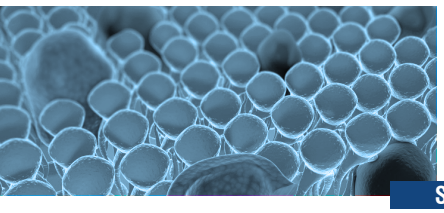
charles river



SAFETY ASSESSMENT

Agrochemical, Chemical and Veterinary Medicine Facilities and Capabilities

Global capacity and multidisciplinary capabilities enable us to design a safety assessment program around what our clients value most.

Study Design	Facilities						
	Lyon, France	Den Bosch, Netherlands	Edinburgh, UK	Spencerville, Ohio, USA	Ashland, Ohio, USA	Horsham, Pennsylvania, USA	Skokie, Illinois, USA
Regulatory Support							
Veterinary, agrochemicals, biocides and industrial chemicals (global)		•					
Project coordination		•					
Data gap analysis and testing strategy		•					
Dossier preparation, including study summaries (IUCLID, OECD)		•					
Human and environmental exposure and risk assessment		•					
(Q)SAR analysis (e.g., DEREK), read across and/or grouping strategies		•					
Communication with Competent Authorities/Agencies		•					
Classification and labeling (CLP/GHS) and preparation of CLH reports		•					
Dossier submission (CADDY, R4BP, REACH-IT, CDX)		•					
Field Trials*							
Crop residue		•	•				
Efficacy			•				
Home and garden/amenity			•				
Variety and seed treatment			•				
Glasshouse and forestry			•				
Soil dissipation			•				
Soil accumulation			•				
Rotational crops			•				
Human exposure studies			•				

* Trials at our field bases in the UK, Spain, Italy, Germany and France are coordinated through our Edinburgh facility. Subcontracted trials extend our reach throughout Europe.

EVERY STEP OF THE WAY

Study Design	Facilities						
	Lyon, France	Den Bosch, Netherlands	Edinburgh, UK	Spencerville, Ohio, USA	Ashland, Ohio, USA	Horsham, Pennsylvania, USA	Skokie, Illinois, USA
Residue Metabolism							
Plant metabolism			•				
Rotational crop metabolism			•				
Livestock metabolism			•		•		
Livestock feeding			•		•		
Fish metabolism			•				
Simulated processing			•				
Environmental Fate							
Aerobic and anaerobic degradation in soil systems		•	•				
Aerobic and anaerobic degradation in aquatic sediment systems		•	•				
Mineralization in surface water		•	•				
Soil adsorption-desorption/mobility		•	•				
Soil leaching		•	•				
Hydrolytic stability		•	•				
Photolytic stability (soil and aqueous)		•	•				
Sludge adsorption/desorption		•	•				
Ecotoxicology							
Acute prolonged toxicity to cold- and warmwater fish		•					
Acute and prolonged toxicity to *Daphnia magna*		•					
Algal growth inhibition		•					
Fish early life stage		•					
Zebrafish embryo toxicity test		•				•	
Bioaccumulation		•					
Lemna spp. growth inhibition		•					
Acute toxicity to *Chironomus riparius/Lumbriculus*		•					
Acute and reproduction toxicity to earthworms		•					
Seedling emergence and vegetative vigor		•					
Collembola		•					
Modified Sturm test		•					
Inherent biodegradation (Zahn-Wellens)		•					
Simulation test		•					

Study Design	Facilities						
	Lyon, France	Den Bosch, Netherlands	Edinburgh, UK	Spencerville, Ohio, USA	Ashland, Ohio, USA	Horsham, Pennsylvania, USA	Skokie, Illinois, USA
Laboratory Sciences							
Five-batch		•					•
Physicochemical		•	•				
Stability		•	•		•		
Product characterization		•			•		
Analytical chemistry		•	•		•	•	
Residue analysis		•	•				
Endocrine Disruptor Screening							
In vitro studies							
Estrogen receptor (ER) binding – rat uterine cytosol (OPPTS 890.1250)		•			•		
Estrogen receptor – transcriptional activation (OECD 455, OPPTS 890.1300)		•					
Androgen receptor – transcriptional activation (OECD 458)		•					
Androgen receptor (AR) binding – rat prostate cytosol (OPPTS 890.1150)		•			•		
Steroidogenesis – human H295R cell line (OECD 456, OPPTS 890.1550)		•					
Aromatase (human recombinant) assay (OPPTS 890.1200)		•			•		
Screening studies		•					
In vivo studies							
Uterotrophic assay (rat)					•	•	
Hershberger (rat)					•	•	
Pubertal female (rat)					•	•	
Pubertal male (rat)					•	•	
Amphibian metamorphosis (frog)		•					
Fish short-term reproduction		•					
General Toxicology							
Neurotoxicity (OECD 870.6200/6300 & OECD 424)	•	•	•		•	•	
Inhalation – acute		•	•	•	•		
Inhalation – chronic			•		•		
Oral (diet/gavage/water) – acute & chronic	•	•	•	•	•	•	
In vivo skin irritation		•		•	•		
In vivo eye irritation		•	•	•	•		
In vivo skin sensitization		•	•	•	•		
In vivo skin absorption (OECD 427)		•	•		•		
Dermal toxicology	•	•	•	•	•	•	
Immunotoxicology	•	•	•		•	•	

