

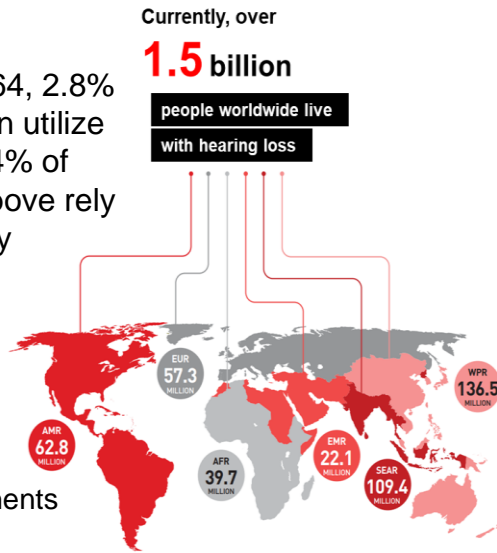
Development of Printed Lithium-Ion Microbatteries for Compact Rechargeable Hearing Aid Device

Prof. Yury Gogotsi, Sokhna Dieng, Dr. Ruocun (John) Wang, Kyle Matthews, Alex Inman

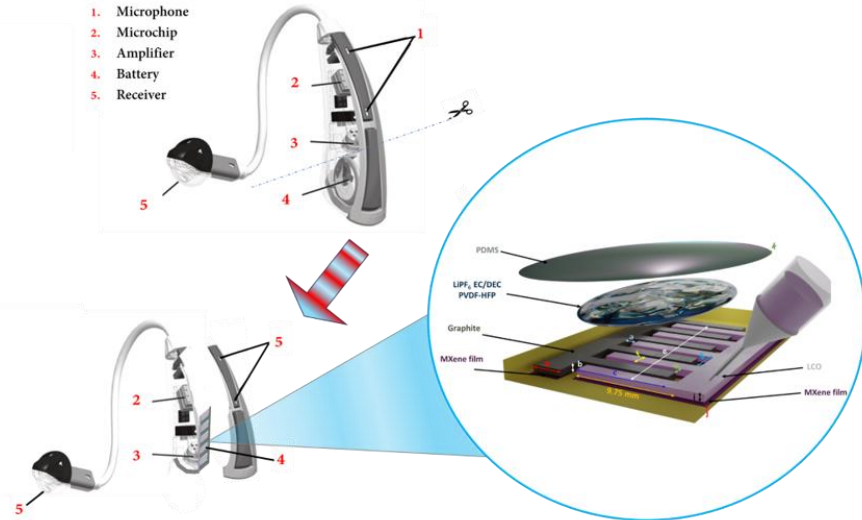


Target Problem

- Among adults aged 45 to 64, 2.8% of men and 1.9% of women utilize hearing aids. More than 14% of individuals aged 65 and above rely on hearing aids for auditory support.
- Hearing aids relied on disposable, removable batteries that have
 - ✓ Insufficient power
 - ✓ Long charging time
 - ✓ Contain toxic components
 - ✓ Short cycle life



Microbattery Design

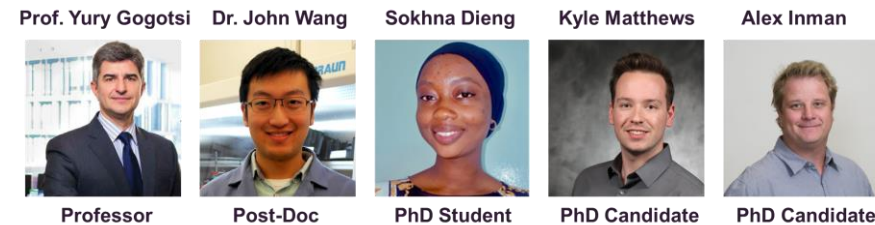


Design Specifics

- Replacing steel shell button batteries by printed interdigitated battery
 - ✓ Graphite anode
 - ✓ LCO cathode
 - ✓ Gel polymer electrolyte,
 - ✓ MXene as binders and conductive additives,
 - ✓ MXene as current collectors
 - ✓ PDMS (packaging)
- Advantage of the design: improved specific energy and power density, more flexible, reduced weight, volume and thickness of the battery, leading to lighter hearing aid devices, and ensuring a comfortable fit and discreet appearance for users.

Team Introduction

The A.J. Drexel Nanomaterials Institute (DNI) Team



Industrial Partners

