Bactéries lactiques et pathogènes opportunistes

Rapport Hcéres

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

Section des Unités de recherche

Evaluation report

Research unit

Bactéries Lactiques et Pathogènes Opportunistes

INRA

March 2009

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

Section des Unités de recherche

Evaluation report

Research unit

Bactéries Lactiques et Pathogènes Opportunistes

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 : Bactéries Lactiques et pathogènes opportunistes

Requested label : Unité de Recherche INRA

N° in case of renewal : UR 13 0888

Head of the research unit : Ms Alexandra GRUSS

Institutions and research organization :

INRA

Date of the visit :

9 December 2008

Members of the visiting committee

Chairman of the commitee :

M. Philippe GLASER, Institut Pasteur, Paris

Other committee members :

Ms Hanne INGMER, University of Copenhagen, Denmark

M. Ivo GOMPERTS-BONECA, Institut Pasteur, Paris

M. Jean-Michel FAURIE, Danone Research, Palaiseau

M. Thierry JOUENNE, Université de Rouen, France

M. Guy PERRIERE, Université Lyon 1, France

M. Patrick TRIEU CUOT, Institut Pasteur, Paris

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

M. Frédéric BARRAS (CSS INRA)

Observers

AERES scientific representative:

M. Stéphane MERESSE

Research organization representative :

Ms Emmanuelle MAGUIN, INRA, Jouy-en-Josas

Evaluation report

1 • Short presentation of the research unit

The unit comprises 5 teams. Team 1 includes a pilot P2 cheese production plant that is a platform available to external users. The head of the unit is not leader of one of the 5 teams. In total the unit comprises 46 persons at the date of the evaluation, 33 hold a permanent position and 13 are employed on a contractual basis with the following distribution :

- 13 full time researchers
- 1 postdoctoral fellow
- 6 PhD students, all with a fellowship
- 2 research engineers (having a PhD)
- 18 engineers, technicians and administrative assistants with permanent position and 6 on contract

In addition,

- 8 researchers have their HDR, 6 of them are PhD supervisors
- 10 students have defended their thesis since January 2004
- 13 out of 13 scientists are publishing according to AERES criteria

2 Preparation and execution of the visit

The visit was well prepared by the head of the unit together with all lab members and in particular with the 5 team leaders. A written report was sent to the committee well in advance, allowing the writing of pre-reports and allowing also the Head of the unit to provide additional information upon request. One member of the committee participated in the previous INRA evaluation of the unit. This allowed us to determine the evolution of the unit and how recommendations had been taken into consideration during the last five years (year 2004 being included in the report). The report is well structured and provides all necessary information about the organization of the unit, the past activity and the future research projects. It provides also administrative information about the unit. Finally the project is presented within the perspective that the teams of the unit will join the large MICALIS unit.

The visit lasted for one full day. All presentations and most discussions were in English. The day was organized as follows :

- Closed committee meeting to discuss the organization of the day and of the report. The AERES representative presented his role as observer and defined the aim of the visit and of the evaluation.
- General presentation of the unit by the director : the people, the organization in 5 teams, financing and administrative aspects, the scientific animation, the general objectives and the main achievements.
- Presentation (20 minutes + discussion) by the group leaders describing their objectives, achievements and projects.
- A closed committee meeting took place after the two first presentations and after the three following.
- In the afternoon the committee was split in 4 groups that visited each team. During this visit detailed presentations were performed allowing in depth discussions of the research in the framework of the UBLO unit and with respect to the future of the MICALIS unit.
- The scientific meetings were followed by three parallel short meetings with the technical personnel, the students/postdoctoral researchers and the scientists that are not team leaders.
- The visit finished by a long closed committee discussion to make conclusion on the evaluation of the research teams and of the unit as a whole.

During the day, informal discussions between the unit members and the committee took place at coffee breaks, lunch and dinner.

