

| Document N | Number: SASoM/EQUIP/056.v2               |
|------------|--|
| Title:     | Use and Maintenance of the NanoDrop Lite |
| Version:   | v2                                       |
| Author:    | Peter Mullen                             |
|            |  |

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| SOP HISTORY |            |                   |
| Number      | Date       | Reason for Change |
| v1          | 02/08/2013 | Original          |
| V2          | 02/08/2018 | Update            |
|             |            |                   |
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### 1.0 Purpose –

The purpose of this SOP is to outline the principles of the routine use and maintenance of the NanoDrop in Laboratory 249 at the St Andrews School of Medicine (SASoM).

### 2.0 Scope -

This SOP applies to routine use and maintenance of the NanoDrop within the SASoM.

# 3.0 Responsibilities

It is the responsibility of all users of the NanoDrop within the SASoM to comply with this SOP.

# 4.0 Procedure –

Principles of Operation

The NanoDrop Lite is a standalone microvolume instrument to measure nucleic acid (DNA / RNA) or protein in biological samples.

Its main features are:

- 1. It requires only 1-2 µL of nucleic acid or protein samples for accurate quantitation.
- 2. It can measure nucleic acid concentration at 260 nm and purity using the 260/280 ratio.
- 3. It can measure purified protein concentration at 280 nm.
- 4. It delivers the accuracy and reproducibility of other NanoDrop instruments.
- 5. It uses built-in controls and software no computer is required

6. Offers an optional printer for cryogenic labels

The method of operation is as detailed below, read in conjunction with the operator's manual located beside the instrument.





| Menu S   | Selectio   | n  |                                   |                      |
|--|--|--|-----------------------------------|----------------------|
| Figure 5. Hom                                  | e screen   |  |                                   |                      |
| Thermo<br>F<br>F<br>S                          | Home<br>NA<br>NA<br>Protein<br>Fools & S<br>Sleep                            | e<br>Settings  |                                   |                      |
|  | •  | •  | Select                            |                      |
| DNA<br>dsDNA<br>ssDNA                          |  | fa   | ctor = 50<br>ctor = 33            |                      |
| RNA  |  | 6  | etas 40                           |                      |
| Protein (1A)<br>Protein (1gC)<br>Protein (1gC) | /cm = 1 mg<br>;)<br>A)   | g/ml) D<br>E   | efault gener<br>1%-13.7<br>1%-6 7 | al reference setting |
| Figure 6. Too<br>Thermo<br>S<br>S<br>F<br>C    | is & Settings<br>Tool:<br>System In<br>Reset San<br>Calibratio<br>Diagnostic | screen<br>s & Settin<br>fo<br>nple ID<br>n Check<br>cs | ıgs                               |                      |
| S  | Sample Hi  | story  |                                   |                      |
| E<br>S<br>Home                                 | Sample Hi  | story<br>▼   | Select                            |                      |

| Tools & Settings                        | Function   |
|---|--|
| Baseline correct: On/Off<br>Date & Time | <ul> <li>On is the default state.</li> <li>It is best to keep Baseline correct setting On.</li> <li>If you turn Baseline correct Off, the instrument no longer uses the 365 nm correction.</li> <li>Set at the factory for Eastern Standard Time, USA.</li> <li>Upon instrument installation, ensure the time and date is set for the long lairne area.</li> </ul> |
| System Info                             | the loca time zone.  |
| Product                                 | NanoDrop Lite  |
| Serial Number                           | Instrument identification  |
| Firmware Version                        | <ul> <li>Version number of firmware<br/>currently installed.</li> </ul>  |
| Calibration Date                        | <ul> <li>Date shown is the last date the<br/>calibration was checked on the<br/>NanoDrop Lite.</li> </ul>  |
| Reset Sample ID                         |  |
| Reset Sample ID? Yes/No                 | <ul> <li>When Yes is selected, the<br/>instrument will reset sample ID<br/>number back to #1.</li> </ul>   |
| Calibration Check                       |  |
|   | <ul> <li>Verifies that the pathlengths are<br/>within tolerance.</li> <li>It is recommended that a pedestal<br/>calibration check be performed<br/>every six months to verify that the<br/>instrument is performing within<br/>specifications.</li> </ul>  |
| New Cal. Check                          | <ul> <li>Follow on-screen directions to<br/>perform new calibration check<br/>using the CF-1 Calibration Check<br/>solution.</li> <li>See NanoDrop Lite Calibration<br/>Check Procedure for more details.</li> </ul>   |
| View Previous Cal. Check                | <ul> <li>Displays data from last calibration<br/>check.</li> </ul>   |
| Diagnostics                             |  |
| Sample History                          | <ul> <li>Follow on-screen directions. Test<br/>checks the LED output and<br/>ensures that arm sensor and<br/>pedestals are operating correctly.</li> <li>Results will be Pass/Fail.</li> </ul>   |
|   | <ul> <li>Displays previous measurements</li> <li>Print option available.</li> <li>The instrument memory holds<br/>data for 500 samples. Sample data<br/>#501 overrides sample data #1.</li> </ul>  |

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# Sleep Function

- When Sleep is selected, the instrument enters a low-power state.
- The screen will go black and the blue LED below the keypad will pulse.
- To wake the instrument, push any button or raise the arm.

