

Summary report on research accreditation

I. General information

Name of organization	Institute of Microbiology and Biotechnology of Academy of Sciences of Moldova
Organization type (<i>to underline</i>)	Research institute
Research mission of organization	Organizing and conducting basic and applied scientific research in microbiology and biotechnology, oriented to the new knowledge in these areas, developing and implementing advanced biotechnology necessary for economic development, social and spiritual sphere, training the highly qualified scientific experts.
Strategic research direction (s)	Valorification of human, natural and informational resources for sustainable development; Biomedicine, pharmaceuticals, health care and strengthening; Agricultural biotechnologies, soil fertility and food security.
Evaluated period	2006-2010
Web of organization	www.imb.asm.md

II. Research capacity (annual average for evaluated period)

Total number of employees	94					
Number of scientific researches	64.5					
Number of researches who possess honorific titles, scientific degrees, scientific and scientific-didactical titles	ASM full members 3	ASM corresp. Members 2	Professor 8.6	Associated professor 16.2	Dr.hab. 12.2	Dr. (PhD) 27.6
Number of researches involved in international projects	FP7 0	STCU 0	Bilateral 10	Others 0		
Number of young researches (under 35 years old)	Dr. (PhD) 6	PhD students 9.4	Others 16.4			
Financial resources (thousand MDL)	Public budget 5005.2	International projects/grants 92.2	Research contracts 11.3			
Distribution of expenditures (thousand MDL)	Salary 3534.4	Infrastructure development 801.51	Other 669,29			
Expenditures for infrastructure development (thousand MDL)	Equipments 581,59	IT infrastructure 42,14	Endowment of experimental resorts 0			
List of 3 basic research	1. Procedure for obtaining the phospholipids complex from Spirulina					

methods, installations, technologies (per accredited field)	<p>platensis biomass. Patent MD 130(13)Y. Rudi L., Miscu V., Cepoi L., Chiriac T., Bulimaga V., Rudic V., Iațco Iu.</p> <p>2. Procedure for obtaining the astaxanthine oil preparation. Patent MD 132 (13)Y. Miscu V., Cepoi L., Rudi L., Cojocari A., Rudic V.</p> <p>3. Procedure for astaxanthine extraction from Haematococcus pluvialis biomass. Patent MD 146 (13) Y. Miscu V., Cepoi L., Rudi L., Cojocari A., Rudic V.</p>
List of provided scientific services	<p>-Scientific and practice consultations for algae, yeasts growth;</p> <p>-obtaining the high value preparations from microorganisms;</p> <p>-training for staff in area of biotechnology;</p> <p>- cultures from Collection of Non-Pathogenic microorganism are open for exchange, sell.</p>
List of editorial activities	Journal of Academy of Sciences of Moldova. Life sciences. Cofounder

III. Distribution of number of research projects and themes during evaluated period

Institutional projects	2006 6	2007 6	2008 6	2009 6	2010 6
Projects in the frame of State Programmes	2006 0	2007 3	2008 3	2009 1	2010 1
Technological transfer projects	2006 0	2007 3	2008 3	2009 1	2010 1
Projects for equipment procurement	2006 0	2007 1	2008 1	2009 0	2010 1
Projects for young researches	2006 0	2007 2	2008 4	2009 3	2010 1
Projects in the frame of bilateral programmes	2006 0	2007 0	2008 2	2009 2	2010 2
International projects/grants	2006 3	2007 2	2008 1	2009 0	2010 0
List of 3 representative international projects/grants	<ol style="list-style-type: none"> « Appui a la recherche et a la lutte contre les polluants », nr.0209-MOL-321-009. Development of combined technologies for the decontamination of organic pollutants from aquatic compartments: use of solar energy and immobilized cells (DECOTECH), INTAS ref. no: 05-104-7596. MTFP 018/05 follow-on „Correlation between Protein Composition and Flour Quality Characteristics” 				
Research contracts	2006 2	2007 3	2008 5	2009 5	2010 5
List of 3 representative research contracts	<ol style="list-style-type: none"> Contract 4151-4-11/13. Joint Institute for Nuclear Research, Dubna, Russia; Contract 2303. Department of Microbiology, Institute of Biology, Romanian Academy Contract with Institute of Biology of South Seas, named after A.O.Kovalevski 				