The visit was coupled with the visit of the INRA BioBac Unit located on the same campus by the same committee on the following day. Given the complementarities of the two units, combining the two visits was useful.

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

The unit underwent significant changes both in terms of its organization in 5 teams and in terms of scientific focus with a shift towards the study of pathogenic bacteria. The unit focuses its interest on four Gram positive species: *L. lactis*, *S. aureus*, *S. agalactiae* and *E. faecalis*. The research themes combine fundamental research and translational research and deal with both the positive flora used in the production of cheese and with pathogenic bacteria. The studies performed by teams 1 to 4 are complementary, and the present organization as a single unit is logical. Team 5 is working mostly in bio-informatics and deals with a broader range of models involving many collaborations external of the Unit. There are very good interactions within the units. However, there seems to be a low level of scientific collaboration, as since 2004 there are almost no collaborations involving members of different teams leading to publications. From discussions during the visit, it seems that this situation is improving and that the scientific staff is positive about joining collaborative work.

The unit is using a broad range of techniques from molecular and cellular studies to cheese production studies by using the P2 production plant. The unit shares the required expertise and is seeking the missing ones through collaborations on and outside the campus of Jouy-en-Josas. Advanced technologies in genome sequencing for genetic studies or in imaging were not considered in the research project. However, they would contribute to accelerate discoveries and would provide further opportunities.

The unit has produced 55 publications during the 2004-2008 period, including several in the best general journals or very good journals in Genetics and Microbiology (PLoS Genet., EMBO J, Cell, Mol. Microbiol., J. Bacteriol, Applied and Env. Microbiol). These publications involve numerous collaborations mostly national. Members of the units have been invited to national and international meetings. They also contribute to various teaching programs and have organized one national meeting.

The unit has a tradition in translational research with numerous collaborations and research contracts leading to several licensed patents. Since 2004, a slight decrease in this component of the research was observed which led nevertheless to one patent. Although the interest for applied research is still present, the shift in the research towards opportunistic pathogens is probably responsible for this trend.

The unit has obtained several grants and research contracts (ANR, EU, INRA industrials) both as coordinator and as partner. Together with the number of publications this is a positive indicator of its national and international recognition.

Given the structure of the unit and the numbers of scientists with an HDR, the number of 10 thesis defended since 2004 (5 in 2004) is less than what could be expected. However, there are currently 6 students preparing a thesis, indicating an improvement of the situation. There were also few postdocs in the unit with only one presently and one starting in December for a one year contract.

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

Team 1: Extra-cytoplasmic fitness factors from low GC% Gram+ bacteria: functional characterization and (bio) technological applications

Organization :

The team was recently formed as a merger between three original teams (6 months ago) and this process was initiated partly in response to a previous evaluation. The three teams focus on 1) peptide transport; 2) protein

quality control during export and 3) behaviour in a food matrix namely cheese. The heads of the original three teams know each other well and have a very positive view of working together in this new merged team.

Achievements :

Since 2005 the three original teams have been performing relevant research of good quality in topics related both to a fundamental understanding of the biology of organisms relevant to food (both LAB and pathogens) and of importance to food biotechnology and the exploitation of microorganisms in food and non-food applications. The results have been published in very good microbiological journals such as J. Bacteriology and Molecular Microbiology. Special care is given to the industrial valuation of this work through filling patents and industrial collaborations.

Research project :

The research project proposed for the next period of time still has the division of activities according to the original three teams and thus is centered around sortase mediated surface localization; oligopeptide transport; protein quality control and HtrA interaction pathway and interactions in the food matrix with the aim of inhibiting S. aureus. Thus, despite the merger of the three teams there has not been any effort to find a common research platform, which may strengthen the interactions between the groups.

Recommendation :

The management structure should be clarified and the responsibility of the team leader should be made clear. The individual projects are good but the team spirit has not yet been established although the researchers are individually clearly interested in participating in team activities. We recommend that the team leader take the responsibility to create a cooperative project that will bring the team areas together. This will not substitute for the already proposed project activities but should be a cooperative activity that will link the researchers and will benefit from the different expertise.