### **Measurement Basics**



- 1. Raise the arm and pipette the sample onto the lower pedestal.
- 2. Lower the arm and initiate a measurement.

The sample column is automatically drawn between the upper and lower pedestals and the measurement is made. The formation of the liquid column during measurement may be viewed through the aperture on the side of the NanoDrop Lite arm.

When the measurement is complete, raise the arm and wipe the sample from both the upper and lower pedestals using a dry, lint-free laboratory wipe.

Tip Simple wiping with a dry laboratory wipe is sufficient to prevent sample carryover in subsequent measurements.

### **Taking Measurements**

#### Blanking the Instrument

- 1. Select the assay type from the Home screen.
- Establish a blank by pipetting 1-2 µl of the blanking buffer onto the bottom pedestal, lower arm and press Blank.
- When measurement is complete, raise the arm and wipe buffer from both upper and lower pedestals using a dry laboratory wipe.
- Confirm blank measurement by pipetting a fresh aliquot of blanking buffer onto the bottom pedestal, lower the arm and press Blank.
- When measurement is complete, raise the arm and wipe buffer from both the upper and lower pedestals using a dry laboratory wipe.

### **Measuring a Sample**

Pipette 1-2 µl of sample onto lower pedestal and press Measure.

Note A fresh aliquot of sample should be used for each measurement.

Although it is not necessary to blank between each sample, it is recommended that a new blank be taken every 30 minutes when measuring many samples.

Note When measuring more than one sample, be sure to wipe the upper and lower pedestal before loading the next sample.

Figure 7. Sample measurement screen



#### **Transferring Data From Instrument to Computer**

These options appear when a USB device is inserted. Figure 8. USB Operations



| USB Operations   | Function   |
|------------------|--|
| Save Data        | Saves all data currently in<br>instrument's memory to USB<br>memory device.          |
| Save Diagnostics | Appends diagnostic data to sample<br>measurements and saves to USB<br>memory device. |
| Save Cal. Check  | Saves the last calibration check<br>data to USB memory device.                       |

The sample data is automatically saved on the instrument. To transfer data from the instrument to USB memory device, insert the device and then from the USB Operations menu select Save Data. This file can be transferred to a computer and opened in Microsoft Excel\*. The Save Data will only appear when a USB device is inserted.



NOTICE A maximum of 500 samples will be saved in the instrument and are available to be transferred to a USB memory device at any time. Sample #501 will replace sample #1.

### Cleaning the Pedestals

The primary maintenance for the NanoDrop Lite is to keep the pedestal surfaces clean.

- 1. Pipette 3 $\mu l$  of deionized water (dH2O) onto the bottom pedestal. Do not use a squirt bottle to apply dH2O or any other liquid to the surface of the instrument.
- Lower the arm to form a liquid column; let it sit for approximately 2-3 minutes.
- Wipe away the water from both the upper and lower pedestals with a dry, lint-free lab wipe.

Between measurements: Wipe the sample from both the upper and lower pedestals with a clean, dry, lint-free lab wipe, to prevent sample carryover and avoid residue buildup.

Between users: A final cleaning of both measurement surfaces with  $dH_2O$  is recommended after the last sample measurement.

See the Pedestal Cleaning and Reconditioning guide for more details.

### 5.0 Personnel protection -

Howie coat must be worn at all times.

Gloves as specified in the appropriate COSHH RA

### 6.0 Spillages -

Always clean up any spills immediately after use

Only you know what you have spilt and are aware of that chemicals hazard.

Mop up spills with paper towels. Wash the site of spillage with water & detergent.

# 7.0 General maintenance -

Apply 3-5ul of dH<sub>2</sub>0 onto the bottom pedestal. Never use a squirt bottle to apply de-ionized water or any other liquid to the surface of the instrument.

Lower the upper pedestal arm to form a liquid column; let it sit for approximately 2-3 minutes.

Wipe away the water from both the upper and lower pedestal with a dry, lint-free lab wipe (Lens Tissue)

Additional cleaning: Substitute 0.5M HCl for the dH<sub>2</sub>0 in the procedure above when proteins have dried on the pedestal.



Decontamination: Use a sanitizing solution, such as a 0.5% solution of sodium hypochlorite (1:10 dilution of common commercial bleach solution, freshly prepared), to decontaminate the measurement pedestals. Follow with 3- 5ul of  $dH_20$ .

The instrument should be subject to a Yearly visit by engineer to calibrate the NanoDrop.

## 8.0 Training -

All users have to be trained before using the instrument by a designated person.

### 9.0 Related documents -

- 10.1 Equipment manual
- 10.2 Equipment Maintenance Log
- 10.3 Equipment Maintenance Information sheet
- 10.4 Risk assessments RA/GEN/027

### 10.0 Approval and sign off -

| Author:         |                    |
|-----------------|--------------------|
| Name:           | Peter Mullen       |
| Position:       | Research Fellow    |
| Signature:      | Date:              |
| Management Appr | roval:             |
| Name:           | Mary Wilson        |
| Position:       | Laboratory Manager |
| Signature:      | Date:              |
| QA release by:  |                    |
| Name:           | Alex MacLellan     |
| Position:       | QA Manager         |
| Signature:      | Date:              |
|                 |                    |