

University of Pittsburgh Cancer Institute



UPCI Chemical Biology Facility (ChBF) unit of the Drug Discovery Institute (UPDDI) July 2017

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Director of Operations, Drug Discovery Institute

Research Associate Professor, Computational and Systems Biology

www.upddi.pitt.edu



Budget for ChBF from UPCI

- Current Year Budget (ends 7/31/17): \$77K Total
- Personnel and Effort:
 - Facility Director – Mark Schurdak 9%
 - Faculty Support - Lans Taylor 3%
 - Data Manager/Information Specialist – TongYing Shun 10%
 - Research Specialists – Celeste Reese 9%
 - Research Specialists – Seia Comsa 13%



Specific Aims of the Chemical Biology Facility

1. Guide collaborators in designing effective drug discovery projects or programs for the discovery of novel cancer therapeutics.
2. Provide access to the state-of-the-art use of Quantitative Systems Pharmacology (QSP) in implementing novel drug discovery programs.
3. Provide assistance to designing, developing, and implementing cost effective screening assays, as well as access to compound libraries for probe and lead identification, including assisting in early toxicity assays for profiling compounds.



Functions of the UPDDI/ChBF Over the Last 2 Years and into the Future

**Optimize
Drug Discovery
Projects
w/Faculty**

**Create
Comprehensive QSP
Discovery Programs**

**Support/Lead
Grant Proposals**

**Educate
Students, Post-
Docs and Faculty**

**Support
Development of
Therapeutics and
Companion
Diagnostics**

**Harness Industry
for Support
& Collaboration**

**Develop
Translational
Technologies**

**Build
Collaborations
in Academia and
Government**

**Harness
Foundations/
Philanthropy
“Revolution
Fund”**

Specific ChBF Services

- **Program/Project Development**
 - Assist collaborators in designing QSP driven drug discovery programs
 - Assist collaborators in designing drug discovery/development projects
- **Translational Technologies**
 - Implementation of heterogeneity analysis in assays
 - Assist investigators with access to companion diagnostic opportunities
 - 3D, microfluidic organs on chip assay design, development, validation & implementation
 - Early safety assessment
 - Lead characterization and optimization (Med-Chem) collaborations
- **Pharmaceutical Partnering**
 - Assist investigators with connections to pharmaceutical companies
- **Assay Development and Implementation**
 - High Content Screening (HCS) capability for primary and secondary screens
 - High Throughput Screening (HTS) facilities for small to large scale screens
 - Access to small molecule libraries (>250,000 cpds)
 - Zebrafish assay design and implementation
 - Data management and informatics
 - Computational and Systems Biology

Organizing the Research & Development Functions of the UPDDI & ChBF

Present Programs

(Andy, Lans, & Mark)

**Quantitative Systems
Pharmacology**

Projects

(Mark Schurdak, Andreas Vogt &
Andy Stern)

**Discovery
Collaborations (e.g.)**

Translational Technologies

(Lans Taylor, Bert Gough,
Chakra C., Mark Schurdak, Tim
Lezon & Ivet Bahar)

Metastatic Breast Cancer

(A. Lee, A. Stern
& Steffi Oesterreich, plus UPCI)

Neurodegenerative Disease

(David Okonkwo, Robert Friedlander,
Ivet Bahar, M. Schurdak, plus
Brain Institute)

Liver Diseases

(Paul Monga, L. Taylor, Alex
Soto-Gutierrez & Liver Center)

Acute Kidney Injury-N. Hukreide

Profilin-1 Dependent Metastasis-P. Roy

FGF Signaling- M. Tsang

Pancreatitis endothelial cell toxicity – D.
Whitcomb

Mcm2-7 helicase – A. Schwacha

Pediatric gliomas – I. Pollack

Dab2 inhibitors – D. Madden

**Develop Metrics for Heterogeneity
In Drug Discovery & Development**

**Develop new Computational &
Systems Biology Tools (QSP)**

**Create Human
Organs on a Chip**

**Develop Biosensors for Efficacy &
Safety Testing**

Develop Companion Diagnostics

Process for Starting Collaborations: ChBF Information on UPDDI Website



Contact ChBF Director
mes234@pitt.edu
412-648-3090



Group Seminar



New Project/Program Team

- Goal
- Technical staff effort
- Major equipment usage
- General use of facility
- Supplies needed
- Other collaborators required



Joint Decision

- Project vs Program
- Costs to complete
 - Led by ChBF Director



Identify funding opportunities

- Grants
 - Engage ChBF early
- Assisted by UPDDI Director



Implementation