

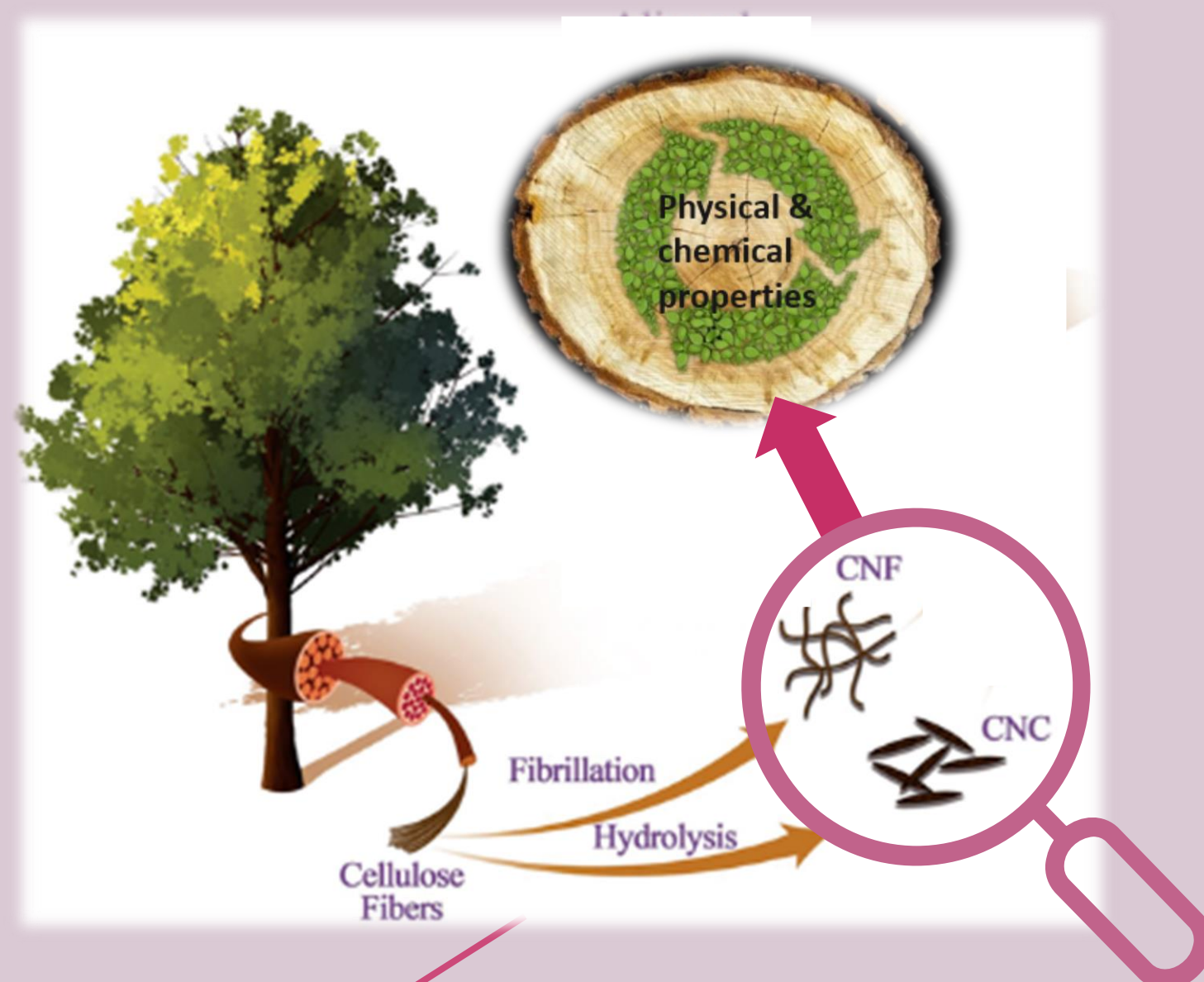
Nanocellulose: Characterization and environmental behavior

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Background: Nanocellulose, which can be extracted from cellulose, possesses attractive properties such as high strength, excellent stiffness, and high surface area. Nanocellulose has been used at different directions such as a strengthening agent, a component of the retention system, and printing a quality aid. As a greener alternative to traditional polymers, nanocelluloses have lately been involved in different applications in fields like biomedicine, food packaging, and cosmetics, as well as in the paper and construction industries. However, before applying nanocellulose in the commercial products, the **risk, and potential hazards** of nanocellulose to human and our environment must be fully assessed.

Our ambition: In this study we mainly focus on determining **physicochemical properties** of nanocellulose, as well as reaching the **risk assessment** of released nanocellulose through experiments that simulate environmental conditions.

