

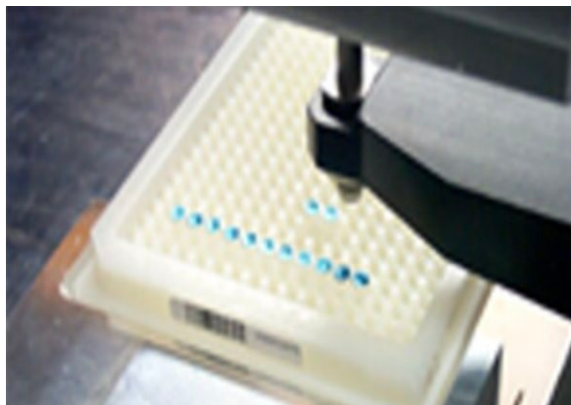


## LIMR Chemical Genomics Center (LCGC)

Ultra-high throughput screening methods to detect synergistic drug interactions

Chemical collections and methods for rapid storage, retrieval and assay are vital for new drug discovery.

LIMR Chemical Genomics Center's (LCGC) large chemical collection covers a unique structural space not covered by other pharma or commercial libraries. LCGC has developed a variety of hardware and software solutions to enable efficient, low-cost drug screens directed to any molecular target of interest. Together these LCGC assets offer a complete low-cost infrastructure to R&D entities seeking to engage in drug discovery.



### LCGC's technologies offer multiple sources of value

1. Ownership of novel chemicals.
2. Ready access to many commercial or other known chemicals, including FDA-approved drugs.
3. Patent protection of new therapeutic targets through validation with a small molecular inhibitor. Critical for drug target protection even if a drug discovery campaign is not desired: drug target patents are vulnerable to invalidation without demonstrating a proof-of-concept inhibitor or agonist.
4. NARS Robotic Storage-And-Retrieval Freezer: A 2000 ft<sup>3</sup> robotic freezer to store, retrieve, and format chemicals for drug screening. Enables rapid high-integrity management of large chemical collections up to 10,000,000 compounds, without freeze-thaw steps that degrade many chemicals.
5. NARS storage plates: Fully addressable 384-well plates with moveable wells (see above). Enables rapid formatting of drug screening plates without freeze-thaw (up to 10,000 picks / day).
6. Software: Algorithms that deepen uses for NARS-based drug discovery system (below).
7. A complete infrastructure of chemicals, hardware and software for early-stage drug discovery. Suitable as a one-stop shop for government laboratories, private foundations, or universities.

Few biomedical R&D organizations have the capability to identify proprietary new drug leads. Intra-institutional collaborations are difficult due to intellectual property limitations and concerns. Rival methods for preclinical drug discovery (*in silico*, artificial intelligence) are partially effective at best, posing risks from algorithm bias and requiring intensive time, expertise, and access to large data sets for computer data learning. LCGC's technologies offer unique tools that, employed together, can enable any R&D organization to start to engage in drug discovery.

### Opportunities for Sale or Licensing

1. **A Chemical Library (>250K compounds)** that covers a unique structural space compared to existing commercial, academic and pharmaceutical libraries.

**This library was donated to LCGC from a Chem-Ag company. As such, it is the first Chem-Ag library to be made available for biomedical drug discovery in a unique chemical space: a unique place to mine for new drugs.**

2. **A Robotic Storage-And-Retrieval Freezer (NARS)** enabling compound organization and management without freeze-thaw or technician labor to assemble compounds for drug screening.  
**The ~2000 ft<sup>3</sup> NARS robotic freezer has a storage capacity of 10 million compounds with retrieval pick rates of 10,000/day. NARS can reduce storage and access costs up to 80% for chemicals (or biomolecules/specimens).**
3. **A Set Of Patented Methods to Compress Drug Screens, Identify Drug-Drug Synergies, and Lower Costs:**
  - **Orthogonal Pooled Screening (OPS)** to screen multiple drug candidates at a time.
  - **Ultra-High Throughput Screening for Synergy (UHTSS)** to permit multidrug discovery against a therapeutic target, i.e., identify unknown drug synergies.
  - **Double-Blinded Drug Discovery (DBD2)<sup>®</sup>** to enable collaborations of non-profit and for-profit entities, e.g. one organization's enzyme target and another organization's chemical collection, without revealing either organization's property.

## Unique Attributes

- **Unique Chemical Library:** Fully annotated compound collection includes a first-ever proprietary ChemAg library of 104,000 drug-like small molecules, meeting high QC and QA benchmarks. This set encompasses thousands of chemical scaffolds for iteration by medicinal chemistry that are unavailable elsewhere. Additional known chemicals include the following:
  - ChemBridge: 100,000 compounds assembled from the 50,000-member DIVERSet™-EXP library, plus the 50,000-compound DIVERSet™-CL library.
  - Life Chemicals Inc.: 50,000 compounds selected to complement overall diversity.
  - MicroSource Pharmakon: 1,760 combines the 1,360 drugs in its U.S. drug collection with the 400 drugs from the international drug collection.
  - MicroSource Spectrum: ~1,000 bioactive compounds and natural product analogs.
  - NCI-Approved Oncology Set: 166 of the most current FDA-approved anticancer drugs.
  - Nutraceuticals: ~150 individual neat powders acquired from Sigma, Cayman and other vendors.
  - Miscellaneous: ~8,000 compounds acquired from other commercial vendors, primarily ChemDiv and TimTec.
- **Unique Automated Chemical Repository:** State-of-the-art storage and retrieval to protect and distribute chemical (or biological) assets without freeze-thaw, preserving chemical integrity.
- **Unprecedented Efficiencies:** Up to 80% reduction in storage and retrieval costs. Up to 500% increase in efficiency of high-throughput screening (HTS). Ultra-HTS compression up to 15:1. Provides medicinal chemists just-in-time new chemical scaffolds to assist decision-making on lead and backup drug candidates; opportunity to rapidly screen most approved, generic, or OTC drugs for pharmaceutical repositioning; opportunities for nutraceutical R&D, and other value-add screens.

## Intellectual Property

Chemical collection is proprietary. Hardware and software technologies are patent-protected.

## Acquisition Opportunity

Seek to sell, partner or license some or all LCGC technology for early-stage drug discovery.

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