

Junior

Small molecule preformulation

Walk up, set up your run and walk away. Junior automates the parts of your API screening process you'd normally do one by one at the bench. Preconfigured decks for high-throughput solubility and polymorph screenings are ready to go when you are. Examine more variables in a single day, get them done the same way every time and check out a broader developability and formulation space.

Applications

- Solubility screening
 - Chiral resolution
 - LogP and LogD determinations
- Polymorph screening
 - Solvent screening
 - Salt selection/solvent screening
 - Cocrystal screening
- Powder dispensing
- Reaction screening

Key features

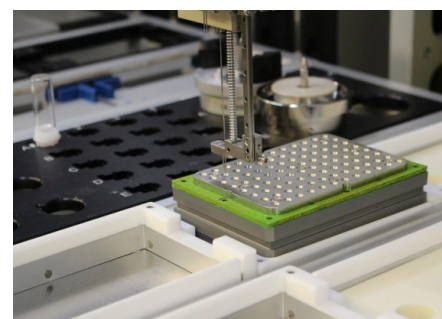
- Evaluate up to 384 crystallizations per run
- Analyze samples by birefringence, XRD and Raman spectroscopy without wrecking a single crystal
- Transfer and filter 96 solutions at elevated temperatures with no API precipitation
- Heat, cool, and mix on-deck, allowing for parallel slurry, precipitation, cooling, and evaporation experiments on a single platform
- Design complex experiments quickly using LEA's logical recipe-oriented approach
- Add process chemistry screening capabilities and screen up to 96 reactions in parallel to rapidly identify the best solvents, ligands, catalysts, and reagents for your chemistry



Junior configured for small molecule preformulation



SV dispensers use vibration for precise delivery



Crystallizer block for polymorph screening



Example Junior deck configured for small molecule preformulation

- | | |
|---------------------------------|---------------------------------|
| 1 Solvent tray | 5 Heating/cooling/stirring |
| 2 Position passive plate rack | 6 3-position heating/stirring |
| 3 3-Position passive plate rack | 7 Heated 4-tip liquid dispenser |
| 4 Spray wash | 8 Optional pH probe |

Available options

Heated 4-tip liquid dispenser – extended tip

Heated reservoir volume per tip: 1 mL
 Reservoir temperature: Up to 120 °C
 Temperature uniformity: ± 2 °C (across tips)
 Tip pitch: 9 mm
 Extendible tip: 1
 Syringe sizes: 50 μ L – 10 mL
 Needle size: 22 gauge, piercing

Heating/cooling/stirring station

Temperature range: -20–180 °C
 Mixing: Up to 750 rpm
 Mixing type: Magnetic tumble stirring

Heated filter block

Vial operating temperature: Ambient to 120 °C
 Temperature controller accuracy: ± 1 °C
 Heater temperature ramp rate: 2 °C/min while heating
 Cooling: By convection
 Vial temperature uniformity: ± 6 °C @ 60 °C
 Filter: High efficiency 0.7 μ m binder-free glass microfiber

Crystallizer

Format: 96 independent crystallizations, with a universal substrate

pH measurement

Configuration: Single or 4-channel probe
 Measurement time per 96-well plate: <90 minutes
 Range: 1–13 pH unit
 Resolution: 0.05 pH unit
 Repeatability: ± 0.1 pH unit

Heated single-tip liquid dispenser

Heated reservoir volume: 1 mL
 Reservoir temperature: Up to 120 °C
 Syringe sizes: 1–2.5 mL (standard)
 Needle size: 16 gauge, non-piercing

Vortexing station – 3 positions

Orbital: 60–3570 rpm
 Maximum vortexing mass: 2268 g (5 lb/plate)

Deck screening pressure reactor (DSPR)

Max pressure rating: 200 psi @ 180 °C
 Pressure drop: <5 psi/hr

Solid dispense

Dispense technology: Dispense algorithm dynamically controls the dispensing head to adjust for powders with different densities, particle sizes, particle shapes and static charges

- **Classic powder dispense:** Traditional stirrer dispense mechanism
 - Hopper volume range: 10–100 mL
- **Storage vial (SV) powder dispense:** Unique vibratory dispensing mechanism for highly precise dispensing of small amounts as low as 0.5 mg
 - Hopper volume: 4 mL

Balance with integrated camera

Maximum weight:

- Standard: 1200 g
- High-sensitivity option: 220 g

Sensitivity:

- Standard: 0.1 mg
- High sensitivity option: 0.01 mg

Resolution:

- Standard: 0.1 mg
- High-sensitivity option:
 - 0.01 mg (0–110 g)
 - 0.1 mg (110–220 g)

Repeatability:

- Standard:
 - High weight (measured >200 g): 0.25 mg
 - Low weight (measured up to 200 g): 0.15 mg
- High-sensitivity option:
 - High weight (measured at 200 g): 0.15 mg
 - Low weight (measured at 10 g): 0.04 mg

Response time: <22s

Camera resolution: 1032 pixels (max wide) x 779 pixels (tall)

Off-deck third-party instrument integration

- HPLC
- XRD
- Birefringence microscope
- Raman

Other systems available for virtual integration.

Please contact Unchained Labs for a full list of systems.

Facilities requirements

Physical:

With integrated enclosure:

105 cm W x 90.4 cm D x 140 cm H, ~150 kg

With integrated table option:

167 cm W x 90.4 cm D x 200 cm H, ~240 kg

Electrical:

Junior:

120–220 V ± 10 %, 50–60 Hz, 16 A

Computer:

US: 115 V ± 10 %, 60 Hz

EU: 220 V ± 10 %, 50 Hz

Compressed dry air: 0.5 MPa to 0.9 MPa (70–130 psi), 4 L/min (8 mm hose)



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