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## NOEMI - Neurobiologie de l'olfaction

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agence d'évaluation de la recherche  
et de l'enseignement supérieur

Section des Unités de recherche

Evaluation report

Research unit

Neurobiologie de l'Olfaction et de la Prise

Alimentaire

INRA



March 2009



agence d'évaluation de la recherche  
et de l'enseignement supérieur

Section des Unités de recherche

# Evaluation report

Research unit

Neurobiologie de l'Olfaction et de la Prise Alimentaire

INRA



Le Président  
de l'AERES

Jean-François Dhainaut

Section des unités  
de recherche

Le Directeur

Pierre Glorieux

March 2009



# Evaluation report )

## The research unit :

Name of the research unit : Neurobiologie de l'Olfaction et de la Prise Alimentaire (NOPA)

Requested label : INRA Research Unit

N° in case of renewal :

Head of the research unit : Ms Edith PAJOT (former director : M. Roland SALESSE)

## University or school :

None

## Other institutions and research organization:

INRA

## Date of the visit :

15 January 2009



# Members of the visiting committee

## Chairman of the committee :

M. Peter MOMBAERTS, Max Planck Institute of Biophysics, Frankfurt, Germany

## Other committee members :

M. Stuart FIRESTEIN, Columbia University, New York, USA

M. Ivan MANZINI, University of Göttingen, Germany

Ms Anna MENINI, Scuola Internazionale Superiore di Studi Avanzati, Trieste, Italy

M. Krishna PERSAUD, SCEAS, The University of Manchester, UK

M. Ivan RODRIGUEZ, University of Geneva, Switzerland

## CNU, CoNRS, CSS INSERM, INRA, INRIA, IRD representatives :

M. Frédéric LEVY (INRA CSS)

# Observers

## AERES scientific representative:

M. Pierre-Hervé LUPPI

## Research organization representative :

M. Philippe CHEMINEAU (INRA)



# Evaluation report

## 1 • Short presentation of the research unit

- Number of lab members : 56 including
  - o 24 Researchers
  - o 8 Researchers with teaching duties
  - o 3 Postdoctoral fellows
  - o 4 PhD students, all with a fellowship
  - o 17 Engineers, technicians, administrative assistants
- Number of HDR : 13, 4 being student advisor
- Number of students who have obtained their PhD during the past 4 years : 2
- Number of lab members who have been granted a PEDR : 2

## 2 • Preparation and execution of the visit

The research unit worked diligently in preparation for the visit, as was demonstrated by the briefings, the formal presentations, and the posters illustrating the work and achievements of the unit. Documentation was received in time for the visiting committee to have an adequate insight of the various groups and research activities within the unit. If anything, the scientific report was too long. The report was flawed by the presentation of some of the unit's own ideas (such as about odorant binding proteins) as state-of-the-art in olfaction. The report would be easier to understand if the various laboratories were identified by the name of their leaders rather than by a bewildering set of acronyms, but perhaps the unit was required to do so.

It was clear from the open and honest exchanges that the unit was happy to share their experiences and expectations for the future with the visiting committee. Their future directions became clear within a short period of time. After a closed-door meeting of the visiting committee, various presentations were given describing both past research activity and future plans. After a second closed-door meeting, the visit ended with a direct discussion with scientists and staff in front of the posters in the hall of the building. Communications were exclusively in English and clear. Members of the research unit were passionate about their work, and the discussion was deep. The time allocated for the agenda was rather limited, and several parts of the agenda were curtailed. The agenda, which was composed without the involvement of the review committee, was too ambitious and not realistic. However, the visiting committee felt that they had enough time to evaluate the research unit.

## 3 • Overall appreciation of the activity of the research unit, of its links with local, national and international partners

From the data presented in written form and orally, it was clear that the research unit has been under considerable stress since 2006 when a new unit NOPA was formed, followed by a change in INRA policy at the end of 2006. This stress resulted in understandable problems of morale in the research unit. However,



individual teams within the research unit are highly active, with a well-established and respected presence nationally and internationally.

