

PHT NANTONG CONTRACT RESEARCH ORGANIZATION

- **Synthetic Chemistry**
 - CRO-based project function – mg to kg
 - Multistep API synthesis (up to 30 steps in past campaigns)
 - Reference compound and forced deg syntheses
 - Natural product synthesis
 - Core scaffold and building block construction
 - Isotopic labelled compound synthesis
 - Med Chem library development
- **Capabilities**
 - Cryogenic-based development
 - Flow chemistry through commercial continuous manufacturing – flow Nitration
 - Surfactant-based micelle chemistry in H₂O
 - Oxidation and Reduction (flow and batch)
 - Organometallic-based (Li, Mg, Zn and Pd ...)
 - High pressure hydrogenation lab
 - Enantioselective chemical development with chiral manipulations on range of chemical classes
 - Heterocyclic core construction (unsat/aromatic and saturated systems)
 - Isotope installation
- **Process Research & Development**
 - Proven track record and long-term experience in process research and development for innovative new drugs
 - Synthetic route scouting and selection
 - Scale-up from g to kg demo batches
 - Process development and optimization for preparation of APIs, KSMs, RSMs and critical intermediates
 - Process development and optimization for crystallization of APIs, including control of target crystal form and particle size distribution (PSD)
 - Comprehensive reports for technology transfer to pilot plant or commercial manufacturer
- **Chemistry Lab Equipment**
 - Corning flow reactor (G1)
 - CEM microwave reactor
 - Biotage flash purification system
 - Radleys parallel chemistry reactor
 - Büchi jacketed glass reactors
 - Shimadzu preparative HPLC
 - Christ freeze dryer, etc.
 - Kilo lab equipped with reactors up to 100L
 - High-pressure reactors up to 10L
- **Analytics**
 - Qualification
 - Qualification for reference standards
 - Certificate of Analysis (CoA) for samples
 - Analytical method development
 - Analytical methods for API and intermediates, including HPLC, chiralHPLC, q-NMR, GC and GC headspace method, for release purpose
 - Analytical method development for in-process control (IPC) purpose
 - Isolation and characterization of single impurities
 - Impurity profiling
 - HPLC/GC impurity profiling
 - Structure suggestion for impurities based on LCMS or GCMS
 - Structure elucidation/verification with following techniques
 - NMR spectroscopy
 - LC/MS
 - IR spectroscopy
 - High quality analytical reports
- **Analytics Equipment**
 - Bruker 400 MHz NMR with 3Q certification
 - Waters HPLC(2695)-MS(SQD)
 - Waters UPLC(H-Class)-MS(SQD2) with 3Q certification
 - Waters HPLC with 3Q certification, equipped with ELSD
 - Agilent HPLC(1260)-MS(6120B)
 - Agilent GC headspace with 3Q certification
 - Thermo Fisher Corona Veo Charged Aerosol Detector (CAD)
 - Bruker FTIR spectrometer with 3Q certification
 - Karl Fischer titrator(volumetric, coulometric) with 3Q certification
 - Büchi melting point apparatus