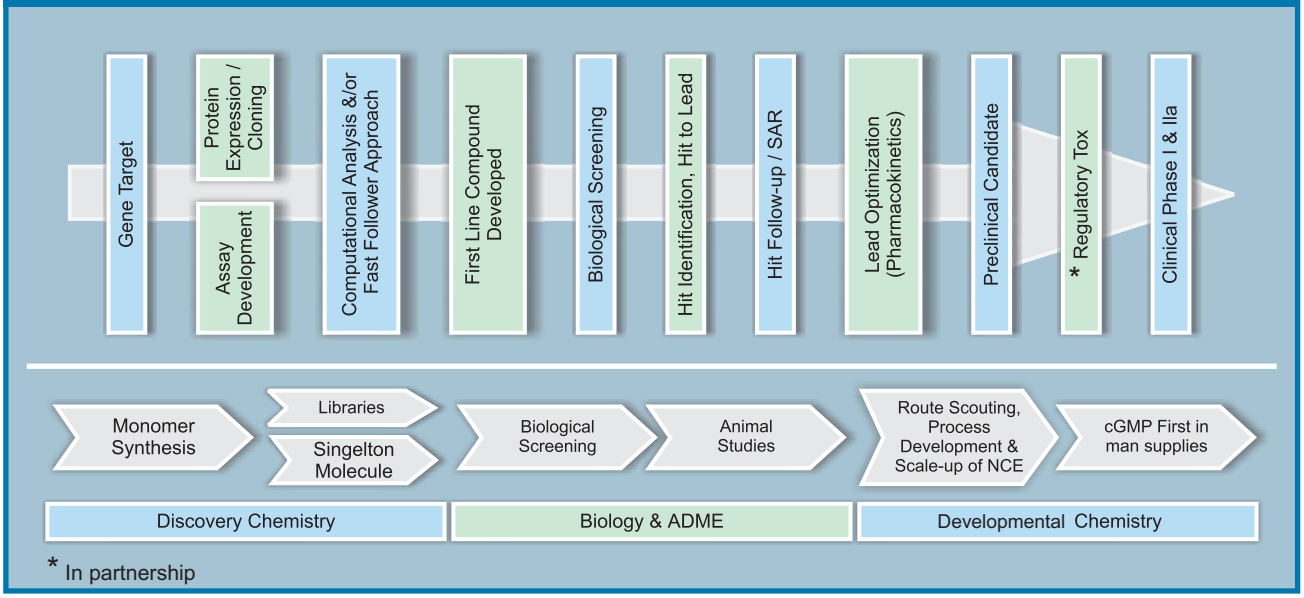
TCG Lifesciences Limited

TCG Lifesciences | CHEMBIOTEK

Integrated Discovery

At **TCG Lifesciences** (TCGLS) we collaborate and serve by providing high end integrated chemistry-biology services. The symbiotic relationship between our chemistry and biology scientists enables us to generate and progress leads for specific drug targets and create molecular assets and also find innovative solutions for our partners. Our scientists have developed a variety of 'new chemical entities' (NCE) and assisted to speed discovery to IND-filing.

Capabilities at a glance



Compound design

Our extensive infrastructure for designing and modeling of small compounds includes:

- Pharmacophore based modeling and virtual screening.
- Molecular docking and virtual screening.
- Global feature based pre-screening of compounds from databases.
- Automatic generation of 3D models of molecular variants
- Predictive ADME and PK related properties along with overall drug-likeness.
- Homology modeling of proteins and protein-DNA complexes
- Prediction of antigen epitopes.

Synthetic chemistry

Our high end analytical chemistry facilities support all synthetic chemistry activities. Our scientists have synthesized thousands of medicinally relevant heterocyclic compounds from mg to grams and our rich array of capabilities includes:

- Synthesis of compounds with varying scale and complexity (mg to kg)
- Multi step synthesis of compounds (upto 29 steps)
- Synthesis employing special needs like ozonolysis, photoreaction, carbonylation
- Microwave assisted synthesis
- Asymmetric synthesis including asymmetric hydrogenation
- Process Chemistry / Scale-up. Kilo lab with 10 to 200 L reactors
- Chiral resolution, preparative chiral separation