IV. Scientific publications

Total number of publications abroad	Books 5	Chapters in books 3	Journal papers 264
Total number of publications in ISI journals and books	Books	Chapters in books	Journal papers 4
Total number of publications in the country	Books 4	Chapters in books 1	Journal papers 162
Total number of conference abstracts	International abroad 118	International in the country 40	National 75
List of 5 representative publications (per accredited field)	<ol style="list-style-type: none"> DuPont, Frances M., Samoil, Vitalie, Chan, Ronald. Extraction of up to 95% of Wheat (<i>Triticum aestivum</i>) Flour Protein Using Warm Sodium Dodecyl Sulfate (SDS) without Reduction or Sonication. <i>J. Agric. Food Chem.</i> 2008, 56, p.7431-7438. (IF – 2.562) Bourosh, P. N.; Koropchanu, E. B.; Desyatnik, A. A.; Bologa, O. A.; Tiuryna, Zh. P.; Stratan, M. V.; Ciobănică, O. A.; Lipkovsky, Ya.; Bulkhak, I. I.; and Simonov, Yu. A. Supramolecular Structure Organization and the Biological Properties of [Co(DH)₂(PP)₂][BF₄]. <i>Russian journal of coordination chemistry.</i> 2009, Vol.35, Nr. 10. ISSN 1070-3284. doi: 10.1134/S1070328409100078 (IF: 0.605). C.Chorao, F.Charmantray, P.Besse-Hoggan, M.Sancelme, <u>A.Cincilei</u>, M.Traïkia, G.Mailhot, A.-M.Delort. 2-Aminobenzothiazole degradation by free and Ca-alginate immobilized cells of <i>Rhodococcus rhodochrous</i>. <i>Chemosphere</i>, 2009, vol.75, p.121-128. (IF: 3.054) Filippova, I. G.; Gherco, O. A.; Simonov, Y. A.; Deseatnic-Ciloci, A. A.; Clapco, S. F.; Tiurina, J. P.; Baca, S. G. Synthesis, structures and biological properties of nickel(II) phthalates with imidazole and its derivatives. <i>Polyhedron.</i> 2010, V. 29(3), p. 1102–1108. ISSN 0277-5387. doi: 10.1016/j.poly.2009.11.016 (IF: 1.886). Cepoi L., Rudi L., Miscu V., Cojocari A., Chiriac T., Sadovnic D. Antioxidative activity of ethanol extracts from <i>Spirulina platensis</i> and <i>Nostoc linckia</i> by various methods. In: <i>The Annals of Oradea University, Biology Fascicle</i>”, Tom XVI/2, pp 43/48 (ISSN: 1224-5119; CNCSIS B+, BDI THOMSON, CABI, ExLibris; Copernicus) 		
List of 5 citations	<ol style="list-style-type: none"> Imamoglu E., Dalay M.C., Sukan F.V. Semi-continuous Cultivation of <i>Haematococcus pluvialis</i> for Commercial Production. <i>Appl Biochem Biotechnol</i> (2010) 160:764–772 (<i>Citat: RudicV., Brevet MD 1723</i>) Karin Popa, Claudiu C. Pavel. Radioactive wastewaters purification using titanosilicates materials: State of the art and perspectives. <i>Desalination</i> 293 (2012) 78–86 (<i>Citat: A. Cecal, I. Palamaru, K. Popa, I. Caraus, V. Rudic, A. Gulea, Accumulation</i> 		

