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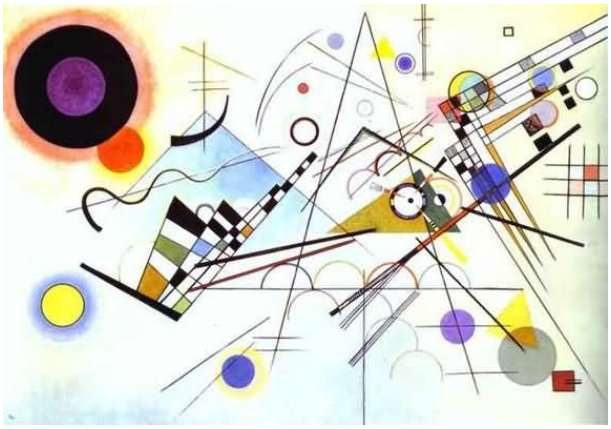

RESCAR
Report on researchers careers

Sveva Avveduto
M. Carolina Brandi
Wendy Hansen

What is IRPPS?

IRPPS is an Interdisciplinary Research Institute that conducts studies on demographic and migration issues, welfare systems and social policies, on policies regarding science, technology and higher education, on the relations between science and society, as well as on the creation of, access to and dissemination of knowledge and information technology.

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Project Synopsis and Executive Summury

Overall objectives:

The overall objective of the study is to collect existing data on researcher stocks and to develop new data collection for researcher mobility and careers.

Specific objectives:

Carry out the work under three work packages:

WP1 – data collection and analysis on doctorate graduates.

WP2 – survey of doctoral students and post-docs in social sciences and engineering

WP3 – survey of life scientists in the public and private sector.

Planned Results Final Report:

WP1: data collection and analysis of doctorate holders

WP2: survey and analysis of students and post-docs in social sciences and engineering.

WP3: survey and analysis of life scientists in the public and private sector: the report will include a description of the methodology, ten country reports presenting analysis of the survey results and a summary of key findings (word document). The report submitted under WP3 will also include the delivery of a database of the information collected with the e-survey (electronic database). The report will include the analysis of the ten countries' results as well as a summary of the key findings.

This report presents only the results or WP3 for the three countries analyzed by CNR-Irpps: Italy, Spain and Portugal

Activities (summarised) under WP3:

A kick-off meeting took place where the methodology was presented as part of the project overview (e.g. with WP1 and WP2). An electronic survey to gather information on researchers in the life sciences was designed. A 2nd workshop was held to discuss WP2 and WP3 at which time a discussion of the questionnaire and WP2 work programme took place. The e-survey was carried out; the responses collected and set up on a series of ten databases (one for each country). Country experts carried out analysis of the country results, on an individual basis. A report was prepared to include documentation of the design and carrying out of the survey, the database, ten country reports prepared by the country experts as well as a summary of key findings prepared by the PM.

The breakdown by researcher partner is as follows:

MERIT – Main contractor

Partners:

CNR-IRPPS: Consiglio Nazionale delle Ricerche–Istituto di Ricerche sulla Popolazione e le Politiche Sociali

GEM-CITE

Gogte Institute of Thechnology

IKU: University of Budapest

INCENTIM

Department of Science and Technology Policy Research

Centre for European Economic Research

1. Introduction

This contribution to the RESCAR project analyses experienced EU life scientists. Experience was determined by a set of parameters developed for the citation and patent information sources and according to criteria such as number of citations and number of patents according to national representativeness.

A sample frame of life scientists in ten countries (Czech Republic, France, Germany, Hungary, Italy, Norway, Portugal, Spain, Sweden and the UK) was compiled based on experienced life scientists listed in citation and patent databases. A survey instrument was created and piloted and carried out online.

The results of the survey were analysed and reported on. For each of the main areas of interest (personal and education profile of the life scientists, career characteristics and job satisfaction), research partners prepared individual country reports. Key findings were extracted and compared and contrasted.

Information on the personal and education profile was a key starting point to inform on the profile of the sample and to provide for development of indicators (e.g. different choices among men and women; national similarity and contrast). A major focus is on the mobility of European experienced life scientists and sector and international mobility is analysed. A second major area of interest is on job satisfaction of experienced life scientists.

The final report has been prepared to include a thorough documentation of the methodology, discussion of key findings and implications and a presentation of ten individual country reports. An electronic database of the entire data set (anonymised) has been assembled and generated in user-friendly .csv format amenable to a variety of packages (e.g. MS Excel, SPSS, Dbase).

This Report presents only the common general prts (written by Wendy Hansen) and the results of the research activity carried out by CNR-Irpps (Sveva Avveduto and M. Carolina Brandi) on the three contries selected: Italy, Spain and Portugal.

2. Background

The study *Collection and analysis of existing data on researchers careers and implementation of new data collection activities* is motivated by the desire of ERA to build a common science and technology base. Highly skilled resources are key for the European Research Area to foster the European Knowledge Society. The skills and availability of highly skilled human resources are essential for the European Union to develop and adopt leading edge science and technology for improving economic performance and enhancing social benefits.

The overall aim of the study is to collect existing data and information and develop new data and information on researchers and their careers. The study has three components (work packages). Work package 1 (WP1) sets out to collect existing data and information on researchers. Work package 2 and work package 3 will see the development of new survey instruments for collecting information on researchers' networks and on individual researchers.

The goal of WP3 is to develop and test a new methodology to collect information on characteristics and career dynamics of experienced researchers in the life sciences in the public and private sectors. The information gathering centres around three elements:

- Personal and education characteristics
- Career characteristics
- Job satisfaction

The task is to carry out the study for ten (10) countries in the EU: the Czech Republic, France, Germany, Hungary, Italy, Norway, Portugal, Spain, Sweden and the United Kingdom.