We propose that the team seek additional international cooperation – and that international expertise and cooperation is thought into new project activities. Also the team should seek EU funding within FP7, which will also increase international exposure.

There are many master students and 3 PhD students, which probably relates to the lectures and the exposure associated with the team members participation in teaching. This is strongly encouraged also in the future and should inspire other teams to use similar ways to recruit students.

The most worry of the team "food" will be in focus in the new MICALIS structure. We encourage continued discussions between researchers, engineers and technicians and the management to obtain a maximum level of information flow to eliminate the uncertainty about the future that will drain energy and resources. In addition we encourage that additional cooperation is sought with the researcher of V. Monnet's unit, which will both support the scientific work and will facilitate the transition to the MICALIS.

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	A	B

Team 2: Genetics of immobilized bacteria

Organization :

Team 2 is of modest size with one permanent INRA staff scientist (CR1), one technician and one PhD student. Nevertheless, the team has attracted during the last 4 years 2 other PhD students, which is the best level of PhD recruitment per permanent position in the UBLO unit.

Achievements :

Despite the small size of team 2, the group has been able to produce a normal output of scientific publications in the best journals in the field of microbiology (J. Bacteriol, Mol Microbiol, Microbiology, etc.). The team 2 also made an important discovery on the regulation of cell response to lysozyme mediated cell wall damage by the TCS CesSR and the SpxB regulator (one paper in J Biol Chem). The field of cell response to cell wall damage has received recently an increased attention from researchers as it has a central role in survival of bacteria in stressful conditions (ex: antibiotics, nutrient starvation, etc.). The team 2 has generated new knowledge suitable to create an excellent niche for the future. In contrast, team 2 has a poor record in successful grant applications.

Research project :

Team 2 proposes to capitalize on their acquired knowledge with a well designed and rational scientific research project for the next couple of years. The research project is sufficiently ambitious and reasonable given the small size on team 2. In particular, team 2 acknowledges the need to collaborate to maximize their work potential (several collaborations on cell wall structure and membrane biochemistry).

From the initial work on immobilization of bacteria, Team 2 is planning to characterize the mechanism of selection of genetic diversification. Team 2 revealed an unexpected mechanism of selection pressure during bacterial immobilization. Understanding the underlying mechanisms of diversity can be very important for other relevant bacterial models particularly in the medical/nosocommial environment as nosocommial infections are often the consequence of commensal bacteria biofilms (ex. Enterococcus or Staphylococcus).

Recommendation :

Team 2 has analyzed correctly its strengths and weaknesses. Team 2 should clearly give a priority to find resources to finance a post-doctoral fellow. Despite the potential of the scientific project, the cell wall field is a challenging one that requires a specialized knowledge and therefore the recruitment of a fellow from this field is highly recommended. This is a rare commodity.

Although it is recommended to shift to other bacterial models, team 2 should try to keep its research at the edge of knowledge by pursuing its research on L. lactis. Shift to other bacterial models should be a way to capitalize on their work of the last couple of years to publish and establish permanently in the field. Otherwise, team 2 will disperse.

The two subjects are related as dispersal of immobilized bacteria is proposed to be driven by cell wall weakening and that the bacterial response to such cell wall damage can be sensed by the CesSR/SpxB pathway. The committee was just worried that team 2 will not have the manpower to accomplish these two scientific goals if their team is not expanded with new post-docs and/or PhD students.

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

Team 3: Adapatation and redox systems in Streptococcaceae

Organization :

The team has a significant size including 6 persons with permanent INRA positions (one DR1, one DR2, two CR1, one AI and one TR), and three on contractual basis (one post doc, one AI on an industrial contract and one master 2 student). This team has increased its size by one CR1 during the last 5 years. However, there are only two PhD students who have prepared their degree in this team having defended their thesis in 2004. The general objective of this team on respiration related functions is well focused. It seems that the whole team works collectively on this theme, which makes sense in terms of efficiency. Nevertheless three main sub-themes are defined: heme, menaquinone and fatty acids.

