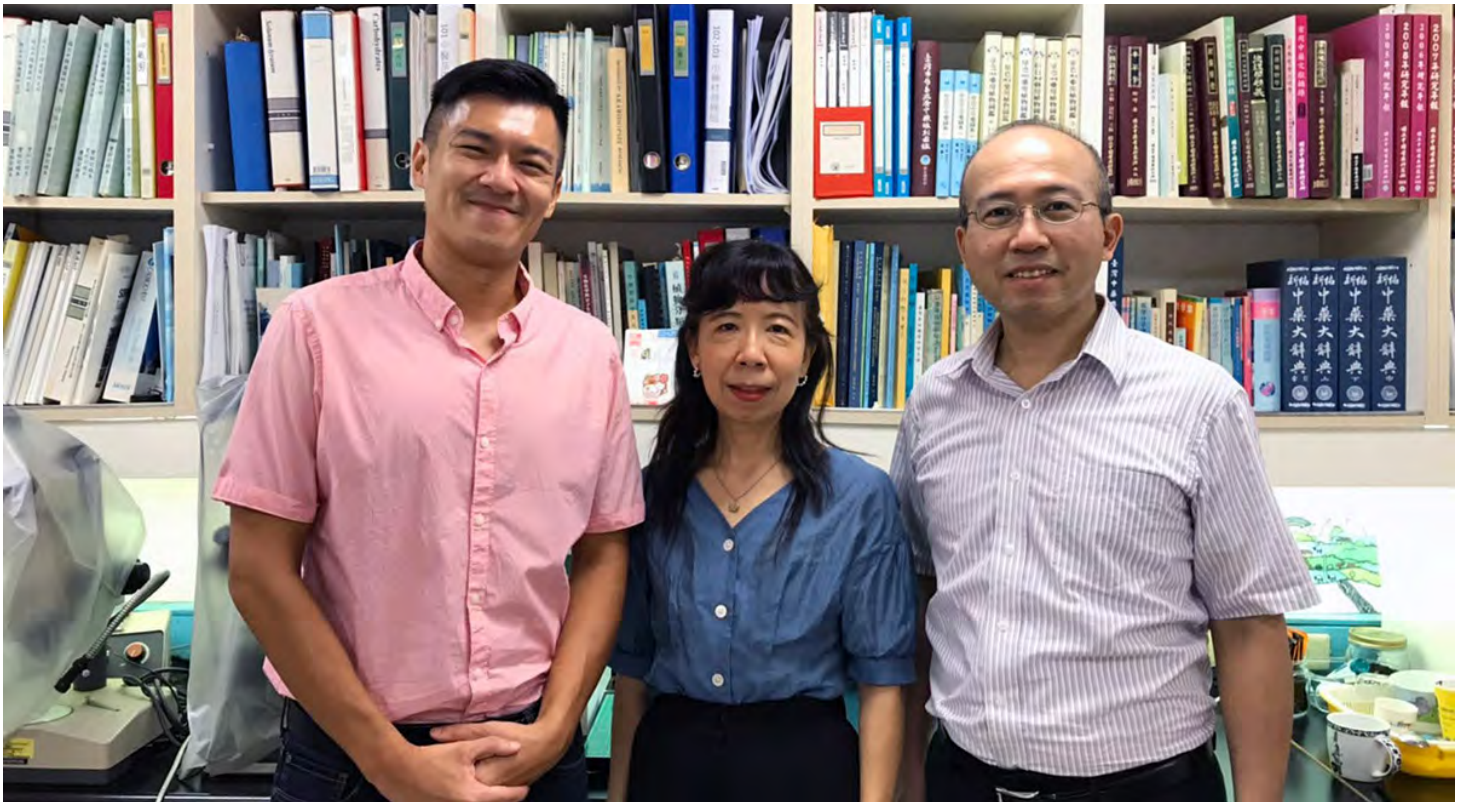
ACHIEVEMENTS

Scientists Uncover a Rare Sugar in Taiwan's Medicinal Fungus with Potent Anticancer Potential



The collaborating researchers (left to right): Prof. Tung-Yi Lin, Prof. Mei-Kuang Lu, and Prof. Chia-Chuan Chang.