Excellent links with local partners: strong involvement in teaching and creation of two master courses, in Versailles University and Paris 6 University, participation in a local association for spreading scientific knowledge to the public; active contribution to creation of a local neuroscience network IFR144 Neuro-sud Paris.

Good links with national partners : responsible for a research group in the chemical senses field AROMAGRI which is behind a successfully granted ANR project AROMALI; collaboration with the competitiveness hub “cosmetic valley”, a network of perfume-cosmetics industrials; successful national collaborations in the context of an ANR project (2008-2010; NOSE) which aims at understanding dynamic interactions between olfactory receptors, odorant binding proteins and odorants.

Successful international collaborations : in the context of the European project SPOT-NOSED during which characterization of olfactory receptors was carried out using nanometric acellular structures.

Of particular relevance were the combined studies in the same research unit of the two chemosensory systems, olfaction and taste, which are both of great relevance for animal production.

The concept of NOeMI is well elaborated. The combination of the development of new technologies [receptor-based micro and nanobiosensors (BOB) and the statistical three-dimensional modeling and 3D reconstruction software design (AMIB)] and the possibility to apply these technologies to important questions in biological sciences are well appreciated. A better collaboration between the NOeMI subgroups should be aspired. In some cases the review committee had the impression that the various groups do not know sufficiently what others do. To improve the collaboration and integration, a monthly group meeting or seminar should be established. The connection and interaction with national and international partners should also be improved, and a better presentation of the research unit's work at international congresses and symposia should be aspired.

#### 4 • Specific appreciation team by team and/or project by project

The loss of a group due to retirement of the group leader, followed by dispersion of key members of the group caused a loss of critical mass in the field of chemoreception.

Of the four teams represented, all were highly active, and the work presented to the reviewers was impressive. Of particular note was work presented by BOB, showing a very dynamic approach to practical olfactory biosensors - a multidisciplinary approach with much long term potential, that could be developed for a variety of practical applications in agriculture. This team maintains a good balance between basic research and research with biotechnological applications. The development of nanoliposomes has wide applications. The RCC/BOB combination has been a complementary force in driving the research forwards. However, BOB seems to include too many projects, and would benefit from focusing on fewer projects. The choice of these projects is left to the strategic decisions of BOB about overall research directions.

Note de l'équipe	Qualité scientifique et production	Rayonnement et attractivité, intégration dans l'environnement	Stratégie, gouvernance et vie du laboratoire	Appréciation du projet
A	A	A	A	A



The presentation of functional neuroanatomical modelling by AMIB represents a multidisciplinary approach.

AMIB has been involved in development of software for three-dimensional reconstruction of 2-D images with wide applications in anatomical imaging. AMIB has concentrated on aspects of olfactory pathway modelling, showing how connection pathways can be visualised in the brain. The multimodal data fusion approach to neural modelling is innovative. The investigation of the linkages of the olfactory tubercle and the crossroads between olfaction and behavior are refreshing. AMIB pursues a policy of free software distribution, which makes the package popular in applications by researchers in a large number of imaging areas - both within and outside of France. AMIB should improve the collaboration with the BOB group in order to be able to demonstrate the usefulness of the software for biological questions. Finally, although the scientific questions pursued by AMIB were not always clear, the value of its products (the software) is not in doubt.

Note de l'équipe	Qualité scientifique et production	Rayonnement et attractivité, intégration dans l'environnement	Stratégie, gouvernance et vie du laboratoire	Appréciation du projet
B	B	B	B	A

## 5 • Appreciation of resources and of the life of the research unit

The resources of the research unit appear to have been limited in comparison to others at international research institutes. The researchers have been able to supplement their support from a variety of grant sources including the European Community and national grants (leader in two ANR grants, participation in a third grant). The funding cycles are short, thereby limiting the long-term research objectives of the various groups, as well as the placement of publications in highly cited journals. The research unit has been in turmoil due to the changes in strategy of INRA. The unit has suffered from a loss in personnel that represented a critical mass that made the unit known internationally. It needs a period of stability to recuperate.

## 6 • Recommendations and advice

### – Strong points :

Enthusiasm, dynamism, competence, innovation, multidisciplinary research.