Workflow and focus:

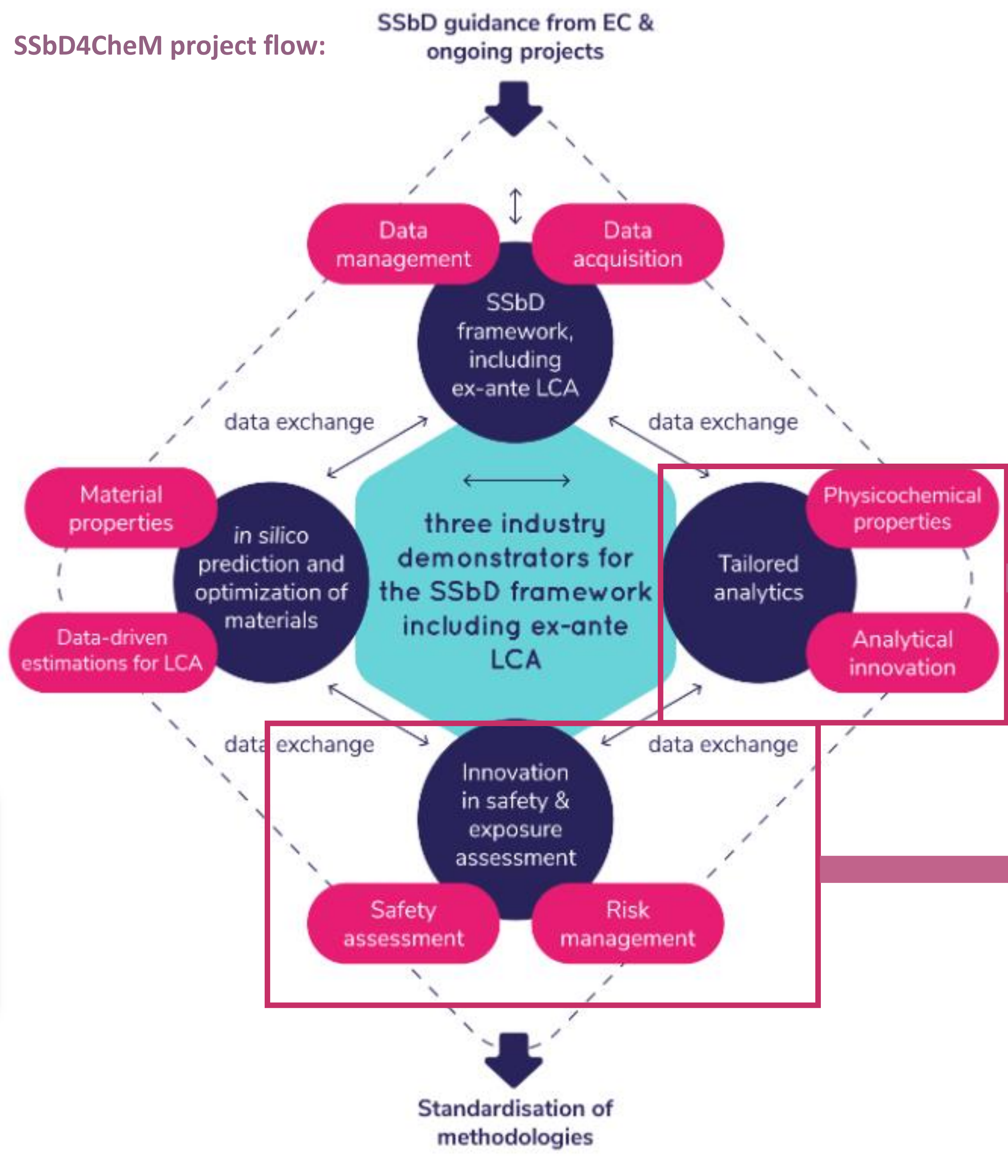


Characterization of nanocellulose



Nanocellulose releasing to our environment

Simulated experiments needed:
To study the behavior of nanocellulose released to our environment, experiments with environmentally relevant conditions will be performed. To do so, parameters such as pH, concentration and type of electrolytes, concentration and type of organic matter or natural colloids will be controlled to study the behavior of released nanocellulose.



My focus:

My work mainly focuses on fully understanding nanocellulose's physical and chemical properties and possible impacts to our environment, two aspects will be included:

- Tailored analytics
 - ✓ Using various techniques to determine the physicochemical properties.
 - ✓ Coupling or combining different techniques to reach analytical innovation.
 - ✓ Developing fast and robust analytical method to characterize nanocellulose.
- Innovation in safety & exposure assessment
 - ✓ Different parameters will be controlled to simulate real environmental conditions, such as: pH value, electrolytes type and concentrations and so on.
 - ✓ Results evaluation to reach risk assessment.

Expect results:

- The physical and chemical properties of nanocellulose are expected to be known after conducting different analytical methods analyses and results evaluation.
- The differences and similarities of nanocellulose's behaviors will be understood after performing the real environment mimicking experiments.
- The risk assessments are expected to be reached after studying the behavior of nanocellulose "releasing" to our environment.

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