

Agri-food Processing Lab., Univ. Tsukuba

Investigation of various **processing & measurement** methods for food and agricultural products

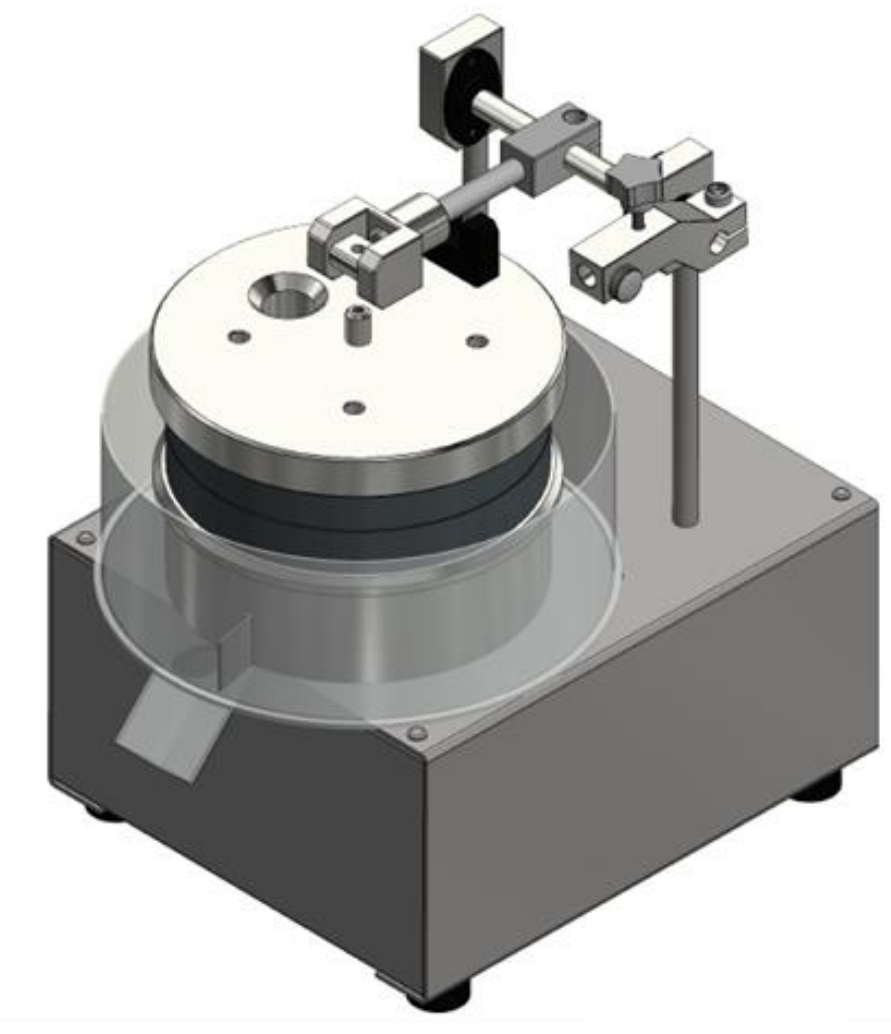
Micro Wet Milling

▼ Development as a efficient extraction method

- Extraction of functional compounds, emulsifiers, enzymes from spice

▼ Increase in bioavailability of functional compounds

- Increase in polyphenol bioavailability (blueberries), fibers, and vitamins (brown rice)
- Effective use of discarded parts (orange skin)



Micro-wet milling system



Orange slurry, spice slurry, paste from salmon bone

Novel Rice-based materials

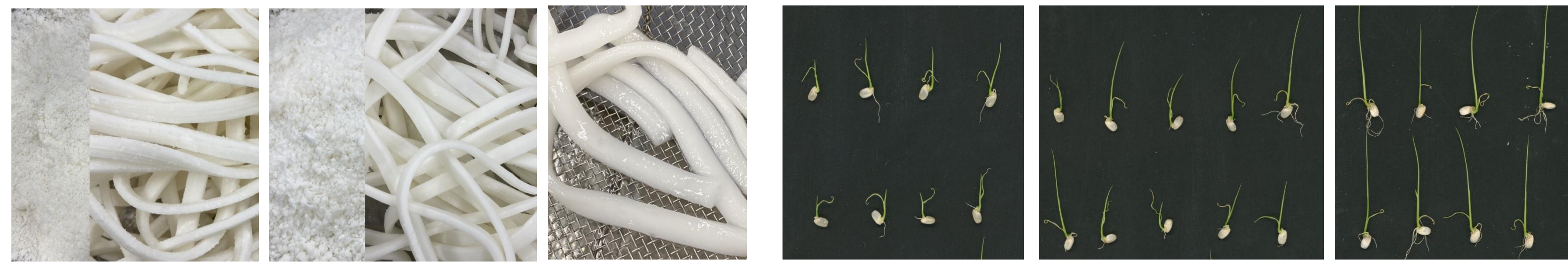
▼ Novel processing methods: rice gel and sprouted brown rice

