

Library Synthesis

Our Core Capabilities & Infrastructure

❖ Specialization in Library Reactions:

- Complex Cyclizations: Expertise in spiro-cyclization using β -diketones to generate structurally diverse spirocyclic scaffolds
- PROTAC Libraries: Advanced capability in designing and synthesizing CRBN- and VHL-based PROTAC libraries with diversified linker systems
- Cross-Coupling & Metal-Catalyzed Reactions: Extensive experience in Suzuki, Buchwald, Sonogashira, Stille, Negishi, Heck, SNAr, and C–N coupling chemistries
- Heterocyclic Chemistry: Synthesis of diverse 5- and 6-membered heterocyclic analogues including triazoles, oxadiazoles, imidazoles, pyrazoles, and spiroisoxazolines
- Carbohydrate Chemistry: Advanced synthesis and functional modification of carbohydrate-based compounds
- Solid-Phase Synthesis: Focused library generation using solid-phase methodologies including SPPS
- Standard Medicinal Chemistry Transformations: Amidations, reductive aminations, alkylations, click chemistry, and C–C/C–N/C–O bond-forming reactions
- Scaffold Diversification & AI-Assisted Design: Expertise in identifying diversification points and synthetic route design for AI-generated core structures

❖ Focused & Target-Based Library Synthesis

- Over 20 years of successful library synthesis experience across diverse therapeutic programs
- Execution of libraries ranging from small focused sets (50–200 compounds) to large screening collections (>10,000 compounds)

- Expertise across hit generation, hit follow-up, and lead optimization libraries with varying diversity-point strategies
- Ability to develop tailored synthetic methodologies for unprecedented and complex chemistries
- Validation-driven workflows with optimized reaction conditions, work-up protocols, and purification strategies
- Strong experience in scaffold hopping and target-focused library design for accelerated SAR exploration

❖ High-Throughput Workflows & Compound Management

- Semi-automated parallel synthesis systems capable of executing up to 400 reactions simultaneously under variable conditions
- High-throughput experimentation workstations for rapid reaction condition screening and optimization
- Automated mass-, UV-, PDA-, and ELSD-triggered preparative purification systems for fast compound isolation
- Dedicated compound management team supporting assay-ready plate preparation, barcode-enabled tracking, and SD file generation
- Integrated workflows for compound drying, lyophilization, purification transfer, and shipment coordination
- Flexible production workflows supporting customized sub-libraries and parallel processing approaches

❖ Instrumentation & Analytical Infrastructure

• Synthesis & Reaction Platforms

- Pierce Reacti-Therm heating systems and customized heating blocks for controlled parallel reactions
- Radley's Carousel 6 & 12 reaction stations and GreenHouse Plus parallel synthesizers
- Microwave parallel reactors with autosampler capability for up to 24 simultaneous reactions
- Orbital and environmental shakers for controlled reaction environments
- MO stirrer systems with 24-microwell plate compatibility
- IKA ElectraSyn 2.0 and Penn PhD photoreactor M2 platforms
- Customized vacuum plate filtration systems for high-throughput processing

• Purification & Analytical Systems

- Waters, Agilent, Gilson, and Biotage automated purification systems with PDA, Mass, and ELSD triggering
- Reverse-phase and normal-phase preparative HPLC purification workflows
- Waters/Agilent UPLC systems with PDA, ELSD, and QDa mass detection capabilities
- Dedicated analytical scouting systems for rapid method development and optimization
- Integrated barcode-enabled fraction collection systems minimizing manual handling errors

- Reverse-phase chiral separation capabilities with specialized chiral columns for complex and highly polar molecules

- **Evaporation, Drying & Compound Processing**

- High-throughput solvent evaporation systems including Genevac HT-8, HT-12, Series 3i, ThermoSavant, and Buchi Syncore platforms
- Dedicated lyophilizers supporting sensitive molecules including PROTACs
- Controlled compound drying and post-purification processing workflows for improved stability and delivery quality

- **Advanced Analytical Support**

- Extensive analytical method libraries and rapid LC-MS/UPLC method optimization capabilities
- Specialized purification strategies for unstable, highly polar, or poorly soluble compounds
- High-temperature purification workflows to address precipitation and solubility challenges
- Dedicated analytical support for PROTAC purification, chiral separations, and gram-scale purification workflows
- Wide range of reverse-phase, polar, phenyl, PFP, CSH, amide, and core-shell columns supporting diverse compound classes