

CherryTempTM

The fastest heater/cooler for microscopy



10' sec
temperature shift



5 to 45°C
range



0.1°C
precision.



- ✓ Ultrafast temperatures Shifts during live-cell Imaging
- ✓ Heating & cooling your samples
- ✓ Precise and stable for long-term observations
- ✓ Fine-tuned temperature calibration taking into account immersion objectives temperature sinks | self-sufficient, no more objective collar.
- ✓ Constant room temperature monitoring for absolute live correction.
- ✓ Easy & intuitive software | one-click temperature shifts.

Non-contractual
Subject to change



CherryTemp heater/cooler - A pack for your application

YEAST PACK

Yeast dedicated spacers: pre-coat your slides with ConA and stay focused.

From yeasts to observation in 30 seconds with customized inserts.



MAMMALIAN PACK

Directly grow your adherent cells on our slides and observe thermalization effects.

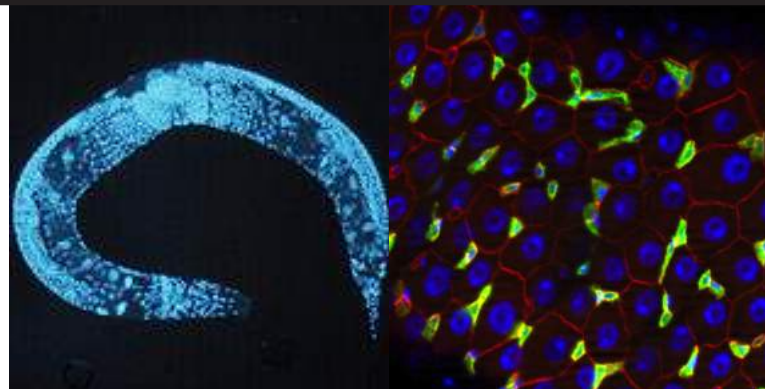
Benefit from smart designs to avoid any shear stress for your cells.

C-ELEGANS PACK

Embryo-designed slides to dissect and directly observe first divisions.

One-click temperature shifts and stability from 15 to 26° C and much more.

No shear stress for your worms.



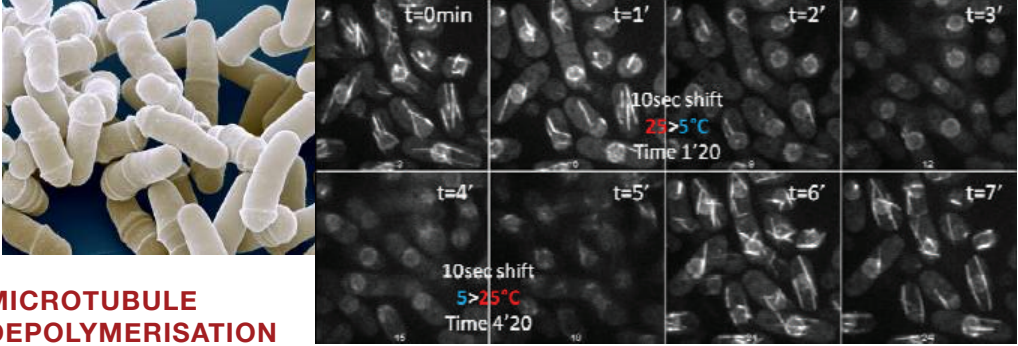
DROSOPHILA PACK

No interference with your samples: no shear stress for tissues.

Easy & rapid mounting of your sample: stay focused on the results.