The life sciences included are based on the classification of ISCED '97. The focus is on researchers in the life sciences in mid-career (as opposed to fresh graduates). The sample frames were to be produced from two key databases for obtaining contact names for 'experienced' researchers in the life sciences as measured by number of publications (Thomson citation database) and by number of patents (European patent database).

This study is about gathering information on experienced researchers in the life sciences in selected European countries. The basic unit of analysis is the individual. In order to

locate the individuals, the citation and patent databases were used to provide as much information as possible (existing e-mail references; research affiliations) to obtain the e-mail address of the researchers. An electronic survey designed for this study was sent to individual researchers.

3. Methodology

The methodology was developed based on the need to collect new and timely information on researchers in the life sciences in ten EU countries and in particular on *senior researchers* in consideration of providing a link to previous studies (e.g. NetReAct) to broaden the knowledge and understanding of researchers in the life sciences.

3.1 Designing the survey questionnaire

A questionnaire-based survey was designed and conducted as an e-survey with direct mail-out to individual researchers in ten countries. The questionnaire was designed to collect information on researchers in the public and private sectors in the life sciences. The questionnaire also provided the respondent to indicate he/she would like to be made aware of the results of the survey when/if they are made public. This option is seen as a response rate enhancer and it is an important element of an e-survey of professionals in the scientific community .

The questionnaire addressed three main areas of interest including:

Personal and education statistics

- Gender
- Age
- Civil status
- Country of birth
- Country of citizenship (allowing for multiple citizenship reporting)
- Education - information on 1st bachelor/professional degree and 1st doctorate including field of degree, year of degree and country of degree

Career characteristics

- Country of current employment
- Sector of current employment including details on positions in higher education sector (tenured and non-tenured) and non-employment
- Time elapsed from highest degree to 1st permanent employment in R&D
- Time use – time spent in research and other activities
- Sector mobility

- Mobility between public and private sectors and within the public and private sectors
- Factors that influenced the mobility

- International mobility – mobility – current, past and planned in the future
  - Factors that influenced the mobility, the return to the country and the plans for the future

Job satisfaction

- Rating of job conditions and expectations
- Rating of adequacy of degree training
- Rating of suggestions on how to increase the attractiveness of a career in science

There were a total of eighteen core questions but in the areas of career characteristics (e.g. mobility) and job satisfaction, there were a series of questions attached depending on the answer. For example, if the person indicated he/she had worked abroad in the past, a link was made to another series of questions on factors that influenced their career choice.

The question was presented in English only. This approach was taken with the bias towards English in scientific literature and international research and given the time and resource constraints, it was agreed that one language (English) would not limit the outcome of the pilot survey.

3.2 Universe and sample

The countries vary in size and R&D strength. The selection represents countries from across the EU including new member states. There are ten countries covered in the study: Czech Republic, France, Germany, Hungary, Italy, Norway, Portugal, Spain, Sweden and the UK.

3.2.1 Defining the life sciences

A list of fields of life sciences was developed using guidelines of ISCED ’97 and the Eurostat’s Fields of Education and Training Manual (December 1999). This meant including Group 422 environmental science. The list was discussed among the research team and we obtained final approval of our field of specialization (e.g. field of degree) from IPTS.

The list of disciplines includes:

Group 421 Biology and biochemistry:

- Biochemistry
- Biology
- Biometrics
- Biphysics
- Botany
- Entomology
- Genetics
- Limnology
- Microbiology
- Molecular biology
- Ornithology
- Parasitology
- Pharmacology
- Toxicology
- Virology
- Zoology

Group 422 Environmental science:

- Ecology
- Environmental science

3.2.2 Identification of the researchers' e-mail addresses

The target population is researchers in the life sciences in the public and private sectors. There is a specific focus on senior researchers in contrast to earlier studies that focus on fresh graduates and post-docs.

The task is to collect information on researchers with experience in the life sciences to expand information gathering and analysis beyond doctoral graduates and post-docs as targeted in the NetReAct project. The challenge was to build a database of valid e-mail addresses of experienced researchers in the life sciences to invite them to participate in an e-survey developed around key client interests of personal and educational characteristics, career characteristics and job satisfaction measures.

Two key sources for information on experienced researchers and of particular relevance to researchers in life sciences are records of their research activities as measured by outputs with citations and patents. Researchers in the public and private sectors can be identified from citation and patent data analysis. The databases of ISI-Thomson (citations) and EPO (patents) provide starting points for research for e-mail addresses.

Citations

Names of academic researchers were drawn from top searches in the Web of Science database. The publication data RANGE = 1/1/2004 to present which brought the database to three full years plus approximately the first two months of 2007. The timeliness of the database enhanced the possibility of identifying and locating researchers' details to obtain an e-mail address for the survey invitation. The life sciences were categorized according to Web of Science Field of Science Codes. Searches were based on the "OR" of the following codes:

a) Biochemical research methods
b) Biochemistry and molecular biology
c) Biology
d) Biophysics
e) Ecology
f) Entomology
g) Environmental sciences
h) Genetics and heredity
i) Limnology
j) Microbiology
k) Ornithology

l) Parasitology

m) Pharmacology and pharmacy

n) Plant sciences

o) Toxicology

p) Virology

q) Zoology

A search was carried out for each of the ten targeted countries by searching for the country name in the affiliation field within the database and limiting the results to the codes listed above.

Table 1 presents the results of the country searches using the citation data.

