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VetAgro Sup



UMR1233

Wild Rodents, Health Risks and Population Management (RS2GP)

Management

Virginie Lattard, Director

Research topics

- Biology, medicine and health
- Agronomic and ecological sciences

Key figures

- 14 researchers and equivalent
- 9 engineers and technicians
- 1 single research team

Keywords

- Rodents
- Human and animal health
- Environment
- Population management

Mission and objectives

Human-rodent cohabitation has always been difficult. Crop predation, grassland destruction and contamination of agricultural products by rodent excrement affect a considerable proportion of world agricultural production. Rodents carry more than 60 zoonotic pathogens. These socio-economic observations are at the origin of RS2GP's objectives: manage the pullulation of rodents in urban, rural, and island habitats effectively, sustainably, and in a well-reasoned manner in accordance with the risks associated with the population.

Wild Rodents, Health Risks and Population Management is a joint research unit of VetAgro Sup and INRAE.



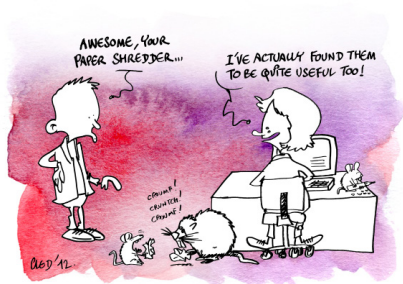
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The main objectives are to:

- evaluate and understand the risks associated with pullulations of wild rodents;
- evaluate current management methods and develop innovative alternatives;
- study the dynamics of Leptospirosis infections.

The unit's work mainly involves:

- a multidisciplinary approach (combining infectiology, ecology, toxicology, nutrition, biochemistry and epidemiology);
- a multi-scale approach from in silico modelling to field experiments, in close partnership with the social and professional stakeholders from the urban and agricultural sectors.



Centre
Lyon-Grenoble Auvergne-Rhône-Alpes



Campus vétérinaire de VetAgro Sup
1 avenue Bourgelat
69280 Marcy-l'Étoile
Tel.: + 33 (0)4 78 87 25 25

<http://www.vetagro-sup.fr/>



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Research

The unit's projects essentially involve:

- **Rodent management methods**

1. Resistance to anticoagulants: mechanism, dispersion, biological cost, modelling of the target and molecular docking.
2. Ecotoxicity of anticoagulants:
 - Monitoring of wild animal populations, development of toxicity/exposure markers;
 - Development of environmentally compatible strategies;
 - Use of stereochemistry concepts.
3. The development of alternatives to anticoagulant rat poisons and the promotion of agroecology.

- **Molecular epidemiology of leptospira**

1. Complete, improve and modify methods of detection and identification / characterization of leptospira.
2. Evaluate the virulence of leptospirosis strains in order to identify the genic zones to be targeted in order to analyse the virulence of strains in the field.
3. Study the persistence of leptospira excreted by rodents in the environment.
4. Identify the role of rodents with respect to other wild reservoirs – rodents: the guilty party or a shared role? (ANSES/VAS grant).

- **Approach involving the evaluation and management of risks linked to rodents and of risks linked to their management**

Collaboration and expertise

At local and regional level, the unit collaborates with ICBMS, LBBE, LEHNA and EPIA. It is a member of ANTHARES Living Lab for nature-based solutions. It is part of the BIOENVIS research federation, the IMU LabEx, the InfectioTron Equipex, the EVVAS veterinary expertise centre and the SAARA network. It works in collaboration with the Region's socio-economic stakeholders.

At national level, it has various partnerships in different collaborative research programmes. It collaborates with numerous academic partners (MNHN, ANSES, CNRS, IRD, IFREMER), with socio-economic partners in different cities and with associations (LPO, SEOR). It has numerous private-sector partners through the CIFRE programme.

At international level, it collaborates with different veterinary schools (Vienna, Tunisia, Dakar), African and Middle Eastern universities (Carthage, Beirut, Algeria) and with the USDA and the USGS through joint research programmes.

Scientific facilities

RS2GP has an analytical chemistry facility (LC-UV/Fluo, LC/MS, LC-MS/MS, LC-QTOF), an accredited animal facility to keep and breed wild rodents (brown rat, black rat, mouse, water vole, field vole, Mediterranean pine vole) and a connected rodentodrome.

Teaching

The unit is very heavily involved in teaching at VetAgro Sup. It is also involved in the THERV Master's (Université Paris Descartes), the Microbiology Master's (Université de Lyon), the EpiRis Master's (Université de Lyon), the MRESTE Master's (Université Grenoble Alpes), the Health Master's (Université de Lyon / VetAgro Sup) and the GLOQUAL International Master's.



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