

# Novel technique to prevent fires in lithium-ion batteries

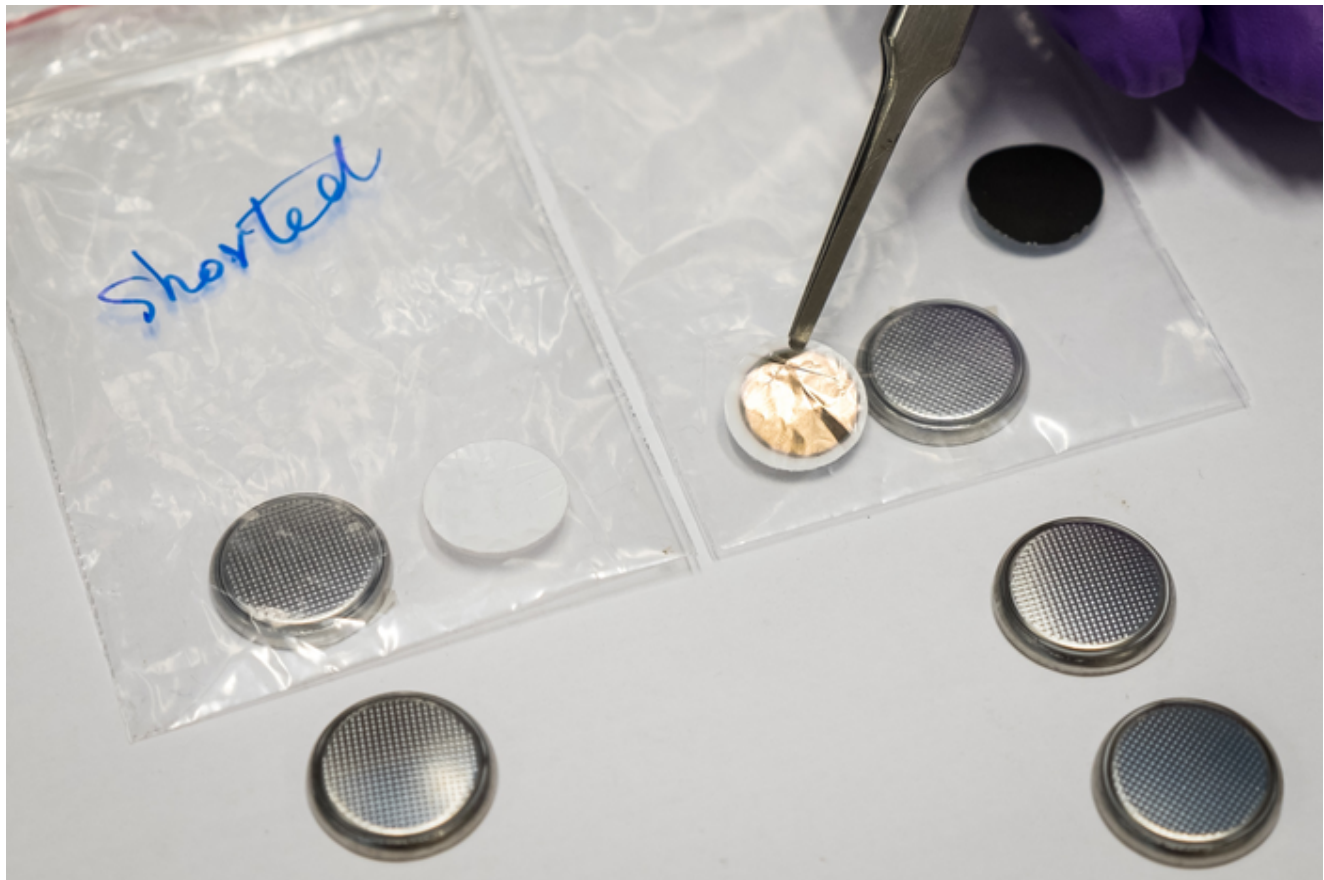
Singaporean scientists have developed a special device that prevents the formation of dendrites in lithium-ion storage. The additional layer they created works as an interface on behalf of the negative electrode, to exchange lithium-ions with the positive electrode.

SEPTEMBER 22, 2021 **EMILIANO BELLINI**

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The anti-short layers stop short circuits from happening in lithium-ion batteries.

*Image: NTU Singapore*

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Scientists from [Nanyang Technological University, Singapore \(NTU Singapore\)](#), have developed a novel technology that they claim is able to prevent internal short-circuits in lithium-ion batteries.

These short-circuits still represent a major hurdle to overcome for battery makers, as lithium-ion devices can [catch fire](#) if they are damaged or not properly manufactured. What causes these short-circuits, the research team explained, is the formation of [dendrites](#), which are needle-like projections

that can grow inside a battery and cause a number of undesirable effects, including, in a worst-case scenario, complete battery failure and even fires. The dendrites cross the separator between the positive cathode and negative anode electrodes of a lithium-ion battery during charging.

In order to prevent the dendrites from reaching the cathode, the academics placed what they called an “anti-short layer” on the separator itself. “Instead of preventing the formation of dendrites, we decided to make use of their intrinsic properties by coating an additional layer of conductive material on the separator for these dendrites to connect with,” said NTU researcher Jason Xu. “Once the dendrites make the connection, [they] will not be able to continue their growth further, thus preventing them from ever reaching the other side.”

The additional layer works as an interface on behalf of the negative electrode to exchange lithium-ions with the positive electrode. It was tested on more than 50 cells with different li-ion battery architectures and, according to the scientists, no short-circuits arose during the charging phase, even with the battery cells that exceeded their expected lifecycle. “The anti-short layer is a common material used in battery manufacturing and can be easily integrated into the current separator manufacturing process, making it easy for companies to adopt and scale up,” the Singaporean group stated, noting that it would increase lithium battery production costs by around 5%.

NTU University's spin-off NTUitive is planning to bring this novel technology to commercial production and is currently in the process of securing a patent.

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