CHEMICAL GENOMICS CORE

Core Director
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ABSTRACT
The Chemical Genomics Core Facility (CGCF) is a new shared facility of the IU Simon Cancer Center and the IU School of Medicine that was established less than two years ago. The mission of CGCF is to provide IU investigators with cost-effective access to high-throughput screening of structurally diverse, drug-like small molecules in biological assays provided by the investigators. This service enables the investigators to discover small molecule tools for basic research, therapeutic development and diagnostic applications. Facility staff will work closely with each investigator through all stages of the screening process, providing an opportunity for students and fellows to gain experience and training in high throughput screening at the facility.

SERVICES PROVIDED
- Consultation for assay development
- Assistance in assay implementation and validation
- Assistance in carrying out high-throughput screening of chemical libraries
- Provide compound libraries pre-plated, available for use in a 96- or 384-well format
- Provide training in the use of facility-maintained instrumentation
- Assistance with data analysis and compound selection

CHEMICAL LIBRARIES
ChemDiv 40K
ChemBridge 43K
ChemDiv 59K

- The three libraries consist of a total of 160,000 compounds obtained from ChemDiv and ChemBridge
- They are structurally diverse, pharmaco-structure-rich collections of drug-like small molecules
- Compounds generally obey Lipinski’s “rule of five” and demonstrate good ADMET (absorption, distribution, metabolism and excretion) profiles
- Purity of the compounds is typically greater than 90%

NC01 and NC02:
- The NC01 library consists of 1,950 compounds selected from the NCI open collection of 140,000 compounds
- Compounds were selected based upon drug-likeness
- Library includes a challenge set of 57 compounds
- Novel structural types show unusual patterns of cell line sensitivity and resistance
- The NC02 library consists of 879 compounds representing structural diversity

NCI01 and NC02:
- The NCI01 library consists of 1,950 compounds selected from the NCI open collection of 140,000 compounds
- Compounds were selected based upon drug-likeness
- Library includes a challenge set of 57 compounds
- Novel structural types show unusual patterns of cell line sensitivity and resistance
- The NCI02 library consists of 879 compounds representing structural diversity

MAJOR EQUIPMENT

Freedom EVO 150 MCA (TECAN)
It is an automatic liquid handling platform and a flexible robotic workstation. It is currently equipped with an MCA robotic 96-channel pipetting head using disposable tips and 20 plate carrier and 6 service carrier, but it offers versatile configurations, including:
- Up to three liquid handling & robotic arm options.
- Choice of one or two high precision liquid handling arms that can each be equipped with one, two, four or eight washable or disposable pipetting tips
- 96- or 384-multi-channel pipetting head options.
- Freely configurable workstation that may include separation and detection devices, shakers and incubators in addition to standard labware carriers and is easily reconfigured for multiple applications or different users.
- Field upgradeability via additional options or, capacity extension via extensive storage options.

Genesis Workstation 150 (TECAN)
This is another automatic liquid handling workstation. It is equipped with three liquid handling and robotic arm options:
- LPAH, a liquid handling arm with eight washable pipetting tips that can reach any where on the station.
- TDAH: a 96-channel pipetting head that can use either fixed or disposable tips.
- ROMA: an arm with a 5-point rotational robotic gripper to move microplates between positions, devices, and storage.

CHEMICAL GENOMICS INCOME SOURCE
ABSTRACT
CCSG
Recharge
IUSCC
7%
26%
67%
25%

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- TDAH: a 96-channel pipetting head that can use either fixed or disposable tips.
- ROMA: an arm with a 5-point rotational robotic gripper to move microplates between positions, devices, and storage.

Chemical Genomics Facility

FUNDING RESEARCH PROJECTS UTILIZING OR LEVERAGING THE CCDF

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TYPE OF ASSAYS IMPLEMENTED
- In vitro enzymatic activity assay
- In vitro protein binding assay
- Cell proliferation assay
- Cell-based reporter gene assay

DETECTION SPECTROMETERS

EnVision Plate Reader (Perkin Elmer)
Multifunctional filter based plate reader
- Equipped with dual stacks
- Works independently to detect:
  - Absorbance
  - Fluorescence Intensity (FI)
  - Time-Resolved fluorescence (TRF)
  - Fluorescence polarization
  - AlphaScreen™ technology
  - Luminescence

Ultra 384
Multifunctional filter based plate reader
- Works independently or integrated with Genesis Workstation.
- Detects:
  - Absorbance
  - Fluorescence Intensity (FI)
  - Time-Resolved Fluorescence (TRF)
  - Time-Resolved luminescence

SpectraMax Plus 384
- High performance absorbance plate reader
- Possesses a full spectral range of 190 - 1,000nm
- Accommodates 96- and 384-well microplates

Victor Light
- Microplate counter for luminescence
- Equipped with stackers and dual injectors
- Dedicated to detect:
  - Flash luminescence
  - Glow luminescence
  - Dual luciferase assays
  - Dual emission luminescence (such as BRET and BRET2)

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