

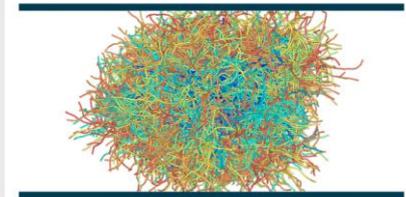
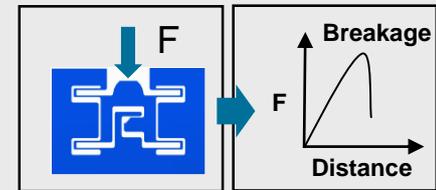
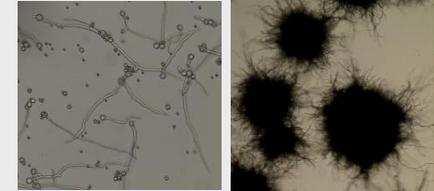


Measurement of the mechanical properties of fibrous bioparticles

Filamentously growing microorganisms are used industrially for the production of enzymes or antibiotics. There is a close connection between the morphology of the pellets and the formation of the product. The morphology is influenced by the mechanical stress on the pellets during cultivation, whereby the mechanical properties of the cell walls determine the resistance of the pellets to mechanical stress. Currently, there are almost exclusively qualitative methods for determining the tensile strength of hyphae, so a microsystem is being tested that enables tensile tests with fibrous bioparticles. For the first investigations with the microsystem, cellulose fibres will be used for simplification. For comparison with simulations, additional compression tests of whole pellets are to be carried out.

The focus is on the following tasks:

- Cultivation of the spores to produce individual hyphae and pellets.
 - Positioning and fixation of a hyphae or cellulose fibre using a micromanipulator and a special adhesive under an optical microscope
 - Carrying out load tests by means of nanoindentation
 - Evaluation of force-displacement curves to calculate mechanical properties of cell walls (E-modulus, tensile strength) and pellets
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- There is the possibility that a Master's thesis in the field of filamentous microorganisms (also together with the ibvt) can be carried out afterwards
 - We can arrange a personal meeting at any time to discuss this, or other topics, without obligation.



Start:

Contact:



By arrangement

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