Combinatorial Drug Discovery Program Libraries

Approved Drugs, Investigational Agents and Bioactive Molecules

CDDP Custom Informer (CCI)_2022	**4,309 Compounds**
	The CDDP Custom Informer (CCI) drug library is a subsampling of 4309 bioactive molecules from the MedChemExpress bioactive collection. This library was built by selecting representative chemical entities from clusters generated using drug target and mechanism of action (MoA) annotations. Accordioning, this library provides high mechanistic coverage with relatively few molecules. As a secondary consideration, drug families were selected from multiple generations that span pre-clinical to approved-use applications. Thus, this library balances mechanistic probes with translational applications. Furthermore, this library is pre-arrayed in 384-well plate format with enriched drug MoA, thus allow one to screen only the most relevant sections and further improve the efficiency of the screen. All compounds in this set are 10mM in 100% DMSO.
National Cancer Institute Approved Oncology Set X_2021	**168 Compounds**
	This set contains most current FDA-approved anticancer drugs. The current set consists of 168 agents and is intended to enable cancer research, drug discovery and combination drug studies. All proprietary agents in this set were obtained through commercial sources. This collection was updated in 2021 to contain all of the drugs currently described in the AOD-X Collection. All compounds in this set are 10mM in 100% DMSO.
TargetMol Epigenetics Compound Library_2019	**380 Compounds**
	Epigenetics is the study of molecular processes that influence the flow of information between a constant DNA sequence and variable gene expression patterns. This includes investigation of nuclear organization, DNA methylation, histone modification and RNA transcription. Epigenetic processes can result in intergenerational (heritable) effects as well as clonal propagation of cell identity without any mutational change in DNA sequence. Epigenetics has the potential to be a key element in a paradigm change of our understanding of aging, development, cancer, heart disease, psychological disorders, and other diseases. For example, Epigenetic modifications have a considerable effect on cancer. Changes in the pattern of histone modifications in the promoter sequences as epigenetic regulation lead to changes in chromatin

structure thus may be the cause of altered gene expression by activation of oncogenes. The Epigenetics Compound Library by TargetMol, containing 380 compounds related to epigenetic regulation, can be used for research in epigenetics, high throughput screening and high content screening for new drugs in epigenetic modification. Compounds are present at 10mM in DMSO.

Custom Clinical Collection_2021 — **146 Compounds**

The Custom Clinical Collection contains approximately 147 compounds to a wide variety of targets. Fifty-seven percent of the compounds are currently used in the clinic for the treatment of various forms of cancer and 37% of the compounds are in clinical trials. Compounds are present at 10mM in DMSO.

Targeted and Focused Collections

Cancer Therapy Evaluation Program (CTEP) Collection_2018 — **48 Compounds**

This collection contains 48 drugs selected from the approximate 63 drugs currently available through the CTEP investigational drug portfolio program for clinical development because of their commercial availability. The CTEP program, part of the National Cancer Institute, coordinates the clinical therapeutics development program of the Division of Cancer Treatment and Diagnosis (DCTD), NCI. Compounds are present at 10mM in DMSO.

TargetMol Mitochondrial Targeting Collection_2019 — **64 Compounds**

The mitochondrion is a double-membrane-bound discrete organelle found in most eukaryotic organisms, generating most of the cell's supply of adenosine triphosphate (ATP) and controlling the cellular basal metabolic rate, called as the cell's powerhouses. In addition to supplying cellular energy, mitochondria are the major source of ROS (reactive oxygen species) that reflect the level of cellular oxidative stress and play an important role in mitochondria ROS signaling such as apoptosis, proliferation, and aging, etc. In addition, the fine modulation of mitochondrial calcium (Ca2+) homeostasis plays a fundamental role in many of the processes involving this organelle. Mitochondrial Ca2+accumulation is a tightly controlled process, in turn regulating functions as diverse as aerobic metabolism and induction of cell death. Mitochondrial DNA mutations may lead to many mitochondrial metabolic disorders, and are thought to contribute to aging by promoting

