

## Certificate of Analysis

**3D-PHAD®** 

Monophosphoryl 3-Deacyl Lipid A (Synthetic)

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Molecular Weight1537.114Chemical FormulaC82H158N3O20P

Physical State Powder Storage -20°C

**Expiration Date** One year from date of receipt

M Lot Number 5089PGA018

Avanti Lot Number 699852P-1MG-A-018

ANALYSIS	SPECIFICATION	RESULTS
Physical Examination	<b>Powder</b> : White solid which contains no foreign matter	Pass
TLC	>99% Purity Ninhydrin: negative Iodine: one major spot Phosphorus: positive Charring: positive Water dip: one major spot	>99% Purity Ninhydrin: negative lodine: one major spot Phosphorus: positive Charring: positive Water dip: one major spot
HPLC-ELSD	NLT 99% (AUC)	99.8 % (AUC)
Proton NMR	NMR spectrum consistent with structure	Consistent with structure
Phosphorus NMR	NMR spectrum consistent with structure	Consistent with structure
Mass Spectroscopy	[M-NH <sub>4</sub> ] <sup>-</sup> = 1519.1 ± 1 amu	[M-NH <sub>4</sub> ] <sup>-</sup> = 1518.1 amu

Approved By: