Electronic Supplementary Material (ESI) for Integrative Biology.

Supplementary technical information 2

TC-LSFM temperature-controlled chamber

Measurement of the temperature distribution in the chamber.

Setup overview

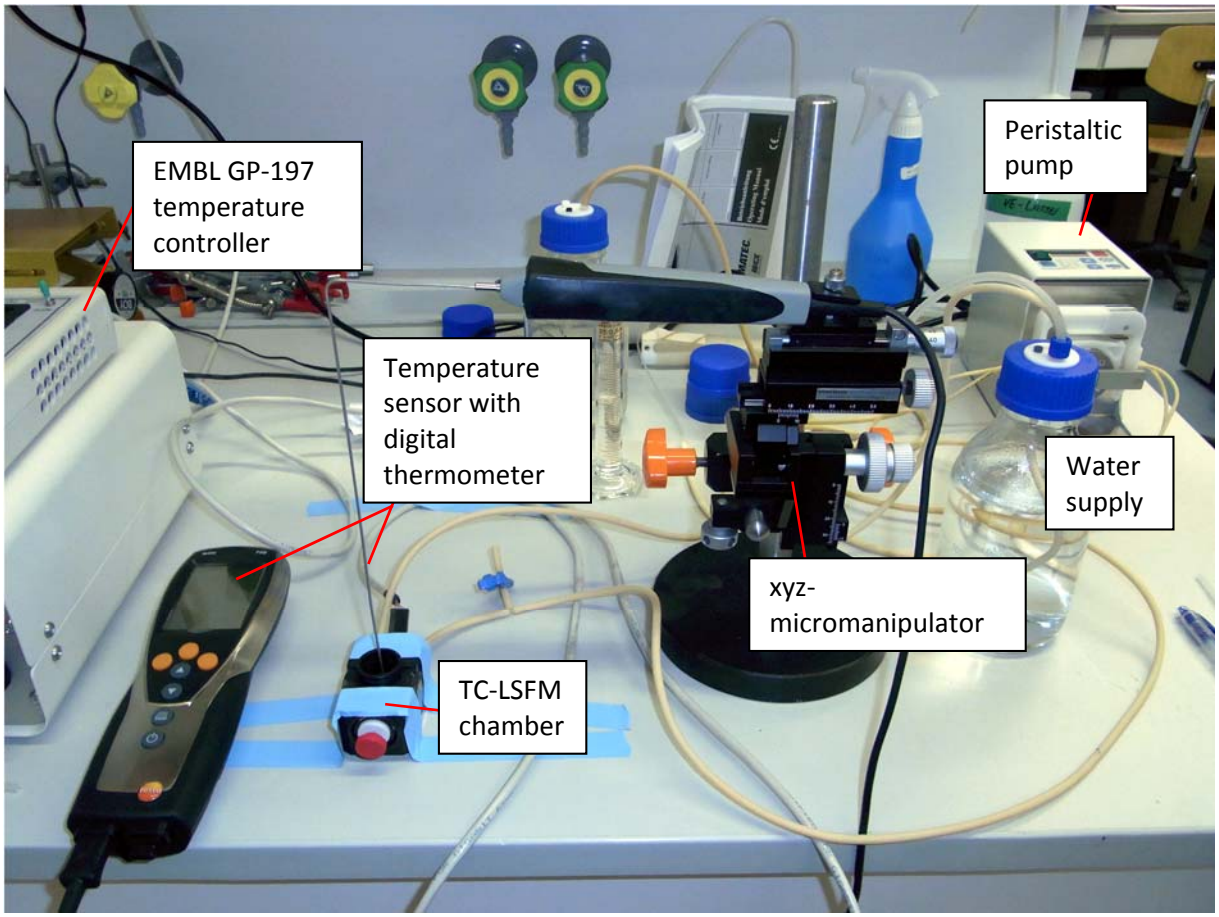

Figure 1 – Overview of the set-up to check the temperature distribution inside the TC-LSFM temperature controlled chamber.