A research team led by Prof. Chia-Chuan Chang of the Department of Pharmacy at National Taiwan University, with Prof. Mei-Kuang Lu of the School of Chinese Medicine and Prof. Tung-Yi Lin of the Institute of Traditional Medicine (Director; also Associate Chair of the School of Chinese Medicine, and Director of the Traditional Chinese Medicine Glycomics Research Center) at National Yang Ming Chiao Tung University, has identified a hitherto underexplored bioactive compound in *Antrodia cinnamomea* (niu-chang-chih), often referred to as Taiwan's national treasure.

Fruiting bodies from a 24-month-old sample of *Antrodia cinnamomea* (Photo adapted from doi:10.1093/ecam/nep108).

Antrodia cinnamomea is a medicinal fungus endemic to Taiwan and widely used in traditional herbal medicine. Its bioactive properties long had been attributed primarily to triterpenoids and small-molecule components, such as maleic acid and

succinic acid derivatives. However, the team's findings reveal that this fungus also produces a specialized sugar-based molecule with significant anti-inflammatory and anticancer potential.

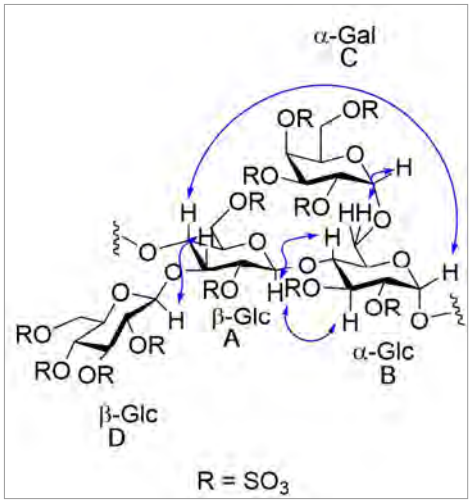
By cultivating *Antrodia cinnamomea* under highly controlled conditions enriched with ammonium sulfate, Prof. Lu's team stimulated the fungus to produce a rare compound, called sulfated polysaccharide (SPS). Among the extracted compounds, one fraction—designated N50 F2—displayed particularly robust biological activity.

Through in vitro cellular experiments, Prof. Lin's team found that N50 F2 significantly reduces levels of key inflammatory markers, including IL-6 and TNF-□, which are commonly elevated in inflammatory and immune-related diseases. The compound was observed to act by dampening hyperactive immune signaling pathways, suggesting potential applications in managing chronic inflammatory conditions.

Beyond its anti-inflammatory effects, N50 F2 also exhibited pronounced anticancer activity in lung cancer cell models. The compound not only inhibited cancer cell proliferation but also induced apoptosis, the programmed self-destruction of malignant cells. By modulating multiple cancer-related proteins and signaling pathways, N50 F2 represents a promising candidate for the development of novel anticancer strategies.

Structural analysis conducted by Prof. Chang's team revealed that N50 F2 is a unique sulfated galactoglucan, composed of glucose and galactose units with sulfate groups. This distinctive molecular architecture is believed to contribute to its bioactive properties.

Together, the collaborators' findings underscore the untapped potential of natural fungal polysaccharides for drug discovery and biomedical applications. With scalable cultivation and extraction methods already established, the research teams are optimistic that N50 F2 may be developed for use in health supplements and clinical therapies. The research team plans further studies to evaluate the efficacy of N50 F2 in animal models and, ultimately, in human trials.



Proposed repeating unit of N50 F2, a sulfated galactoglucan derived from *Antrodia cinnamomea*.

Click or Scan the QR code to read the full article in *Carbohydrate Polymers*.

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