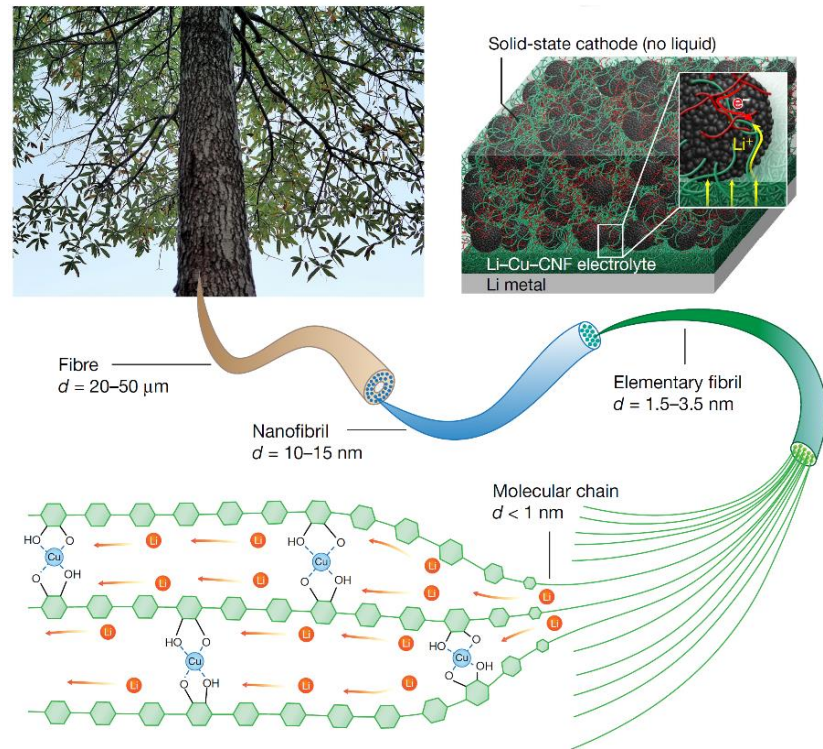


# Turning to Trees to Improve Battery Performance



The schematic depicts how synthesized cellulose combined with copper can be used to funnel lithium ions (bottom) so that it can be used as an electrolyte in a solid-state battery (top, right).

## Scientific Achievement

Scientists designed a new solid ion conductor that combines copper with polymer chains of cellulose nanofibrils derived from wood for solid-state batteries.

## Significance and Impact

To replace the liquid conductors commonly used in today's lithium-ion batteries with solid materials, researchers need to find new materials that fulfill the demand for high conductivity. This study offers a new potential candidate.

## Research Details

- Material has an ion conductivity that is 10 to 100 times better than other polymer ion conductors.
- Verified the copper attachment using the ISS beamline at NSLS-II.
- Showed that the new material could be used as an electrolyte or as a conductive binder.
- Showed that the approach can be mimicked with other polymers and metal cations.

C. Yang, Q. Wu, W. Xie, X. Zhang, A. Brozena, J. Zheng, M. N. Garaga, B. Hee Ko, Y. Mao, S. He, Y. Gao, P. Wang, M. Tyagi, F. Jiao, R. Briber, P. Albertus, C. Wang, S. Greenbaum, Y.-Y. Hu, A. Isogai, M. Winter, K. Xu, Y. Qi & L. Hu. *Nature* **598** (7882), 590-596 (2021).