

Assembly and Operation of a Cooling Stage to Immobilize *C. elegans* on Their Culture Plates

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Materials

Name	Company	Catalog Number	Comments
12-V power supply	ANYTITI	ledpower00	output DC 12V +/-0.5V, 5A power 60W
8-32 screw	arbitrary		for bracket fixation
bracket	N/A	N/A	3D printed using 1.75mm PLA filament. See supplementary for 3D model.
breadboard	DEYUE	7545924028	400 pin solderless board kit for DIY electric connection
copper cooling block	Kalolary	Kalolary-Heatsink001	40*40mm internal fin thickness 0.5mm
copper plate	arbitrary	N/A	Machined from a 170x120x3 mm 99.9% pure copper sheet. See supplementary for 2D drawing for manufacturing.
digital thermocouple thermometer	Proster	4333090752	dual channel thermometer with two K-type thermocouple probes measuring range -50-300°C accuracy ±1.5% resolution 0.1°C /°F < 1000°
isolation base	N/A	N/A	3D printed using 1.75mm PLA filament. See supplementary for 3D model.
jumper wires	arbitrary		for electronic connection
multistage peltier	DigiKey	TEC1-12706	thermoelectric cooling device size 40*40*7.05 mm U _{max} 16.1 V I _{max} 8.5 A ΔT _{max} @ Th 85°C @ 27°C Q _{max} @ Th 51.6W @ 27°C resistance 1.65 Ω
Nalgene 50 Platinum-Cured Silicone Tubing	ThermoScientific	14-176-332E	ultrasoft tube durometer hardness Shore A, 50 inner diameter 1/4 in outer diameter 9.5 mm
packaging tape	arbitrary		4 inch wide to cover the copper plate
pump tank	Yosoo	SC-300T	input power DC 12V

			flow rate 300L/h max
radiator	DIYhzWater	10463	12 pipe aluminum heat exchanger cooling water drain row with two 120mm fans
sapphire window	Altos Photonics, Inc.	N/A	Contact Altos for custom order size \varnothing 80mm, 3mm thick surface quality 60-40s/d uncoated
thermal paste	Corsair	XTM50	reduce thermal impedance between surfaces thermal conductivity 5.0W/mK
tunable power supply	Kungber	DY-SPS3010B	voltage range 0 – 30V current range 0 – 10A linear Power Supply with 4-Digits coarse and fine adjustments with alligator leads