

# Laboratory Facilities & Equipment



Serajuddin Research Lab  
St. John's University, Queens, NY

# *Facilities*

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## ❖ Laboratory G9

(St. Albert's Hall), 650 sq. ft.

## ❖ Laboratory B21

(St. Albert's Hall), 500 sq. ft.

## ❖ Laboratory B2

(St. Albert's Hall), 1100 sq. ft.



# *Research Focus*

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## **Formulation**

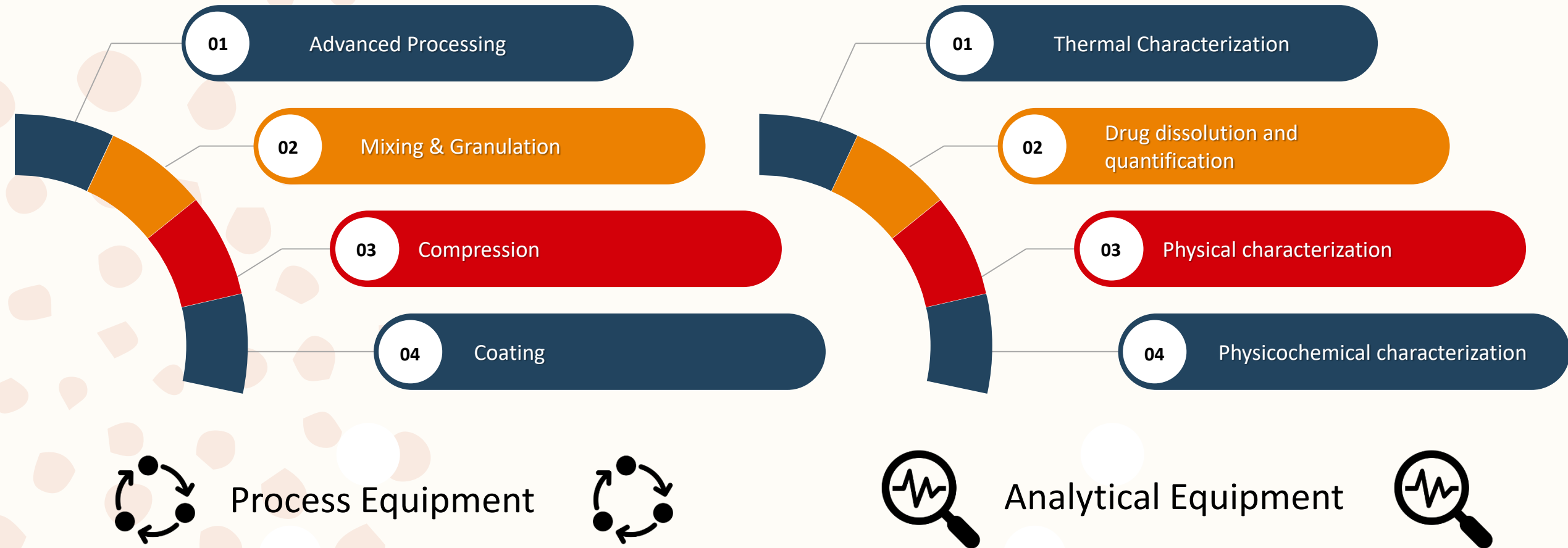
- Lipid Based Drug Delivery Systems
- Amorphous Solid Dispersions
- Nanoparticulate Systems
- Pharmaceutical Salts, Microenvironmental pH Modulation
- Supersolubilized Systems by Acid-Base Interaction
- Cocrystal Synthesis, Dissolution and Solubility Study
- Controlled Drug Delivery Systems
- Caco-2 cell permeability study, cytotoxicity

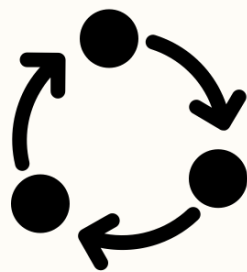
## **Processing**

- Melt Extrusion
- Melt/Wet Granulation
- Continuous Processing
- 3D Printing of Personalized Medicines
- 3D Printing for Immediate Drug Release
- Compaction Physics
- Spray Drying
- Processing of abuse-deterrent products

# *Process & Analytical Equipment*

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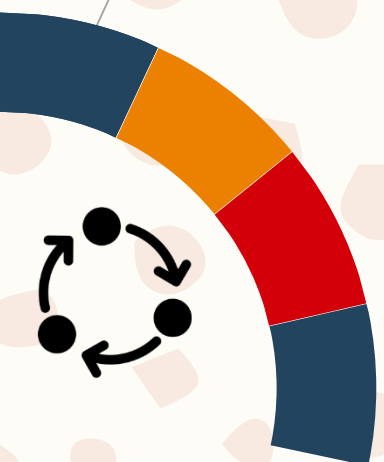
## *Process Equipment*

