PROCEDURE TO OPERATE EMULSIFLEX HIGH PRESSURE HOMOGENIZER

A high pressure pump pushes the product through a homogenizing valve. It can break cells very easily and efficiently by producing high pressure. It requires a compressed air or gas source (non-explosive and non-dangerous) to create pressure.

EMULSIFLEX EQUIPMENT:

A. Hose to connect air or gas supply
B. Measure incoming air/gas pressure by Gauge
C. Discharge tube
D. Hose with control valve for pump motor
E. Hose/Quick connect to pressurize sample cylinder
F. Regulator assembly for pneumatic control
G. Sample cylinder body
H. Sample cylinder cap
I. Pump motor
J. Pump body
K. Inlet check valve
L. Outlet check valve
M. Homogenizing valve
N. Homogenizing pressure gauge

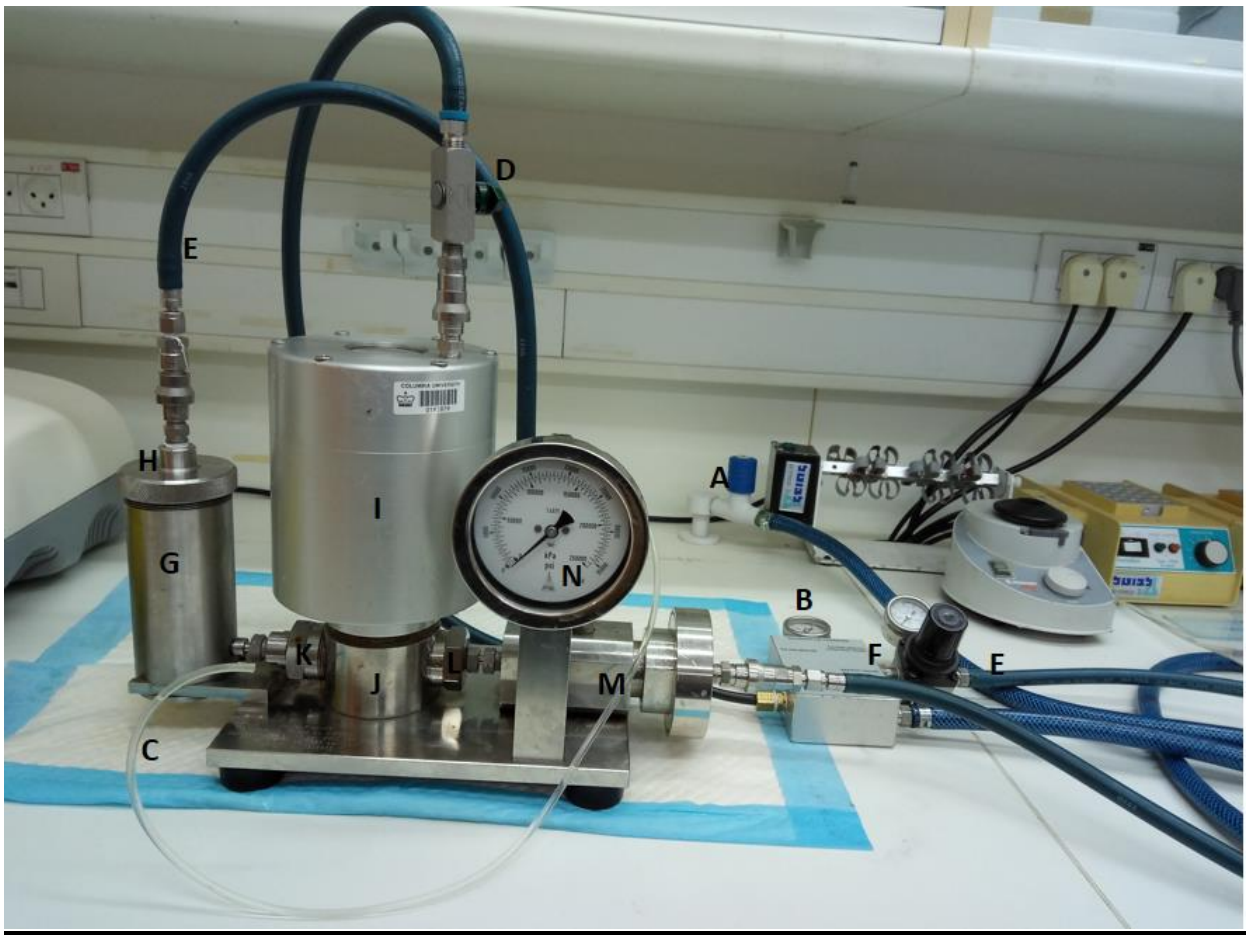

Figure: Avestin Emulsiflex, High Pressure Homogenizer

OPERATING PROCEDURE:

1. Connect the compressed air or gas supply hose (A) to the air compressor or gas cylinder. The small gauge on the hose assembly reads the pressure which will reach the pump motor.

2. Wash the sample cylinder body with ethanol first and then with distilled water (DW). During washing put ethanol or DW in the sample cylinder body (G). Maximum capacity of the cylinder is 250ml but one can put minimum 7ml. Place the free end of the discharge tubing into an empty flask and let the liquid flow through the inlet check valve(K), pump body(J), outlet check valve(L) etc. by turning the control valve knob (green one) at vertical position.

3. Put the buffer first in the cylinder body and equilibrate the instrument with your desired buffer in which your sample should be homogenised. Then one can put the sample into the sample cylinder body (G). Make sure that the sample does not contain any clump otherwise it will stick inside any of the check valves and the instrument will stop working.

4. Start the pump motor by turning the control valve knob (D) to the vertical position. As the pump starts to cycle, the pump plunger will move up and down quickly inside the pump. The sample will be sucked through the inlet check valve (K) into the pump body (J) and pumped through the outlet check valve (L) and into the homogenizing valve (M). The homogenizing pressure shown on the gauge (N) will be low because the homogenizing valve is open. The pump motor can be stopped at any time by turning the green control valve (D) back to the horizontal position. Let the pump run for approx. 60 seconds. The sample should now be pumping into your flask via the outlet tubing.

5. If no sample passes through the instrument, close the cap of the sample cylinder and connect the second Quick Connect (E) to pressurize the sample. After the pump is primed the cap can be removed after first removing the Quick Connect from the cap.

6. Adjust the homogenizing pressure by adjusting the pressure in the pneumatic control cylinder. Turning the regulator knob (black one) clockwise increases air pressure in the cylinder, closes the gap, reduces the flow rate and increases the homogenizing pressure. Turning counter-clockwise decreases air pressure in the control cylinder, opens the gap, increases the flow rate and reduces homogenizing pressure. As soon as your sample comes out from the discharge tubing turn the green knob horizontal position to stop the pump. Then place the discharge tubing into a clear conical where you want to collect your homogenised sample or you can place the discharge tubing into the cylinder body to repeat homogenisation process two or three times (closed cycle). This will assure the homogenisation process.

7. Then you can start collecting your sample to a fresh conical.

8. As soon as the sample cylinder is empty the pump motor will speed up. Turn the green knob (D) to the horizontal position to stop the pump.

9. Again you should wash the instrument with distilled water (DW) and ethanol by following the same procedure.

PRECAUTIONS:

1. Do not run the instrument dry for more than a few cycles. If the instrument is not lubricated by a liquid, the plunger can seize in the pump. This will significantly reduce the lifetime of the seal in the pump.

2. Only run clean fluids through the instrument. Contaminating particulate matter can block the check valves and prevent the instrument from operating properly.

3. Do not add too much of sample for homogenization. It can block the check valves and the pump will stop working.