

Simple 2D grid optimization in WaspRun

There are 3 experiment scripts in WaspRun for creating gradients:

Experiment	Microtip required	Description	Dispense drops or reservoirs
4 Corner Optimization	4-bore	Create a 2D grid by specifying the corner conditions	Drops only
2D Grid, Precipitant vs Protein	3-bore	Create a 2D grid varying protein against precipitant concentration	Drops and reservoir using microtip only (limited volume range) recommend 15uL res volume low viscosity
2D Grid, pH Gradient	4-bore	Create a 2D grid varying pH against precipitant concentration.	Drops and reservoir using microtip only (limited volume range) recommend 15uL res volume low viscosity

Step-by-Step Instructions:

4 Corner Optimization

Destination Plate

Plate Name: SwissCI_2Drop (1)

Protein required [uL]: 9.39

Ingredient 1 required [uL]: 1.44

Ingredient 3 required [uL]: 1.44

No of drops to be dispensed: 1

Well Numbers and Solution Names

Wells to be dispensed: 30

Protein Name: Protein X

Ingredient 1 Name: Additive 1

Ingredient 2 Name: Reservoir solution

Ingredient 3 Name: Additive 2

Additional Settings

Protein viscosity level: 1. Water

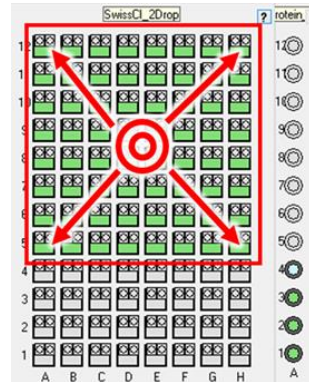
Ingredient 1 viscosity level: 3.e.g.30% PEG 3.5k (3)

Ingredient 2 viscosity level: 3.e.g.30% PEG 3.5k

Ingredient 3 viscosity level: 3.e.g.30% PEG 3.5k

Use Evaporation Shield: (4)

Ingredient 2 from reservoir:



Droplet Top Left Volumes

Protein [uL]: 0.30

Ingredient 1 [uL]: 0.00

Ingredient 2 [uL]: 0.30

Ingredient 3 [uL]: 0.00

Droplet Top Right Volumes

Protein [uL]: 0.30

Ingredient 1 [uL]: 0.00

Ingredient 2 [uL]: 0.30

Ingredient 3 [uL]: 0.00

Droplet Bottom Left Volumes

Protein [uL]: 0.30

Ingredient 1 [uL]: 0.00

Ingredient 2 [uL]: 0.15

Ingredient 3 [uL]: 0.15

Droplet Bottom Right Volumes

Protein [uL]: 0.30

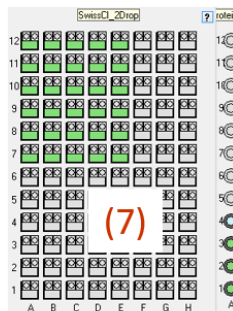
Ingredient 1 [uL]: 0.15

Ingredient 2 [uL]: 0.15

Ingredient 3 [uL]: 0.00

Droplet position

Droplet Position: (6)



1. Choose a Plate type.
2. Specify up to 4 ingredients.
3. Specify viscosities and use evaporation shield.
4. Specify "Ingredient 2 from reservoir." If selected ingredient 2 will be taken from each reservoir rather than a sample tube, e.g. for screening experiments.
5. Specify 4 corner conditions.
6. Select which drop to dispense to.
7. Select where to dispense to on **plateloader window**.

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2D Grid, Precipitant vs Protein

Destination Plate and Solution Volumes

Plate Name: SwissCI_3Drop (1)

Plate Barcode: []

Protein required [uL]: 9.39

Est. Precipitant required [uL]: 194.52

Est. Diluent required [uL]: 194.52

No of drops to be dispensed: 1

Drop Volume [uL]: 1.00

Reservoir Volume [uL]: 15.0 (4)

Additional Settings

Protein viscosity level: 1. Water

Precipitant viscosity level: 3.e.g.30% PEG 3.5k (3)

Diluent viscosity level: 1. Water

Use Evaporation Shield:

Well Numbers and Solution Names

Wells to be dispensed: 24

Protein Name: Protein x

Precipitant Name: Precipitant

Diluent Name: Water (2)

Y Direction Gradient [1-12]

Protein in drop start [Svol]: 50.00 (5)

Protein in drop stop [Svol]: 25.00

Droplet One

Droplet Position: []

Execute this drop:

Droplet Two

Droplet Position: []

Execute this drop:

Droplet Three

Droplet Position: []

Execute this drop:

X Direction Gradient [A-H]

Precipitant Start [% vol]: 80.00 (6)

Precipitant stop [% vol]: 20.00

(7)

1. Choose a Plate type. SwissCI_3 drop plate recommended
2. Specify protein, precipitant and diluent.
3. Specify viscosities and use evaporation shield.
4. Specify reservoir volume to dispense 15 uL recommended for SwissCI_3 drop.
5. Specify protein. [Protein] varies in the Y axis (1-12 on plate)
6. Specify precipitant gradient. [Precipitant] varies in the X axis (A-H on plate)
7. Select where to dispense to on **plateloader window**.

2D Grid, pH vs Precipitant

Destination Plate and Solution Volumes

Plate Name: SwissCI_3Drop (1)

Plate Barcode: []

No of drops to be dispensed: 1

Drop Volume [uL]: 0.60

Reservoir Volume [uL]: 15.0 (4)

Use Evaporation Shield:

Wells to be dispensed: 24

Viscosity Settings

Protein (X1): 1. Like water

Diluent (X2): 1. Like water (3)

Hit Solution pH 1 (Y1): 1. Like water

Hit Solution pH 2 (Y2): 1. Like water

Solution Names

Protein (Channel X1): Protein X

Diluent (Channel X2): Water

Hit Solution (Channel Y1): Cocktail #13

(Channel Y2): Cocktail #13 (2)

Hit solution properties

pH of Hit Solution Y1: 6.00

pH of Hit Solution Y2: 8.00

Droplet Specification

Protein Volume [%]: 50.00 (5)

Protein Volume [uL]: 0.30

X Direction Gradient [A-H]

Hit Solution Start (Volume %): 100.00 (6)

Hit Solution Stop (Volume %): 80.00

Y Direction Gradient [1-12]

Approximate pH Start: 6.00

Approximate pH Stop: 8.00

(7)

1. Choose a Plate type. SwissCI_3 drop plate recommended
2. Specify protein diluent and a high and low pH cocktail of the precipitant.
3. Specify viscosities and use evaporation shield.
4. Specify reservoir volume to dispense 15 uL recommended for SwissCI_3 drop.
5. Specify protein volume. Constant across plate.
6. Specify precipitant gradient. [Precipitant] varies in the X axis (A-H on plate). Specify pH gradient. pH varies un the Y axis (1-12 on plate)
7. Select where to dispense to on **plateloader window**.

Note pH gradient is linear and unlike XStep, WaspRun does not calculate the final pH using pKas.