apoptosis. Mitochondria therefore represent an attractive drug target for metabolic diseases, neurodegeneration, or hyperproliferative diseases (cancer). A number of pre-clinical and clinical data have shown that mitochondria as drug targets have great potential. Small molecule drugs or biologics can act on mitochondria through various pathways including ETC inhibition, OXPHOS uncoupling, mitochondrial Ca2+modulation, and control of oxidative stress via decrease or increase of mitochondrial ROS accumulation. Mitochondrial Targeting Compound Library from TargetMol, a unique collection of 64 compounds targeting mitochondria, can be used for research in mitochondrial medicine and related target study. Compounds are present at 10mM in DMSO.

TargetMol Wnt-Hedgehog-Notch Compound Library_2019	**74 Compounds**

The Wnt signaling pathway is an ancient and evolutionarily conserved pathway that regulates crucial aspects of cell fate determination, cell migration, cell polarity, neural patterning and organogenesis during embryonic development. Aberrant regulation of the Wnt signaling pathway is a prevalent theme in cancer biology. The Hedgehog (Hh) pathway is a major regulator of many fundamental processes in vertebrate embryonic development including stem cell maintenance, cell differentiation, tissue polarity and cell proliferation. Constitutive activation of the Hh pathway leading to tumorigenesis is seen in basal cell carcinomas and medulloblastoma. A variety of other human cancers, including brain, gastrointestinal, lung, breast and prostate cancers, also demonstrate inappropriate activation of this pathway. Targeting the Hh signaling pathway provides a new and exciting therapeutic option for a broad variety of cancers. The Notch signaling pathway is a highly conserved cell signaling system present in most multicellular organisms. The Notch signaling cascade is critical for cell proliferation, differentiation, development and homeostasis. Deregulated Notch signaling is found in various diseases, such as T-cell leukemia, breast cancer, prostate cancer, colorectal cancer and lung cancer as well as central nervous system (CNS) malignancies, CADASIL, Alagille syndrome, spondylocostal dysostosis, etc. Wnt/Hedgehog/Notch Compound Library from TargetMol, a unique collection of 74 Wnt/Hedgehog/Notch signaling targeted compounds, can be used for research in Wnt/Hedgehog/Notch signaling and related drug screening (high throughput and high content screening). Compounds are present at 10mM in DMSO.

Combinatorial Drug Discovery Program Libraries

TargetMol Oxidation-Reduction Compound Library_2019	**118 Compounds**
	Alberto Montero and Jacek Jassem report (PMID: 2181250) that some cancer cells are vulnerable to oxidative signals. They respond to oxidative stress with effects on cell division and are particularly sensitive because of persistently high reactive oxygen species (ROS) levels. Excess ROS levels ca potentially contribute to oncogenesis by mediating oxidative DNA damage. The Oxidation-Reduction Compound library by TargetMol contains 118 compounds that inhibit a number of metabolic and cellular signaling pathways and is useful for studying the therapeutic vulnerabilities of cancer cells to oxidation-reduction modulators. Compounds are present at 10mM in DMSO.
TargetMol Cell Cycle related compound Library_2019	**130 Compounds**
	Cell cycle, the ordered sequence of events that occur in acellin preparation for cell division, is also divided into two periods: interphase and the mitotic(M) phase. Interphase itself is split into different phases: G1 phase, S phase and G2 phase. Cell Cycle related compounds rely on differing mechanisms of action to regulate the normal progression of the cell cycle. Some of these compounds interfere with CDK/cyclin complexes leaving cells stuck at the G2/M phase border, while others affect CaMKII phosphorylation, inducing arrest at the G1phase. Other mechanisms of action include interference with RNA function and inhibition of protein synthesis. Many of these compounds ultimately induce apoptosis as a result of their interruption of the cell cycle. This library can be used for anti-cancer drug screening. The TargetMol's Cell Cycle Compound Library, a unique collection of 130 cell cycle related compounds, can be used for research in cell cycle and related drug screening. Compounds are present at 10mM in DMSO.
TargetMol MAPK Inhibitor Library_2019	**140 Compounds**
	Mitogen-activated protein kinases (MAPKs) are a highly conserved family of serine/threonine protein kinases involved in a variety of fundamental cellular processes such as proliferation, differentiation, motility, stress response, apoptosis, and survival. A broad range of extracellular stimuli including mitogens, cytokines, growth factors, and environmental stressors stimulate the activation of one or more MAPKK kinases (MAPKKKs) via receptor-dependent and -independent mechanisms. MAPKKKs