### – Weak points :

Poor morale, frequent restructuring leading to instability, spread out over too many projects, publications all too often in low-impact journals, insufficient collaboration between BOB and AMIB.

### – Recommendations :

The groups need a period of stability so that they can gain or regain scientific prominence in the field. They should be allowed to carry out research that can be published in high-quality journals. The publication process at a high-quality journal takes more time than at a lower-rank journal, but the unit does not have this luxury due to the frequent reviews and the short-term perspectives. The projects with practical applications such as





detection of oestrus in animals should be encouraged, while maintaining a portfolio of basic research. Both teams should be in the same building if possible. NOeMI should have enough time to do a good job; yearly evaluations and the expectation to publish in too short a time are certainly not beneficial for NOeMI. Finally, they should continue the collaborations between teams studying the two chemosensory systems.

Note de l'unité	Qualité scientifique et production	Rayonnement et attractivité, intégration dans l'environnement	Stratégie, gouvernance et vie du laboratoire	Appréciation du projet
A	A	A	A	A

**Research Unit** : Neurobiologie de l'Olfaction et de la Prise Alimentaire (NOPA),  
Director Roland Salesse

**Future Research Unit** : Neurobiologie de l'Olfaction et Modélisation en Imagerie  
(NOeMI), Future Director Edith Pajot

March 30, 2009

### **Reply of the Research Unit to the report of the AERES evaluation committee**

We thank the evaluation committee for their analysis about our research unit. As the members of the committee, the members of the unit also felt quite frustrated about the agenda of the visit being both unrealistic and curtailed. However, the committee obviously had a fair understanding of the situation of our research unit based on its short and troubled history. We thank all the members of the committee for the cordial and direct atmosphere of the evaluation and the animated discussions.

We are particularly aware of the loss of critical mass for the research unit in the recent months, and that a closer interaction of the two remaining NOeMI subgroups participates in the requisite response. We do need to find some stability to achieve a better efficiency, gain in performance and visibility, and precisely select our strategic aims. Indeed, regular meetings are planned for better knowledge of each other's work, and also for efficient progress of our collaborative project about the detection of oestrus and the tracing of the olfactory pathways activated by the specific odors involved. Physically gathering both teams in a unique building would be desirable, although largely beyond our control.

In terms of publication strategy, we perfectly agree with the recommendations of the committee to place publications in high-quality journals, and with its analysis about the counter-productive frequency of research reviews and the short funding cycles.

As for the particular relevance of our combined studies of olfaction and taste, we deplore that this aspect will unfortunately be somewhat hampered by the research unit reorganization into the new NOeMI, and mainly by the discontinued involvement of the Division supporting the studies on taste (AlimH). However, special attention will be paid to further address the multimodal aspect of the sensory perception.

The evaluation committee pointed out that BOB should make strategic decisions among the projects presented. Indeed, if several research directions are considered,

this panel will be restricted by the fundings obtained from our responses to national and international calls, so that BOB will focus on fewer projects.

Concerning the committee's remarks mentioning that a better presentation of the research unit's work at international congresses and symposia should be aspired, the members of the research unit are somewhat surprised, since special attention is paid to communication about our work in these scientific events. In addition, the Récepteurs et Communication Chimique (RCC) team (future BOB : Biologie de l'Olfaction et Biosenseurs) maintains close international connections, be it with partners of European projects, but also through additional on-going interactions with national and international collaborators.

The evaluation board noticed that the scientific report was "flawed by the presentation of some of the unit's own ideas (such as about odorant binding proteins) as state-of-the-art in olfaction". If this refers to the results obtain by SPR on OBP-receptor interaction, it is indeed not (not yet ?) state-of-the-art, as only very few publications deal with this topic; however, it may give experimental support to one of the many functions ascribed to OBP.

for the Research Unit,  
Roland Salesse

Edith Pajot

A handwritten signature in black ink, appearing to read 'Salesse', with a long horizontal line underneath.A handwritten signature in black ink, appearing to read 'EPajot', with a horizontal line underneath.