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Comitato di Indirizzo per la Valutazione della Ricerca

EVALUATION OF SCIENTIFIC PRODUCTION OF

Consorzio Interuniversitario Nazionale

“La Chimica per L’Ambiente”

Years 2001-2003.

Rome, February 7 th , 2007

Area	Placement	Rating[1]	Calculated products[2]	Merit Judgements[3]						Products	ETP Researchers	Property degree (average)[5]			Average IF[6]	Products with IF[6]
				E%	E	B	A	L	NV[4]			of products	of excellent products of structure	of excellent products average of the area		
03 - Chemistry	10/12 large	**0.73**	37.20	18	9	21	18	3	0	51	120.00	0.88	0.71	0.64	3.95	41
05 - Biology	11/22 small	**0.80**	2.40	33	1	1	1	0	0	3	3.83	1.00	1.00	0.60	2.80	3
09 – Industrial and information engineering	18/18 small	**0.55**	2.20	0	0	1	2	1	0	4	10.50	1.00	0.00	0.75	0.00	0
15c – Sciences and technologies of nano/Microsystems	11/29 small	**0.85**	3.40	50	2	1	1	0	0	4	1.50	0.42	0.37	0.50	3.87	4
15e - Sciences and technologies for sustainable development and governance: economic, social, energetic and environmental aspects	1/5 medium	**0.86**	8.60	40	4	5	1	0	0	10	3.00	0.94	0.96	0.64	4.62	9
15f - Sciences and technologies for evaluating and upgrading cultural goods	9/26 small	**0.80**	0.80	0	0	1	0	0	0	1	0.50	1.00	0.00	0.84	15.90	1

[1] = Calculated products divided products
[2] = E + 0.8∗B + 0.6∗A + 0.2∗L
[3] E%: % of excellent products on the total
E: Excellent; B: Good; A: Acceptable; L: Limited; NV: Impossible to evaluate
[4] These products cannot be evaluated: (a) products belonging to the typologies listed in DM 2206/03 (art 11); (b) products presented twice in the same structure, contrasting with the DM 2206/03 (art. 11 comma 3); (c) products with a property degree that cannot be assigned to the Structure
[5] The property degree of a product is given by the relationship between the number of authors belonging to the Structure (regarding also possible multi affiliations) and the total number of authors
[6] Impact Factor (ISI)
[7] Products presented by several structures have been calculated once

Scientific Areas

The Structure is active in 6 scientific Areas as categorized herein. Within the Structure is one large sized Area (Chemistry); one medium sized area (Sciences and technologies for the sustainable development and governance) and 4 small sized areas within the Structure (Biology, Industrial and information engineering, Sciences and technologies of nano/Microsystems, Sciences and technologies for evaluating and upgrading cultural goods). In other the 4 areas (Physics, Medical Sciences, Agronomy and Veterinary Sciences, Economics and Statistics) the Structure highlights the presence of researchers, however is not yet represented by products.

Excellent products are present in 4 Areas; in one Area there are also limited products. The Area “Sciences and technologies for sustainable development and governance” is placed in an important position in the segment of affiliation with a property degree of excellent products upwards of the national average of the Area, suggesting a possible leadership in the same Scientific Area.

Evaluation of the context data of the Area

N.	Area	Selected Products	Researchers (1)		Researchers in international mobility (2)		Researchers in Training (3)		Funding of Research projects (4)								
									Total	by MIUR (5)		by international bodies (6)		by its own means (7)		by other subjects (8)	
		n	FTE	years. person	years. person/ FTE (%)	n	n/ FTE		000 eur	000 eur	000 eur/ FTE	000 eur	000 eur/ FTE	000 eur	000 eur/ FTE	000 eur	000 eur/ FTE
1.	02: Physics	0	1.8	0.0	0.0	1	0.4		0	0	0	0	0.0	0	0	0	0
2.	03: Chemistry	51	120.0	0.4	0.3	100	0.8		2.010	1.271	11	0	0.0	156	1	583	5
3.	05: Biology	3	3.8	0.0	0.0	7	1.7		408	408	107	0	0.0	0	0	0	0
4.	06: Medical Sciences	0	0.5	0.0	0.0	1	2.0		0	0	0	0	0.0	0	0	0	0
5.	07: Agronomy and Veterinary Sciences	0	4.3	0.0	0.0	3	0.7		0	0	0	0	0.0	0	0	0	0
6.	09: Industrial and information engineering	4	10.5	0.0	0.0	12	1.1		43	0	0	0	0.0	0	0	43	4
7.	13: Economics and Statistics	0	0.5	0.0	0.0	1	2.0		0	0	0	0	0.0	0	0	0	0
8.	15c: Sciences and technologies of nano/Microsystems	4	1.5	0.0	0.0	0	0.0		13	0	0	0	0.0	13	9	0	0
9.	15e: Sciences and technologies for sustainable development and governance: economic, social, energetic and environmental aspects	10	3.0	0.0	0.0	0	0.0		1.695	417	139	10	3.3	98	33	1.170	390
10.	15f: Sciences and technologies for evaluating and upgrading cultural goods	1	0.5	0.0	0.0	0	0.0		7	0	0	0	0.0	0	0	7	14
Structure values		**73**	**146.4**	**0.4**	**0.3**	**125**	**0.9**		**4.176**	**2.096**	**14**	**10**	**0.0**	**267**	**2**	**1.803**	**12**