then phosphorylate and activate a downstream MAPK kinase (MAPKK), which in turn phosphorylates and activates MAPKs. The MAPK Inhibitor Library by TargetMol, containing 140 compounds targeting MAPK signaling, can be used for research in MAPK signaling, and drug screening for related diseases. Compounds are present at 10mM in DMSO.

TargetMol JAK STAT Compound Library_2019	**145 Compounds**

Cell signal transduction is the transmission of molecular signals via various proteins in a signaling cascade, which carries and amplifies the signal. The JAK-STAT signaling pathway communicates information from chemical signals outside of a cell to the cell nucleus, resulting in the activation of genes through a process called transcription. There are three key parts of JAK-STAT signaling: Janus kinases (JAKs), Signal Transducer and Activator of Transcription proteins (STATs), and receptors (which bind the chemical signals). JAK-STAT signaling pathway is a chain of interactions between proteins in a cell, and is involved in processes such as immunity, cell division, cell death and tumor formation. Disrupted JAK-STAT signaling may lead to a variety of diseases, such as skin conditions, cancers, and disorders affecting the immune system. There are 4 JAK proteins: JAK1, JAK2, JAK3andTYK2, and there are 7 STAT proteins: STAT1, STAT2, STAT3, STAT4, STAT5A, STAT5B and STAT6. JAK/STAT Compound Library from TargetMol, a unique collection of 145 compounds targeting JAK/STAT signaling, can be used for research in JAK/STAT signaling and related drug screening (high throughput and high content screening). Compounds are present at 10mM in DMSO.

TargetMol PI3K-AKT-mTOR Compound Library_2019	**190 Compounds**

ThePI3K/AKT/mTOR pathway is an intracellular signaling pathway important in regulating the cell cycle. Therefore, it is directly related to cellular quiescence, proliferation, cancer, and longevity. Phosphatidylinositol 3-kinase (PI3K), AKT, a serine/threonine protein kinase also known as protein kinase B (PKB), and mammalian target of rapamycin (mTOR) are 3 major nodes in the pathway. PI3Kactivationphosphorylatesand activates AKT, localizing it in the plasma membrane. AKT can have a number of downstream effects such as activating CREB, inhibiting p27, localizing FOXO in the cytoplasm, activating PtdIns-3ps, and activating mTOR which can affect transcription of p70 or 4EBP1. mTOR is a component of the PI3K/AKT cell survival pathway that

monitors the availability of nutrients, mitogenic signals and cellular energy and oxygen levels, a major regulator of the autophagic process, and alterations in components of the mTOR pathway have a major role in tumor progression. Therefore, mTOR is an appealing therapeutic target in many tumors. Encouraging data from preclinical studies have offered new opportunities to fully exploit the therapeutic potential of mTOR targeting in cancer. The PI3K/Akt/mTOR Compound Library by TargetMol, containing 190 compounds targeting PI3K/Akt/mTOR signaling, can be used for high throughput screening and high content screening for new drugs. Compounds are present at 10mM in DMSO.

