FINAL REPORT:

Evaluation of the

National Institute of Research & Development for Biological Sciences
Ministry of Education, Research, Youth and Sport
National Authority for Scientific Research
Romania

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To the Instructions for the Teams of experts-evaluators

FINAL REPORT

I	**The Name of the Institution to be evaluated**	National Institute of Research & Development for Biological Sciences
II	**Evaluation Period**	2007-2011
III	**Members of the Team**	
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I. CONCLUSIONS AND RECOMMENDATIONS

Our team has evaluated the National Institute of Research & Development for Biological Sciences. The self-evaluation documents were made available through web-based access about 2 weeks before the site visit, which took place on March 5-6 in Bucharest and March 7 in Cluj.

During the visit, the panel received oral presentations from all of the team leaders and was able to have detailed discussions with the management group and to meet PhD students and inspect the research facilities. The site visits were very useful since they provided an important additional view of the human and infrastructure resources of the institute.

After the visit the panel prepared the Preliminary Report, which was sent to the Ministry of Education, Research, Youth and Sport, National Authority for Scientific Research, as well as to the evaluated institute. The institute agreed with the conclusions of the report and the suggested future measures. They had only one comment regarding the number of publications, which was taken into account in this final report.

The impressive features of the institute are:

- Modern infrastructure, which offers excellent possibilities for high quality research at the level of both basic and applied sciences.
- Good age structure of the research personnel with a high number of young scientists and no missing generations in the middle-age bracket.
- Valuable research experience of some scientists obtained in good foreign laboratories, which can serve as crystallization points to develop new internationally competitive research directions.

Besides these positive impressions we also noted a number of problematic areas, which pose barriers for achieving a consistent level of internationally competitive science in the institute:

1. Lack of reliable core funding

The institute currently obtains only a limited core funding (20 % ?) and depends on grants to cover the remaining 80 % of costs including salaries, maintenance of buildings (heating, electricity, etc.) as well as research infrastructure and actual costs of research. Therefore, the researchers have to spend lots of effort "chasing money" for day to day survival, which diverts them from actual research. This also leads to unfocused research projects since the primary aim is to obtain support instead of solving problems that are important for science and society. The national agencies, which support science in Romania, could improve the situation by increasing the level of core funding to the best institutes to maintain continuity by covering the costs of core facilities and the salaries of the top researchers. Importantly we also feel that the development of international quality science in Romania requires a long-term commitment of targeting research money to areas of strategic importance and to research groups of international excellence. To achieve this aim, national grant proposals must be evaluated on the quality of the science and the track-record of the applicants determined using internationally recognized performance parameters.

2. Low quality of publications

Although the importance of publishing results in high quality international journals is recognized by the leadership of the institute and by leading scientists, the internationally visible publication output for the institute has been extremely low in the reporting period. The ca. 130 scientists published 172 ISI articles with non zero AIS (total number of ISI

publications: 214) in 5 years, which comes to 0.26 ISI papers with non-zero AIS /capita/year. The average AIS factor for these papers is 1, which shows that not only the number, but also the quality of the publications is at a low level. These papers also only attracted about 0.3 citations/year. Overall these data indicate that the institute has extremely low visibility at the international level. This situation can be reversed only by a performance-based evaluation system for national grants, which ensures that support is given only to those researchers/groups who target important research aims and have proven internationally visible performance (ISI articles, citations, international patents). The new system which sets eligibility limits for applicants based on their publication output is a good step forward. However, this should be accompanied by other elements of the evaluation system, which ensure that only high quality applications, which follow or open new research trends, get supported.

3. ***Dispersed and isolated research potential***

The institute has branches at four different locations (Bucharest, Cluj, Iasi and Piatra Neamt). Among those the Bucharest and Cluj locations provide good research environments. However, the groups located in Iasi and Piatra Neamt are very small and scientifically isolated. With few exceptions these groups have very low scientific output and lack international visibility, lack funding and young scientists, and seem to lack scientific contacts even with their neighboring research groups. Development of expensive infrastructure at these locations is not a cost-effective option since only few researchers can use them. Unless there is a strong argument to keep such research facilities close to natural resources necessary for research, or there are plans to develop larger research units where critical mass can be achieved, the future of these units has to be seriously considered.

