid Reagents
- **cGMP Manufacturing**
API & Contract Manufacturing
- **Adjuvants**
Vaccine Development
- **Analytical Services**
Lipid Analysis
- **Lipidomics**
MS Standards, Antibodies & Lipid Toolbox
- **Formulations**
Liposomes & Nanoparticles
- **Equipment**
Liposome Production Tools
- **Custom Synthesis**
Synthesis & Beyond



Avanti[®]
POLAR LIPIDS, INC.

Research Products Division

Highest Purity Lipid Reagents

- Phospholipids
- Sphingolipids (Simple & Complex)
- Neutral Lipids
- Stable Isotopes (Deuterated Lipids)
- Sterols

Global Alliance Partnership with Merck

5 Year Exclusive Global Contract Excluding US Sales

Always Innovative & Growing

In 2018, 166 new products introduced.

In 2019, 140 new products introduced.

In 2020, 140 new product introduced....and counting.



99%
pure

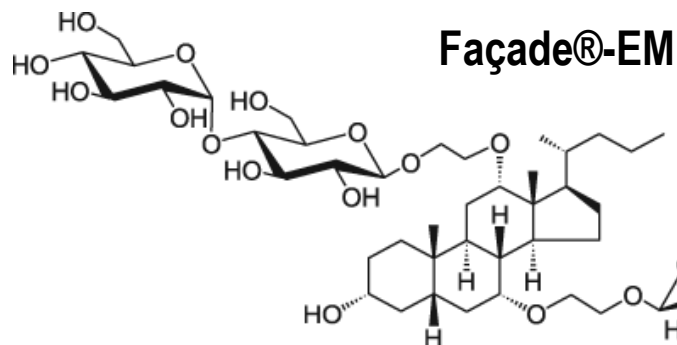
We sell the **good** stuff.



Avanti[®]
POLAR LIPIDS, INC.

Facial Amphiphiles for Membrane Protein Stabilization and Crystallization

Available Exclusively from Avanti

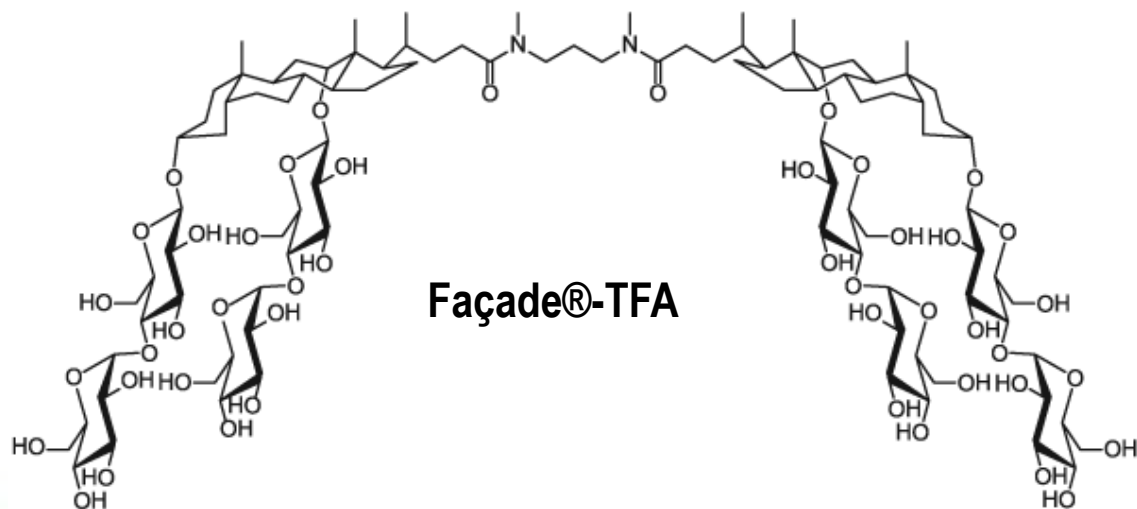


Also in stock:

Façade®-TEG

Façade®-EPC

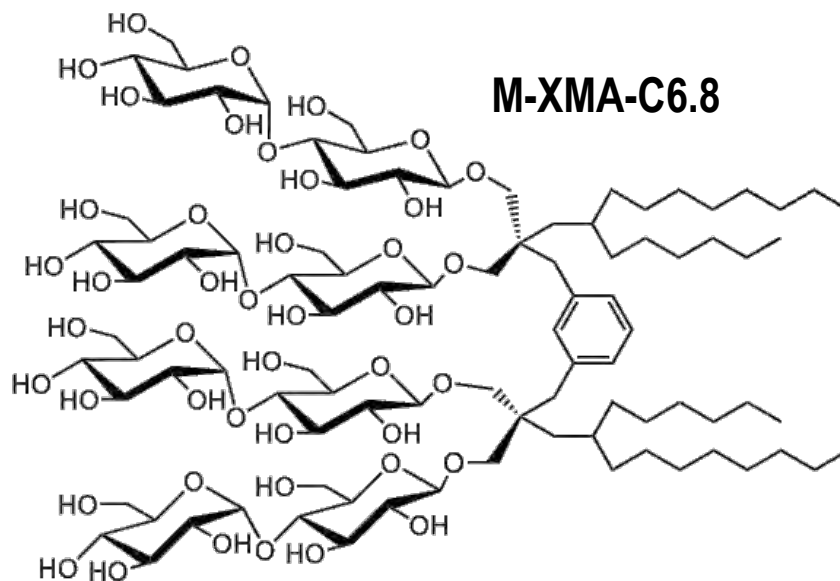
Façade®-TEM



Avanti®
POLAR LIPIDS, INC.

Maltoside-Bearing Amphiphiles for Membrane Protein Stabilization and Crystallization

Available Exclusively from Avanti

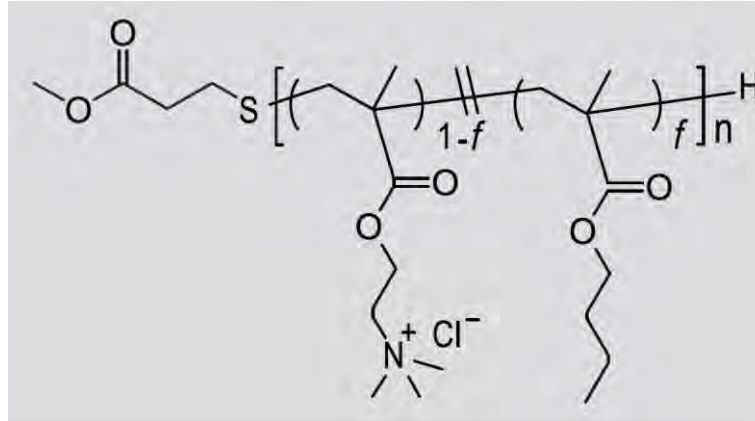


Additional Maltoside-Bearing Amphiphiles Coming Soon!

Polymethacrylate (PMA) Copolymers

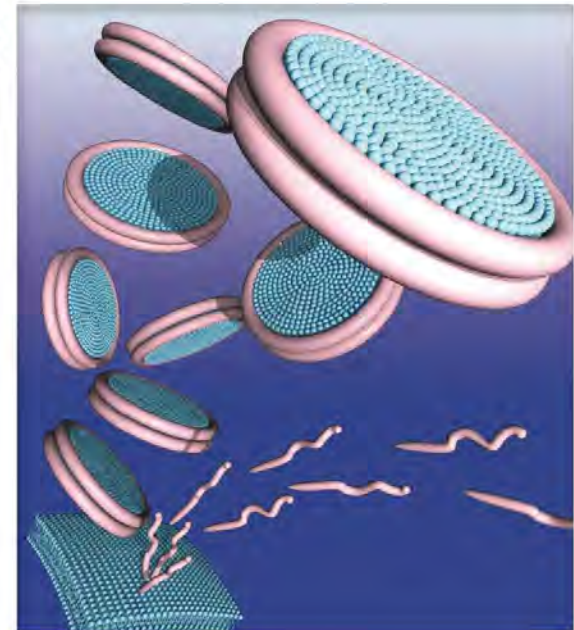
Perform Structural and Functional Studies on a Variety of Membrane Proteins

Available Exclusively from Avanti



Advantages of PMA Based Lipid Nanodiscs:

