

# NOVEL BENZO CROWN-ETHERS TO CREATE SYNTHETIC ION CHANNELS

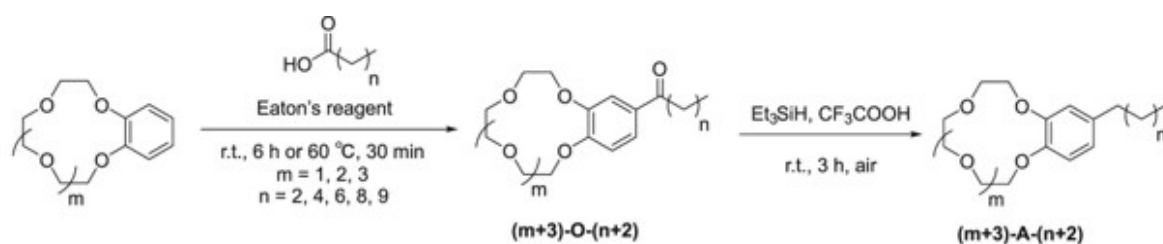
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## Technology Description

Researchers in Baron Chanda's lab at Washington University and Jennifer Schomaker's lab at University of Wisconsin-Madison have developed a library of benzo(crown-ether) compounds capable of self-assembly into ion channels. These monoacylated and monoalkylated benzo crown-ethers (MABCEs) do not cause membrane lysis at high concentrations, unlike other similar compounds. MABCEs are ideal for the production of synthetic ion channels in biological membranes.



## Stage of Research

The researchers have produced 30 different monoacylated and monoalkylated benzo (crown-ether) compounds. Though some compounds were not soluble in standard reagents, the rest were tested in gram-positive bacteria to determine the kinetics of membrane depolarization. Translocation rates of K<sup>+</sup>, Na<sup>+</sup>, and NMDG<sup>+</sup> cations were also determined.

## Publications

- Carrasquel-Ursulaez W, Deghany M, Jones CL, ... Chanda B. (2022). [Acylated and alkylated benzo\(crown-ethers\) form ion-dependent ion channels in biological membranes](#). *Biophysical Journal*, 121(6): 1105-1114.

## Applications

- Synthetic ion channel production
- Bacterial growth inhibition

## Key Advantages

- Non-toxic bacterial growth inhibitor
  - Causes membrane depolarization which increases the energy cost for maintaining cell viability and thereby inhibits bacterial growth. May be useful where the host cells are post-mitotic and pathogen is actively dividing.
- No membrane lysis at high concentrations, unlike earlier generations of ionophores
- Adjustable potency by changing alkyl chain length

**Patents:** Pending

**Related Web Links:** Chanda [Profile](#) & [Lab](#)