Infinium HTS Assay Automated Workflow Checklist

Amplify DNA

- ☐ 1 Add DNA into either of the following to create a DNA plate:
  - ▶ Midi plate: 20 µl to each DNA well
  - ▶ TCY plate: 10 µl to each DNA well
- ☐ 2 Select **MSA3 Tasks | Make MSA3**.
- ☐ 3 Select the DNA plate type.
- ☐ 4 Enter the **Number of DNA plates**.
- ☐ 5 Place the MA1, MA2, and MSM tubes in the robot tube rack.
- ☐ 6 Pour 15 ml NaOH into a trough and place on the robot bed.
- ☐ 7 Place DNA and MSA3 plates on robot bed.
- ☐ 8 Select **Run**.
- ☐ 9 Enter the barcode of each DNA plate.
- ☐ 10 Place the DNA plates on the robot bed and select **OK**.
- ☐ 11 Vortex the MSA3 plate at 1600 rpm for 1 minute.
- ☐ 12 Centrifuge at 280 × g at 22°C for 1 minute.
- ☐ 13 Remove the cap mat, place the MSA3 plate on the robot bed, and select **OK**.
- ☐ 14 When complete, select **OK**.
- ☐ 15 Remove and seal the MSA3 plate.
- ☐ 16 Centrifuge at 280 × g.

Incubate DNA

- ☐ 1 **[LIMS]** Select **Infinium HTS**
  - ☐ a Scan the barcodes.
- ☐ 2 Incubate the MSA3 plate for 20–24 hours at 37°C.

Fragment DNA

- ☐ 1 Centrifuge the MSA3 plate at 50 × g at room temperature for 1 minute.
- ☐ 2 Select **MSA3 Tasks | Fragment MSA3**.
- ☐ 3 Place the MSA3 plate on the robot bed.
- ☐ 4 Place FMS tubes in the robot tube rack.
- ☐ 5 Select **Run**.
- ☐ 6 When complete, select **OK**.
- ☐ 7 Remove the plate and seal with a cap mat.
- ☐ 8 Vortex at 1600 rpm for 1 minute.
- ☐ 9 Centrifuge at 50 × g at room temperature for 1 minute.
- ☐ 10 Place on the 37°C heat block for 1 hour.

SAFE STOPPING POINT

If you are stopping, seal the plate(s), and store at -25°C to -15°C.

Precipitate DNA

- ☐ 1 Select **MSA3 Tasks | Precip MSA3**.
- ☐ 2 Place the MSA3 plate on the robot bed.
- ☐ 3 Place a half reservoir in the frame, and add 1 tube PM1 for 96 samples.
- ☐ 4 Place a full reservoir in the frame, and add 32 ml 2-propanol.
- ☐ 5 Select **Run**.
- ☐ 6 Remove the MSA3 plate from the robot bed. Do not select **OK**.
- ☐ 7 Vortex at 1600 rpm for 1 minute.
- ☐ 8 Incubate on the heat block for 5 minutes.
- ☐ 9 Centrifuge at 50 × g for 1 minute.
- ☐ 10 Set the centrifuge at 4°C.
- ☐ 11 Place the MSA3 plate on the robot bed.
- ☐ 12 Select **OK**.
- ☐ 13 Remove the MSA3 plate from the robot bed and seal.
- ☐ 14 Invert 10 times to mix.
- ☐ 15 Incubate at 4°C for 30 minutes.
- ☐ 16 **[LIMS]** Select **Infinium HTS | Spin MSA3**.
- ☐ 17 Select **Run**.
- ☐ 18 Place in the centrifuge.
- ☐ 19 Centrifuge at 3000 × g for 20 minutes.
- ☐ 20 Remove MSA3 plate.
- ☐ 21 Make sure that a blue pellet is present.
- ☐ 22 Remove and discard the cap mat.
- ☐ 23 Quickly invert the plate and drain the supernatant.
- ☐ 24 Firmly tap until all wells are free of liquid.
- ☐ 25 Place the plate on a tube rack for 1 hour at room temperature.
- ☐ 26 Make sure that a blue pellet is still present.

SAFE STOPPING POINT

If you are stopping, seal the plate(s), and store at -25°C to -15°C.

Resuspend DNA

- ☐ 1 Select **MSA3 Tasks | Resuspend MSA3**.
- ☐ 2 Place the MSA3 plate on the robot bed.
- ☐ 3 Place a quarter reservoir in the frame, and add 7 ml RA1 for 96 samples.
- ☐ 4 Select **Run**.
- ☐ 5 Remove the MSA3 plate from the robot deck.
- ☐ 6 Apply a foil seal to the MSA3 plate.
- ☐ 7 Incubate in the Illumina Hybridization Oven for 1 hour.
- ☐ 8 Vortex at 1800 rpm for 1 minute.
- ☐ 9 Make sure that the pellets are resuspended.
- ☐ 10 Pulse centrifuge at 280 × g.

SAFE STOPPING POINT

If you are stopping, seal the plate, and store at -25°C to -15°C for up to 24 hours. For more than 24 hours, store at -80°C.

Store RA1 at -25°C to -15°C.

