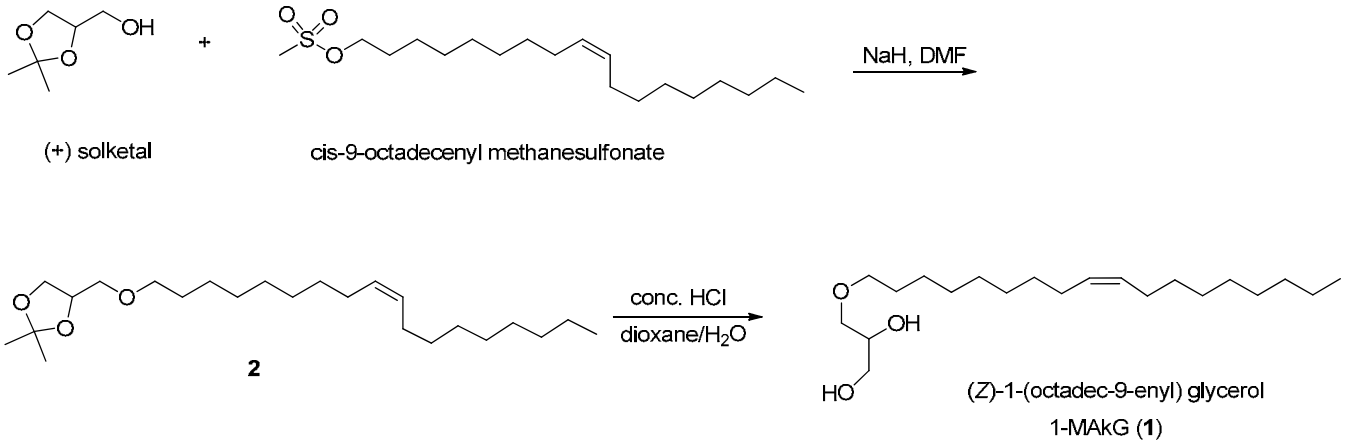
Supplement Figure 1: Schematic diagram for the synthesis of 1-monoalkylglycerol (1-MAkG, 1).



Synthetic Procedures:

(Z)-2,2-dimethyl-4-((octadec-9-enyloxy)methyl)-1,3-dioxolane 2: To a stirring suspension of sodium hydride (60% in mineral oil) (67 mg. 1.675 mmol) in anhydrous N,N-dimethylformamide (4 mL) cooled at 0ºC was added (±) solketal (132 mg, 1.0 mmol, Sigma). After stirring at 0ºC for 5 min, *cis*-9-octadecenyl methanesulfonate (520 mg, 1.5 mmol, Aldrich) in anhydrous N,N-dimethylformamide (1 mL) was added dropwise. After addition, the mixture was stirred at room temperature for 20 hours. The reaction was cooled at 0ºC, and quenched by addition of water. The resulting mixture was extracted twice with ethyl acetate. The combined extracts were washed with water, brine, dried over anhydrous sodium sulfate and concentrated to dryness. The obtained crude product was purified by chromatography (40 g silica gel; mobile phase: ethyl acetate/hexane, 0-20% gradient over 25 min) to afford intermediate **2** (358 mg, 93.7% yield) as a colorless oil.

(Z)-1-(octadec-9-enyl) glycerol or 1-MAkG (1): To a mixed solution of **2** (358 mg, 0.937 mmol) in dioxane (13 mL) and water (2 mL) was added conc. HCl (0.3 mL) dropwise. After addition, the reaction mixture was stirred at room temperature. The completeness of reaction was monitored by TLC (20% ethyl acetate/hexane). After stirring for 7 hours, the reaction was quenched by addition of satrated aqueous sodium bicarbonate, and then concentrated in vacuum to remove most of the volatiles. The obtained aqueous residue was taken into ethyl acetate, washed with satrated aqueous sodium bicarbonate, water, brine, dried over anhydrous sodium sulfate and concentrated to dryness. The obtained crude oily residue was purified by chromatography (40 g silica gel; mobile phase: ethyl acetate/hexane, 0-50% gradient over 35 min) to afford **1-MAkG (1)** (264 mg, 82.4% yield) as a colorless oil. *Analytics*: ^{1}H-NMR ($CDCl_3$, 400 MHz)