AutoSampler Controller outline

Description:

This outline defines the operational steps for the autosampler build composed of the Hamilton MVP valve switch, New-era peristaltic pump and New-era syringe pumps. The operations will end in a sampling of a defined volume at defined time points. The operational steps are categorized into:

* Start operation
* Sample operation
* Quench operation
* End operation

Function that run the operations are defined below:

Valve, pri\_pump are defined (Check Controller codes)

1 – CellSample function (gets cells to tube)

* Hamilton valve position to cells
* Peristaltic pump infuse at max rate

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11 | **def** **cellSample**():  """  Sets valve to cell flask  and pump infue of 5 mL + ygDV  MISSING: cellport1, ygDV  """  valve.ValveRotation("a", cellport1)  pri\_pump.pump.pumping\_direction = PumpingDirection.INFUSE  pri\_pump.pumping\_volume = **5** + ygDV  pri\_pump.pumping\_rate = **75**  pri\_pump.run() |

2- flushPeri function (fushes excess cells in yellow tube)

* Switches Hamilton valve to air
* Switches arm to waste
* Peristaltic pump infuse at max rate of yDV

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13 | **def** **priFlush**():  """  switches hamilton valve to air  switches arm to waste  and pump infuse yDV at max rate  MISSING: yDV, air  """  valve.ValveRotation("a", air)  #arm function to switch to waste  pri\_pump.pump.pumping\_direction = PumpingDirection.INFUSE  pri\_pump.pumping\_volume = yDV  pri\_pump.pumping\_rate = **75**  pri\_pump.run() |

3 – cellbackFlush function (returns cells in green back into cells)

* Switches hamilton valve to cell port
* Peristaltic pump windraw max rate of gDV

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10 | **def** **cellBackflush**():  """  Swicthes valve to cell port  and pump withdraw at max rate for gDV  """  valve.ValveRotation("a", cellport1)  pri\_pump.pump.pumping\_direction = PumpingDirection.WITHDRAW  pri\_pump.pumping\_volume = gDV  pri\_pump.pumping\_rate = **75**  pri\_pump.run() |

4- ywash function (washes the yellow tube with PBS + 5% BSA)

* Switches Hamilton valve to wash port
* Peristaltic pump infuse max rate of 3x yDV

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13 | **def** **ywash**():  """  washes the yellow tube  swicthes hamilton to wash port  swicthes arm to waste  and pump infuse 3x ydv at max rate  """  valve.ValveRotation("a", wash)  #arm function to switch to waste  pri\_pump.pump.pumping\_direction = PumpingDirection.INFUSE  pri\_pump.pumping\_volume = yDV \* **3**  pri\_pump.pumping\_rate = **75**  pri\_pump.run() |

5 – blocking function (flushes cell to tube tubing with blocking/wash buffer)

* Having blocking/wash buffer tube in the cell port tube
* Switch Hamilton valve to cell (which actually has wash/blocking buffer)
* Switches arm to waste
* Pump gyDV at 1 ml/min rate

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12 | **def** **blocking**():  """  flushes cell to tube tubing  with blocking/wash buffer  MISSING:  """  valve.ValveRotation("a", cellport1)  #arm function to switch to waste  pri\_pump.pump.pumping\_direction = PumpingDirection.INFUSE  pri\_pump.pumping\_volume = ygDV  pri\_pump.pumping\_rate = **1**  pri\_pump.run() |

6- prime function (primes all tubes and valves except cells)

* Switches hamilton valve to glycine port
* Peristlatic pump gDV at max rate
* Switch hamitlon valve to wash port
* Peristaltic pump at gDV at max rate

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11 | **def** **prime**():  """  primes glycine and wash tubing  pump ing gDV fof each tube  """  valve.ValveRotation("a", gly)  pri\_pump.pumping\_volume = gDV  pri\_pump.pumping\_rate = **75**  valve.ValveRotation("a", wash)  pri\_pump.pumping\_volume = gDV  pri\_pump.pumping\_rate = **75** |