TargetMol Apoptosis Compound Library_2019 **191 Compounds**

Apoptosis is a form of programmed cell death that occurs in multicellular organisms. In contrast to necrosis, which is a form of traumatic cell death that results from acute cellular injury, apoptosis is a highly regulated and controlled process that confers advantages during an organism's lifecycle. Apoptosis leads to characteristic cell changes (morphology): the cell breaks apart into multiple vesicles called apoptotic bodies, which undergo phagocytosis. Apoptosis is regulated by both pro-apoptotic (such as Fas receptor and caspases) and anti-apoptotic (such as Bcl-2 and IAP) factors. Disordered apoptosis is implicated in a variety of human diseases. Inhibition of apoptosis can result in a number of cancers, autoimmune diseases, inflammatory diseases, and viral infections. Excessive apoptosis may also be a feature of some conditions such as autoimmune diseases, neurodegenerative diseases, and ischemia-associated injury. Consequently, considerable interest has arisen in therapeutic strategies for cancer, autoimmune diseases, and neurodegenerative diseases by modulating apoptosis pharmacologically. TargetMol's collection of 191 apoptosis-related compounds, Apoptosis Compound Library, is divided accordingly with compounds designed for either pro- or anti-apoptosis purposes and can be used for research in cancer and neurodegenerative diseases. Compounds are present at 10mM in DMSO.

TargetMol Endocrinology-Hormones Library_2019 **297 Compounds**

Endocrine glands are made of a group of cells that secrete their products, hormones, directly into the blood rather than through a duct. Hormones are transported by the circulatory system to target distant organs to regulate physiology and behavior, such as metabolism, growth, development, and reproduction. Hormones

have diverse chemical structures, mainly of 3 classes: eicosanoids, steroids, and amino acid/protein derivatives. Endocrine disease is characterized by irregulated hormone release, inappropriate response to signaling, lack of a gland, or structural enlargement in a critical site such as the thyroid. The Endocrinology-Hormones Compound Library by TargetMol, containing 297 compounds targeting endocrine system, can be used for research in endocrine system, high throughput screening and high content screening for new drugs in endocrine diseases. Compounds are present at 10mM in DMSO.

TargetMol Tyrosine kinase inhibitor library_2019 — **339 Compounds**

A protein kinase is a kinase enzyme that modifies other molecules, mostly proteins, by chemically adding phosphate groups to them (phosphorylation) to regulate the majority of cellular pathways, especially those involved in signal transduction. Phosphorylation usually results in a functional change of the target protein (substrate) by changing enzyme activity, cellular location, or association with other proteins. Of the 518 known kinases, the most successful class for drug targeting is the tyrosine kinase family consisting of 90 distinct and diverse members. Abnormal expression of PTK usually leads to cell proliferation disorders, and is closely related to tumor invasion, metastasis and tumor angiogenesis. More recently, PTKs play a pivotal role in inflammatory diseases such as idiopathic pulmonary fibrosis. The Tyrosine Kinase Inhibitors Library by TargetMol, containing 339 tyrosine kinase inhibitors, can be used for research in tyrosine kinase signaling, and drug screening for related diseases. Compounds are present at 10mM in DMSO.

TargetMol Stem Cell Library_2019 — **340 Compounds**

Stem cells can differentiate into other types of cells and can divide to produce more of the same type of stem cells. For example, embryonic stem cells can differentiate into all the specialized cells—ectoderm, endoderm and mesoderm. Somatic stem cells are thought to be limited to differentiating into different cell types of their tissue of origin. To generate enough specialized cells or tissues that can be used for specific purposes such as tissue regeneration, cell-based therapies, drug screening, or disease models, scientists (must control the cell fate of pluripotent stem cells) are currently working on methods to effectively differentiate stem cells into functional specialized cells. Natural and synthetic small molecules have been shown to be useful chemical tools for controlling and manipulating the fates of cells. For example,

Glycogen synthase kinase 3β (GSK-3β) inhibitor could induce differentiation of neural progenitor cells (NPCs). Bone marrow stromal stem cells (BMSSCs) may have potential to differentiate in vitro and in vivo into hepatocytes following the treatment of inhibitor of histone deacetylase and some well-defined cytokines Stem Cell Differential Compound Library from TargetMol, a unique collection of 340 stem cell differentiation signaling targeted compounds, can be used for stem cell research and related drug screening (high throughput and high content screening). Compounds are present at 10mM in DMSO.