Tab. 1 - Results of country searches - citation

Italy	18,587 records	61,682 Authors	10,082 Institutions
Portugal	3,546 records	10,362 Authors	2,699 Institutions
Spain	19,045 records	48,892 Authors	8,569 Institutions

Source: RESCAR WP3 E-survey of life scientists, July 2007

Patents

For the creation of the sample of inventors for gathering names of researchers in the life sciences, a stepwise approach was followed.

As a source file, the EPO patent database has been used. The first step was to identify the relevant technology domains that pertain to biomedical research. This was done using the Science-Technology concordance table developed by Incentim-CWTS. This S-T concordance table relates fields of science to technology domains by using non patent references: a more outspoken relationship between a scientific field and a technology domain is assumed if relatively more citations within a technology domain refer to the scientific field.

For biomedical science, the following technological domains (denoted by the IPC classification) can be considered as most appropriate:

- 'A61': Medical or veterinary science, hygiene
- 'C07': Organic Chemistry

- 'C12': Biochemistry, Microbiology, Enzymology; Mutation or genetic engineering
- 'G01': Measuring, Testing.

In addition, only patents *applied for after 2000* have been considered to ensure high levels of accuracy and relevancy when contacting identified inventors within latter steps of the process.

After selecting all relevant patents within these technology domains, the ten countries under study were selected (based on nationality of applicants).

Table 2 presents the results of the country searches using the patent data.

Tab. 2 - Results of country searches – patents

Italy	2,431 Patents	4,032 Inventors	995 Organizations
Portugal	48 Patents	90 Inventors	32 Organizations
Spain	531 Patents	1,478 Inventors	290 Organizations

Source: RESCAR WP3 E-survey of life scientists, July 2007 (Raw un-cleaned data)

3.2.3 Preparation of data

Both the citation and patent searches provided a rich collection of potential survey respondents. However, prior to contact, the names had to be filtered and cleaned to improve the likelihood of a successful respondent. The results of these cutting processes are presented in Table 3.

Tab.3 - Results of filtering of citation and patent searches

	Raw Sample Authors	Authors from Local Institutions	Minimum Papers per Author	Final Number of Names
Italy	61,682	32,027	8+	1,651
Portugal	10,362	3,603	3+	1,226
Spain	48,892	23,316	9+	1,583

Source: RESCAR WP3 E-survey of life scientists, July 2007

With the citation data, the first step was to isolate those individuals who are most likely from local institutions in the target country (removing collaborators from foreign institutions, visiting professors, etc.). After this filtering process reduced the pool of

authors, the set was further reduced by requiring that each author have at least a specified number of papers published during the time period covered by the set. Requiring a minimum number of papers increased the chances that researcher would be either mid-career or above. Since the records in the citation set covered three years plus two months, a minimum threshold of three records was selected as a base value. The journal coverage of Web of Science is highly selective and does not include conference articles or non-peer reviewed material. The likelihood that students or recent graduates could obtain three accepted articles in three years in this information source is low.

In countries that had large numbers of high frequency authors, the threshold was increased to a value that produced a final pool of around 1,500 names per country (the survey target for each country was 1,000 names). The results of this process yield what can be loosely described as the most "highly productive" researchers in each country. If a cut-off of three articles was used uniformly across all countries, the name pools would vary greatly in size. This size difference would have presented problems in identifying appropriate selection criteria since the survey samples across countries were supposed to be of roughly similar size. With the current process, the countries are equal in the sense that the most "highly productive" researchers are included in the pool. However, the definition of "highly productive" varies by country. There are other alternatives to this name selection process such as randomly selecting names or including citation indexes in the selection process. If this survey is repeated, the results of this pilot study should be assessed to determine the effectiveness of the cutting techniques at properly targeting the desired pool of researchers.

Within the citation data, there were three types of names:

1) Names that included possible email addresses embedded in the reprint information (Pass1).
2) Names that could be associated with a specific institution with a high degree of certainty (Pass 2).
3) Names that could be associated with short list of possible institutions. Ultimately, the names that met the third criteria where collected but not needed. (The first two passes within the citation data combined with the patent data provided a sufficient pool of names to meet the targets for the survey).

Like the citation data, the patent data also needed preparation. The first step was to remove duplicate names that appeared in both patents and citations. This step reduced the effort

required to contact survey participants by lowering the possibility that the same individual would be contacted twice. Prior to name matching, the inventor names required cleaning using a fuzzy matching algorithm with cross-field matching to correct for name variations inherent in the data. After de-duplication, applying a filter that required that an inventor have a specified number of patents within a specified time frame further reduced the data set. As with citations, this cutting process increased the likelihood that researcher would be at least mid-career or above.

This de-duplication and cutting effort results are presented in Table 4.

Tab. 4 - De-duplication and refinement of country data sets

	Raw Sample Inventors	Possible Duplication with Authors Set	Minimum Patents/Year Criteria	Final Number of Inventors
Italy	4,032	198	6+	112
Portugal	90	6	1+	80
Spain	1,478	23	6+	115

Source: RESCAR WP3 E-survey of life scientists, July 2007

Unlike the citation data, there was no email address information embedded within any record. However, there was a one-to-one correspondence between inventors and organizations, so at least the person's organizational affiliation was clearly known.

3.2.4 Identification of the individuals and e-mails

A mail-out list of e-mail addresses was assembled based on starting points/references provided by the citations and patents files and then researched on the Internet. In some cases, a number of e-mail addresses were provided and research was carried out to determine the most likely current e-mail address. Names, e-mail addresses and affiliations provided key information for the search (Table 5).

