



## SAFETY ASSESSMENT

# General Toxicology

### Routes of Administration

- Drinking water
- Inhalation/intranasal/tracheal
- Intra-articular
- Intraduodenal
- Intraocular/intravitreal
- Intraperitoneal
- Intrathecal/intracerebral/epidural

Charles River has performed general toxicology studies for the safety evaluation of pharmaceutical, biotechnology, chemical and agrochemical products for over 30 years. In that time, we have helped clients submit thousands of completed studies to regulatory authorities worldwide.

Drawing from a deep base of knowledge, our team of scientists, technical experts and regulatory advisers plan and conduct both standard and complex study designs, provide guidance within a given program, offer feedback on recommended investigations and help manage unanticipated findings.

We support the unique needs of every client by first creating a specialized core team of discovery, bioanalytical, toxicology and regulatory advisers drawn from our global network of experts. We then optimize the team to suit each stage of development as a compound moves through the preclinical program. By assessing the preclinical development program at its start, we can assure clients of the relevance and applicability of the program to its future use.

### Acute and Dose Range Finding Studies

Acute single dose toxicity testing is used to help define and characterize the intrinsic toxicities of potential drug substances, and provide data for establishing acute exposure to that substance. Information generated in acute studies along with dose range finding assessments is used to guide the design and selection of dose levels for subsequent subchronic and chronic toxicity studies. Our staff can advise the selection of appropriate *in vivo* models and routes of administration for optimum study results.

The selection of appropriate dose levels for toxicity studies is of great importance in assessing human risk. Our toxicologists can advise clients and design dose range finding studies that include dose escalation/maximum tolerated dose studies to provide sufficient information to proceed to longer term studies.

EVERY STEP OF THE WAY



### Support Services

- Bioanalysis (including drug quantitation using immunochemical assays)
- Biomarkers
- Clinical and anatomical pathology
- Formulation development, pharmacy and analytical chemistry
- Immunology
- Drug metabolism/ pharmacokinetics/ toxicokinetics
- Regulatory support

We offer a full spectrum of *in vitro* and *in vivo* regulatory-compliant studies in a host of accepted laboratory species to evaluate general systemic toxicity, dermal and ocular irritation skin sensitization, contact hypersensitivity and local tolerance.

### Subchronic and Chronic Studies

We offer a wide spectrum of subchronic and chronic toxicity studies using rodent and nonrodent models.

These studies are designed to detect physiological and pathological effects of a test article using a battery of assessments and specialty endpoints, as required. The most common routes of administration are oral (by gavage, capsule or incorporation into formulated laboratory diets), dermal, subcutaneous, intravenous and intramuscular bolus injections, though we offer many additional specialized routes and designs.

### Carcinogenicity

Carcinogenicity data is typically required for human pharmaceuticals intended for long-term therapeutic use, and for compounds that produce results suggestive of carcinogenic potential during genotoxicity testing. Carcinogenicity studies expose animals to the test article for a major portion of their life span and assess the development of potential neoplastic lesions in multiple organs and organ systems. Charles River has built a worldwide reputation for excellence in the conduct of the standard design, transgenic and diet-optimized rodent carcinogenicity programs.