

Molecular & Cell Biology

At TCG Lifesciences, we deliver integrated, high-quality CRO solutions in molecular and cell biology—supporting the development of robust biological tools, assay-ready cell lines, and custom research platforms to accelerate drug discovery. Our comprehensive range of molecular biology and cell-based research services includes gene cloning, vector modification and scalable plasmid preparations. Our team has expertise in developing and validating stable and transiently overexpressing cell lines for functional studies of GPCRs, ion channels, receptor tyrosine kinases, and more. We have expertise in handling a wide variety of cell lines and related applications, supported by rigorous quality control measures to ensure scientific precision and reproducibility. Our anti-infective facility maintains over 75 microbial strains within BSL-2 laboratories, enabling comprehensive screening of bacteria, parasites and fungi. It offers advanced assays for drug efficacy, resistance, and mechanisms to support precise anti-infective research decisions.

Molecular Biology Services

- Gene cloning, vector modification and scalable plasmid preparations.
- Gene expression studies in bacterial and mammalian (cell and tissue) systems.
- Gene expression analysis platforms including qPCR for biomarkers and CYP mRNA induction and various other targets.
- PCR-based genotyping from rodent samples.

Cell Line Development

- End-to-end capabilities including transfection, clonal selection, and rigorous validation by immunocytochemistry and functional assays.
- Access to a diverse panel of over 80 cancer cell lines and numerous primary cell types such as PBMCs, neutrophils, monocytes, splenocytes, cortical neurons, DRG neurons, microglia, etc.

Tool Cell Lines, Reporter Systems & Selection Markers

- Tool cell lines include CHO-K1, HEK293, cancer cell lines, and non-human cell lines for protein expression, regulation, and functional studies.
- Reporter genes / systems (expertise): GFP, luciferase, TET-regulated system, Flp-In system, HiBiT system, and more.
- Selection markers: G418, Puromycin, Hygromycin, Blasticidin—facilitating versatile applications.

Expertise in Cell line development for Assay services

- Experienced in using various cationic lipid-based (e.g., Lipofectamine 3000, RNAiMAX) and non-liposomal synthetic transfection reagents (e.g., FuGENE HD) to generate overexpressing cell lines and target protein knockdown for functional assays.
- Capability to generate both stable and transient overexpressed cell lines featuring critical targets like GPCRs, ion channels, and receptor tyrosine kinases, etc.

Quality & Compliance

- Rigorous cell quality assessments via western blot, immunofluorescence (IF), and qPCR verification.
- Essential sterility testing, mycoplasma testing, freeze–thaw stability testing.

Anti-Infective Facility

- Cell bank supports extensive screening and profiling of pathogens like *P. falciparum* (with drug-resistant strains), *T. brucei*, bacteria (with MDR panels), and candida through large-scale in-house cultures and over 75 microbial strains maintained in BSL-2 facilities.
- Advanced testing for drug efficacy, resistance, and mechanisms, including assays such as PRR, MIR, antibacterial susceptibility, biofilm disruption, and antifungal activity, facilitating precise anti-infective research decisions.

By combining technical expertise with a flexible, client-focused approach, TCG Lifesciences empowers researchers with validated molecular and cellular platforms designed to deliver actionable, decision-enabling data.