- Gluten free bread and noodles made from rice gel
- Evaluation of physical properties of rice gel made from lactic acid bacteria fermented rice
- Sprouted brown rice, a new sprout made from rice



Rice gel shows a wide range of rheological properties

Bread made from brown rice gel and differences between rice cultivars



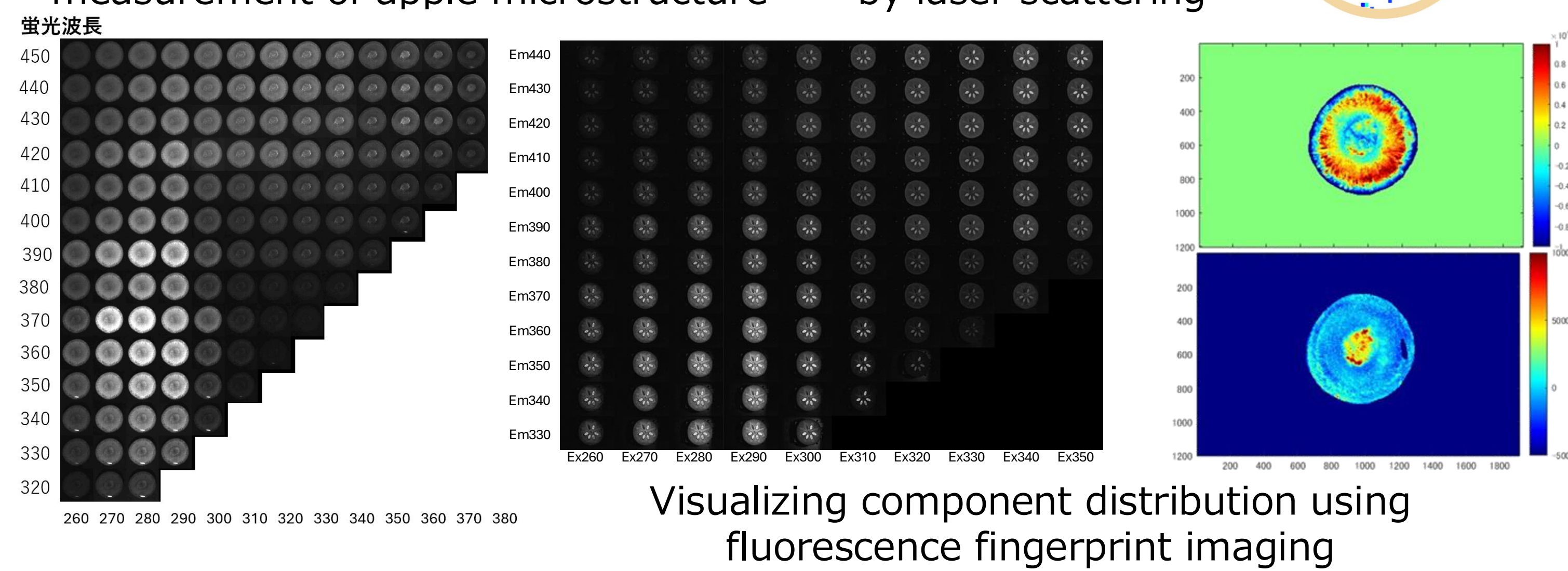
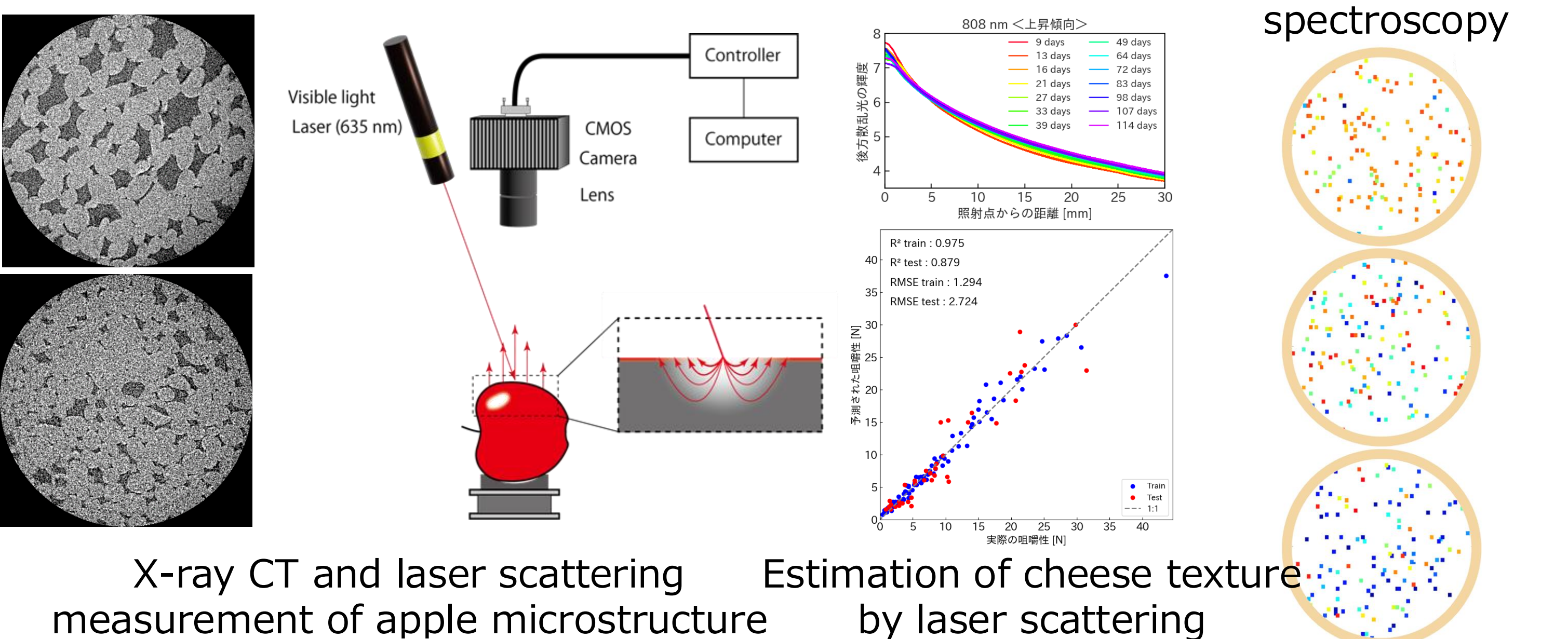
Rice noodles made from rice gel

