

### Encadrement :

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Nature du financement de la gratification :

acquis xprévu : bourse de mobilité

### Titre du stage :

**A root herbivore hijacks plant toxins for its own benefit.**

### Mots clés :

Maize, *Diabrotica virgifera*, plant-herbivore interactions, benzoxazinoids, RNA interference, insect behavior and performance.

### Résumé :

*The group of Biotic Interactions offers a master internship position on the interactions between maize and an invasive pest in Europe: *Diabrotica virgifera*. This insect is extremely harmful for maize crops as it cause about 1 billion dollar crop losses every year in the US (where it originated from) and raises ecological and economic concerns in Europe. As no pest management strategy seems to be efficient, our group aims at understanding how the insect deals with the natural defenses of the maize. Our first findings suggest that the insect larvae actually tolerate the major maize secondary metabolites, the benzoxazinoids, but even sequester them against their own natural enemies!*

*We currently focus on the molecular basis of this interaction. We proceeded to the transcriptomic analysis of the insect fed on plant producing or not the toxins and are now in the process of silencing the up/down regulated genes in the larvae using RNAi. The silencing of the benzoxazinoid induced/suppressed marker genes will allow us to test their importance in vivo by feeding the larvae on benzoxazinoid containing plants and exposing them to their natural enemies.*

*We offer a multidisciplinary environment to learn and apply some biological techniques in different fields. The Biotic Interactions group uses outstanding techniques to address fundamental and applied challenging questions in agriculture and ecology.*

### Deux références bibliographiques:

Robert CAM, Veyrat N, Glauser G, Marti G, Doyen GR, Villard N, Gaillard MDP, Köllner TG, Giron D, Body M et al. 2012. A specialist root herbivore exploits defensive metabolites to locate nutritious tissues. *Ecology Letters* 15: 55–64.

Baum JA, Bogaert T, Clinton W, Heck GR, Feldmann P, Ilagan O, Johnson S, Plaetinck G, Munyikwa T, Pleau M, Vaughn T, Roberts J. Control of coleopteran insect pests through RNA interference. *Nature Biotechnology*. 2007;25:1322–1326.

### Techniques mises en œuvre:

PCRs, RNA interference (production of dsRNA), gene silencing in the larvae and performance/behavioral tests.

### Compétences particulières exigées:

We are looking for motivated students with a background in biochemistry, genetic or ecology, willing to learn and apply multidisciplinary techniques. Candidates with an interest in continuing research after their master (PhD) are encouraged. The members of the lab come from all around the world; therefore, the main spoken language is English. French can also be used with the maize project members.