Parallel synthesis / Arrays and libraries

- Scaffolds / building blocks including complex structure involving multi-step synthesis with complete characterisation
- Lead generation, lead optimization and SAR libraries generated in 5 to 50 mg scale with >90% purity and LCMS/UV/ELSD data in customer preferred format
- Focused libraries and large size libraries (25 to 2000 members with up to 3 point diversity)
- From proof of concept to validation to final production and purification

Chemistries handled	Reaction parameter variability	Purification & charecterisation
▪ Spirocyclization ▪ Suzuki coupling ▪ Nuceophillic and SNAr type aminations, amidation and esterifcation ▪ Acylation, alkylation, urea, carbamate, pyrazole, pyridone, spiroisoxazoline, oxadiazole formation, reductive amination, ether formation for large libraries ▪ Peptide libraries and solid phase amindation	▪ Solution phase parallel synthesis at operating temperature range of -20^{0}C to 150^{0}C and in inert atmosphere (when needed) ▪ Parallel synthesis can be carried out in 24 wellplate to 86 wellplate formats on flat bed and orbital rotary type shakers ▪ Custom designed teflon filtration manifolds	▪ Lab scale purification capabilities. ▪ Evaporation techniques include vacuum centrifuge ▪ Freeze dryer apparatus and Shelf Freeze drying for high throughput. ▪ Identification of the pure fractions by FIA-MS analysis, purity of fractions established using UPLC, and further analysis of the pure compound by LCMS

Compound evaluation

Our biology scientists have developed expertise to take up projects starting from unique targets to assisting in ongoing projects. They use advanced technologies like FLIPR, fluorescence polarization, time resolved fluorescence, mass based analysis for in-vitro efficacy studies and have also established animal models for in-vivo studies.

In-vitro compound evaluation

Have set up and standardized more than 100 assays against therapeutically relevant classes of proteins including GPCRs, kinases, proteases, PDEs as well as a variety of cell based assays.

In vitro **ADME and rodent pharmacokinetics**

- **Absorption:** Caco2, PAMPA
- **Distribution:** LogD
- **Metabolism:** Human / rat liver microsome, CYP 450 enzymes
- **Physico-chemical properties:** Solubility, Stability, Plasma binding
- **Rodent pharmacokinetics:** Have India's largest panel of in-vitro ADME screens

In Vivo **Pharmacology**

- CPCSEA (Government of India) approved in-house holding and breeding facilities for rats and mice
- Develop animal model systems and generate data for early lead selection, process development and 'proof of concept' studies.

Models developed

Metabolic disorder models: Streptozotocin/ Alloxan induced diabetes & high fat induced obesity

Inflammatory disorder models: Air pouch, paw edema, endotoxemia, Collagen induced arthritis and adjuvant induced arthritis models

Pain models: Tail flick, hot plate, mechanical allodynia & formalin induced pain models.

Kilo scale synthesis facility

Our cGMP compliant kilo scale synthesis allows us to offer developmental chemistry services which enables us to speedily and seamlessly transfer technology from our current chemistry labs to the kilo lab for scale-up, process development and optimization. Capable of handling a variety of reactions, it supports all Investigative New Drugs ("IND") enabling activities and the manufacture of clinical trial materials under GMP conditions. Other capabilities include analytical method development, synthesis of impurities, metabolites and degradation products and stability studies, as per the international guidelines.

IT infrastructure

A strong in-house informatics department and a robust IT structure comprising of integrated web-enabled informatics platform (Affinity), Sapphire LIMS platform and ERP based financial accounting system. To ensure security we have firewall to control traffic, elite grade IDS (Intrusion Detection System), snifters, content inspection instrument, PGP/Verisign for secure email transaction and data encryptions and a host of other security measures. We use leased lines and VPN connectivity.

We practice

- Collaborative planning and transparent communication
- Direct engagement with client group scientists to improve delivery & reduce cycle times
- On-line indent tracking, on-line inventory management with access to client, on-line LNB submission
- Constant improvement of evaluation tool for better work-planning, skills matching and metrics analysis
- Continuous streamlining of dispatch and procurement procedures
- Value partner's assets including IP and ensure its protection
- Providing access to all major databases like Sci-Finder, Beilstein, Science Direct, ACS, etc. to our scientists
- Recruit & retain the best talent and maintain a high PhD / MSc ratio

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