Achievements :

During the last five years, the team has obtained significant results in the field of respiratory chain and fatty acid biosynthesis research leading to several articles in well ranked journals (Mol. Microbiol., J. bacteriol). The well-balanced combination of fundamental and applied research allowed obtaining both, ANR and industrial contracts. Team 3 has obtained recently a large number of still unpublished results, which promise to lead to high quality papers in the near future and which provide the bases for the future research project.

Research project :

It constitutes a general continuation of the themes developed during the last 4 years on heme trafficking, physiological consequences of respiration and fatty acid metabolism and the associated regulatory processes. It is a solid project, which will lead to interesting results, but might be quite large. Therefore, caution should be exerted in selecting the parts the most original and the most likely to generate research of broad interest for the microbiology community. There is also a need for development of a more global view on these complex processes, although it is possible that this global picture will emerge from the combination of the specific projects proposed.

Recommendation :

The role of the different scientists within the team needs to be clarified and the two CR1 and the DR2 should continue to develop their own projects within the general research theme of the group. The relative function of the group leader and the unit director, who is a member of this team, will have to be better defined in the context of MICALIS. We encourage this team to attract PhD students and also possibly postdocs. Finally, the team may consider also E. faecalis, which is like S. agalactiae a gut inhabitant expressing a bd terminal oxidase and intensively studied by team 4. The complementarities of the studies performed in the different bacteria deserve to be improved.

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

Team 4: Opportunism and pathogenesis of Enterococci

Organization :

This team is composed of three scientists (2 CR1-HDR and 1 CR1), one engineer, and two assistant-engineers. However, all work carried out during the period 2004-2008 was supervised directly by the CR1 who initated the Enterococcus project alone; one of the three CR has recently joined this team. One PhD thesis (2003-2006), one post-doc (2004-2006), and 2 Master 2 students (2004 and 2007) were trained during the period considered. This team is part of an European project (ERANET Pathogenomics 2006) and has developped strong collaborations with groups of the University of Caen and at the Catholic University of Rome. The projects developped aimed at understanding the dual life style of Enterococcus faecalis as a commensal and as pathogen by characterizing factors involved in host fitness (colonisation and/or virulence) and to decipher the regulatory cascades controlling their expression.

Achievements :

During the past 4 years, the team has studied 1) the genetic diversity of 80 E. faecalis strains isolated from patients (invasive infections and carriage) and dairy food origins using specific macroarrays for genes encoding surface proteins, 2) a Leucine-rich repeat required for virulence in a mouse peritonitis model, and 3) genes specifically expressed in the gastro intestinal tract of mice as compared to in vitro conditions. The team has also constructed a target-selected mutant library of E. faecalis and has developped a simple insect model (Galleria mellonella) to test their virulence. More recently, the team has initiated the characterisation of E. facalis non coding RNAs as putative coordinators of adaptation processes. During the period considered, this team has published five papers on the topic E. faecalis (2 J. Bacteriol; 1 Infect. Immun., 1 Int J Food Microbiol., 1 J Microbiol Methods) and was associated with three research contracts (1 ANR, 1ANR-ERANET, 1 INRA).

Research project :

The research projects are essentially the direct continuation of the present programs :

1) expression of ElrA in vitro and in vivo and characterisation of its role in pathogenesis and of its ligand. This project is straightforward but not so innovative and will be carried out by a PhD student under the supervision of the group leader.

2) in vivo screening of genes involved in commensalism or virulence using two different animal models : virulence in Galleria and colonisation in mice. It is not clear how so distantly related models can be complementary. In particular, the search of factors involved in resistance to innate immunity can be more easily carried out in vitro with cellular models. The functional analysis of genes induced in the murine gastro intestinal tract will be also analysed in detail and the expertise of one researcher will be clearly helpful. It will be appropriate to develop a model that mimics the bacterial translocation, i.e., the ligated ilea to further characterize this process.

