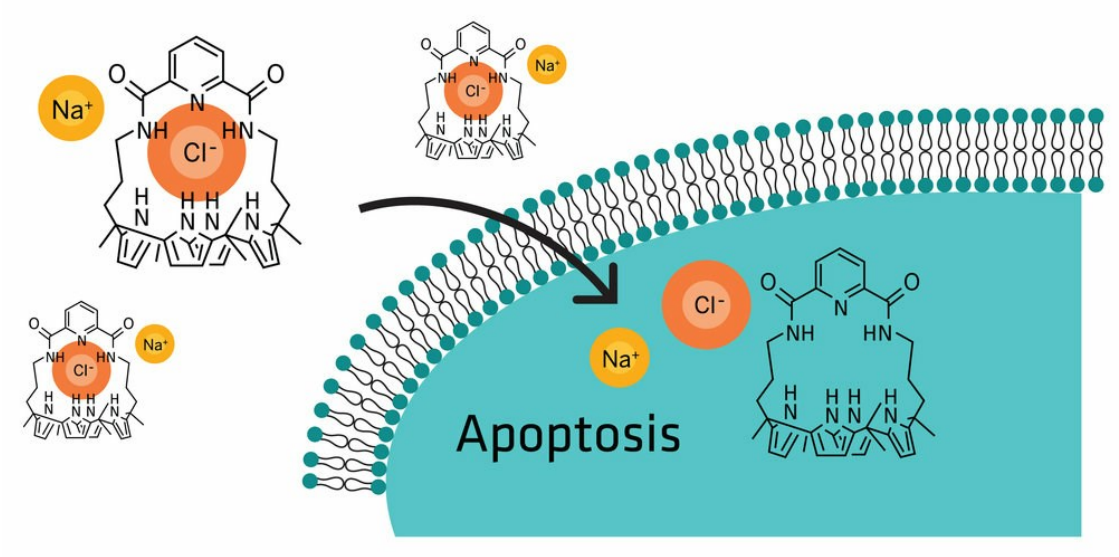
Getting Cancer to Self-Destruct

DISCOVERY ZONE, CHEMISTRY, RESEARCH, HEALTH



Sessler and colleagues recently created a synthetic ion transporter that ferries sodium and chloride ions into cancer cells, causing the cells to self-destruct.

Human cells work hard to maintain a stable concentration of ions inside their membranes. Disrupting this delicate balance can trigger programmed cell death known as apoptosis. Sparking that innate self-destruct sequence in cancer cells by skewing their ion balance would be one way to combat the disease. Unfortunately, cancer cells change how ions get transported across the cell membrane in a way that blocks apoptosis.

Almost two decades ago, scientists discovered a possible workaround in a substance that acts as a natural ion transporter and has an anticancer effect. Since then, according to Jonathan Sessler, the Roland K. Pettit Centennial Chair in Chemistry at The University of Texas at Austin, it has been a "chemist's dream," to find "synthetic transporters that might be able to do exactly the same job, but better, and also work for treating diseases such as cystic fibrosis."

Sessler and colleagues recently created a synthetic ion transporter that ferries sodium and chloride ions into cancer cells, causing the cells to self-destruct. The molecule works by binding to chloride ions, essentially surrounding each one in an organic blanket and allowing it to dissolve in the cell's membrane. The transporter tends to use naturally occurring sodium channels in the cell's membrane, bringing sodium ions along for the ride.

Sessler notes that right now the synthetic molecule triggers apoptosis in both cancerous and healthy cells. To be useful in treating cancer, a version will have to be developed that binds only to cancerous cells. Sessler is optimistic about the potential to pair the self-destruction-inducing molecule with other lab innovations that would let researchers target cancer cells specifically. He has work underway already toward this goal.

Read more about the study and Sessler's personal battle with cancer.

PREVIOUS
A Vegetable A Day

NEXT
A More Stable Source of Stable Isotopes


The University of Texas at Austin
College of Natural Sciences