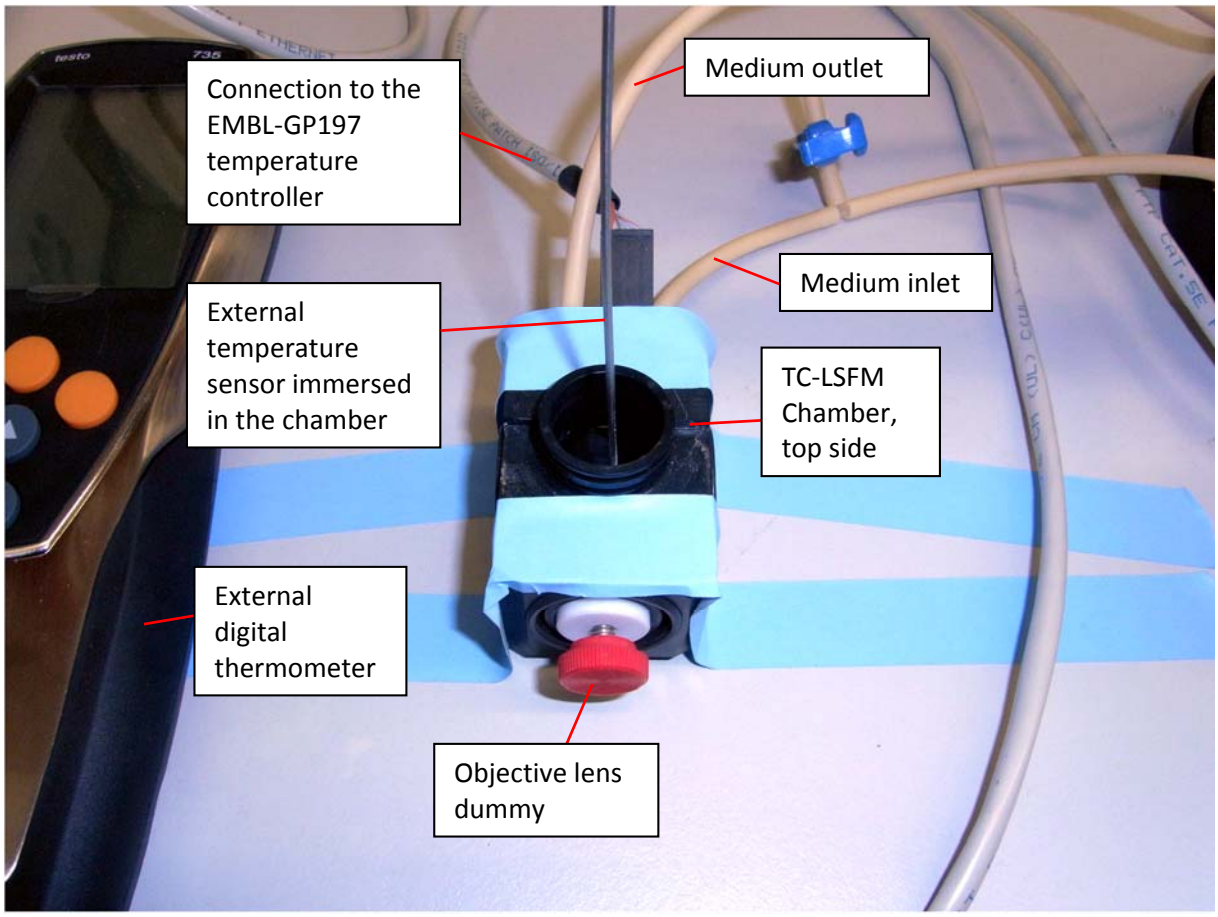

Figure 2 – TC-LSFM chamber connected to the EMBL-GP197 controller and to the medium inlet and outlet.

Figure 3 – EMBL-GP197 heating controller.