Hybridize DNA to the BeadChip

- ☐ 1 Incubate the MSA3 plate on the heat block for 20 minutes.
- ☐ 2 Cool at room temperature for 30 minutes.
- ☐ 3 Pulse centrifuge at 280 × g.
- ☐ 4 Place the gasket into the hybridization chamber.
- ☐ 5 Add 400 µl PB2 into each reservoir.
- ☐ 6 Place the hybridization chamber insert into the hybridization chamber.
- ☐ 7 Immediately cover the chamber with the lid.
- ☐ 8 **[LIMS]** Select Select **Infinium HTS | Confirm for Hyb**.
- ☐ 9 **[LIMS]** Scan the barcodes.
- ☐ 10 Remove all BeadChips from packaging.
- ☐ 11 Place BeadChips into the robot BeadChip alignment fixtures.
- ☐ 12 Place the robot BeadChip alignment fixtures onto the robot deck.
- ☐ 13 Pulse centrifuge the MSA3 plate at 280 × g.
- ☐ 14 Place the MSA3 plate onto the robot deck.
- ☐ 15 Select **Run**.
- ☐ 16 Place each robot tip alignment guide on top of each robot BeadChip alignment fixture.
- ☐ 17 To start the run, select **OK**.
- ☐ 18 When complete, select **OK**.
- ☐ 19 Remove the robot BeadChip alignment fixtures.
- ☐ 20 Place each BeadChip in a hybridization chamber insert.
- ☐ 21 Place the lid on the chamber and secure with the metal clamps.
- ☐ 22 **[LIMS]** Select **Infinium HTS | Prepare Hyb Chamber**.
  - ☐ a Scan the barcodes.
- ☐ 23 Incubate at 48°C for 16–24 hours.

Prepare for Next Day

- ☐ 1 Add 330 ml fresh 100% EtOH to the XC4 bottle.
- ☐ 2 Vigorously shake to resuspend.
- ☐ 3 Leave the bottle upright on the lab bench overnight.
- ☐ 4 Soak the robot tip alignment guides in 1% aqueous Alconox solution.
- ☐ 5 Rinse and dry the robot tip alignment guides.

Wash BeadChips

- ☐ 1 Submerge the wash rack in the PB1 wash.
- ☐ 2 Remove the hybridization insert.
- ☐ 3 Remove the BeadChips.
- ☐ 4 Remove the cover seals from the BeadChips.
- ☐ 5 Place the BeadChips into the submerged wash rack.
- ☐ 6 Move the wash rack up and down for 1 minute.
- ☐ 7 Move the wash rack to the next PB1 Wash.
- ☐ 8 Move the wash rack up and down for 1 minute.
- ☐ 9 Confirm that you are using the correct Infinium LCG glass back plates and spacers.
- ☐ 10 Fill the BeadChip alignment fixture with 150 ml PB1.
- ☐ 11 For each BeadChip, place one black frame into the BeadChip alignment fixture.
- ☐ 12 Place each BeadChip into a black frame.
- ☐ 13 Place a ***clear*** spacer onto the top of each BeadChip.
- ☐ 14 Place the alignment bar onto the alignment fixture.
- ☐ 15 Place a clean glass back plate on top of each clear spacer.
- ☐ 16 Secure each flow-through chamber assembly with metal clamps.
- ☐ 17 Remove the assembled flow-through chamber from the alignment fixture.
- ☐ 18 Trim the spacers from each end of the assembly.
- ☐ 19 Leave assembled flow-through chambers on the lab bench.
- ☐ 20 Wash the hybridization chamber reservoirs with DI H_2O.

Extend and Stain BeadChips

- ☐ 1 Fill the water circulator.
- ☐ 2 Select **Robot QC Tasks | Circulator Manager** to set to 44°C.
- ☐ 3 Select **XStain Tasks | XStain LCG BeadChip.**
- ☐ 4 Add the following reagents to reservoirs:

Reagent	# BeadChips	Volume
95% formamide/1 mM EDTA	1–8	15 ml
	9–16	17 ml
	17–24	25 ml
RA1	1–8	10 ml
	9–16	20 ml
	17–24	30 ml
XC3	1–8	50 ml
	9–16	100 ml
	17–24	150 ml

- ☐ 5 Invert the LX1, LX2, EML, SML, and ATM tubes to mix. Remove the caps, and place on the robot deck.
- ☐ 6 Enter the number of BeadChips.
- ☐ 7 Select **Run**.
- ☐ 8 [Non-LIMS]Enter the stain temperature listed on the SML tube.
- ☐ 9 Place the flow-through chambers into the chamber rack.
- ☐ 10 Select **OK**.
- ☐ 11 Remove the flow-through chambers from the chamber rack.
- ☐ 12 Set up two top-loading wash dishes labeled PB1 and XC4.

- ☐ 13 Add 310 ml PB1 to the PB1 wash dish.
- ☐ 14 Submerge the staining rack in the wash dish.
- ☐ 15 Leave the staining rack in the wash dish.
- ☐ 16 Disassemble each flow-through chamber.
- ☐ 17 Place the BeadChips into the submerged staining rack.
- ☐ 18 Slowly lift the staining rack 10 times.
- ☐ 19 Soak for 5 minutes.
- ☐ 20 Vigorously shake the XC4 bottle.
- ☐ 21 Add 310 ml XC4 to the XC4 wash dish and cover.
- ☐ 22 Transfer the staining rack from the PB1 to the XC4.
- ☐ 23 Slowly lift the staining rack 10 times.
- ☐ 24 Soak for 5 minutes.
- ☐ 25 Remove the staining rack and place it onto the tube rack.
- ☐ 26 Dry each BeadChip as follows.
  - ☐ a Grip the BeadChip by the barcode end.
  - ☐ b Place onto a tube rack with the barcode facing up and toward you.
- ☐ 27 Place the tube rack into the vacuum desiccator.
- ☐ 28 Dry the BeadChips for 50–55 minutes at 675 mm Hg (0.9 bar).
- ☐ 29 **[LIMS]** Select **Infinium HTS** | **Coat**.
  - ☐ a Scan the barcodes.