

261<sup>st</sup> Regular Open Seminar (2020 Oct 28)

**Title :** Biomaterial processing by utilizing the hierarchical structures of wood.

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**Related RISH mission :** Mission4 (Development and Utilization of Wood-based Sustainable Materials in Harmony with the Human Living Environment)

Mission 5 (Quality of the Future Humanosphere)

**Abstract :**

The biomaterials have increasingly been researched in terms of high functionalization and of improvement (or stabilization) of performance. Representative biomaterial as such is the cellulose nanofiber (CNF) for example. The method of producing such material has a common process; the plant as a raw material was broken down to the smaller pieces at first, and then the pieces were reconstructed and bonded to each other. In such a process, however, it takes much energy to produce the useful biomaterial. This is the critical problem for realizing the sustainable and renewable society and the cooperative human living environment. To obtain the biomaterial with higher performance in lower energy, not only the biomaterial itself but also the process to produce it should be intensively researched. Thus, I have been researched on the high-performance biomaterial processing with the least breaking down process.

Wood is one of the most important biomaterials in the world and has great physical properties and fine hierarchical structures produced for supporting trees and for migrating water and nutrient. Thus, the key to produce the high-performance biomaterial is to utilize the fine hierarchical structure in the processing as well as in the final product. In this seminar, a new impregnation technique and a new forming technique for wood will be introduced as the structure-utilized processing.