Tab. 5 - An example of searches based on provision of possible e-mail links

Author (Cleaned): 9+ Spain	Reprint Address (org name)	Email provided	E-mail identified for database
Reprint Match	**Top 2 Items**	**Top 2 Items**	
Soriano, V	Hosp Carlos III [19]; Calle Nueva Zelanda 54 [15]	vsoriano@dragonet.es [50]	vsoriano@dragonet.es
Martinez, A	CSIC [6]	ATMartinez@cib.csic.es [6]	ATMartinez@cib.csic.es
Martin, J	Univ Leon [9]; INBIOTEC [9]	degjmm@unileon.es [19]; dcgjmm@unileon.es [1]	degjmm@unileon.es

Source: RESCAR WP3 E-survey of life scientists, July 2007

A second scenario (Pass2) was the provision of a name with affiliation but no e-mail address provided. In this case, the available information (e.g. name + affiliation reference) was used to identify the researcher through Web searches (Table 6).

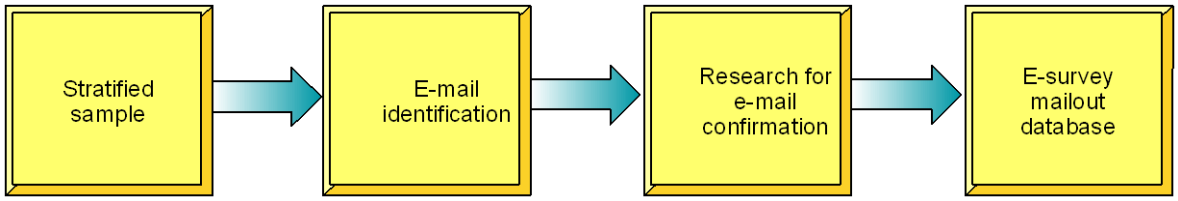
Tab. 6 - An example of searches based on name and affiliation

Author (Cleaned):8+ Italy: Not Reprint	Author Affiliation (Name)	E-mail identified for database
One Affiliation Only	**Top 1 Items**	
Scalise, G	Univ Politecn Marche [2]	g.scalise@univpm.it
Fadda, G	Univ Sacred Heart [3]	giovannifadda@rm.unicatt.it
Gessa, G L	Univ Cagliari [2]	lgessa@unica.it

Source: RESCAR WP3 E-survey of life scientists, July 2007

The research partners carried out the searches to confirm supplied e-mail addresses and/or find others. The results of the Internet searches were collected and a database of e-mail addresses (by country) was assembled (Figure 1).

Fig. 1 - Assembly of the e-survey mail-out database



The mail-out of the invitations took place in two waves, one week apart. Two weeks after the mail-outs, a reminder notice was sent.

The results of the e-mail-out suggest that the use citations and patents as starting points is a valid, useful and practical approach. Only one in ten (9.9%) of the invitations were not successful (e.g. did not reach destination researcher). The use of the citations, and more than in the case of patents, allows timely targeting of researchers with citations providing information on authors up until the beginning of 2007 (Table 7).

Tab. 7 - Loss of invitations – 'bouncers'

Country	Invited	Bouncers	Net invited
ESP	1,348	109	1,239
ITA	1,359	83	1,276
PRT	776	55	721

Source: RESCAR WP3 E-survey of life scientists, July 2007

Some of the bounced e-mails were due to invalid or out-of-date e-mail addresses identified. However, the bouncers also reflect growing IT-preventative measures such as firewalls and spam filters with the researchers' host IP providers. The risk associated with carrying out a successful e-survey is growing in an environment of increasing efforts to minimize SPAM and other invasive e-mails.

The positive results of the e-mail out provide validity to our hypothesis that sending an invitation from a edu domain may help with getting past firewalls, SPAM filters and other barriers on-line people are using to deal with today's e-mail overload. At the same time, links to the research partners were provided and the researchers could 'research' our research team to verify validity.

A grand total of 1,118 e-invitations to the 11,293 life scientists invited 'bounced' back to the MERIT host server. A net figure of 10,175 life scientists were invited to participate in the e-survey.

3.2.5 Response rates

Response rates and number of useable questionnaires were higher than expected thresholds for all of the countries examined. At the outset we had two goals. First, we needed to meet a minimum of 100 respondents per country. Second, we aimed to have a minimum response rate of 10%.

There are two response rates to consider. One is based on complete questionnaires and a second on the total of complete and incomplete questionnaires. Questionnaires could be incomplete and still provide valuable information for one or more themes of the survey. For example, a survey might be complete and the respondent did not wish to provide information on gender. The rest of the answers are still valuable and the sample size is reduced for gender analysis and implications. Incomplete questionnaires are taken into careful consideration for the country analyses.

Table 8 presents the figures showing the number of e-mail invitations (valid) and the response rate for fully completed questionnaires and partially completed questionnaires. For each country we met our minimum requirements in terms of response rate and number. Note: there were a number of dropouts once the respondent examined the survey in-depth. The figures have been deducted from the totals.

Tab.8 - Response rate by country

Country	Net invited	Completed	Partially completed	Total submitted (complete + incomplete)	Drop outs	Response rate (complete)	Response rate (completed + incomplete)
ESP	1,239	268	37	305	15	21.6%	24.6%
ITA	1,276	264	55	319	11	20.7%	25.0%
PRT	721	164	25	189	4	22.8%	26.2%

Source: RESCAR WP3 E-survey of life scientists, July 2007

The highest response rates were observed among the southern countries. In fact, the response rate for Italy, Portugal and Spain was at least 25%. Figure 2 illustrates the

different response rates among countries for overall response rate and for completed questionnaires only.