	<p><i>of 60Co^{2+} and UO_2^{2+} ions on hydrophilic plants, <i>Isot. Environ. Health Stud.</i> 35 (1999) 213–219.; A. Cecal, D. Humelnicu, K. Popa, V. Rudic, A. Gulea, I. Palamaru, G. Nemtoi, <i>Bioleaching of uranium (VI) from poor uranium ores by means of cyanobacteria, J. Radioanal. Nucl. Chem.</i> 245 (2000) 427–429)</i></p> <p>3. D. Bontea, C. Mita, D. Humelnicu. Removal of uranyl ions from wastewaters using cellulose and modified cellulose materials. <i>Journal of Radioanalytical and Nuclear Chemistry</i>, Vol. 268, No.2 (2006) 305–311 (<i>Citat: Al. Cecal, M. N. Palamaru, K. Popa, V. Rudic, A. Gulea, Rev. Chim. (Bucharest), 52 (2001) 495</i>)</p> <p>4. Maria Cazacu, Angelica Vlad, Constantin Turta, Gabriela Lisa. New iron-cobalt clusters with silicon-containing dicarboxylic acids. <i>Cent. Eur. J. Chem.</i> • 10(4) • 2012 • 1079-1086 (<i>Citat: S. Melnic, D. Prodius, C. Simmons, L. Zosim, T. Chiriac, V. Bulimaga, V. Rudic, C. Turta, Inorg. Chim. Acta 373, 167 (2011)</i>)</p> <p>5. E. Kistanova, Y. Marchev, R. Nedeva, D. Kacheva, K. Shumkov, B. Georgiev, A. Shimkus. effect of the <i>Spirulina platensis</i> included in the main diet on the boar sperm quality. <i>Biotechnology in Animal Husbandry</i> 25 (5-6), p 547-557, 2009 (<i>Citat: Rudic V., Bulimaga V., Chiriac T., Cepoi L., Rudi L, Granaci V., Darie G., Toderash I., Macari V. (2008): BioR – a new preparation from spirulina biomass for reproductive function regulation of sire bulls and boars. Proceed. Intern. Conf., Bucharest, 1- 3 July, 2008, http: www.bioing.com</i>)</p>
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V. Innovation outputs

Total number of patents	Registered in the country 97	Registered abroad 2	Implemented 20
Total number of new developed methods and technologies	Registered 21	Non-registered	Implemented
Total number of new scientific products	Registered 8	Non-registered 20	Implemented 8
Total number of scientific outputs for central and local authorities (draft of law, strategies etc.)	6		
Total number of scientific outputs for educational institutions	Handbooks for high education	Handbooks for pre-university institutions 2	Delivered university courses 19
List of 5 representative innovation outputs (per accredited field)	1. Procedeu de stimulare a vitalității icrelor și larvelor de pește. Brevet MD 2593 / Procedure for fish larvae vitality stimulating. Patent MD 2593. Implementation contract 31.10.2007, Ivancea, Orhei; Implementation contract 12.11.2007, „Milpeș-Prim” SRL Nisporeni; Implementation contract 01.11.2007, OOO „Prudi”, s. Nezavertailovca; Implementation contract 01.11.2007, „Hidrocentrala Cuciurgan”.		

	<p>2. Supliment furajer pentru larvele de pește. MD 2926/ Feed supplement for fish larvae. Patent MD 2926. Implementation contract 31.10.2007, fish farm „Gura Bîcului”, Anenii-Noi; Implementation contract 12.11.2007 „Milpeș-Prim” SRL Nisporeni; Implementation contract 01.11.2007 OOO „Prudi”, s. Nezavertailovca ; Implementation contract 01.11.2007 „Hidrocentrala Cuciurgan”.</p> <p>3. Tehnologia de producere a preparatului de origine algală BioR^{SP}. MD 2409/ Technology for producing the BioR^{SP} preparation of algal origin. Patent MD 2409. FICOTEHFARM SRL, Implementation contract Nr. 05 din 15.11. 07</p> <p>4. Tehnologia de producere a preparatului de origine algală BioR^{Cr}. MD 2368/ Technology for producing the BioR^{Cr} preparation of algal origin. Patent MD 2638. FICOTEHFARM SRL, Implementation contract Nr. 06 din 20.11. 07</p> <p>5. Tehnologia de producere a preparatului de origine algală BioR^{Zn}. MD 2409/ Technology for producing the BioR^{Zn} preparation of algal origin. Patent MD 2409. FICOTEHFARM SRL, Implementation contract Nr. 07 din 20.11. 07</p>
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VI. Major scientific and innovation achievements