3) small ncRNAs. The role of these molecules in the regulation of gene expression in E. faecalis remains to be determined. The proposed approach is sound and quite feasible. This is a new subject and researcher in charge of the project is perfectly trained to carry out this work.

Recommendations :

Efforts should be made to increase quantitatively the publications of the team. This is expected to be achieved by the development of the new research theme on small non coding RNA and of cellular and animal models. This team should also greatly benefit from the development of structured collaborations with other teams of this unit (in particular with teams 3 and 5).

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	A	A	B

Team 5: Genome architecture of bacteria and bacteriophage

Organization :

Team 5 comprises two CR1, one TR (holding INRA positions), one postdoc and 2 PhD students. Given the small size of this team, its activity is structured around several productive collaborations both with mathematicians or informaticians and with biologists. For their research, they combine bioinformatics and experimental validations of these predictions.

Achievements :

One of the main themes of the group deals with short motif identifications and the analysis of the implication of such motifs in the evolution of bacterial genomes. Especially in the case of Chi sites, this team obtained important results leading to the development of a prediction method that may be useful for a broad range of biological studies as those sites are involved in recombination in bacteria.

The scientific production of Team 5 is very good, with publications in high-level "general" journals (PloS Genetics, Cell and EMBO J.) as well as in one of the two reference bioinformatics journals (BMC Bioinformatics). Development of algorithms for motif detection is a competitive area as many international groups in bioinformatics are involved in this activity. In that context, this team is recognized at the national and international level, as shown by its regular participation in the main conferences in this field (JOBIM, GCB, ECCB). Its success in getting grants and its ability to attract students are other signs of its dynamism.

Research project :

The research project is interesting as the study on the recombination mechanisms in bacteriophages may lead to broader perspectives (for instance on horizontal gene transfers in bacteria). A possible problem in the future is linked to the fact that one of the two CR1s is leaving for a sabbatical year at the end of 2009, and this will clearly diminish the bioinformatics potential of the team.

Most of the work in bio-informatics was performed in collaboration with experimentalists for the validation of the predictions. There is a wish to further combine in silico approaches and wet lab experiments within the team. This may lead to a loss of visibility and of efficiency. For example the study of rolling circle plasmids in S. agalactiae was not fully convincing.

Recommendations :

In the context of MICALIS, this team does not seem to meet a sufficient critical mass and deserves to be reinforced. This will be even more pronounced during the sabbatical year of one of the CR1s. It should also pay attention not to loose its focus and should not underestimate the difficulty to combine within a small group in silico and wet lab experiments. However, given it expertise and achievements this team is in a good position to federate the research in bioinformatics and more particularly related to genomics in the new unit.

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

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

The unit is occupying a single building on its own. This is a comfortable situation in terms of lab and office space and meeting rooms. However, this leads to certain isolation. The budget is run as a common pot for consumables. During the last four years, it seems that the obtained contracts were sufficient to run the unit in satisfactory conditions. There seems to be a good agreement among the team leaders on this organization.

Considering the size of the unit, its direction remains rather informal, although the staff requests more regular council meetings. A *general assembly* of the unit is supposed to be organized every year but was not organized during the last year. There seems to be a good atmosphere within the unit without problems of communication. The scientific policy of the unit is defined by the head of the unit together with the researchers. However, with the creation of the MICALIS unit, the decision and ways of communicating within the unit need to be reinforced.

The main issue is now the reorganization of the five teams of the unit within the MICALIS unit. Given the small size of two teams, some will have to associate with other groups within or outside the UBLO unit. There remain ambiguities on how MICALIS will be organized and how the 5 teams of UBLO will be structured within MICALIS. This leads to uncertainty for most members of the unit.