4. Key findings and implications

4.1 Key findings

- Most of the researchers were native born. The share of native born went from some seven in ten in France to more than nine in ten in Italy. Foreign-born researchers typically came from other countries within the EU. Representation from other parts of the world such as the United States and India is insignificant.
- International mobility is partially revealed through the share of researchers that report earning their bachelor/1st professional degree in a different country than their 1st doctorate. In general, some one in ten reported a different country for their 1st doctorate compared with the country where they earned their bachelor/1st professional degree.
- Researchers used a variety of sources for financing of their doctorate studies. Typically seven or eight in ten (and higher for some countries) reported having funding from a scholarship. The source of scholarship funding was typically either the higher education sector or the government. In most countries (e.g. Italy, Sweden, Hungary, Czech Republic) it was the higher education sector providing the lion's share of scholarship funding and in countries like Germany, Norway it was the government sector. Employment income typically came from teaching assistant salaries/fees and research assistant salaries/fees. For most, it was research assistant employment over teaching employment that provided most of the employment income.
- Although most of the respondents were found to be working in their country of birth, there was considerable variance among the countries examined. In countries like Italy, Spain, the Czech Republic and Hungary, at least nine in ten were working in their country of birth. In countries like France, Sweden and the UK it was around seven in ten. Among those working outside of their country of birth, they were typically located in EU countries (except for the case of Norway).
- As one might expect, most of the persons who responded to the survey

were in the higher education section (based on sample selection and responses). Occupations in life sciences tended to dominate followed by teaching. Women tended to have a higher share in the government sector then men. In countries like Spain and the UK, about 3% separated the share of women in the government sector compared with men: in Spain, 34% of the women and 32% of the men were in the government sector; in the UK, 22% of the women and 19% of the men were in the government sector. In countries like Italy and Norway, the different career options of men compared with women is more evident: in Italy, 28% of the women and 18% of the men are in the government sector; and, in Norway, 33% of the women and 22% of the men are in the government sector.

- Not surprisingly most of the researchers who filled in the questionnaire were working in professions in the life sciences. There were notable differences comparing men and women across the countries. In Spain, whereas 47% of the men were in occupations in the life sciences, only 37% of the women are in occupations in life sciences. In the UK, the gap is narrower with 60% of the men and 57% of the women in occupations in the life sciences. In Hungary, the trend is different where the results show that 50% of the women and only 40% of the men are in occupations in the life sciences. Teaching is of course the second most popular occupation and again there are observable differences between men and women.
- The time elapsed from the highest degree to 1st permanent employment in R&D shows regional differences and this is not surprising if one considers the various R&D funding policies and practices in the life sciences across the EU. For example, in Germany, one in five did not obtain permanent employment in R&D and in Sweden and Norway, the figure was up to one in three. In Italy, fewer than one in ten did not obtain permanent employment and in the UK almost no one reported they did not obtain permanent employment in R&D. In Hungary less than 5% did not obtain permanent employment in R&D but in the Czech Republic it was twice the share at 10%.

- The responses to the questionnaire reveal that women tend to spend more time on research and less time on teaching compared with men and men spend more time on teaching and management/administration, in general. In Italy, Women spend 59% of their time on research compared with 50% for men. In some countries women did spend less time on research then men — in Hungary and Norway, for example.
- Flows between public sector to the private sector did take place and they varied from country to country. For example, in France, 11% reported a move from the public sector to the private sector , the same as from the private sector to the public sector. In the UK, the flow of public sector to private sector was outdone by the flow from the private sector to the public sector: 10% had moved from the public sector to the private sector and 17% had moved from the private sector to the public sector. This was the typical trend. In Germany, 11% moved from the public sector to the private sector and 6% from the private sector to the public sector. In Sweden, 14% reported going from the public sector to the private sector and 10% from the private sector to the public sector.
- For each country examined, the greatest sector flow was within the public sector itself. Employment opportunities were cited across a number of countries as important factors for the move from the public sector to the private sector as were working salaries/wages. With regards to the flow in the opposite direction, from the private sector to the public sector, it was the freedom to pursue research that scored high in a number of the countries.
- Researchers in the life sciences did travel abroad for work. Strong factors include the freedom to pursue research, R&D funding and employment opportunities.
- The main reasons for staying in the country of birth are related to family and general working conditions and job opportunities. International mobility was not an option for many because of family responsibilities and due to cultural conditions. When asked about why they did not travel abroad, the results hinged less on the negative factors abroad (e.g. lack of financial incentive, lack of R&D funding and so on) and more on the

factors described above.

- Life scientists who had worked abroad returned because of employment or contract ending abroad and for reasons like family responsibilities.
- Interestingly, the researchers in life sciences who responded to the questionnaire provided fairly positive feedback on their job satisfaction and expectations. Perhaps as one might expect from researchers in France, job security ranked *very satisfied.* And France was not alone — high satisfaction with job security showed up again and again. Other positive feedback is the form of the high satisfaction with the *responsibilities* of the job.
- In terms of adequacy of degree for career preparation, a fairly consistent picture emerged. The scientific/subject matter skills score high on the 'adequate' scale and management/administration skills are highlighted as low on the 'adequate' scale. This is a common message from the researchers in the life sciences. In Italy and the UK, fore example, management/administrative skills scores only 2.4 on a scale of 5.0; in Hungary and Germany it scores only 2.7 and in Sweden 2.6.
- There is also a fairly clear message in terms of improving the attractiveness of a scientific career — increase public awareness of science and promote young people's interest in science. The Swedish results score this as 4.1 on a 5.0 scale. The other two dominant factors are salary/benefits and improving job security (even though there were positive indications of job security earlier). Countries like Hungary and the Czech Republic continue to have problems and score many of the factors quite high including ranking the need to increase salary/benefits as the most critical. In Italy, the need to increase international mobility ranks high, almost as high as the need to increase salary/benefits.

