



Balancing best practices, regulatory compliance and sustainability in a toxicology lab environment

April 4 NVT **Green Toxicology**

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Charles River Laboratories Den Bosch



CHARLES RIVER Contract Research Organisation (CRO)



Founded in 1947 by Dr. Henry Foster



A leading, full-service drug discovery and early-stage development company



Our scientists worked on ~85% of the drugs approved by the FDA



Den Bosch-Schajjk-Leiden-Groningen



Total Employees : 800
Substances: 1500 per year

We currently operate

110+  **20+**
Facilities Countries

We supported the development of

86% 
of the novel FDA-approved drugs



ecovadis



- General Toxicology
- In vitro Toxicology
- Genetic Toxicology (in vitro & in vivo)
- Neurotoxicology
- Juvenile Toxicology
- Developmental and Reproductive Toxicology (DART)
- Immunotoxicology
- Infusion Toxicology
- Inhalation Toxicology
- Environmental Toxicology
- Absorption / Distribution / Metabolism / Excretion (in vitro & in vivo)
- Safety Pharmacology (including hERG assay)
- Formulation Analysis
- Bioanalytical Chemistry
- Toxicokinetics / Pharmacokinetics
- Histology
- Pathology
- Clinical Pathology
- Surgical Models
- Commercial Archiving
- Preclinical (toxicology) formulation development
- Formulation Development and Production(GMP)
- Regulatory consultancy for agrochemicals, biocides, industrial chemicals and pharmaceuticals (Environmental Risk Assessment)

Practical examples in challenges finding a green balance

Anaesthetics

Fixation of tissue

Climate Control

Packaging materials



Best practices, regulatory compliance and sustainability

Safety

Human & animal welfare + environment

Safety first!

Using **STOP** method **S**ubstitute **T**echnical Measures **O**rganisation **P**PE

Quality

Product and data

High standard necessary and regulated. Impacting global safety

Efficiency

Business performance & availability

Changes in operations, process and organisation creates innovation and possibilities for improvement. Positive and negative factors can influence choices

Sustainability

Footprint CO2

Continues journey in organisation, investing in new innovations

Anesthetics

Anesthetic gasses: change from Isoflurane to CO2

Challenges

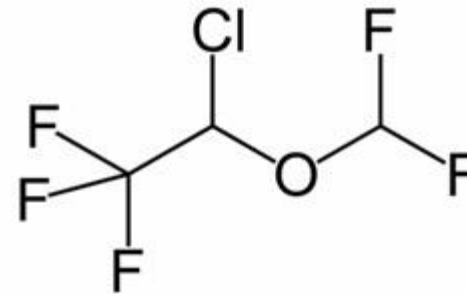
- Animal welfare
- Quality
- Facility (technical) gas tube station

Benefits

- Safety: easy to detect
- Sustainability: less emission and replacement of F and CL

Project team:

- ✓ Veterinarian
- ✓ Pathologist
- ✓ Toxicologist
- ✓ EHS&S manager
- ✓ Biotechnician



Absorber isoflurane



Absorber CO2



Fixation of tissue

Formalin: recycle or replace??

Challenges

- Safety – Recycling is more handling. Can we work safe?
- Quality – Globally no replacing chemical known with similar characteristics
 - Stability expectations

Benefits

- Safety: CMR decrease
- Sustainability: less emission and less energy on waste destruction
- Efficiency: Less expense

Project team:

- ✓ Global EHS + Quality
- ✓ Histologist
- ✓ Pathologist
- ✓ EHS&S manager
- ✓ Archive specialist



Formalin recycler (4-5 times)

Climate control

Decrease of “over” ventilation were possible

Challenges

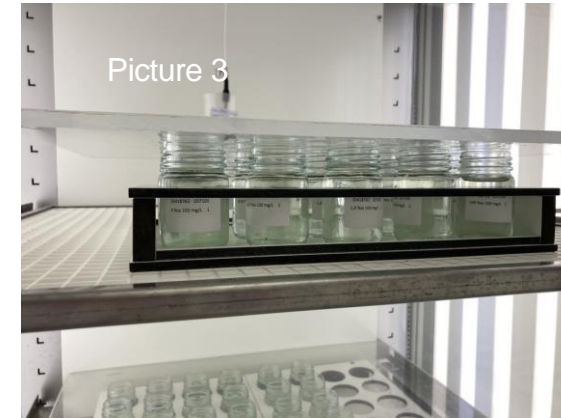
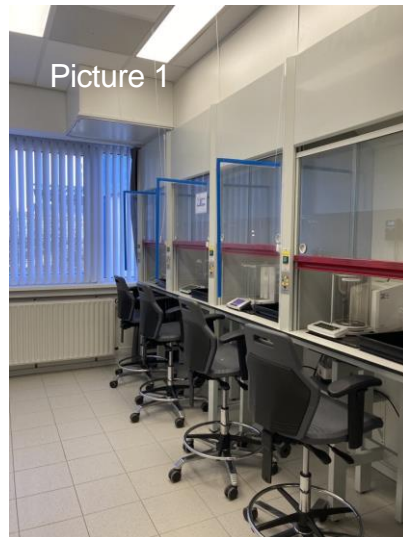
- Quality: Requirements set in guidelines animal housing
- Safety: Meet the requirements evaluated in RIE exposure hazardous chemicals and allergens
- Efficiency: Investments high air handling
- Sustainability: Technical, isolation minimum impact due to high ventilation frequency: 8-10-15 times per hour

Benefits

- Sustainability: Less energy use due to decrease heating and cooling

Project team:

- ✓ Global EHS + Quality
- ✓ Facility management
- ✓ EHS&S manager



Packaging materials

Reuse of packaging as waste funnels or send back to supplier

Challenges

- Quality & Safety: Requirements set in regulations (waste) funnels need certification.
- Efficiency & sustainability: Is transport leading factor in footprint?

Benefits

- Sustainability: less waste and transport

Project team:

- ✓ Facility management
- ✓ EHS&S manager
- ✓ Supply chain/suppliers



Green Toxicology

Keys in journey for green Toxicology

- Find the balance



- Dare to change
- Set up a project team for each change
- Share knowledge
- Drive suppliers and contractors for greener solutions
- Focus on use of chemicals, materials & energy
- Request authorities to change with you