Everybody in the unit has access to trainings without restriction. However, the demand is rather low and almost no training dealing with technologies and methods not used in the unit were taken. For example there is a strong demand for cellular biology expertise, one technician or one engineer would have benefited from training in this domain.

The scientific life of the unit is good. Regular lab meetings are organized at the unit and the team level. The unit contributes also actively to the scientific life of the INRA site, for example by organizing monthly seminars in microbiology. The students receive an excellent training, they have the possibility to interact with the different teams and have the opportunities to participate in national and international meetings.

The security issue is important for the unit. There is a strong involvement of the engineer, technician and administrative staff and the situation is good. However, they would expect a better recognition of the corresponding investment. Due to this, there is only one ACP (agent chargé de la prévention) in the unit and no volunteer was found to share this duty at the time of the meeting.

6 • Recommendations and advice

— Strong points :

A general homogeneity of the themes and an excellent atmosphere within the unit contribute to the productivity and the excellent working climate of the unit.

The unit succeeds to combine "fundamental" and translational research.

The development of research projects on opportunistic pathogens following recommendations of the INRA scientific committee is globally a success.

The unit succeeded to obtain a significant number of contracts and grants during the period of evaluation.

The unit has a good scientific production leading to several publications in the best or very good journals or journal in Genetics and Microbiology.

— Weak points :

The main weak point is a lack of students and postdocs.

The size of two teams within the unit will be too small in the MICALIS context.

Collaborations and interactions between teams did not lead to shared publications.

Although the unit has established numerous collaborations with research units outside the campus of Jouy-en-Josas, interaction (integration) on the campus should be improved.

The methods used are relatively "traditional" and no plans were presented to apply more recent technologies.

— Recommendations :

The main recommendation concerns the integration of the five UBLO teams in the MICALIS project. The quality of the research preformed by the UBLO teams depends on the success of this integration. In the present plan, the head of the unit would become the head of one of the three "divisions" of the MICALIS unit. However, the size of two teams is too small to constitute an independent team within the new unit. The scientists should seek for constructive interactions and try to fuse with teams from other INRA units, which will join MICALIS. There is also probably a need of intra-team reorganization as for UBLO team 1. MICALIS is an opportunity for this unit, it should contribute to increase its attractiveness for students. However, they have to pay attention to keep their specificity within this large microbiology research centre.

The committee recommends that the unit should clearly define a strategy to prepare the new organization. This should involve the whole unit, not only the team leaders and the head of the unit. Furthermore, it should be done in interaction with the head of the department and the future director of MICALIS, which should provide a clear message of what they wish for MICALIS. The unit may also seek for external advice for this task, for example from members of this committee.

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

UBLO

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April 10, 2009

U888 responses to AERES evaluation report based on visit of December 8, 2008

We present below the errors that appeared in the AERES report of U888, followed by our responses to specific points. We feel that a question session with the unit director, and "retour à chaud" (we were informed that this procedure was suppressed by the AERES) at the end of the day could have avoided some of the errors and speculation that appear in the report.

After receiving the report (3-27-09), the unit director discussed with the AERES committee President, who acknowledged validity of several points raised in this letter.

Below are listed the main factual errors and incorrectly interpreted points, followed by responses of U888 to specific points. In the attached word document of the AERES report, point-by-point corrections (including details not listed below) and comments are highlighted in color.

I hereby certify that all corrections and comments in this response were carefully verified, and are, to my knowledge and that of the UBLO researchers, completely correct.

A. Errors, oversights, incorrect interpretations (plus points highlighted directly in attached report):

Part 3. Overall appreciation:

- We do not study S. thermophilus as written. We study L. lactis.

- 'Advanced technologies… were not considered': Teams 2 and 3 regularly use transcriptomics Team 4 developed in vivo transcriptomics. Teams 1 and 3 do proteomics. Team 1 uses 2-hybrid screening.