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# Process Equipment

01

## Advanced Processing

- 
1. **Thermo Scientific, Process 11, Hot Melt Extruder**
  2. *Buchi, B-90 Nano Spray Dryer*
  3. *MakerBot Replicator 2 & Raise 3DPrinter*



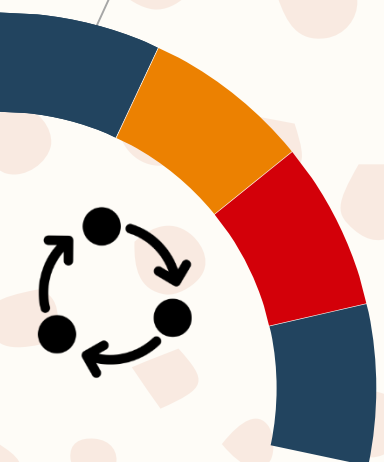
Thermo Scientific, Process 11, Hot Melt Extruder



# Process Equipment

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## Advanced Processing

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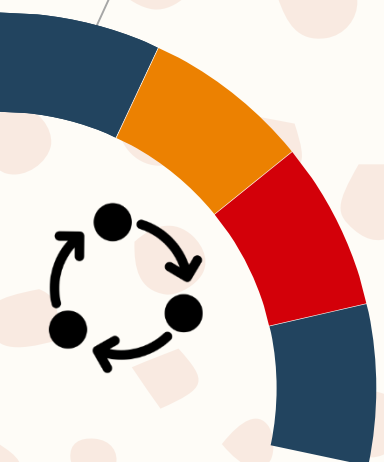


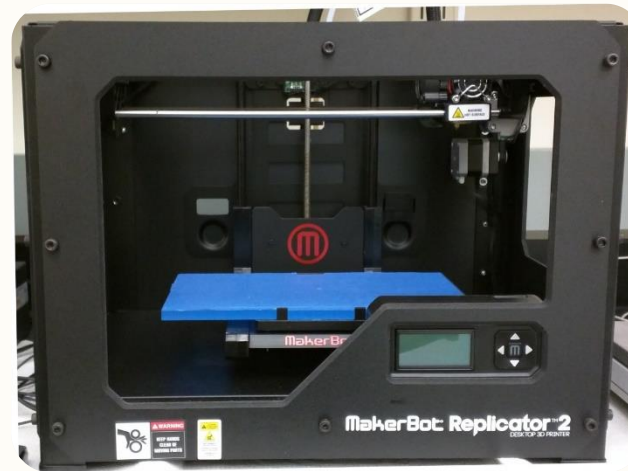
Buchi, B-90 Nano Spray Dryer

# Process Equipment

01

## Advanced Processing

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  2. Buchi, B-90 Nano Spray Dryer
  3. **MakerBot Replicator 2 & RAISE 3D Pro2**



MakerBot Replicator 2



RAISE 3D Pro2



# Process Equipment

02

## Mixing & Granulation

- 1. *Mixing***  
High Shear Granulator, Turbula Mixer, Planetary Mixer and V Blender
- 2. *Fluid Bed Drying***  
Freund Vector, VFC Lab Micro-Flo Coater
- 3. *Milling***  
MRC, MOM5 Oscillating Mill
- 4. *Roller Compaction***  
MRC, Roller Compactor



High Shear Granulator



Turbula Mixer



V Blender

# Process Equipment

02

## Mixing & Granulation

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**Freund Vector, VFC Lab Micro-Flo Coater**
3. *Milling*  
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MRC, Roller Compactor



Freund Vector, VFC Lab Micro-Flo Coater

# Process Equipment

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## Mixing & Granulation

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High Shear Granulator, Turbula Mixer, Planetary Mixer and V Blender
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Freund Vector, VFC Lab Micro-Flo Coater
3. *Milling*  
**MRC, MOM5 Oscillating Mill**
4. *Roller Compaction*  
**MRC, Roller Compactor**



MRC, MOM5 Oscillating Mill



MRC, Roller Compactor



# Process Equipment



03

## Compression

1. Cadmach Machinery, Benchtop Rotary Tablet Press 8 Station
2. Carver Tablet Press, Single station Model C
3. Shanghai Tiangfeng, TDP Series, Automatic Single Punch Tablet Press



Cadmach Machinery, Benchtop Rotary Tablet Press 8 Station

# Process Equipment



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## Compression

1. Cadmach Machinery, Benchtop Rotary Tablet Press 8 Station
2. **Carver Tablet Press, Single station Model C**
3. Shanghai Tiangfeng, TDP Series, Automatic Single Punch Tablet Press