4. ***Lack of closer interaction among the teams***

The interdisciplinary nature of the institute provides a large potential to develop new ideas by regular exchange of scientific information. This potential does not seem to be realized by the institute, and there seems to be a lack of cross fertilization among the different units. Some of the units are working side-by-side, often on similar topics, instead of working together on larger projects, where complementary expertise would be a highly valuable asset. There are already good examples for initiating larger joint projects, such as the planned Platform for Tissular Engineering and Biomedical Biotechnologies. The involvement of several teams in the international Danube project could also lead to productive interactions within the institute, if the participating teams will indeed work together and the interdisciplinary potential is utilized. On the other hand involvement of groups whose activity is far from the aim of the Danube project "foster sustainable management of wetlands and river-delta-coastal areas & sea macro-systems" could just further extend the already present tendency of money-hunting unfocused research, and therefore not desirable. Interdisciplinary interactions could be promoted by regular seminar series where the researchers of each team would present their topics, problems, progress, and results to the whole institute. This would serve also as an inner control for high quality research.

5. ***Lack of institutional background for science administration***

Our team has learned that there is a high level of bureaucracy involved in the financial management of research grants, most of which has to be done by the project leaders. This diverts their time and energy away from dealing with science. The institute should establish an efficient finance management system to remove this burden from scientists. It would be also useful to establish a grant office, which could help identifying national and international grant application possibilities.

Besides the important recommendations, which are formulated above the panel has further recommendations, which are intended to help the improvement of the institute:

- The number of the scientists who came to the institute after a significant research experience in good foreign laboratories is reasonable. However, all of them are Romanian origin. The institution would benefit from offering possibilities to foreign-born professionals to come to work in the institute, even in the form of a temporary appointment. Additionally the introduction of short-term fellowships for early stage and mid-career scientists within the institute to visit foreign labs to learn new techniques and develop collaborations is an extremely cost-effective mechanism for developing new lines of research.

- Some teams have developed new methods and have research results that are validated under laboratory conditions but they need efficient cooperation with partners from industry to put these new products on the market. The institution should support scientists who want to engage in business, through the creation of innovative spin-off and start-up companies.

- The institute has good infrastructure and research capacity but sharing of equipment and facilities could be improved. The leadership of INCDSB should create a more efficient policy for common usage of expensive equipments.

- Most of the revenue is from research grants. No strategy is in place to attract funds from industry by exploitation of research results or patents, in order to ensure that they remain sustainable for the next 5-year period.

II. JUSTIFICATION OF MARKS

C1: The quality of R&D activities and their results **Mark: 3.0**

- The number and quality of international publications are generally low, although there are examples of some high quality publications.
- The quality of research activity varies widely between teams.
- They have 8 international and 25 national patents, but no income from their utilization.
- They are successful in obtaining funds international (10 %) and private (3.1 %) sources.
- The national dissemination activity is effective and successful. International visibility should be improved.

C2: Human resources Quality **Mark: 3.8**

- The institute has groups with largely different sizes and scientific capacities and scientific output. Some of the groups are very isolated and do not maximize potential interactions.
- The age structure of the institute is good. In some units there is successful brain gain.
- The ratio of the administrative staff is not too high (18 %), but the researchers have a high load of administrative work regarding project (financial) management.

C3: Quality infrastructure and its rate of exploitation **Mark: 5.0**

- The general level of up-to-date infrastructure is impressive and is clearly at international level in some teams.
- Certain areas, such as molecular biology and protein biochemistry, which are vital for improving the quality of research, need to be substantially improved.
- The average rate of exploitation is quite high (80 %, according to the representatives of the institute)

C4: Management efficiency and quality of the research environment **Mark: 3.8**

- The leadership of the institute is very motivated, and eager to improve the scientific environment, and outcome of the research work.
- Running the research projects is still highly bureaucratic. There is limited administrative support to help the research project leaders.
- The level of satisfaction was generally high, but in certain areas (insufficient help with project management; insufficient transparency in allocation of funds within the institute) the satisfaction levels were low.
- Despite the high ratio of administrative personnel the administrative/management load of the researchers (project leaders) is high.
- No problems were spotted regarding scientific ethic procedures and behavior.