<p>Short description of main scientific results and its confirmation (by awards, citations, development of international projects etc.)</p>	<p>Scientific results obtained by researchers of the Institute are presented in monographs, scientific articles, are patented and appreciated by national and international awards.</p> <p>Research results were published in 484 scientific works including 5 monographs, one Volume of papers / articles, four articles in ISI journals and 20 articles in other journals published abroad, 162 articles in reviewed journals in the country. Institute researchers participated with articles and scientific reports at scientific events (conferences, congresses, scientific symposiums), and published 210 abstracts.</p> <p>During the reporting period the Institute researchers were authors and coauthors of 101 patents, of which 2 were obtained abroad. Have been implemented 16 patents, with 25 acts confirmed for implementation.</p> <p>The National Collection of Nonpathogenic Microorganisms submitted 60 strains of nonpathogenic microorganisms and issued certificates of storage. For eight strains of microorganisms were obtained patents. Were developed and documented 126 methods, procedures, technologies, substances and materials, most of which were patented.</p> <p>Scientific results obtained by researchers of the Institute were exposed to five exhibitions and shows in the country and 29 international exhibitions and shows. Researchers patenting activity was appreciated by 45 gold medals, 20 silver medals, 9 bronze medals, 8 degrees and one special prize.</p>				
<p>Number of organization' invited speakers at international conferences</p>	2006	2007	2008	2009	2010
		1	3		1
<p>Short description of technological transfer and innovation results</p>	<p>During the reporting period were found co-financiers and obtained under the competition four technology transfer projects.</p>				

and its certification by implementation	<p>Veterinary preparation "Apispir, 1%" developed in collaboration with the Institute of Zoology and used as feed supplement for bees was assimilated into industrial manufacturing technological flow by SRL Ficotehfarm and is produced by the plant since in 2007.</p> <p>Also during this period based on scientific-technical cooperation agreement between IBM and SRL Ficotehfarm of December 9, 2006, were similar in technological process:</p> <ul style="list-style-type: none"> • veterinary preparation BiorSp according nr.01/10 Protocol implementation studies of 25 October 2008 "Technology of preparation BiorSp production " • pharmaceutical product "BIOR-chrome alcoholic solution, 10 mg / ml and / or 50 mg / ml" • pharmaceutical product "BIOR alcoholic solution zinc, 10 mg / ml and / or 50 mg / ml" 				
Number of defended dr.hab. and dr. theses per year	2006 1/5	2007 0/1	2008 0/1	2009 0/4	2010 0/4

VII. Present/further involvement in the Seventh Framework Programme (FP7): specific programmes (Cooperation, Ideas, People, Capacities) of interest and its sub-divisions.

The Institute of Microbiology and Biotechnology participates actively in FP7 project proposal writing. Areas of interests are: KBBE, ENVIRONMENT COOPERATION projects, interthematic approaches with HEALTH and ICT projects, as well as ERA-NET and PEOPLE projects. It has been participating in following consortia since 2008:

- FP7-KBBE-2010-4 "Growing algae for high value products – **ALGHIVA-PRO**", nr. 265708 (as partner);
- FP7-INCO-2011-6 "Capacity building for sustainable management of hazardous mining wastes in Georgia – **HAZMIN-GEORGIA**", nr. 294934 (as partner);
- FP7-PEOPLE-2012-IRSES, "Nutritional labelling study in Black Sea region countries – **NUTRILAB**", nr. 318946 (as coordinator) – project is financed by EC from January 2013, negotiation is finished.

Currently under elaboration are 5 projects in KBBE, one - in IAPP (PEOPLE).

VIII. Accredited research field and its evaluation by the National Council for Accreditation and Attestation of the Republic of Moldova (very good/good/satisfactory)

Microbiology and biotechnology / good

IX. Category (A/B/C) attributed by the National Council for Accreditation and Attestation of the Republic of Moldova to the organization

Category B

X. Institutional development actions planned for the next 5 years (maximum ½ page).

- Maintain present funding level by active participation in different international projects (FP7, COST);
- Increase Institute visibility by articles published in ISI journals;
- Improve the performance of the laboratories;
- Improve the quantity of undergraduate, graduate and postdoctoral students interested in research and scholarship;
- Increase endowment for research;
- Purchase needed cutting edge equipment from institutional and other funding sources;
- Extend collaboration with research institutions and SMEs in the country and abroad;
- Assure expansion of research support services by recruiting additional personnel in the offices of Grants Management, Industry Contracts, & Technology Transfer commensurate with increase research activities to sustain expected growth after an analysis of the efficiency;
- Help investigators with grant preparations and submission;
- Maintain the capacity to transfer technology and increase effectiveness of investment in technology transfer.