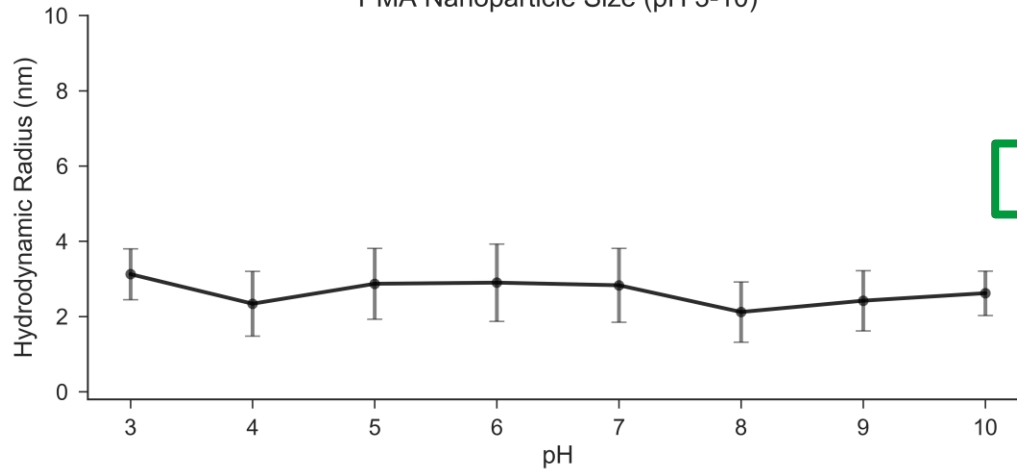
- Spontaneously Forms Lipid Nanodiscs through Fragmentation of Lipid Bilayer
- Amenable to Biophysical Characterization using CD, UV/vis, and Fluorescence Spectroscopy
- Ability to Produce Nanodiscs of Various Sizes
- Larger PMA Polymer Nanodiscs can be aligned in a magnetic field allowing for solid-state NMR studies on membrane proteins or peptides.



PMA Nanoparticle Stability: pH and NaCl Concentration

(0.2mg of DMPC and 0.25mg PMA (1.25x excess by mass of lipid) in 100uL, or 2.5% w/v)

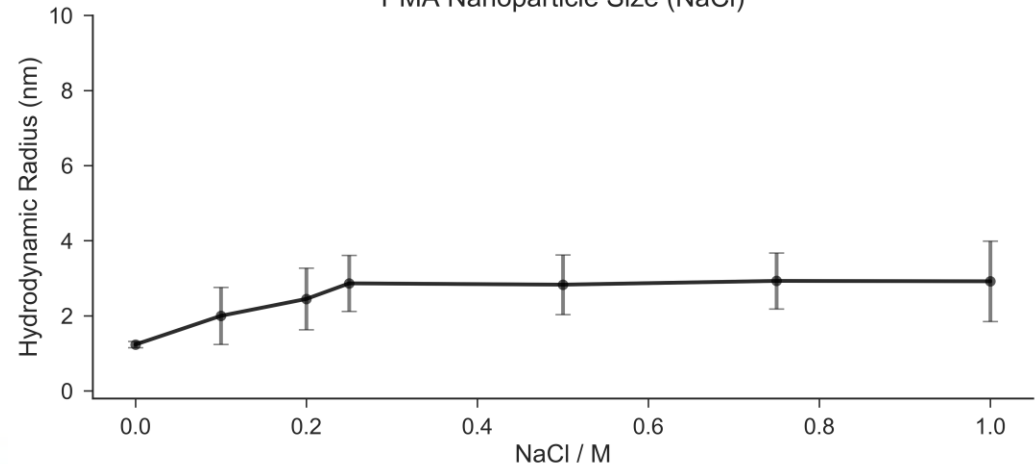
PMA Nanoparticle Size (pH 3-10)



No observable aggregation over hours

- PMA/DMPC Nanoparticles after SEC for Homogeneity
- Various Buffers for pH data; pH \pm = 0.2
- 20mM HEPES, pH 7.4 for NaCl Data
- Ionic Strength Constant
- Hydrodynamic Radius from DLS
- 8 Samples Prepared and Measured

PMA Nanoparticle Size (NaCl)

