

<b>KCMC Biotechnology Laboratory</b>	<b>STANDARD OPERATING PROCEDURE</b>	<b>Effective Date</b> <b>19 July 2006</b>	<b>SOP-Number</b> <b>EQP.001-02</b>
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<b>Title: THERMOMETER CALIBRATION</b>			

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**This SOP has been read and understood by:**

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Annual Review	
By	Date

# KCMC Biotechnology Laboratory

## STANDARD OPERATING PROCEDURE

Effective Date  
19 July 2006

SOP-Number  
EQP.001-02

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Date  
19 July 2006

Title: **THERMOMETER CALIBRATION**

### Document History:

Version Number	Reason for Changes	Date
EQP.001-02	Addition of acceptable range for temp in refrigerated centrifuges	16 Nov 2006

### Copies distributed to:

Name	Date

**Title: THERMOMETER CALIBRATION**

**PURPOSE**

To ensure the thermometers used to monitor room temperature and temperature controlled equipment (water baths, incubators, refrigerators, and freezers) are accurate.

**PRINCIPLE**

Laboratory thermometers used to monitor temperatures are compared to a certified National Institute of Standards and Technology (NIST) thermometer once per year.

**SCOPE**

This procedure applies to the calibration of Biotechnology Laboratory thermometers by technical staff assigned..

**FREQUENCY**

Thermometer calibration is to be verified once per year, after maintenance, malfunction or in accordance with manufacture's recommendations, whichever is most frequent.

**MATERIALS**

Laboratory thermometers (assigned a unique number)  
Certified NIST thermometer\*  
Thermometer Calibration Verification Record Sheet

\*Calibration of the NIST thermometer should be current. Thermometer will be sent for recalibration when certificate expires or on notification by the manufacturer.

**PROCEDURE**

1. Put on gloves to handle laboratory thermometers.
2. Inspect each thermometer for cracks, and gaps in the spirit liquid.
3. Place the probe of the NIST traceable thermometer under the same conditions and near the thermometer being verified. If the test thermometer is in glycerin or other liquid, then the traceable thermometer must also be in this liquid.
4. Allow both thermometers to equilibrate.
5. Record both temperatures of the thermometer being verified and the certified thermometer, as accurately as possible, on the Thermometer Calibration Verification Record Sheet.
6. Calculate the difference between the two thermometers and record. If there is a difference between the Test thermometer and the certified thermometer, indicate whether the Test thermometer difference is lower with a minus sign or higher with a plus sign.

**Title: THERMOMETER CALIBRATION**

**ACCEPTABLE RESULTS**

The following lists the acceptable temperature differences between the Certified and Laboratory thermometers:

<u>Instrument</u>	<u>Tolerance (°C)</u>
Incubator	$\pm 2^{\circ}$
Water bath	$\pm 1^{\circ}$
Heating block	$\pm 1^{\circ}$
Centrifuge	$\pm 2^{\circ}$
Refrigerator	$\pm 2^{\circ}$
Freezer (-20°C)	$\pm 5^{\circ}$
Freezer (-80° C)	$\pm 10^{\circ}$ , but must be below $-65^{\circ}$ C

If results are acceptable, label the thermometer with the following:

Date calibrated

Technician initials

Difference between the reading of the thermometer and the certified thermometer  
(E.g.  $\pm 1$ )

**CORRECTIVE ACTIONS**

1. If the difference is not acceptable, repeat the process.
2. If still not acceptable, remove the thermometer from use.
3. Record the failure and the date the thermometer was removed from use on the Thermometer Calibration Verification Record Sheet and notify the supervisor.
4. Obtain an alternate, acceptable and uniquely numbered thermometer.

**REFERENCES - NA**

**APPENDIX**

Thermometer Calibration Verification Record Sheet