Weaknesses

- Blue field for indexes <50% of the area value

Strong points

- Yellow field for indexes ≥ 200% of the area value
- Orange field for the elements of description of the first structures, situated in decreasing order, absorbing 50% of the area value

1. Researchers of the Structure (tenure researchers) expressed in Full Time Equivalents (FTE), average for years 2001-2003
2. Researchers of the Structure (tenure researchers) in mobility abroad and researchers living abroad operating in the Structure (for periods longer than three months), average for years 2001-2003
3. Enrolled in PhD and instituted in (or supported by) the Structure by scholarship, and post-doc tenure in the Structure, average for years 2001-2003
4. Funding assigned by the Structure to research projects, for years 2001-2003
5. PRIN, FIRB, FAR, Centres of Excellence, etc.
6. UE Programmes Included
7. Funding and co-funding assigned by the Structure to research projects with unbound resources
8. National and international research agencies, funds provided by other Ministries (not MIUR), local bodies and companies

International mobility

The tendency towards international mobility is lower than the national average for the respective Areas. In 9 areas (of a total 10 areas) there has been no international mobility.

High training

The tendency towards higher training is above the national average for the Area “Medical Sciences”, while it is lower in 4 other areas. In 3 of these areas there has been no reported activities of higher training.

Access to research programmes

Research Programmes called (funded) by MIUR. The successful programmes are higher than the national average in “Biology” and “Sciences and technologies for sustainable development and governance”. They are lower for 8 Areas. For 7 of these areas there has been no acquisition of resources.

Research programmes called (funded) by UE or other international bodies. The successful programmes are always lower than the national average of the Areas. For 9 of these areas there has been no acquisition of resources.

Ability to attract funds from other subjects

It is higher than the national average in “Sciences and technologies for sustainable development and governance” but it is lower in 9 Areas. In 6 of these areas there has been no acquisition of resources.

Funding/co-funding of research with unbound funds of the structure

The engagement is in line with the national average of the respective Areas with one Area but it is lower in 9 Areas. In 8 of these areas there has been no acquisition of resources.

Evaluation of the activities of applicative upgrading

Structures	Evaluated Patents [1]					Deposited Patents				Active Patents				Gain €/000[2]	Costs €/000[3]	Index of Economy[4]
	E	B	A	L	TOT	2001-2003	%	Abroad	%	until 31/12/03	%	Abroad	%			
INCA	0	2	3	0	5	4	0%	2	1%	5	0%	4	1%	0.00	9.00	-1.80

Weaknesses
* Light blue field for the index of economy < 0

Strong point
* Yellow field for the index of economy > 0
* Orange field for the elements of description of the first structures, in decreasing order, absorbing 50% of the area value
(1) Patents selected for evaluation by the Structure and evaluated by the area panel (E, Excellent; B, Good; A, Acceptable; L, Limited)
(2) Gains obtained by the sale of the patents and their licences, expressed in thousands of € for years 2001-2003
(3) Costs for the application of patents and their management, expressed in thousands of € for years 2001-2003.
(4) (Gain - Costs) / Number of active patents up to 31/12/2003

A – Patents

5 Patents have been evaluated and none have been considered as excellent nor limited. The index of economy for the management of patents is negative.

F – Counselling and socio-economic services

The laboratory of micro-pollutants of Marghera is a centre of excellence in the network of INCA Laboratories. In particular, we intend to outline the contribution made by the Laboratory for the development of activities associated with transfer of knowledge and its services to support Companies (SME and Big Enterprises) and local Institutions, in particular those concerning the analysis of the polichlorodibenzodioxin. In this frame the Laboratory carries on activities of analysis, monitoring and research. The output of these activities is aimed at the commercial market. The Laboratory finances itself and during the period 2001-2003 yielded a profit of Euro 425,253,00. The positive economic gain of this Laboratory permitted the Consortium to use, yearly, its own financial resources which were re-invested in research activities and maintenance of the scientific instruments, creating a virtuous circle.