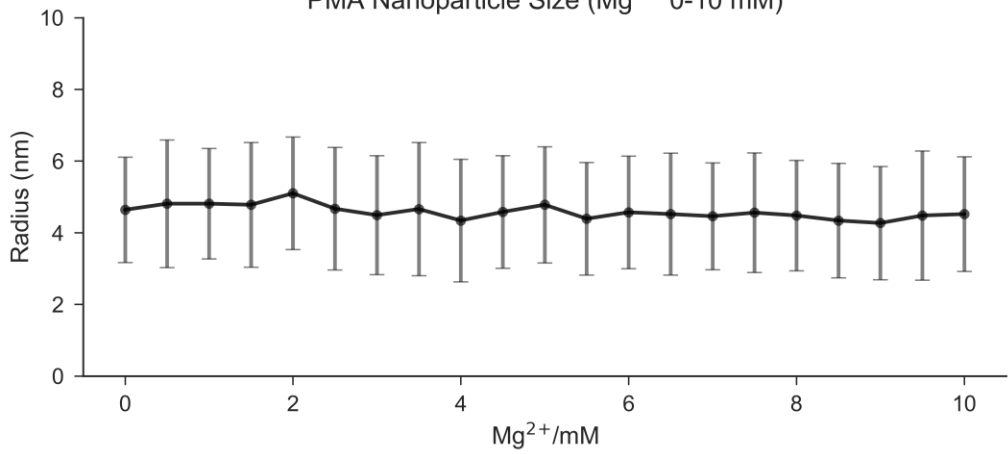


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PMA Nanoparticle Stability: Divalent Cations (Mg^{2+} & Ca^{2+})

(0.2mg of DMPC and 0.25mg PMA (1.25x excess by mass of lipid) in 100uL, or 2.5% w/v)

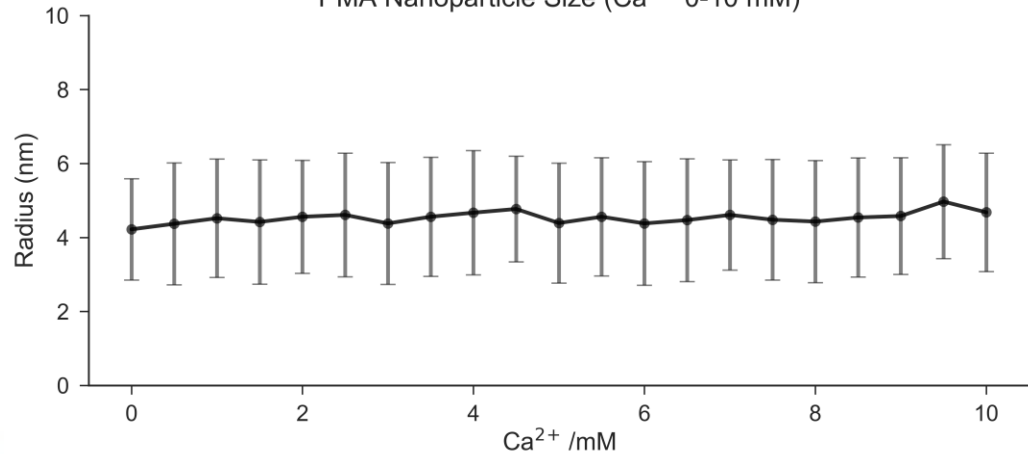
PMA Nanoparticle Size (Mg^{2+} 0-10 mM)



No observable aggregation over hours

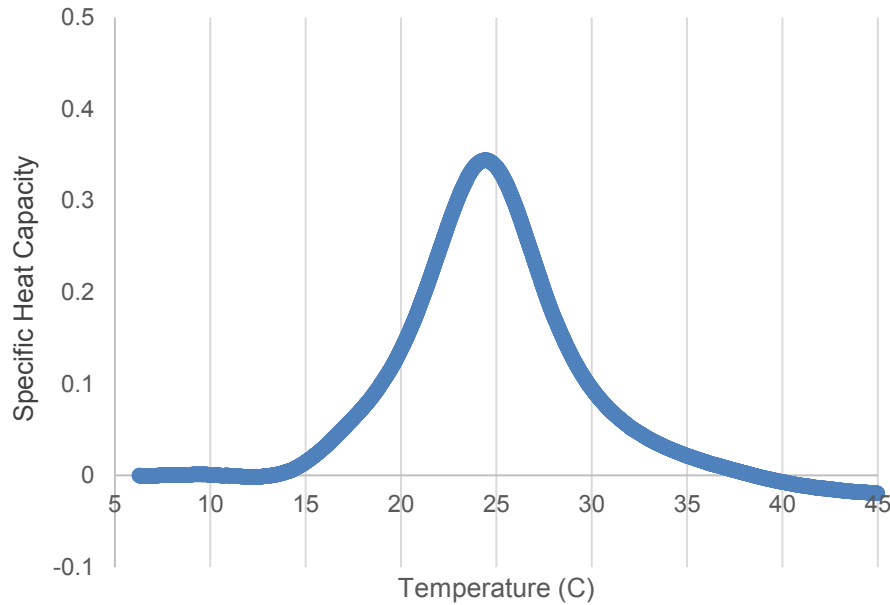
- PMA/DMPC Nanoparticles after SEC for Homogeneity
- 20mM HEPES + NaCl; pH 7.0
- Ionic Strength Constant
- Hydrodynamic Radius from DLS
- 7 Samples Measure at Each Point