CherryTemp heater/cooler - Applications examples

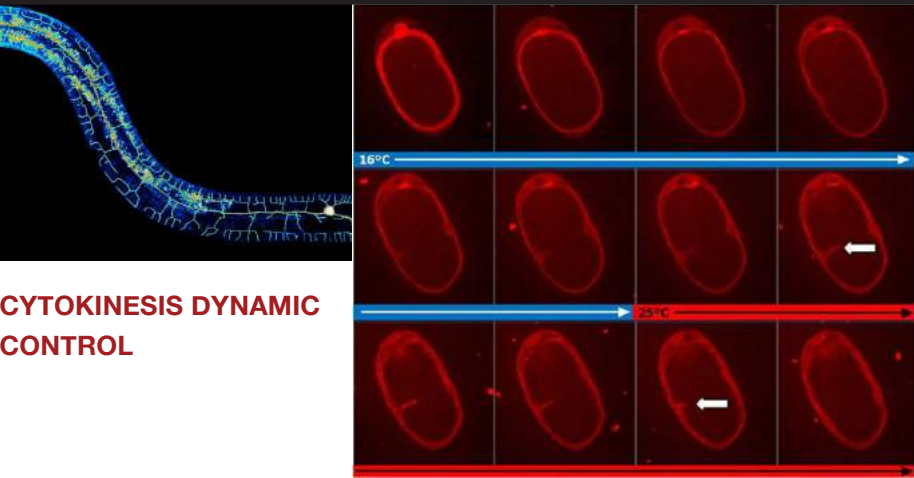


MICROTUBULE DEPOLYMERISATION

S. pombe microtubule cold shock treatment

We depolymerized *S. pombe* microtubules while imaging the cells (gamma-tubulin GFP) with a cold shock at 5°C (25°C to 5°C in less than 10 sec). We then repolymerized by shifting back the temperature within

Time-lapse microscopy images of *S. pombe* cells showing microtubule depolymerization and repolymerization. The sequence starts at t=0min, followed by a 10-second shift from 25°C to 5°C at t=1', t=2', and t=3'. A second 10-second shift from 5°C to 25°C occurs at t=4', t=5', t=6', and t=7'.



CYTOKINESIS DYNAMIC CONTROL

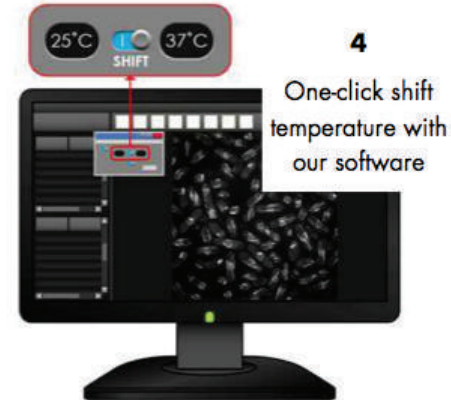
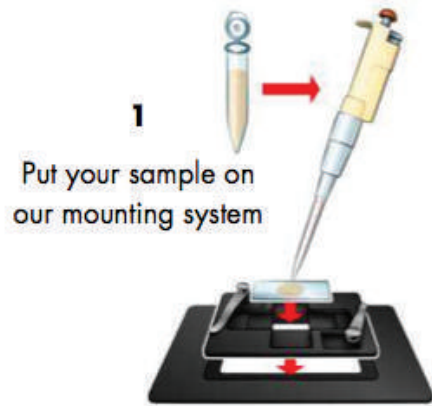
C. elegans embryogenesis control

During our experimentation, *C. elegans* temperature-sensitive embryo mutants (CYK-4^{ts}) were examined under the microscope with a CherryTemp platform. This system allowed to selectively modify the temperature of embryo samples between 16°C and 25°C resulting in cytokinesis arrest. This outlined unprecedentedly observed phenomenon during cell division.

Time-lapse microscopy images of *C. elegans* embryos showing cytokinesis dynamic control. The sequence starts at 16°C, followed by a shift to 25°C, and then back to 16°C. White arrows indicate cytokinesis arrest.

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CherryTemp heater/cooler - Easy, secured and software-guided



PLUG AND OBSERVE

First installation on a microscope in 30 minutes
Can be moved to another microscope in 10 minutes
Once installed, start observing within a minute

CHERRYSOFT INTERFACE

Easy and intuitive software
One-click shift from any temperature to another in the 5 to 45°C range

MICROSCOPES

Any microscope, inverted and upright microscopes.



CherryTemp heater/cooler - Focus on your sample area

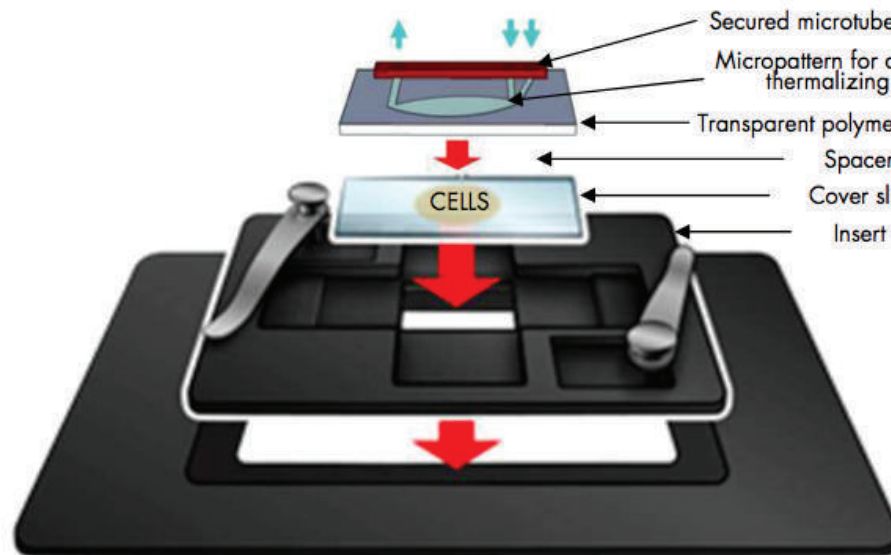
Sample mounting system: a standard for stable and homogenous long-term thermalization