G – Research partnership with a value pair or higher than 500,000 Euro

INCA Consortium, coherently with the strategy of strengthening international relationships with scientific structures of excellence, has signed memorandum of understandings with foreign universities, with the aim of boosting the processes of transfer/exchange of scientific knowledge in the field of Sustainable Chemistry, as well as encouraging scientific cooperation by facilitating the exchange of researchers. In particular, INCA Consortium has signed a memorandum of understanding with each of the following; University of Rio Cuarto (Argentina), Suez Canal University (Egypt), Monash University (Australia).

H – Other activities

Since 1999 INCA Consortium has been implementing in Italy an initiative of awarding prizes to large and medium sized chemical enterprises which invest and develop environmentally friendly chemistry (the first initiative of this type in Europe, similar with the widely recognized “Presidential Green Chemistry Challenge” which has been active in the United States since 1997). The Prize "Clean chemical processes and products” is awarded yearly by the Consortium to the most innovative technologies presented by the participating Italian companies and researchers.

Evaluation of data concerning human and financial resources

Structures	Researchers (1)	Technical and administrative staff (2)		Investments (3)	Structure's incoming (expressed in thousands of € for years 2001-2003)					
		n	Staff/ Researchers	€/000	Amounts	by current transfers from the State	by transfers for investments from the State	by the sale of financial goods	by loans	by special accounting and management
INCA (4)	146.49	27.33	0.19	1.073	8,208	4,691	0	0	0	0

Strong points
* orange field for the elements of description of the first structures, situated in decreasing order, absorbing 50% of total value

Points of strong deviation from average
* dark blue field for values < 50% of national average value
* light blue field for values > 200% of national average value

(1) Researchers of the Structure (tenure researchers), yearly average for years 2001-2003
2) Technical and administrative staff of the Structure (tenure staff), yearly average for years 2001-2003
(3) Investments of the Structure for the purchase of scientific instruments, data base or software exclusively for cultural and scientific interest, with a purchase value higher than 500.000 € per bought unit, expressed in thousands of € for years 2001-2003
(4) Researchers (dependants) from other bodies, in part time regime (calculated at 50%) included

Analysis of NUV/CIV reports

National Interuniversity Consortium "Chemistry for the Environment"

1) Elements of evaluation of the scientific activity

INCA Consortium assembles (as at 2003) 28 universities with 75 research units voluntarily constituted. 44 research units, belonging to 19 universities (8 in Northern Italy, 5 in Central Italy and 6 in Southern Italy, with a homogeneous territorial distribution), with 6 laboratories participating in the evaluation. Every research unit was given the opportunity to present a maximum of 5 products. 228 products were voluntarily presented (with an average distribution from 3 to 5 products per research unit). 73 of these products have been selected for the evaluation. To give a broad overview of the research activities carried out by the Consortium, we chose for evaluation works that demonstrated a high scientific impact, and additionally we selected examples of work that, although were less innovative, underlined the importance of environmental monitoring and elaboration of methods for waste recovery and the treatment of polluted sites, which represent an important part of the Consortiums activities. The distribution of products, based on the expressed criteria, brought forward a selection of products from 15 universities (based on 19 participating), suggesting that most of the assembled universities produce scientific works of good quality. 28 Research units out of 44 were selected. Certain themes, chosen according to the IF, displayed a greater scientific performance. These themes are: (in decreasing order) Clean Combustion, Environmental Catalysis, Detoxification, Green Chemistry, Cultural Heritage, Biochemistry, Natural Processes, Exploitation of natural sources, Analytics, Material renewal/recycle, Environmental Toxicology. The production of cultural interest for the Consortium is spread and of a good level, with peaks of excellence in the University of Venice, University of Turin, University of Trieste, University of Palermo, University of Catania and in the Polytechnic of Milan.

The majority of 73 presented products are situated in the area of Chemistry (51). Additional products are present in the Panel Biology (3) and Engineering (4). There is an important contribution in the special panels as concerns 15e (10), and to a small extent for 15c (4) and 15f (1).

2) Elements of evaluation of the social economic impact of the research activities.

During the years of 2001-2003, 4 patents have been filed and assigned exclusive property of the Consortium, 2 of which are abroad. Until 31.12.2003, 5 patents were active of which 4 were abroad. Referring to the entrepreneurship, we intend to outline the specific role of the Laboratory of Marghera, a place of excellence within the network of the INCA Laboratories. In particular, the Laboratory conducts research activities and analysis in the field of polichlorodibenzodioxin, addressing the needs of the commercial market with its services aimed not only to institutions, but also to Enterprises (SME and large Enterprises). As a result of the strong commercial activity, the Laboratory generates a substantial income which is reinvested in research activities and the purchase of scientific and technological equipment. Furthermore, since 1999 INCA Consortium has been implementing in Italy an initiative of awarding prizes to large and medium sized chemical enterprises which invest and develop environmentally

friendly chemistry (the first initiative of this type in Europe, similar with the widely recognized “Presidential Green Chemistry Challenge” which has been active in the United States since 1997).