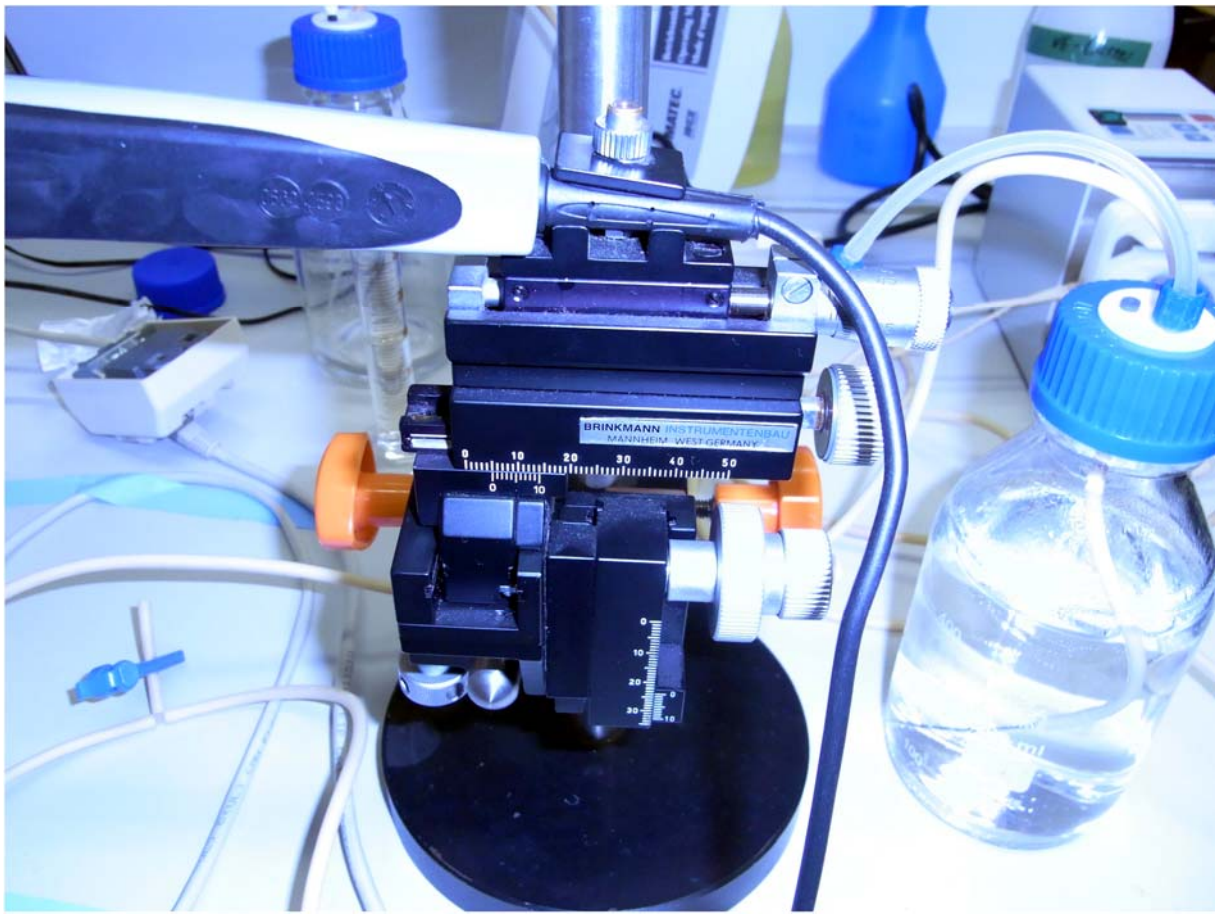

Figure 4 – xyz micromanipulator for the positioning of the temperature sensor inside the chamber.