Standard mounting of samples between two cover slips

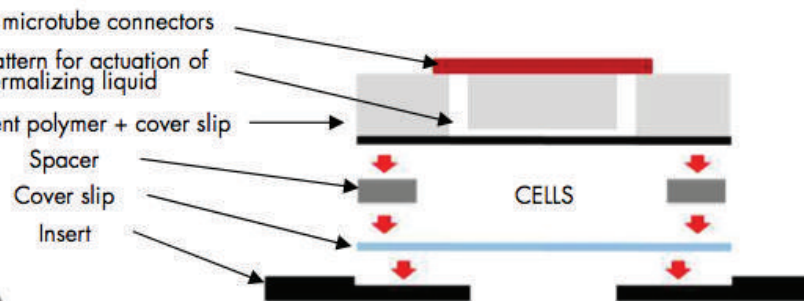
Totally transparent materials

Independant fluidic actuation circuit for stable and homogenous thermalization Two inlets for ultra-fast temperature shifts

A. Overall sample mounting system



B. Cross section – detailed drawing



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CherryTemp heater/cooler - Overall platform

Loop

- ⇒ Controls the thermalization liquid actuation
- ⇒ Closed circuit: a secured loop [Tank-Loop-Exchangers-Chip-Tank]

Tank bottle

- ⇒ Thermalizing liquid container

Temp

- ⇒ Temperature electronic control
- ⇒ Monitors the 2 Peltier of the heat ex-

Software

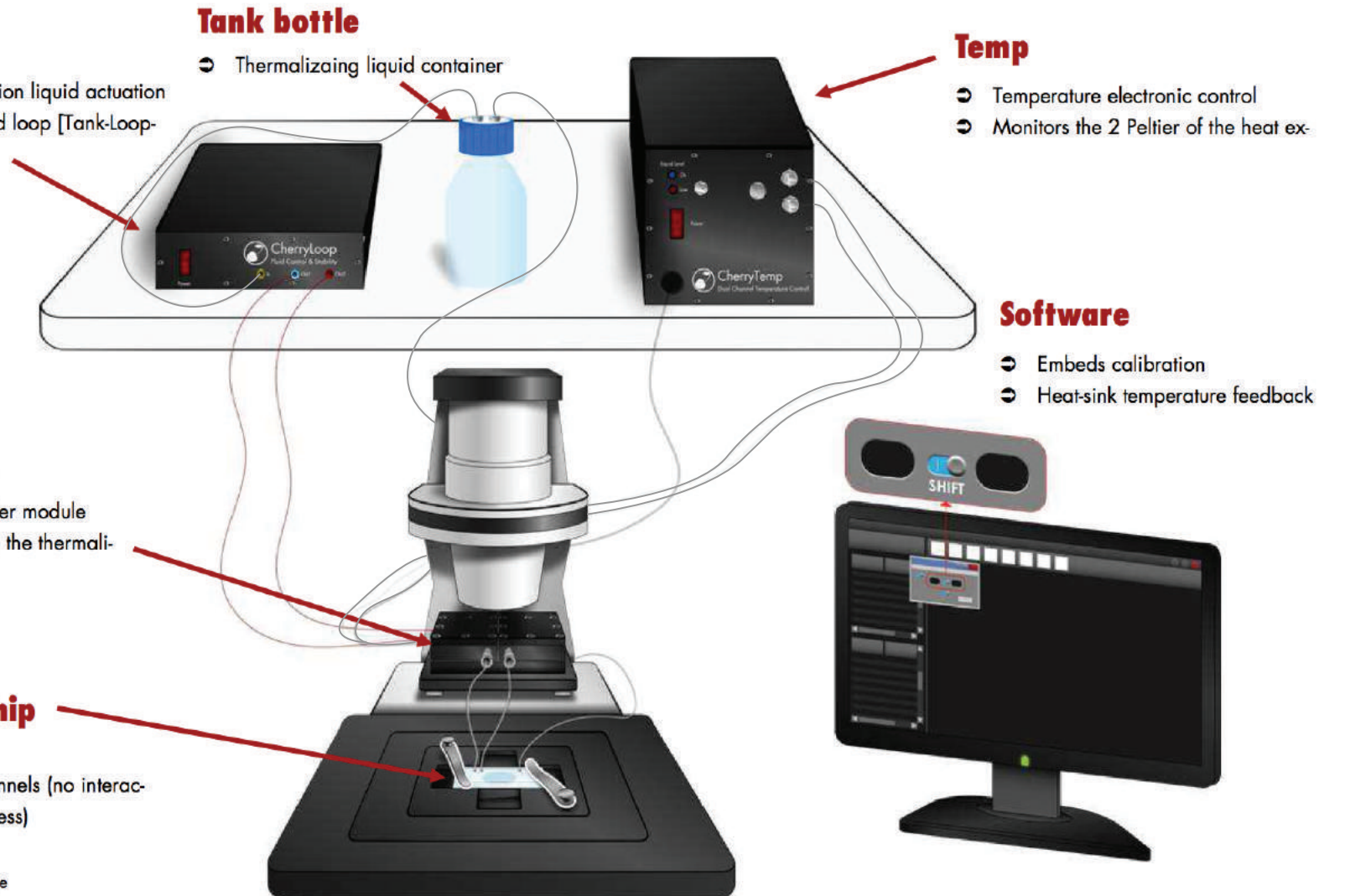
- ⇒ Embeds calibration
- ⇒ Heat-sink temperature feedback