Carver Tablet Press,  
Single station Model C



Automatic Single Punch  
Tablet Press

# Process Equipment



04

## Coating

1. Freund Vector VFC Lab Micro-Flo Coater
2. Shanghai Tiangfeng, Waternut Type Tablet Film Coating Machine



Freund Vector VFC Lab  
Micro-Flo Coater



Film Coating Machine





# *Analytical Equipment*

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# Analytical Equipment

01

## Thermal Characterization

1. **Rheometer**  
TA Instruments, Discovery  
HR- 2 Hybrid Rheometer
2. Thermogravimetric  
Analyzer,  
TA Instruments, TGA Q 50
3. Differential Scanning  
Calorimeter  
TA Instruments, DSC Q 200
4. Moisture sorption analyzer,  
TA Instruments, VTA-SA



TA Instruments, Discovery HR- 2  
Hybrid Rheometer

# Analytical Equipment

01

## Thermal Characterization

1. Rheometer  
TA Instruments, Discovery HR- 2 Hybrid Rheometer
2. Thermogravimetric Analyzer,  
TA Instruments, TGA Q 50
3. Differential Scanning Calorimeter  
TA Instruments, DSC Q 200
4. Moisture sorption analyzer,  
TA Instruments, VTA-SA



TA Instruments, TGA Q 50



TA Instruments, DSC Q 200

# Analytical Equipment

01

## Thermal Characterization

1. Rheometer  
TA Instruments, Discovery HR- 2 Hybrid Rheometer
2. Thermogravimetric Analyzer,  
TA Instruments, TGA Q 50
3. Differential Scanning Calorimeter  
TA Instruments, DSC Q 200
4. **Vapor sorption analyzer,**  
TA Instruments, VTI-SA



TA Instruments, VTI-SA  
Vapor sorption  
analyzer

# Analytical Equipment

02

## Drug dissolution and quantification

1. **Dissolution Apparatus (3)**  
SR8 Plus Dissolution Station (1), DISTEK Dissolution apparatus (2)
2. **HPLC (5)**  
Waters Corporation HPLC (3), Agilent HPLC (2)



SR8 Plus Dissolution Station



# Analytical Equipment

02

## Drug dissolution and quantification

1. Dissolution Apparatus (3)  
SR8 Plus Dissolution Station (1), DISTEK Dissolution apparatus (2)
2. HPLC (5)  
Waters Corporation HPLC (3), Agilent HPLC (2)



Waters Corporation, HPLC



Agilent HPLC



# Analytical Equipment

03

## Physical characterization

1. **Material Testing System**  
Instron 4502 Material Testing System
2. **Pycnometer**  
Micromeritics Inc., Accupyc II 1340 Gas Pycnometer
3. **Viscometer**  
Brookfield, DVR-2 Viscometer



Instron 4502 Material Testing System



Micromeritics Inc., Accupyc II 1340 Gas Pycnometer



Brookfield, DVR-2 Viscometer

# Analytical Equipment



04

## Physicochemical characterization

1. Particle size & zeta potential analyzer
2. Powder X-ray Diffractometer (2)
3. Hot-stage microscope
4. Kaiser Raman RXN1
5. Polarizing microscope



Beckman Coulter, Delsa Nano C,  
Dynamic light scattering  
particle size analyzer



Shimadzu, X Ray  
Diffraction XRD  
6000 &  
Panalytical Xpert

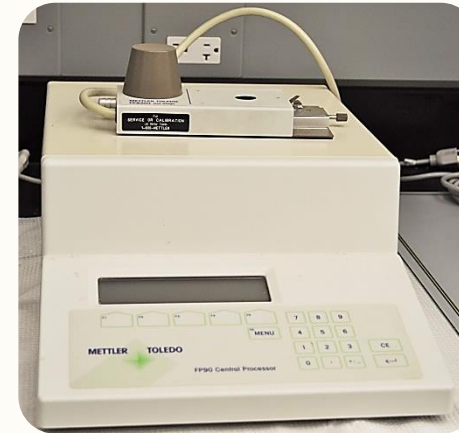
# Analytical Equipment



04

## Physicochemical characterization

1. Particle size & zeta potential analyzer
2. Powder X-ray Diffractometer (2)
3. **Hot-stage microscope**
4. **Kaiser Raman RXN1**
5. Polarizing microscope



Mettler Toledo FP82 Hot Stage Microscope



Nikon Eclipse 50i Polarized Light Microscope



Kaiser RXN1 Raman Spectrophotometer

# *Instrument for Biological and Ex-vivo Studies*

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***Purifier Cell Logic+ Class II, Type A2 Biosafety Cabinets***

# *Advanced Analytical Equipment*

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## *Available In the Department*



- *Scanning Electron Microscope*
- *Transmission Electron Microscope*
- *Confocal Imaging Microscope*
- *Nuclear Magnetic Resonance*
- *FTIR Spectrometer*