4.2 Implications for future work

Getting 'buy-in' from the respondents is important for response rate and perseverance through a questionnaire such as the one we designed for this pilot study. There are two key components used in this e-survey that need to be highlighted.

First of all, the e-survey was sent from an IP address with .edu. It is likely in these times of SPAM and growing issues of invasive e-mails that the .edu allowed the e-mail through organizational and personal e-mail filters. For this type of e-survey to be successful, **consideration needs to be given to the IP provider and platform used to approach the target group.**

Second, and very important, this survey provided the respondent for an option to provide an e-mail address in order to be informed of the output/outcome of this study. Specifically the option read:

If you would like to be notified of when and where the results of this survey are available, please enter your e-mail address.

Table 9 presents the figures for the three countries.

Tab. 9 - Respondents requesting notification of study results - measure of response rate

	Number of respondents requesting notification of results of the study	As a share of total respondents
Italy	201	63.0
Portugal	124	65.6
Spain	196	64.3

Source: RESCAR WP3 E-survey of life scientists, July 2007

Analysis of the results of this show that a large share of the respondents are interested in the results and also some interesting country difference. For example, about two thirds of the respondents in countries like Italy, Portugal and Spain indicated they wish to be advised of the results of the study. The results of the pilot e-survey suggest **the use of a 'return' for time and effort invested can enhance the response rate and completion of the questionnaire.**

5. The country reports

5.1 Italy

The online questionnaire was sent out to 1,276 persons in Italy working in life sciences. We received 319 responses to the mail-out, of which 264 questionnaires were complete and 55 were partially completed. We include both complete and incomplete questionnaires and so our sample size is 319.

Tab. ITA1 - Survey response rates — Italy

Number of e-mails in the sample	1,276
Number of responses	319
Of which fully completed	264
Of which partially completed	55
Response rate – fully + partially complete	25.0%
Response rate – fully complete	20.7%

Source: WP3 survey of life scientists, July 2007

5.1.1 A profile of the personal and education characteristics of the researchers

Gender

In the sample, most respondents are men (73.6%), a figure that does not reflect gender distributions in the field of biology in Italy, where women are in the clear majority, both in universities and in public institutes. This is something that needs further exploration. Is the representation of women due to their lower publishing/patenting activities or less representation in authoring/patenting teams or perhaps it is due to the lack of interest to respond to the questionnaire.

Age

Respondents younger than 40 years make up 19.2% of the total. More than half (53.9%) are aged between 40 and 54. Most of the respondents therefore fall into the intermediate age category, which is generally considered the most productive period of a scientific career. Table ITA2 shows that female are on average lightly younger than the group of male respondents (see age class 35-39).

Tab. ITA2 - Age distribution of life scientists by gender - Italy

	Total	Men	Women
	295	217	78
		Percent	
Under 35	8.5	8.8	7.7
35-39	10.8	8.8	16.7
40-44	17.6	18.4	15.4
45-49	20.3	20.3	20.5
50-54	15.9	15.2	17.9
55-59	12.2	12.4	11.5
60-64	10.2	11.1	7.7
>=65	4.4	5.1	2.6

Note: Figures may not add to 100% due to rounding
Source: WP3 survey of life scientists, July 2007

Civil status

A large majority of the interviewees (81.1%) have family (only 135% were single), and 66% have children (Table ITA3).

Tab. ITA3 - Civil status - Italy

	Total	Men	Women
Number of responses	295	217	78
		Percent	
Total	100.0	100.0	100.0
Single			
Without children	11.5	9.7	16.7
With children	1.7	1.8	1.3
Married			
Without children	20.7	19.8	23.1
With children	60.7	63.6	52.6
Divorced or widowed			
Without children	1.7	0.9	3.8
With children	3.7	4.1	2.6

Note: Figures may not add to 100% due to rounding. Source: WP3 survey of life scientists, July 2007.

Country of birth and country of citizenship

Almost all the respondents (95.3%) were born in Italy. Only 11 were born elsewhere. Similarly, 96.9% of the respondents either hold Italian citizenship only or else selected Italian as their primary nationality. Only six marked their primary citizenship as being of countries other than Italy and only three respondents reported triple citizenship. Table ITA4 provides an overview of the country of birth of the respondents.

Tab. ITA - Country of birth by gender – Italy.

	Total	**Men**	**Women**
	295	217	78
		Percent	
Country of birth – Italy	95.3	95.4	94.9
Other EU	2.0	1.8	2.6
Other countries	2.4	2.8	1.3
Top five foreign countries (of birth)			
Argentina	1.0	0.9	1.3
Australia	0.3	0.5	0.0
Belgium	0.3	0.5	0.0
Ethiopia	0.3	0.5	0.0
France	0.3	0.5	0.0

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Bachelor/1st professional degree

As regards academic qualifications, more respondents hold degrees in Medicine than in any other field (26.6%), followed by Biology (22.2%), Chemistry (19.5%) and Biophysics (7.2%). The sample also encompasses a significant number of graduates from many other disciplines, though no single discipline accounts for more than a few examples. Almost all the interviewees (96.6%) graduated before 2000. They therefore obtained their qualifications under the old system, when degree courses lasted between four to six academic years, depending on the subject. Table ITA5 shows the groups of scientific fields in which the respondents have obtained their bachelor degree or their professional degree, divided by gender.

