Extraction of *chlorella vulgaris*

Extraction methods were tested to disrupt the cell wall of *chlorella vulgaris*.

Preparation

Take 5 mL of *chlorella vulgaris* culture (OD_{750} = 2) from the bioreactor.

High pressure homogenizer

Wash cells with 0,9 % NaCl and resuspend them to reach a final optical density of OD_{750} = 2.

High pressure homogenizer should be washed with 0,9 % NaCl and cell suspension can be loaded afterwards. Take samples after different runs to be able to determine the number of runs needed for cell disruption.

Wash high pressure homogenizer with water afterwards store it in 70 % EtOH.

Autoklave

Fill the cell suspension into an autoclavable tube.

Choose a program for wet autoclavation and autoclave the sample.

Bead mill

Fill 1,5 mL reaction tubes with approximately 1 mL 200 nm glass beads and add the cell suspension. Transfer the tubes into the holder of a ball mill being similar to MM2 Ball Mill from Retch and run samples for either 5 min or 20 min.

Sonification

Transfer the cell suspension into 15 mL falcons and store them on ice during the procedure. Use a sonifiator being similar to Sonopuls HD200 from Bandline. Set the cycles on 50 % and the power on MS 73/D. Sonificate samples for 6 minutes or 20 min.

Acid and base hydrolysis

Resuspend the algae in 1 mL of 1M NaOH, 1M HCL, 1M KOH and 5M KOH, respectively and incubate for one hour at 100 °C. Neutralize the samples with NaOH for acids and HCl for the bases. Measure the end volume for quantification to get the ratio per sample of *chlorella vulgaris* culture right.

Sample storage

Cell suspension and samples were shock frozen in liquid nitrogen and stored at -20°C.