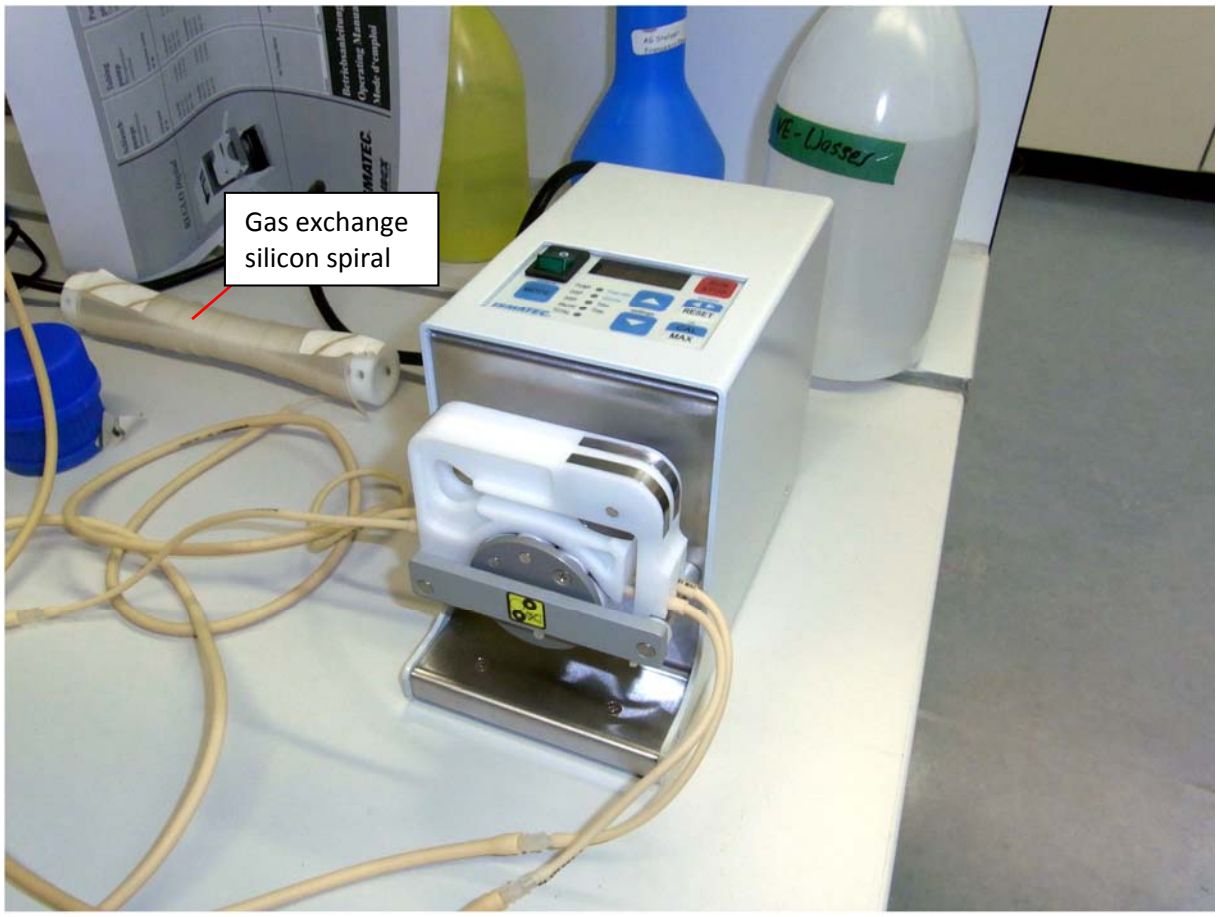

Figure 5 – Peristaltic pump flowing the medium in and out the TC-LSFM chamber.

Procedure

The set-up shown in **Figure 1** exactly reproduces the fluid and temperature control system employed in the TC-LSFM. The TC-LSFM chamber is connected to the temperature controller EMBL-GP198 and to the medium in- and outlet (**Figure 1, Figure 2**). The medium (in this case just water) is pumped in and out the chamber with a peristaltic pump (**Figure 5**), set at the same flow rate used in this work. The water flows from the reservoir bottle, then through the gas-exchange spiral (**Figure 5**), and finally in the TC-LSFM chamber.

First, the medium temperature inside the chamber is set to 37°C with the EMBL-GP197 controller and the peristaltic pump is started. After about 15 minutes, the controller reaches the set temperature. At this point, the temperature distribution inside the chamber is measured with an external digital thermometer. The digital thermometer is connected to a thin temperature sensor, which is precisely placed at different positions inside the TC-LSFM chamber by employing an xyz-micromanipulator (**Figure 1, Figure 4**).

The temperature distribution in the chamber is measured by precisely positioning the temperature sensors at 5 points across the chamber and by moving upward the sensors with 1 mm-steps (**Figure 6**)

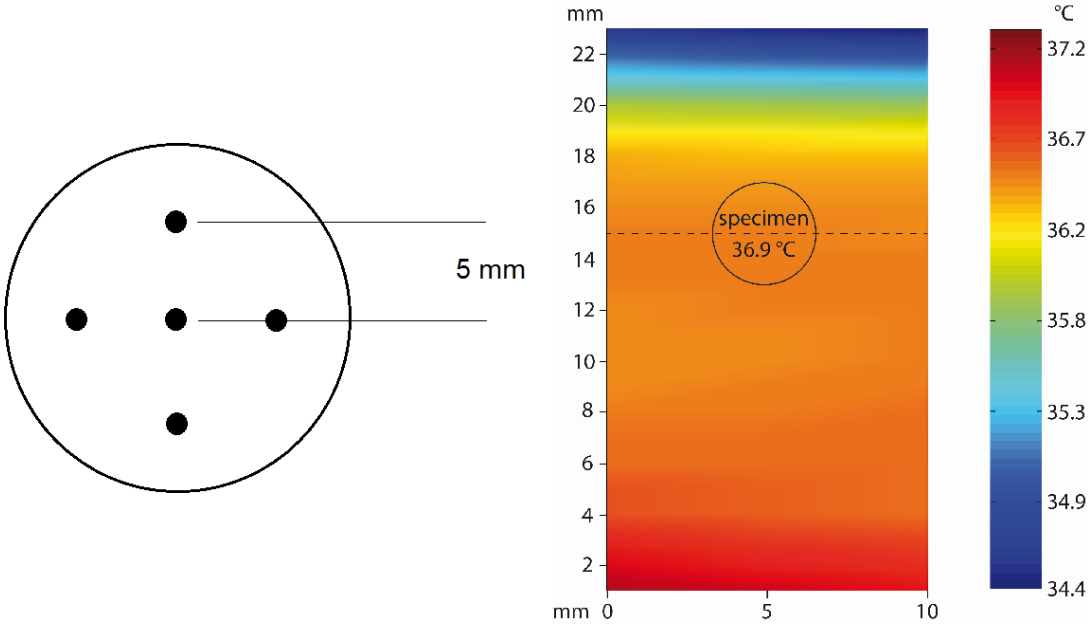

Figure 6 – Temperature distribution in the TC-LSFMchamber