- Omitted (in 'Part 3' and in 'strong points'): Assessment of UBLO publications should include 'general journals'. The unit has publications in EMBO J and Cell, but reference is made only to 'Genetics and Microbiology' journals.

- Report stated a 'slight decrease' in 'translational research'. It should read 'slight increase' (2 contracts on food bacteria, 1 contract on S. aureus, industrial partners in ANR programs, plus the MICA department's largest industrial license-contract [ongoing]).

Part 4. Team evaluations

Team 3:
- Stated is 'need to develop their own projects within the theme': The 3 INRA scientists (2 CR1, 1 DR2) in the team are each focused on a separate project (menaquinones, heme metabolism, fatty acids), as we presented.

Team 4:
- 'The CR1 who initiated the *Enterococcus* project only' should read '…who initiated the *Enterococcus* project alone'.

- Publications (2 J. Bacteriol; 1 Infect. Immun., 1 Int J Food Microbiol., 1 J Microbiol Methods) and research contracts (1 ANR, 1ANR-ERANET, 1 INRA) should be in the 'Achievements' section as made for other teams, not in 'Recommendations' as written.

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Part 5. Appreciation of resources

- 'Due to this, there is only 1 agent de prevention'. The unit has 2 agents de prevention.

- A recurrent error throughout the text is that the size of teams is 'too small'. Three of the five UBLO teams comprise **15**, **9**, and **9 members** at the time of the evaluation (including respectively 11, 6 and 5 permanent INRA staff). The statement should read '2 small teams', and not generalize about small teams as repeated throughout text.

Part 6. Recommendations and advice

Strong points: As above, assessment of UBLO publications should include 'in the best general journals'.

Weak points: See above concerning the size of teams is 'too small', which should read 'the size of two teams is small'.

- 'Did not lead to shared publications' between teams: There were 6 inter-team publications.

- 'seems to be a lack of interaction on campus': We have, and initiated, regular interactions with 4 units on campus, which are documented by 12 inter-unit-publications in international journals.

B. Main responses to specific points:

Part 4. Team evaluations

Team 3
Incorrect interpretation: Point on innovation. This team discovered respiration in Streptococcus agalactiae in 2005. It has the largest industrial contract in the INRA MICA department (based on work in L. lactis), which is currently being exploited commercially. Part of the team's work was just published in Nature (2009). Statement that the team could be 'more ambitious and innovative' is not understandable.

Team 4
The report written for team 4 appears in a different style compared to the entire document. As a result, in contradiction with judgment from other jury members, the journals such as "Journal of Bacteriology" and "Infection and Immunity" are not considered as good microbiology standards and research contracts were not listed as achievements.

Research project: The ElrA project was assessed as "not really innovative". Note that this project was funded in a competitive grant process by the DIM in 2008. Team 4 is aware of the necessity to connect virulence and commensalism by developing a model that mimics the bacterial translocation. Such a model is being developed using a mouse virulence model presented in the morning session.

We were prepared for a deeper scientific discussion which did not take place during the meeting with our team.

Team5
We consider that combining */in silico/* and wet lab experiments is highly pertinent for the scientific questions addressed in the group as exemplified by our work on Chi motifs. We are aware that it is not possible to always achieve this, which is why we also developed fruitful collaborations that led for example to the discovery of */matS/* motifs.

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Part 6. Recommendations and advice

- 'Strong points': '…the relevance of the selected pathogens (GBS and E. faecalis) is not obvious'. The question was not raised during the meeting. As 2 committee members also study these bacteria, we did not feel it necessary to explain this point. Answer: Both bacteria are potential dairy contaminants, find a reservoir in the intestinal tract, and are important opportunist pathogens. Both have proven to be valuable models in our studies.

As head of unit, I was disappointed that the committee did not recommend outright support of Team 5, whose production includes articles in Cell, EMBO J, and Plos Genetics.

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10 avril, 2009