Study Design	Facilities						
	Lyon, France	Den Bosch, Netherlands	Edinburgh, UK	Spencerville, Ohio, USA	Ashland, Ohio, USA	Horsham, Pennsylvania, USA	Skokie, Illinois, USA
Developmental and Reproductive Toxicology							
OECD 421 Reproduction/Developmental Toxicity Screen	•	•	•		•	•	
OECD 422 Repeat Dose + Reproduction/Developmental Toxicity Screen	•	•	•		•	•	
OECD 414 Rat and Rabbit (EPA guidance)	•	•	•		•	•	
OECD 415 One Generation	•	•	•		•	•	
OECD 416 Two Generation	•	•	•		•	•	
OECD 443 Extended One Generation	•	•	•		•	•	
OECD 426 Developmental Neurotoxicity	•	•			•	•	
OPPTS 870-7800 Developmental Immunotoxicology & Immunotoxicity			•		•	•	
Veterinary Pharmaceuticals							
Efficacy		•	•		•		
Palatability		•	•				
Target animal studies	•	•	•	•	•		
Tolerance		•	•				
Drug metabolism		•	•		•		
Dose determination/confirmation		•	•		•		
Reproduction			•				
Bioequivalence		•	•				
Residue depletion			•				
Clinical trials, single- and multisite			•				
Genetic Toxicology – Bacterial Gene Mutation Assays							
OECD TG 471 (Ames assay)		•					•
Ames Blackburn modified (ASTM E1687)		•					
Volatiles test items – modified Ames		•					•
Treat and wash – modified Ames		•					•
Genetic Toxicology – Mammalian *In Vitro* Genotoxicity Assays							
OECD TG 476 (HPRT assay)		•					•
OECD TG 490 (mouse lymphoma assay)		•					•
OECD TG 473 (chromosome aberration assay)		•					•
OECD TG 487 (micronucleus assay)		•					•
In vitro comet assay		•					
Genetic Toxicology – *In Vivo* Genotoxicity Assays							
OECD TG 474 (micronucleus assay)		•			•		•
OECD TG 475 (chromosome aberration assay)		•					•
OECD 489 (comet assay)		•					•
Combined MN and comet (TG 474/489); added to repeated dose toxicology studies		•					•
Pig-A assay							

Study Design	Facilities						
	Lyon, France	Den Bosch, Netherlands	Edinburgh, UK	Spencerville, Ohio, USA	Ashland, Ohio, USA	Horsham, Pennsylvania, USA	Skokie, Illinois, USA
***In Vitro* Toxicology**							
Oral							
Oral using 3T3-NRU (OECD 129)		•					•
Screening oral with 3D EpiOral™			•				
Skin							
Irritation assay using EpiSkin® (OECD 439)		•	•				
Irritation assay using EpiDerm™ (OECD 439)		•					
Corrosivity assay using EpiSkin® (OECD 431)			•				
Corrosivity assay using EpiDerm™ (OECD 431)		•					
Corrositex (OECD 435)		•					
Sensitization DPRA (OECD 442C)		•	•				
Sensitization KeratinoSens™/LuSens (OECD 442D)		•	•				
Sensitization h-CLAT (OECD 442E)		•	•				
Sensitization U-SENS, a.k.a. MUSSAT (draft OECD TG)		•					
Phototoxicity using 3T3-NRU (OECD 432)		•				•	
Dermal absorption *in vitro* (OECD 428)		•	•				
Eye							
Severe damage using BCOP (OECD 437)		•	•				
Irritation assay using HCE (applied for OECD 492)			•				
Irritation assay using EpiOcular™ (OECD 492)		•	•				
Irritation using HET-CAM		•					
Lung							
Pulmonary toxicity using 3D models in VC 10® inhalation robot			•				
Screening pulmonary toxicity using MucilAir™ or EpiAirway™			•				
***In Vitro* and *In Vivo* ADME and QWBA**							
In vitro metabolism (MICS, S9, hepatocytes)		•	•		•		
In vivo ADME (OECD 417)		•	•		•		
In vivo PK (OECD 417)		•	•		•		
In vivo bile duct cannulation (OECD 417)		•	•		•		
Bespoke Testing							
Usually cellular or 3D models to answer scientific questions		•	•				