Sprouted brown rice

Nondestructive measurement by Light

▼ Non-destructive and rapid measurement methods

- Measurement of microstructure using laser scattering and X-ray CT (apples, cheese, avocado)
- Evaluation of freshness and storage characteristics (fish, green tea, wine, beer)
- Estimation of functional compounds in cacao beans, coffee beans and green tea
- Merging imaging and spectroscopy



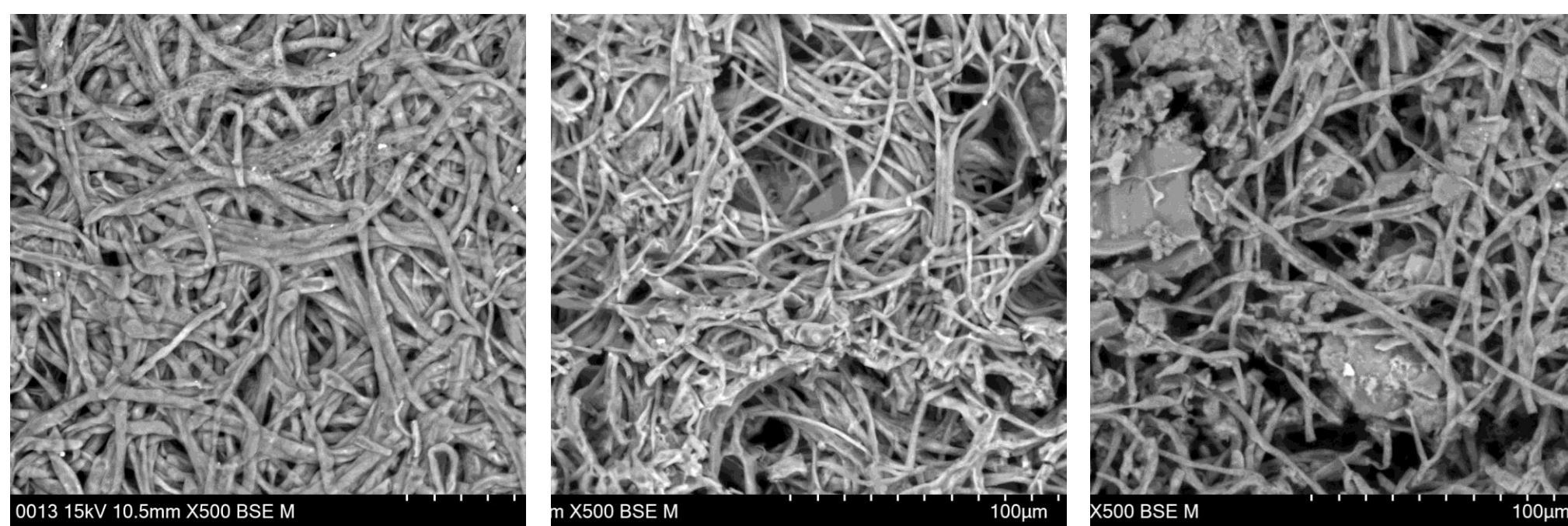
Mycoprotein from koji (*Aspergillus oryzae*)