PMA Nanoparticle Size (Ca^{2+} 0-10 mM)

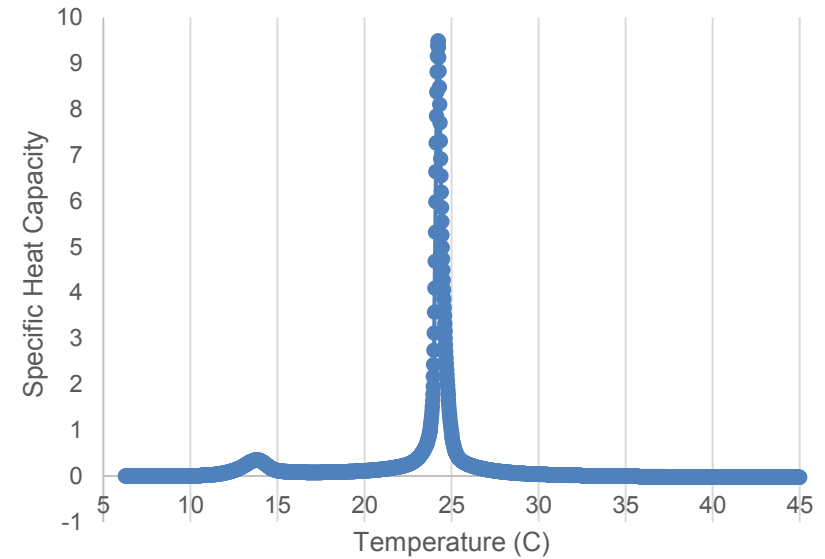


Thermodynamic Data for DMPC LUVs and PMA/DMPC Nanoparticles

PMA/DMPC Nanoparticles



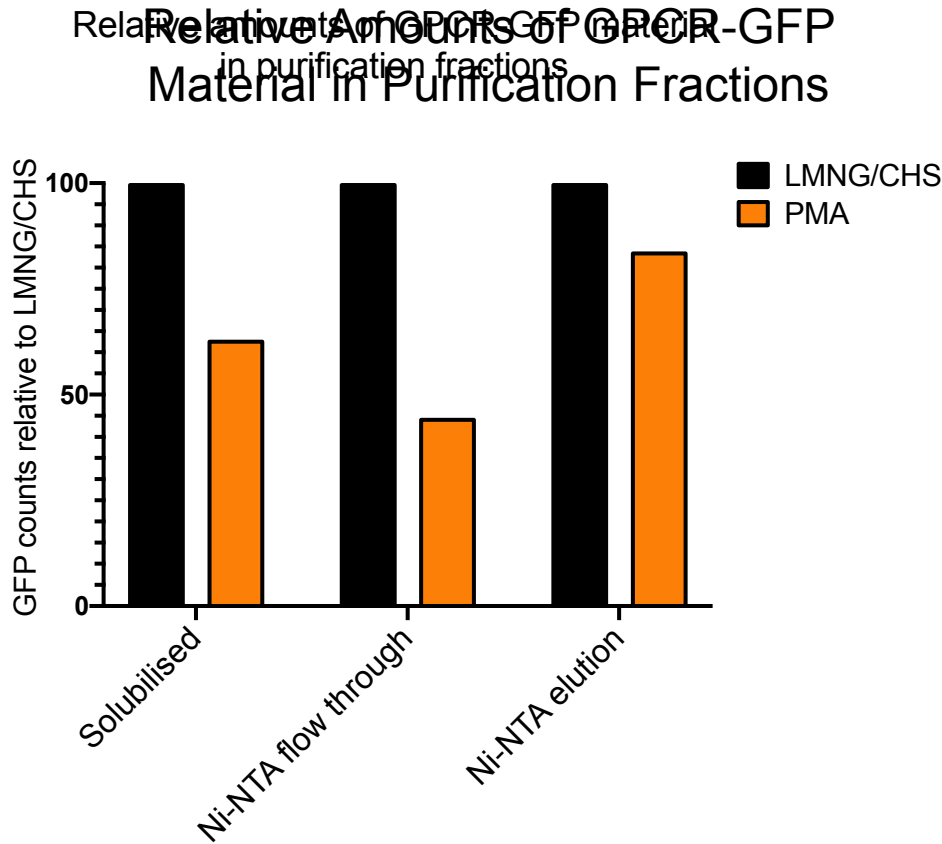
400nm DMPC LUVs



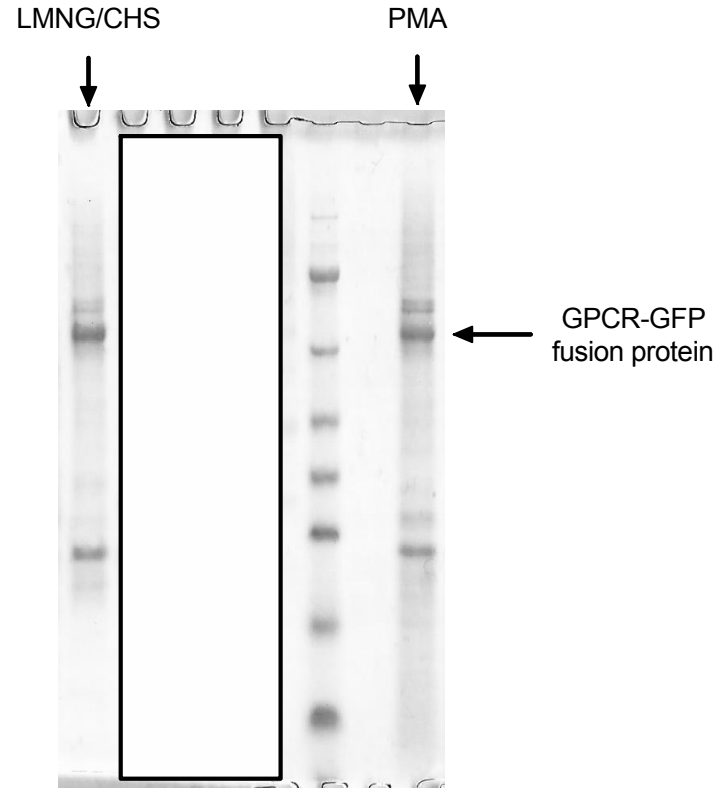
Loss of Cooperativity Consistent with other Polymer Nanoparticles
(chain packing may be similar)

- PMA/DMPC Nanoparticles after SEC for Homogeneity
- 20mM HEPES + NaCl; pH 7.4

Purification of a GFP-Tagged GPCR from Sf9 Membranes using PMA



SDS-PAGE of Ni-NTA Elutions



PMA solubilized material elutes with a similar purity and amount to detergent (LMNG/CHS)



- Method Design, Development, Validation, and Qualification
- API Characterization & Impurity Identification
- Development of Pharmaceutical Specifications
- Lipid Raw Material & Finished Product Release Testing
- Stability Studies
- Method Transfer

Available Analytical Testing Services

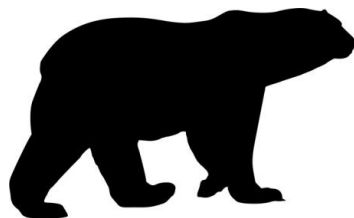
NMR, LC-MS/MS, GC-MS, GC-FID, ICP-MS, Ion Chromatography, HPLC-ELSD, HPLC-UV, Karl Fischer Titration, POV, FTIR, and more



Moral of the Story

People do

amazing



things with our lipids (and polymers and detergents)!

What will **you** do?

Avanti is

**More than
Lipids**

(Phospho)

Our full range of services includes production of unique research products, custom services, analytical services, and much more!

Let Avanti Revolutionize Your Science!

Contact Us:

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Technical: technical@avantilipids.com



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