GPCR Collection_2017 **353 Compounds**

The collection is composed of the Selleck GPCR Collection and additional targeted agents from other commercial sources. The collection is a unique collection of small molecules targeting G-protein coupled receptors used in GPCR screening by pharmaceutical and biotechnology companies in various research and drug development projects. The GPCR compound library contains small molecules associated with many receptors including 5-HT Receptor, Dopamine Receptor, Opioid Receptor, Adrenergic Receptors, Cannabinoid Receptor, mGluR, and the ETA-receptor. The compounds are structurally diverse, medicinally active, and cell permeable. All compounds are NMR and HPLC validated. Compounds are present at 10mM in DMSO.

TargetMol Ion Channel Inhibitor Library_2019 **362 Compounds**

Given the central functional role that the ion channel superfamily plays in human physiology, its membrane localization, and the diverse tissue distribution of different members of the family, it represents an attractive potential target class for drug discovery. Ion channels play a fundamental role in the way cells communicate. This communication between cells allows for the orchestration of physical and mental activities in humans. A number of diseases occur when ion channels do not function properly. Some examples are diabetes, neuropathic pain, cardiovascular diseases, asthma, epilepsy, and neurodegenerative disease, etc. The Ion Channel Inhibitor Library by TargetMol, containing 362 compounds targeting ion channels, can be used for research in ion channel, high throughput screening and high content screening for ion channel drug discovery. Compounds are present at 10mM in DMSO.

Broad Collection_2021 **358 Compounds**

The collection is composed of the compounds described as the "Informer Set" in the publication "Harnessing Connectivity in a

Large-Scale Small-Molecule Sensitivity Dataset." by Seashore-Ludlow B, Rees MG, Cheah JH, Cokol M, Price EV, Coletti ME, Jones V, Bodycombe NE, Soule CK, Gould J, Alexander B, Li A, Montgomery P, Wawer MJ, Kuru N, Kotz JD, Hon CS, Munoz B, Liefeld T, Dančík V, Bittker JA, Palmer M, Bradner JE, Shamji AF, Clemons PA, Schreiber SL. Cancer Discov. 2015 Nov;5(11):1210-23. PMID: 26482930. The Informer Set contains all FDA-approved agents, clinical candidates, and small-molecule probes of the Informer Set that were commercially available. Overall, this Informer Set targets nearly 250 distinct proteins, encompassing a broad range of cell circuitry relevant to cancer cell line growth and survival. These compounds were tested in 16-point concentration response curves for sensitivity in 860 publicly available human cancer cell lines. All of the data from these studies were deposited in a publically accessible Cancer Therapeutic Response Portal (CTRP v2) database. Compounds are present at 10mM in DMSO.

TargetMol DNA Damage/Repair Compound Library_2019 — **475 Compounds**

A significant barrier to effective cancer therapy is the development of resistance to the drugs utilized, therefore, identifying new biological targets and designing new drugs becomes one of the most important strategies. Among the various potential targets, DNA damage and repair system in cancer cells is one of the most pivotal targets. The use of unspecific antibiotics to treat bacterial infections has caused a great deal of multiple resistant strains making less effective the current therapies with antibiotics. Developing inhibitors of DNA repair and related pathways in pathogens will have utility in the treatment of infections. The TargetMol's DNA Damage & Repair Compound Library, a unique collection of 475 DNA Damage & Repair related compounds, can be used for research in DNA damage and repair, and high throughput screening (HTS) and high content screening (HCS). Compounds are present at 10mM in DMSO.

