

## NovaSeq6000 protocol – Genomics Sandbox @INCPM

**Thaw reagents:** If you want the Genomics team to thaw the reagents for you, call us at 5168

1. ~2 hr before running: take out the SBS and cluster cartridges from the -20°C and place in an ice bucket (red) with water.
2. Mark on the printed sheet on the fridge which kit you thawed.

### General preparations:

1. Take out the Flow cell from the 4°C (do not open the Aluminum foil) for 10-15 min until it reaches RT.
2. Prepare fresh 0.2N NaOH: 10 µl 1N NaOH + 40 µl ddw
3. Prepare fresh 0.4M Tris pH8: 40 µl 1M Tris pH8 + 60 µl ddw

### Load flow cell:

4. Visually inspect the flow cells to ensure it is intact and clean. **No ethanol is needed.**
5. In the Novaseq machine – select side A or B (run alternate sides) and load flow cell to make sure it is recognized. If flow cell RFID is not recognized, take out the flow cell and carefully clean the surface of the flow cell and the stage.
6. Proceed with sample preparation as below.

**Sample preparation:** Following guidelines are for a final pool at **2nM** and loading of **400pM**.

1. Prepare final pool at the desired volume using low-bind Eppendorf tubes

FC	Final vol (ul)	Comments
SP/S1	100	
S2	150	
S4	310	

2. Spike- in 1% nondenaturated phix (stock, -20°C) according to the table, or more phix for low complexity libraries

FC	ND 2.5nM phix (stock, ul)	ND library pool (ul)
SP/S1	0.6	100
S2	0.9	150
S4	1.9	310

Vortex 5-10 sec, spin down 20-30 sec

3. Denaturation of library pool and phix by adding 0.2N NaOH:

FC	0.2N NaOH (ul)	ND library pool (ul)	Final vol (ul)
SP/S1	25	100	125.6
S2	37	150	187.9
S4	77	310	388.9

4. Vortex 5-10 sec, spin down 20-30 sec. Incubate **8 min** at RT.
5. After incubation, add 0.4M Tris pH8 to neutralize

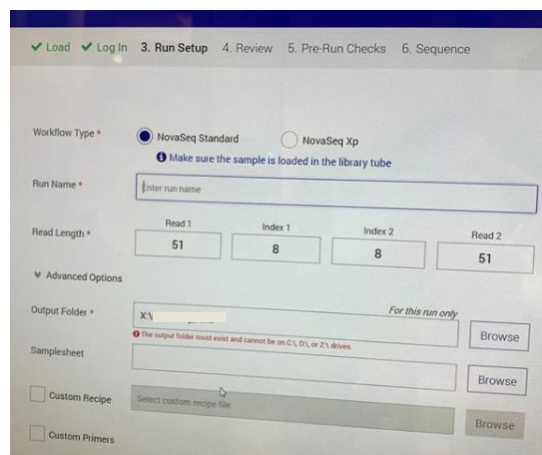
FC	0.4M Tris pH8 (ul)	Final vol (ul)
SP/S1	25	150.6
S2	38	225.9
S4	78	466.9

Vortex 5-10 sec, spin down 20-30 sec

- Transfer the full volume of the denaturated library and phix to the library tube (provided with the kit).
- Measure volumes left in the dilution tubes (NaOH – 25ul, Tris – 75ul, pool) to ensure correct volumes were taken.
- Immediately proceed (**maximum 30 min**) to loading of the uncapped library tube into the cluster cartridge and setting up the run on the NovaSeq.

### Load sample into machine:

- Continue according to NovaSeq instructions on screen:
  - Run Setup: Workflow type: NovaSeq Standard; Output folder: Genomics X:\. See image
  - Empty used reagent bottles – formamide waste should be discarded in the hood
  - Run will start immediately after the pre-run checks
- Make sure your working environment is clean



### Data acquisition:

**Note: The following steps are necessary in order to get the data**

- After the NovaSeq run started, **and within the time the run is taking place**, log into susanc3 using your **susanc** user ID: <https://ngs-pipeline.weizmann.ac.il/bin/main>
- Go to Apps (top row) and select NGS start run.
- Select the relevant NGS machine and proceed according to the instructions.

### Recommended loading concentration

The optimal DNA loading concentration depends on the library type and insert size. The following table provides DNA loading concentrations that are recommended based on Illumina libraries with insert sizes that are  $\leq 450$  bp. Load libraries with smaller insert sizes at the lower end of the recommended range. For libraries  $> 450$  bp, higher loading concentrations might be necessary.



#### NOTE

For libraries generated from non-Illumina library prep methods, you may need to perform a titration of your specific library type initially to obtain optimal seeding concentration to yield best %PF. When optimal loading concentration is determined, it should be applicable for identical library types moving forward.

**Table 13 Recommended Loading Concentrations for Standard Workflow (Software Version 1.1, or later)**

Library Type	Final Loading Concentration (pM)	Pooled Loading Concentration (nM)
PhiX <sup>1</sup>	250	1.25
DNA PCR-free library pool	175–350	0.875–1.75
DNA PCR-amplified library pool	300–600	1.5–3.0
Single Cell <sup>2</sup>	250–500	1.25–2.5