C5: Quality and credibility of the institutional development plan **Mark: 3.8**

- The development plan is well written, and identifies critical points, including weaknesses. However, at certain points the plan is over-ambitiously phrased. A more realistic and specific approach of the development directions would have been more adequate.
- A sufficient emphasis is placed on the promotion of international contacts and cooperation activities in order to obtain new ideas.
- They have a priority for bringing back good scientists from countries with highly developed science. However, it is not clear if recruitment is driven by the availability of scientists willing to come back, or by the strategic needs of the institute for future research.
- Collaboration with domestic and international partners is good, although sometimes short-term.

- Potential opportunities arising from interactions between the groups within the institute are not used optimally. Some of the groups appear to be highly isolated.
- Scientific communication at domestic level is sufficient. Several groups have a track-record of substantial funding through EU and international programmes.
- In some of the teams critical mass is present (Team1, Team 3, Team7). However, there are small groups both at the main site in Bucharest, and also in the side branches in Iasi and Piatra Neamt, where critical mass is clearly lacking.

Strengths:

- They have a good strategy as well as good scientific potential (personnel + infrastructure) to improve substantially the quality of research.
- Qualification of research personnel is good.
- Successful brain gain has already been achieved in certain areas and units.
- Efficient usage of high-level infrastructure.
- Transparent decision making.
- Motivated and highly dynamic leadership.
- The management has correctly identified the main areas of weakness. The ideas for improvement are generally good.

Weaknesses:

- Shortage of expertise in key areas (notably protein biochemistry and molecular biology).
- Lack of the internal collaborative models.
- Large differences in the size and capacities of the teams/groups.
- Due to the dispersed geographical locations of the groups, some of the instruments are duplicated, and cannot be optimally used.
- Too much administration placed on project leader researchers.
- Lack of strategic decisions in certain key areas, such as rearrangement of scientific priorities in the case of low efficiency areas and groups.
- Details for the implementation of the basically good development plan are lacking and seem very optimistic in places.
- There is little or no correlation between past performance and future goals. The institute has too many and too diverse research directions.

III. EVALUATION OF TEAMS

Team E_1 :Bio-Analyis

R&D activity

The team has a good publication record in internationally visible journals (AIS=38) in comparison to other teams of the institute, but these are coming in a large part from application of their methods, and only to a smaller extent from original results. They have established and maintain active national and international cooperation schemes, and have been successful in obtaining significant levels of international funding (ca. 25 % of their funding comes from competitive EU projects, which is a very good ratio) and have applications currently under consideration. They also have good interactions with SMEs. They have developed various biosensing methods, among which a ROS toxicity test is applied by industry.

Human resources

This is a young team (average age: 37,7), with a very dynamic leadership. The size of the team is sufficiently large (15-19 graduate team employees) with a good proportion of PhD students (7), and provides a critical mass for their R&D targets. The leaders have a good scientific track record and international visibility. The senior researchers and PhD holders usually have research experience in foreign laboratories. The team places a significant emphasis on graduate training and provides a good environment for young scientists.

Infrastructure

They have developed very impressive instrumentation (MALDI-TOF, LC-MS, FTIR, electrochemical devices, liquid chromatograpy devices and spectrophotometers), which is used in a large part as core facility for the whole institute. They have necessary technology to solve many complex problems in their research field.

Management & Research Environment

The projects of the team are seemingly managed efficiently, and the critical mass for their research is present within the team, as well as via interactions with other groups in the institute, at national level, and also at international level.

Development plan

They are fully aware of the necessity to improve the quality of their publications, and have well-defined ideas for future research.

General Feedback

One of the best teams of the institute, reaching an international standard and critical mass of scientific potential based their human resources, infrastructure and available expertise. They have potential for improving the quality of their research, as well as developing applications with impact at the level of actual utilization. They should concentrate on publishing in good level internationally visible journals in order to increase their international visibility through citations.