▼ Using the mycelium of koji as a food ingredient

- Investigating different substrates that affect mycelium growth, nutrition, taste and texture
- Storage characteristics of the mycelium
- Processing methods for mycelium



Submerged cultivation



SEM images of koji mycelium



Koji meat



The effect of different substrates on mycelium growth

Extension Work



April: Climbing Mt. Tsukuba ↑



Sep. Lab trip ↑



March: Graduation ↓

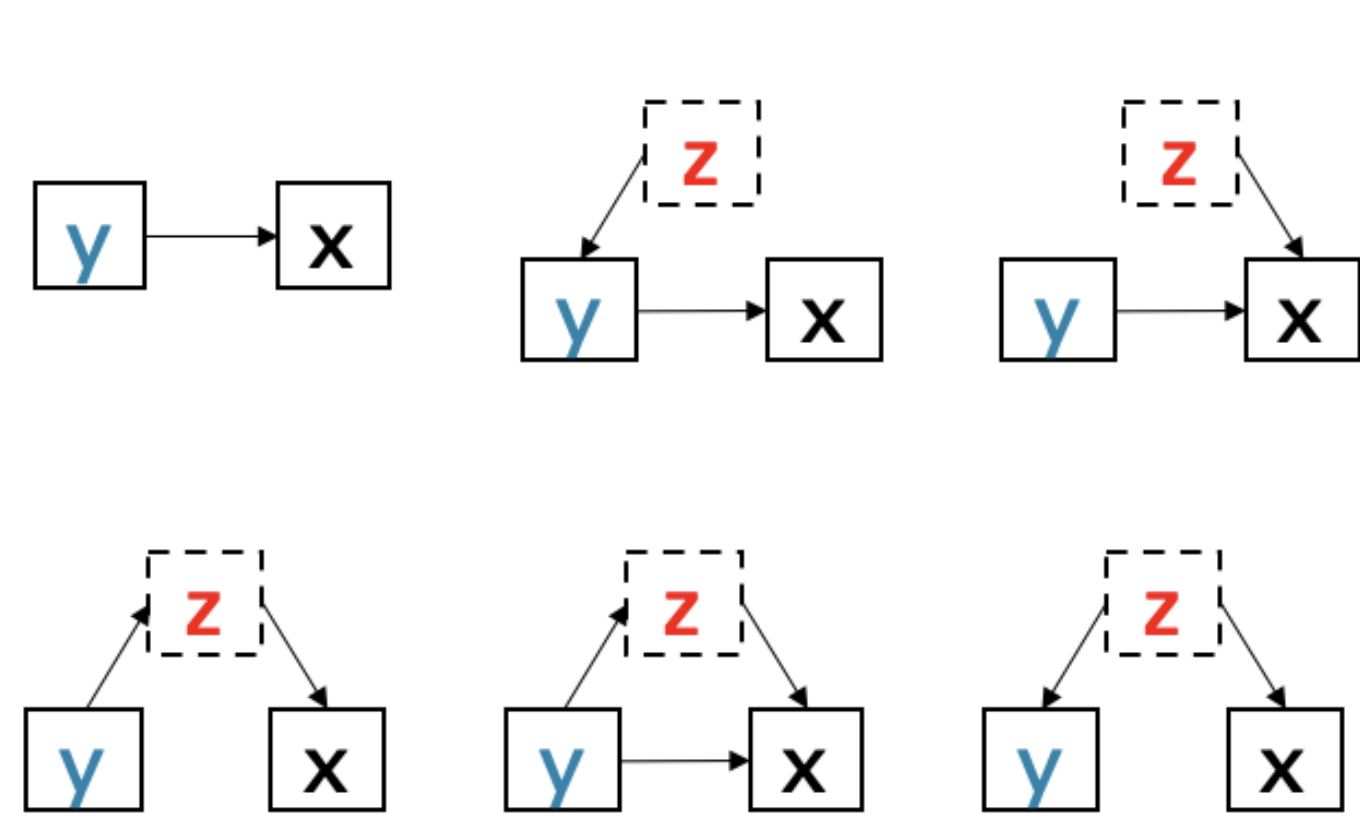


Nov. School festival ↓

Recent Topics

Fermentation of coffee beans and dates seeds for better flavor

Application of causal analysis to spectroscopy



Research is a cooperative process; help each other and become good rivals!