TargetMol Fluorochemical Library_2019 — **586 Compounds**

Fluorine atoms have a unique combination of electronic and physical properties. As such, when incorporated into active pharmaceutical ingredients (APIs), fluorine atoms often influence their protein binding affinity and lipophilicity but not the shape of the resulting fluorochemicals. Fluorination can thus significantly impact the bioavailability or metabolic stability of drug substances. The pivotal role that the element fluorine plays in modulating the properties of bioactive molecules is reflected by

the growth of its presence in approved drugs, as evidenced by the fact that between 15% to 20% of all medicines and agrochemicals on the market contain at least one fluorine atom in their structure. As of 2009, the FDA had approved >140 fluorine-containing drugs, such as fluorouracil, Miglitol, Gemcitabine, Sofosbuvir, atorvastatin, fluoxetine, ciprofloxacin, etc. The judicious introduction of fluorine into a molecule can productively influence conformation, pKa, intrinsic potency, membrane permeability, metabolic pathways, and pharmacokinetic properties. Presently, the application of specialty fluorochemicals in the pharmaceutical industry has been increasingly widespread. TargetMol's fluorochemical library has become an effective tool for developing new anticancer drugs, anesthetics, antidepressants, antifungals, antiviral drugs, antibiotics, cholesterol lowering agents, and anti-inflammatory agents. In addition, in agricultural uses, the addition of fluorine to many agricultural herbicides, pesticides, and fungicides improves the potency and therefore reduces the required application rate of these substances. Compounds are present at 10mM in DMSO.

TargetMol Autophagy Compound Library_2019 — **623 Compounds**

Autophagy is the natural, regulated mechanism of the cell that disassembles unnecessary or dysfunctional components. Targeted damaged cytoplasmic constituents are isolated from the rest of the cell within a double-membraned vesicle known as an autophagosome. The autophagosome eventually fuses with lysosomes and the contents are degraded and recycled. Autophagy, cellular senescence, and apoptosis are three key responses of a cell facing a stress, correlating with each other. It has been reported that defects of autophagy are associated with genomic damage, metabolic stress, and tumorigenesis. The Autophagy Compound library by TargetMol contains 623 compounds with defined autophagy-inducing or -inhibitory activity, and is a useful tool for studying the roles of pro- and anti-autophagic molecules in cells as well as for use in in vitro applications. Compounds are present at 10mM in DMSO.

TargetMol Anti-Metabolism disease Compound Library_2019 — **816 Compounds**

Metabolism is the set of life-sustaining chemical reactions involved in maintaining the living state of the cells and the organism, including catabolism and anabolism, and is one way the body maintains homeostasis. The main focus in metabolism research area is the biological regulatory mechanism and its role in

obesity, diabetes, cardiovascular diseases, and cancer. The unique collection of 816 small chemicals targeting metabolism diseases will provide the support for metabolism research and related drug screening. Compounds are present at 10mM in DMSO.

TargetMol Neuronal Signaling Compound Library_2019	**840 Compounds**

Communication between and within neurons is critical for all functions of the nervous system, from development to aging, through health and disease. The last decade has seen huge advances in our knowledge of the molecular, cellular and systematic signaling pathways within the nervous system. There have been significant breakthroughs in studies on the signaling pathways that underlie neurogenesis, addiction and autism spectrum disorders, as well as the pathophysiology and treatment of mood disorders. G protein-coupled receptors (GPCRs), including 5-HT receptors, histamine receptors, opioid receptors, are the largest family of signaling proteins to neuronal signaling. Changes in the GPCRs functioning can cause diseases many Neurological Disorders; Notch signaling is essential for proliferation, survival, self-renew, and differentiation of neural stem cells (NSCs). Notch signaling in neurons, glia and NSCs may be involved in pathological changes that occur in disorders such as stroke, Alzheimer's disease and CNS tumors. Therefore, the potential of agents that target notch signaling could be used as therapeutic interventions for several different CNS disorders. The Neuronal Signaling Compound Library by TargetMol, containing 840 compounds targeting CNS signaling, can be used for high throughput screening and high content screening for new drugs in neurological disorders. Compounds are present at 10mM in DMSO.