Tab. ITA5 - Field of Bachelor/1st professional degree by gender – Italy

	Total	Men	Women
Number of responses	295	217	78
		Percent	
Total	100.0	100.0	100.0
Life science	43.4	39.6	53.8
Physical sciences	22.0	21.2	24.4
Health/welfare	26.4	30.0	16.7
Veterinary	2.0	2.3	1.3
Engineering. mfg. constr.	1.0	1.4	0.0
Agriculture	3.4	3.7	2.6
All other	1.8	1.8	1.2

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

In 96.2% of cases, the degree was awarded in Italy. Those who graduated abroad were mainly non-Italians. One third of the respondents graduated before 1979, which makes it likely that they were already active in the field of scientific research at the coming into force of the first reform act introducing significant changes to the Italian university system (Law 382/80). The reform law, among its other effects, instituted the research doctorate. It is therefore statistically inevitable that 35.4% of the interviewees should have no research doctorate. Of those that do, 90.9% of them received their degree in Italy.

Tab. ITA5.1 - Year of degree by gender and showing share without a doctorate - Italy

	Total	Men	Women
Bachelor/1st professional			
Number of responses			
		Percent	
Total – all years	100.0	100.0	100.0
Before 1970	9.7	11.3	5.2
1970-1975	12.1	11.8	13.0
1976-1979	11.1	10.4	13.0
1980-1985	23.2	23.6	22.1
1986-1989	15.2	13.7	19.5
1990-1995	14.5	15.6	11.7
1996-2000	10.7	10.4	11.7
2001-2006	3.5	3.3	3.9
Doctorate			
Number of responses	165	119	46
Percent with a doctorate	64.7	63.6	67.9
Percent without a doctorate	35.3	36.4	32.1
Year of doctorate		**Percent**	
Total – all years	100.0	100.0	100.0
Before 1970	100.0	100.0	100.0
1970-1975	4.8	6.7	0.0
1976-1979	4.8	5.9	2.2
1980-1985	3.0	3.4	2.2
1986-1989	11.5	11.8	10.9
1990-1995	13.9	14.3	13.0
1996-2000	27.9	25.2	34.8
2001-2006	13.3	11.8	17.4

Source: RESCAR WP3 E-survey of life scientists, July 2007

1st earned doctorate

A significant percentage (22.9%) of our sample reports having a doctoral degree in specialist areas of medical research. The number of doctorates is also significant in the fields of Biophysics (15.1%), Chemistry (12.8%), and Microbiology (10.1%). Naturally, the number of doctorates obtained in specialist areas of research was considerably higher than those obtained in general disciplines such as Biology, which is the reverse of the pattern for bachelor degrees (Table ITA6).

Tab. ITA6 - Field of 1st doctorate by gender – Italy

	Total	Men	Women
Number of responses	178	128	50
		Percent	
Total	100.0	100.0	100.0
Life science	54.5	50.8	64.0
Physical sciences	14.6	14.8	14.0
Health/welfare	23.6	26.6	16.0
Veterinary	1.1	1.6	0.0
Engineering. mfg. constr	1.1	1.6	0.0
Agriculture	3.4	3.1	4.0
All other	1.7	1.6	2.0

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Country of degree

In Italy most titles are reported to be obtained in the same country of birth that indicates a continuity in the traditional habit of studying in the country of origin. All percentages exceed 90%. (Table ITA7).

Tab. ITA7 - Country where respondents obtained their degree - Italy

	Total	Men	Women
Number of respondents	171	122	49
		Percent	
Different country between Bachelor/1st professional and first Doctorate	7.0	9.8	0.0
Italy as country of Bachelor/1st professional degree	90.9	89.6	94.0
Other EU as country of Bachelor/1st professional degree	1.7	1.4	2.6
Other countries as country of Bachelor/1st professional degree	2.1	1.9	2.6
Italy as country of Doctorate	96.2	96.7	94.8
Other EU as country of first Doctorate	5.1	6.4	2.0
Other countries as country of first Doctorate	4.0	4.0	4.0

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Financial support for doctorate studies

Almost half those with doctoral degrees (43.3%) report that they obtained scholarships from a university, and 19.3% from other public institutes. A significant number (10.5%), on the other hand, received some form of stipend for research work carried out during their post-graduate studies, or else received income from teaching at a university (7.6%). In respect of this, we need to note that in Italy doctoral studies used to be made available only to those who had won scholarships funded by universities, public research bodies and, in a few cases, private institutes. It was not until 1990 that universities were permitted to open their doors to post-graduate students without scholarships. In these cases, the postgraduate students were often offered research contracts or a teaching post with the institute (Table ITA8).

Tab. ITA8 - Source of financial support for doctorate studies by gender – Italy

	Total	Men	Women
Number of scholarship	145	107	38
		Percent	
From higher education institution	43.3	40.8	50.8
From government	19.3	21.2	13.6
From business/private sector	0.8	1.1	0.0
From private non profit	2.9	2.8	3.4
Number of employment income	45	34	11
		Percent	
Teaching assistant salary/fees	7.6	8.4	5.1
Research assistant salary/fees	10.5	9.5	13.6
Other employment income	1.3	1.1	1.7
Number of respondents with funding from employer	4	4	0
Number of respondents with funding from loan	0	0	0
Number of respondents with personal savings	11	7	4
Number of respondents with funding from family	15	13	2
Number of respondents with other funding	4	3	1

Source: WP3 survey of life scientists, July 2007.

5.1.2 Career characteristics

Country of current employment

Of the respondents, 93.2% currently work in Italy. It is interesting to observe that only a few of those who work abroad do so in countries considered leaders in the field of science (such as the USA, Britain or Germany), while a number work in African countries (Table ITA9).