3) Ways of connection between the evaluation of research and the internal decisional processes

The Scientific Board is the statutory body which periodically evaluates the activities of the Research units. Allocation of funding is agreed upon during such evaluations. Notwithstanding the scientific boards evaluation, the Consortium decided to submit its activities for two additional assessments by an external Commission of Evaluation. In 1998, INCA submitted an activity report, subject to a quality evaluation by an International Commission of Evaluation, and in 2003 for a second evaluation which examined 69 Research units. 28 of these research units participated for the first time and were active in one or more of these fields: biological and biomimetic enzymatic techniques; heterogeneous catalysis for sustainable synthesis and environmental decontamination; sustainable synthesis; techniques of decontamination; chemistry of ecosystems; new techniques of monitoring. The Commission of Evaluation was comprised of persons with significant experience in chemistry and the specific areas of interest, as well as exhaustive knowledge of the Italian university and research system. Additionally, the Commission had extensive knowledge in the areas of evaluation and audit of quality, funding systems for national research and the management of research. The Commission of Evaluation examined the programmes of the research units with a particular emphasis on: - Scientific quality in an international perspective, using international standards for university research – Productivity with scientific publications and results of applied research. – Relevance of the role and of the works in the context of INCA Consortium – Chance of development of the Research unit in the context of INCA. The evaluation was based on the criterion of international standards. The Commission considered: the contributions to international conferences and the integrity of scientific results; the original approach and ideas facing scientific and technological problems; other indexes of international reputation besides publications, for example, the status within the international scientific community and the nominations as a result of its scientific status. The Commission confirmed the findings of the first assessment: the reports of auto-evaluation were a formidable unprecedented engagement for Italian chemistry. The information collected through these reports permitted to the Commission to deepen the research activities of the single research unit. Judging the 5 year period leading up to 2003, the Commission of Evaluation considered that INCA has ameliorated its external visibility through a diverse set of additional activities such as, education, publicity and international participations, as well as organizing international schools and conferences. The Consortium established international cooperation on projects co-financed by the Italian Ministry of Foreign Affairs in the frame of programmes of cultural and scientific exchange. Such cooperative projects were developed with Argentina and Russia. INCA also represented Italy in the European Commission's Cost Action 29 in Green and sustainable Chemistry and developed new academic courses and laboratories in the University of Suez (Egypt). The role of INCA Consortium has a positive effect as value added for its units.

The Directive Board of INCA elected the recommendations of the Commission as guidelines and gave to its Scientific Board the task of following these guidelines in determining the Consortium policy, where it concerns the admission of new research units, the assignment of grants on research projects and offering counsel to those research units which don not reach the recommended standards.

4) Evaluation elements of adequacy and competence of human resources

The upgrading activity is strategic for the Consortium, aimed at preparing young experts in science and industrial developments of the future. For the educational activities the Consortium has granted scholarships and post-doctoral fellowships. Among the activities addressing the professional development of researchers we intend to highlight the broad conferential activities realized by the Consortium. These scientific meetings represent an important means of spreading knowledge with the most important representatives of Chemistry for the Environment.

5) Cognitive and evaluation elements of mobility and international cooperation

Considering the recent constitution of the Consortium, the mobility of researchers of the Structure (excluding the university mobility) still cannot be very high: 7 months in 2001 and 7 months in 2003. This data will grow rapidly considering the bilateral contacts in which the Consortium is developing with foreign Bodies and/or universities.

At the international level, the Consortium has developed a strong action concerning education in the field of chemistry for the environment. In particular, since 2003, two projects financed by the Italian Ministry of Foreign Affairs (MAE) have permitted lengthy stays for foreign researchers to undertake research activities in Italian laboratories, particularly for researchers coming from Russia and South America. MAE signed with INCA two important papers for the international cooperation in the field of Green Chemistry which involved Argentina and Russia. Although at the economic level relevant results are yet to be realized, it is important to highlight the engagement of the Consortium, in strengthening relationships with other excellent scientific structures at the international level, through the signature of a memorandum of understanding. Such agreements have been signed with the University of Rio Cuarto - Argentina, Suez Canal University - Egypt (University Education Development Centre), Monash University - Australia (Centre for Green Chemistry).