Selleck Bioactives Collection_2014	**1,150 Compounds**

The Selleck Bioactives Collection is a subset of Selleck Chemical's full collection of compounds. Compounds were selected to cover targets and pathways that were non-overlapping with other in-house collections. The collection contains 1150 compounds where bioactivity and safety of some compounds was confirmed by preclinical research and clinical trials, some compounds have been approved by the FDA, and includes many of Selleck's inhibitors, APIs, natural products, and chemotherapeutic agents. The collection contains compounds that are structurally diverse, medicinally active, and cell permeable. Compounds are present at 10mM in DMSO.

Combinatorial Drug Discovery Program Libraries

Sigma-Aldrich LOPAC Collection_2016	**1,280 Compounds**
	A collection of pharmacologically-active Sigma compounds including the latest, drug-like molecules in the fields of cell signaling and neuroscience against a diverse number of targets such as G-proteins and cyclic nucleotides, gene regulation & expression, apoptosis, on channels, lipid signaling, multi-drug resistance, neurotransmission and phosphorylation. Compounds are present at 10mM in DMSO.
Prestwick Chemical Library_2017	**1,280 Compounds**
	The Prestwick Chemical Library® contains 100% approved drugs (FDA, EMEA and other agencies), presenting a high degree of drug-likeliness. The active compounds were selected for their high chemical and pharmacological diversity as well as for their known bioavailability and safety in humans. Compounds are present at 10mM in DMSO.
TargetMol Natural Compound Library_2019	**1,680 Compounds**
	Natural products are an unsurpassed source of chemical diversity and an ideal starting point for any screening program for pharmacologically active small molecules. Historically, natural products have been the most successful source of new drugs. From 1981 to date, 79 (80%) out of 99 small molecule anticancer drugs are natural product-based/inspired, with 53 (53%) being either natural products or derived therefrom. Natural products have been proven to be successful modulators of difficult targets such as a range of antibacterial targets and, especially, protein–protein interactions. Furthermore, many researchers consider natural products and their derivatives as a privileged tool for the study and manipulation of protein function. The TargetMol Natural Product Monomers (HTS) Library, a unique collection of 1680 natural products with known bioactivity, wide source, and high cost effectiveness, is a powerful tool for drug discovery, pharmacological study, and stem cell differentiation, etc. Compounds are present at 10mM in DMSO.
Microsource Spectrum Collection_2012	**2,000 Compounds**
	US Drug Collection The US Drug Collection is an important collection of 1040 drugs that have reached clinical trial stages in the USA. Each compound has been assigned USAN, USP or NF status and is included in the

USP Dictionary (U.S. Pharmacopeia, 2005), the authorized list of established names for drugs in the USA. Compounds are present at 10mM in DMSO.

NatProd Collection

The NatProd Collection is the ultimate in chemical diversity. This unique collection of 800 pure natural products and their derivatives, includes simple and complex oxygen heterocycles, alkaloids, sequiterpenes, diterpenes, pentacyclic triterpenes, sterols, and many other diverse representatives. Compounds are present at 10mM in DMSO.

Killer Collection

The Killer Collection comprises a collection of 160 synthetic and natural toxic substances. These reference compounds provide an unprecedented opportunity to tease and test your assay. Inhibitors of DNA/RNA synthesis, cellular respiration, cytotoxic agents, antiproliferatives, immune suppressants, endocrine disruptors, and other experimental and therapeutic agents. Compounds are present at 10mM in DMSO.

National Cancer Institute_2016	**2,815 Compounds Total**

Mechanistic Set

The mechanistic diversity set, which consists of 879 compounds, was derived from the 37,836 open compounds that have been tested in the NCI human tumor 60 cell line screen. In contrast to the original diversity set of 1,990 compounds, which was chosen on the basis of structural diversity, this mechanistic diversity set was chosen to represent a broad range of growth inhibition patterns in the 60 cell line screen, based on the GI50 activity of the compounds. Compounds that have been tested in the 60 cell line screen were clustered using the FASTCLUS procedure in the SAS statistical package. This algorithm is based on MacQueen's k-means algorithm, which minimizes the sum of squared distances from the cluster means. The procedure resulted in 1272 clusters. A single representative compound from each cluster, for which an adequate supply of material was available, was chosen. Some clusters are not represented in the set, as insufficient material was available. All compounds in this set are 1mM in 100% DMSO.

