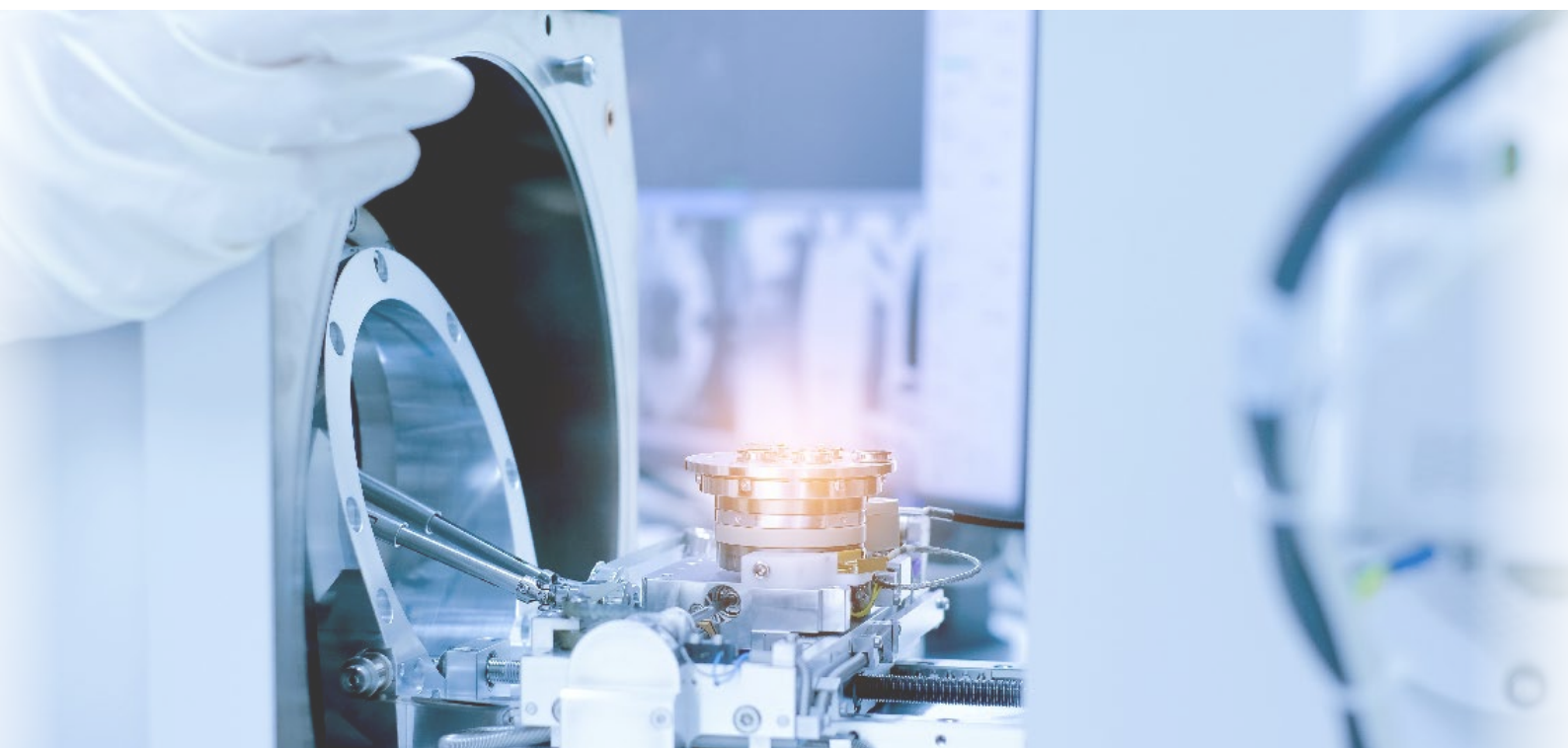


Novel Coat Grids for Facilitation of Cryo-EM Sample Preparation

The method reduces the time required for sample optimization and the time on the microscope required for data collection.

Structure determination by cryo-electron microscopy requires electron micrographs of numerous particles in native conformation, separated from each other, and captured in random orientations in vitreous ice. However, macromolecules and their complexes can be damaged by strong shearing forces during sample preparation, which results in particle aggregation. Therefore, the preparation of optimal samples for cryo-EM often requires tedious optimization.



Seeking

Development partner
Commercial partner
Licensing

IP Status

Patent application in
preparation

Contact

Jana Diblík Daňková, M.Sc., MBA
Masaryk University
Technology Transfer Office
✉ dankova@ctt.muni.cz
☎ +420 54949 8242

CHALLENGE

Technologies using a surface modification of holey carbon grids do exist. These are e.g. graphene coating and subsequent treatment with hydrogen plasma, graphene oxide coating, coating by continuous carbon film, coating by self-assembled monolayers (SAM), and NTA-graphene oxide grids. However, none of them particularly focuses on solving the sample aggregation issue.

TECH OVERVIEW

Researchers at Masaryk University have observed that the deposition of certain mixtures of chemicals on the holey carbon grid prior to the application of a sample for cryo-EM prevents aggregation of particles and increases particle concentration within a foil hole. Influenced by this phenomenon they have developed a method that reduces the time needed for sample optimization, reduces the microscope time needed for data collection, and allows the study of samples that were not accessible by conventional methods.

Deposition of polyelectrolytes on the grid in order to prevent aggregation of the sample has not been used before. Patents that describe the deposition of polyelectrolytes on a grid exist, however, the deposition technique, type of polyelectrolyte, and purpose of the deposition are different from this IP.

This approach of grid coating is very simple and consists of one pipetting step and subsequent blotting. The whole procedure takes no more than 90 sec. There is no need for any specialized equipment or chemicals as it is in the case of other coating methods. Moreover, the technology focuses on solving the sample aggregation issue which is a huge problem for some less stable samples. In fact, many of the tested samples would not be possible to analyze without this technology. Therefore, the simplicity, high throughput, and robustness of the method provide a competitive advantage.

BENEFITS

- Reduces sample aggregation
 - Simple and fast
 - High-throughput and robustness
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APPLICATIONS

Sample preparation for transmission electron cryomicroscopy (cryo-EM)

COMMERCIAL OPPORTUNITY

- The University is looking for a commercial partner who would develop the technology into a commercial product – as a kit for coating or a coated grid
- The technology is also available for licensing