Heat exchangers

- ⇒ Dual Peltier heater/cooler module
- ⇒ Transfers temperature to the thermalizing solution

Thermalization chip

- ⇒ Microfluidic chip
- ⇒ Independent fluidic channels (no interaction with cells = no shear stress)



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CherryTemp heater/cooler - Overall platform

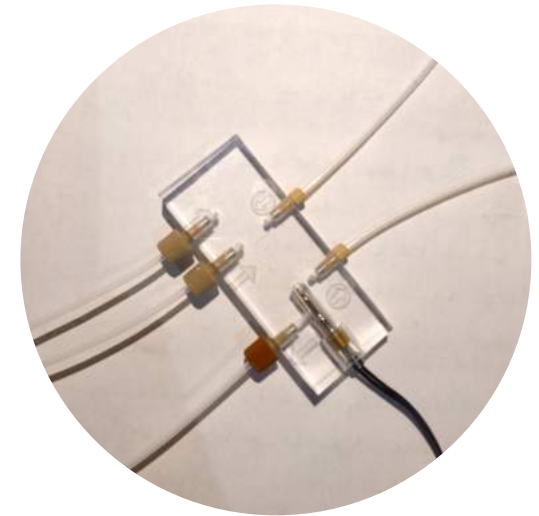
PARAMETERS

CHERRYTEMP FEATURES

Input voltage.....	12-24V nominal
Power supply.....	120V-60Hz /230V-50Hz (US/EU)
Number of channels.....	2 independant temperatures
Temperature sensor types.....	Pt 100
Temperature sample homogeneity*.....	<0,5°C
Temperature precision.....	+/- 0,1°C
Temperature absolute accuracy**.....	+/- 0.5°C
Temperature range.....	5°C to 45°C
Thermal power control.....	PID, performance-optimized
Connection type.....	USB
Control interface.....	CherrySoft™ software
CherryLoop fluidic actuation.....	High precision pulseless pressure pump
CherryTemp box dimensions Lxhx (mm).....	270 x 190 x 170
CherryLoop box dimensions Lxhx (mm).....	210 x 210 x 70
Heat exchanger dimensions Lxhx (mm).....	86 x 54 x 22
Heat exchangers weight.....	400g
Computer specifications.....	USB 2.0 or faster, Intel pentium II 500MHz or faster, 2Go disk space, Windows XP / SP3 and above
Volume of the sample.....	Until 40 µl
Sample size.....	1 µm to 500 µm high

* sample homogeneity measured by infra-red camera and 4-points probes method

** accuracy determined by 4-points probes method



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