Diversity Set III

The diversity set was derived from the almost 140,000 compounds available on plates. Only compounds for which at least one gram of material is available were considered. This was done to allow a large number of copies to be made and to assure adequate amounts to supply refill requests. The 80,000 compounds meeting this criterion were then reduced to the final set using the program Chem-X (Oxford Molecular Group). Chem-X uses defined centers

(hydrogen bond acceptor, hydrogen bond donor, positive charge, aromatic, hydrophobic, acid, base) and defined distance intervals to create a particular finite set of pharmacophores. 3-point pharmacophores were used with the default settings, resulting in almost 1,000,000 possible pharmacophores. The selection protocol considers each molecule, all its pharmacophores and each of its conformational isomers. During the generation of the diversity set, the pharmacophores for any candidate compound are compared to the set of all pharmacophores found in structures already accepted into the set. If the current structure has more than 5 new pharmacophores, it is added to the set. An additional objective with the NCI Diversity Set III was to create a diverse set of compounds that were amenable to forming structure-based hypotheses. Thus, molecules that were relatively rigid, with 5 or fewer rotatable bonds, having a tendency to be planar, 1 or less chiral centers, and pharmacologically desirable features (i.e., did not contain: obvious leaving groups, weakly bonded heteroatoms, organometallics, polycyclic aromatic hydrocarbons, etc.) were given priority in the final selection. This resulted in a set of 3046 compounds. This set was sent to the Molecular Libraries Small Molecular Repository where they were checked for purity via LC/Mass Spec. Only compounds with a purity of 90% or better by this method were accepted. This resulted in a final set of 1597 compounds. All compounds in this set are 10mM in 100% DMSO.

Natural Products Set II

The Natural Products Set II (successor to the original Natural Products Set) consists of 120 compounds that were selected from the DTP Open Repository collection of 140,000 compounds. Factors in selection were origin, purity (>90% by ELSD, major peak has correct mass ion), structural diversity and availability of compound. This set was created in response to numerous drug discovery research groups that expressed a desired to study a variety of scaffold structures having multiple functional groups.

TargetMol Bioactive Compound Library_2019	**5,370 Compounds**

It contains more than 5370 small molecule compounds, with known biological activities causing biological reaction in cells, tissue even whole body, including Clinical compound library (L3400), Preclinical compound library (L3410), and Approved drug library (L1000). All compounds have clear targets and detailed information description, which is the key point to drug research and development like drug repurposing, small molecule inducing stem cell differentiation, and target identification in mechanism interrogation. Many scientists have identified small molecules that can regulate cell fate and function, and stem cell

differentiation by screening annotated bioactive compound library with confirmed activity and known targets. Recent advances in iPSC technology have made reprogramming of somatic cells towards pluripotency possible and simpler. Using both phenotypic screening and hypothesis-driven approaches, a growing number of compounds have been identified that can functionally replace reprogramming transcription factors, enhance efficiency of iPSC generation and accelerate the reprogramming process by single use or a combination of several molecules with success in cardiomyocyte differentiation and proliferation, neural progenitor cells, etc. Compounds are present at 10mM in DMSO.

Small Molecule Diversity Collections for High Throughput Discovery

Maybridge HitFinder Collection_2012 — **14,400 Compounds**

The HitFinder Collection maintains the structural diversity of the Maybridge Screening Collection by using an industry standard clustering algorithm based on Daylight Fingerprints and Tanimoto similarity to select a statistically representative sample of the full Collection of over 56,000 smal molecules. Users of the HitFinder™ Collection therefore gain cost-effective access to the richness of the Maybridge Screening Compounds with rapid access to "hit" analogues for validation and follow-up studies. Compounds are present at 10mM in DMSO.