KATHOLIEKE UNIVERSITEIT
LEUVEN

Luc De Meester,
Head of
department

Department of Biology

The research activities of the Biology Department are diverse, and include molecular and physiological studies at cellular and organismal level as well as ecological research focusing on populations, communities and ecosystems. Although many research units carry out in-depth analyses on specific model organisms, the diversity of life forms studied by the department as a whole is impressive. Our studies are embedded in a dense network of international contacts with universities, research institutes and companies. The department attracts many students and hosts approximately 250 staff members. It has a yearly operational research budget of approximately 1500 kEUR for both fundamental and applied research.

Research profile

The prime drive of the research activities of the Biology Department is to obtain insight in the patterns and processes observed at the various levels of biological organization. Our research includes fundamental and applied studies in:

- Evolution, stress biology and ecology of aquatic and terrestrial ecosystems
- Ethology and neuroendocrinology of insects
- Molecular microbiology
- Animal physiology and neurobiology
- Plant physiology
- Evolution and systematics of flowering plants.

Keywords

aquatic ecology - aquaculture - biochemistry - biodiversity - biogeography - biotechnology - comparative physiology - developmental biology - endocrinology - entomology - evolutionary biology - evolutionary ecology - evolutionary development - fermentation technology - genetics - genomics - immunology - microbiology - molecular cell biology - molecular plant physiology - morphology and anatomy - neurobiology - paleontology - phylogeny - physiology - population biology - proteomics - restoration ecology - systematics - terrestrial ecology

Sections and major research projects

ANIMAL ECOLOGY AND SYSTEMATICS

- Ecology and evolution of aquatic systems with emphasis on: community ecology and ecological biogeography, biodiversity and nature conservation, stress ecology, evolutionary ecology and behavioural ecology, molecular ecology and ecological genetics, aquaculture and environmental microbiology.
- Cooperation and conflict in social insects.
- Vertebrate archaeozoology from late Quaternary deposits onwards.

ANIMAL PHYSIOLOGY AND NEUROBIOLOGY

- Functional genomics, proteomics and peptidomics in various model organisms (Caenorhabditis elegans, Drosophila melanogaster, locust, honeybee, mouse, zebrafish).
- Identification and functional analysis of (orphan) G protein coupled receptor - ligand couples.
- Study of the neuroendocrine mechanisms underlying the control of locust reproduction and phase transition.
- The role of hormones in vertebrate development.
- Molecular mechanisms of developmental and lesion induced plasticity of the mammalian brain.

I Contact

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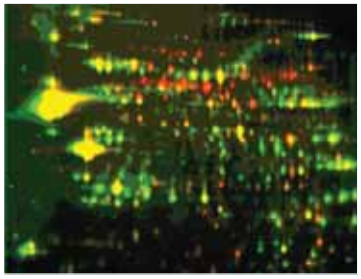

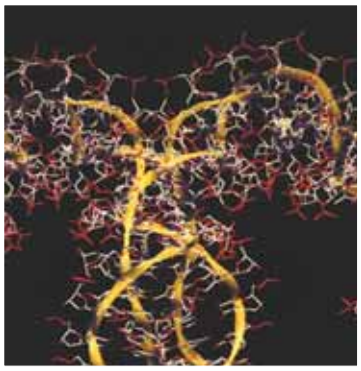

PLANT SYSTEMATICS AND ECOLOGY

- Phylogeny of flowering plants (mainly Ericales and Gentianales) based on DNA sequences and characters of floral ontogeny, palynology, seed and wood anatomy.
- Molecular systematics and evolutionary developmental studies in Ericales.
- Ecology of seed germination (woodland plants and weeds).
- Effects of fragmentation on biodiversity in nature reserves.

MOLECULAR PHYSIOLOGY OF PLANTS AND MICRO-ORGANISMS

- Molecular and biochemical analysis of nutritional, metabolic or hormonal controlled signals transduction processes in plants and micro-organisms.
- Elucidation of the metabolism and physiological role of steviosides, fructans and other reserve carbohydrates.
- Development and validation of transgenic plant and yeast models as tools for medicinal and medical research and biopharming.
- Identification of novel drug targets and lead-compounds with therapeutic potential, novel antimycotics, novel enzymes and products for food and non-food applications.

MOLECULAR MICROBIOLOGY AND BIOTECHNOLOGY

- Molecular genetics of nutrient sensing and signaling in yeast.
- Nutrient sensing and antifungal targets in the pathogenic yeast Candida albicans.
- Development of novel industrial yeast strains (baking, brewing, wine and bioethanol production).
- Yeast and plant trehalose metabolism for improvement of stress resistance in crop plants.
- Yeast as a tool for selecting and studying mammalian proteins with medical interest.

I Unique infrastructure

- Fluorescence, TEM, SEM, and laser micro dissection microscopy
- FPLC and HPLC chromatography
- Proteomics: MALDI-TOF and ESI-Q-TOF mass spectrometry, peptide sequencers
- Flow cytometry
- Genomics: micro-array scanner, automatic sequencers, real time PCR
- Bioanalyzers and screening devices for molecular interactions
- Phosphorimager
- Micromanipulators
- Liquid scintillation counters
- Computerized greenhouse facilities and field laboratories
- Field laboratory and outdoor experimental area for experimental ecology
- Molecular laboratory for population genetic analyses
- Class 2 laboratories for the study of pathogens

I Collaboration and users

The department is involved in a significant number of network training programmes, national and international research consortia (including EU and ESF) and maintains good collaborations with several food, pharmaceutical and biotech companies. The department houses one of the facilities of the Flanders Interuniversity Institute for Biotechnology (VIB).

I Spin-offs

reMYND: www.remynd.com

I Figures

21 professors
50 post-docs
126 researchers