Block Heater Operation

MATERIAL

- BSA (1 mg/ml; 0.05 g BSA (Sigma-Aldrich Ltd., St Louis, MO; U.S.A.) dissolved in 50 ml ddH_2O, aliquoted to 1 ml in Eppendorf tubes and freezed in -20°C)
- HB-1 Block Heater (Wealtec, Taipei, Taiwan)
- 4X protein loading dye
- V-GES equipment (Wealtec)

PROCEDURE

- Turn on the power switch located in the back of the unit.
- The temperature is shown on the left display. Use “Up” and “Down” buttons below the temperature display to set the desire temperature.
- Press the “Up”-button until the display shows “95”. Default setting of temperature is shown in degrees Celsius (*fig 1*). (To see current temperature displayed in degrees Fahrenheit, press “Up” and “Down”-buttons simultaneously after press on “Start”.)
- Press the Start/Stop button to start warming up the block. When the block is in heating mode, the red heating-indicator as well as the green power-indicator will be lit (*fig 2*).
- Wait for the temperature to increase to the set value. It usually takes around 15-20 minutes for the unit to warm up from ambient to 100°C.
- Thaw the BSA-samples while the heater is warming up.
- Apply 25 µl 4X protein loading dye into 75 µl BSA (1 mg/ml).
- Once the heating indicator has been turned off, press the “Start/Stop” button to reach the timer settings (*fig 3*). The time is shown on the right display.
- Set the heating time of the block heater by using the “Up” and “Down” buttons below the timer display (*fig 4*).
- Set the time to 5 minutes.
- Place the sample tubes into the heat block to incubate for 5 minutes at 95°C.

- After 5 minutes, remove the samples and turn off the block heater at the back of the unit.
- Protein in samples are now denatured and ready for electrophoresis after a brief spin down in a table top centrifuge.

RESULTS

- Heating at 95°C will denaturize the protein samples and make it easy to load and separate the proteins. It is needed to heat protein samples at 95°C for 5 minutes before electrophoresis. Reagents, such as SDS and DTT, are frequently used to break down or agent different protein bonds. Boiling the proteins for a short period of time will unfold the structure of the protein and allow SDS access to certain bonds. Overheating of protein, however, might lead to unwanted precipitation of proteins.
- After boiling of samples through use of a block heater, the BSA-samples can be loaded easily and show no degradation on the SDS-PAGE.

REMARKS

- Make sure to set the temperature and start heating about 15-20 minutes prior to actually using the block heater.
- The temperature range of the module is ambient plus 5 degrees to 200°C, which enables a wide range of applications such as enzyme digestion or incubation.

APPENDIX

Figure 1: *Set the temperature by pressing the "Up" and "Down" buttons (green arrows) below "TEMPERATURE". The "Set Temp" and the Power indicators will be lit. The set temperature is shown on the left display. Press the "Stop/Start" button (blue arrow) to start warming the unit.*

Figure 2: *Once the block heater starts warming up, the left display will show the current temperature and the "Heating". The power indicators will be lit.*

Figure 3: *When the unit is warm enough, the "Heating" indicator will turn off. Press the Stop/Start-button to access the timer-settings. The time will be shown on the right display.*

Figure 4: *Set the timer by pressing the "Up" and "Down" buttons below "TIME". To start the timer, press the Stop/Start button.*

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