Tab. ITA9 - Country of current employment by gender – Italy

	Total	Men	Women
Number of responses	280	207	73
		Percent	
Same as country of birth	93.2	94.7	89.0
Employed in other - EU country	3.0	1.4	6.8
Employed in other country (outside of the EU)	3.8	3.9	4.1

Source: WP3 survey of life scientists, July 2007

Sector of employment

Almost three quarters of the interviewees work in universities: 64.7% of respondents have full tenure with universities and 7.1% have non-tenured university posts. A further 19.9% work in other public sector institutes. The private non-profit sector accounts for 3.9% of the respondents, while only 1.4% work for private companies, which is even fewer than those who declared themselves unemployed (2.8%) (Table ITA10).

Tab. ITA10 - Sector of current employment by gender – Italy

	Total	Men	Women
Number of	281	209	72
		Percent	
Higher education sector	71.9	74.2	65.3
With tenure	64.8	67.9	55.6
Not tenured	7.1	6.2	9.7
Government sector	19.9	17.2	27.8
Business enterprise sector	1.4	1.9	0.0
Private non profit	3.9	3.8	4.2
Not currently employed	2.8	2.9	2.8

Note: Figures may not add to 100% due to rounding
Source: WP3 survey of life scientists, July 2007

Occupation

A majority of the respondents (61.3%) work as university teachers. Many are researchers in Life Sciences (29.3%) or in other scientific fields such as Physics and Chemistry (7.5%) (Table ITA11).

Tab. ITA11 - Current occupation by gender – Italy

	Total	Men	Women
Number of responses	266	198	68
		Percent	
Total	100.0	100.0	100.0
Legislators/managers	0.9	1.0	0.0
Physicists, mathematical and engineering science professionals	7.5	7.6	7.4
Life sciences and health professionals	29.3	29.8	27.9
- life science professionals	21.4	21.2	22.1
- health professionals	7.9	8.6	5.9
Teaching professionals	33.6	34.7	26.7
All other professionals	1.9	1.5	2.9

Source: WP3 survey of life scientists, July 2007

Time elapsed from 1st degree to 1st permanent employment in R&D

The measurement of the time interval between the completion of postgraduate studies and the securing of a first permanent post produces a complex pattern of distribution that is difficult to interpret. More than one third of the respondents (34.8%) waited five years or more for their first permanent post, but a fair number (18%) obtained a permanent post within one year of completing their highest degree. Between these two extremes lie those who waited between four and five years (8.7%), three and four years (9.4%), and two and three years (10.9%). That said, we must once again draw attention to the fact that the age/work experience range of respondents is wide, and in the meantime substantial changes have taken place in the manner in which people enter the world of R&D. Certainly, in recent years, the expectations of young researchers have increased Table ITA12).

Tab. ITA12 - Time elapsed from highest degree to 1st permanent employment in R&D by gender – Italy

	Total	Men	Women
Number of responses	276	205	71
		Percent	
Less than 6 months	11.6	10.7	14.1
6 months to 1 year	6.5	7.8	2.8
1 to 2 years	10.9	11.7	8.5
2 to 3 years	10.9	12.2	7.0
3 to 4 years	9.4	9.3	9.9
4 to 5 years	8.7	9.8	5.6
5 years and more	34.8	31.7	43.7
Did not obtain a permanent position in R&D	7.2	6.8	8.5

Note: figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Table ITA13 shows the shares of time spent on doing research, teaching or management/administration.

Tab. ITA13 - Time use and research by gender – Italy

	Total	Men	Women
Number of responses	272	203	69
	Mean of shares (percent)		
Time spent on doing research %	51.8	49.5	58.6
Time spent on teaching %	23.6	23.7	23.1
Time spent on management/administration %	18.6	20.1	14.3
Other %	6.0	6.7	4.0

Note: figures may not add to 100% due to rounding.

Source: WP3 survey of life scientists, July 2007.

More than half the respondents dedicate a good deal of time to research work (46.5% of respondents spend between 25% and 50% of their time in research; 24.9% spend between 50% and 75%, and 12.8% spend between 75% and 100%). A considerable amount of time

also goes into teaching (39.4% of the respondents spend 50-75% of their time in teaching), as well as into administrative activities. A clear difference in the allocation of time exists between scientists in the public sector (who spend more time on research) and tenured university professors (who spend more time teaching).

Sector mobility

Almost all the sample (90.4%) has remained in the public sector without entering the private sector. Indeed, only 18 people made the transition.

Tab. ITA14 - Moves from public to private sector - Italy

	Total	Men	Women
Number of respondents	278	207	71
		Percent	
No	90.3	89.4	93.0
Yes	9.7	10.6	7.0

Source: WP3 survey of life scientists, July 2007

Tab. ITA15 - Moves from private to public sector – Italy

Number of respondents	**Total**	**Men**	**Women**
	276	205	71
		Percent	
No	90.2	89.3	93.0
Yes	9.8	10.7	7.0

Source: WP3 survey of life scientists, July 2007

Given the statistically insignificant number, there is not much to be gained from analyzing the reasons for the transition. Even so, we may note in passing that the main reason seems (see table Table ITA16) to be connected with employment opportunities (4.1), salaries (4.1), research funding (3.6) and access to leading technology (3.8).

Very few of the interviewees have made the trip in the other direction either (from the private to the public sector). Here too, the number of cases was a mere 27. The responses given were sufficiently homogenous to allow us to say that the main reason for the decision (Table ITA13) seems to have been a desire for greater freedom in research (4.7). The

92.3% of the relevant group ranked this consideration between fairly and very important. Other factors were ranked as less important, salaries in particular (2.5).

On the other hand, a fair number of respondents (29.4%) have moved from one public-sector institute to another. The chief motivations (Table ITA13) for the change were greater research freedom (4.4) and better employment opportunities (4.0). Other factors, particularly salary levels (3.1), were accorded much lower importance.

There were very few cases of scientists moving within the private sector (only 13 cases). The chief motivations Table ITA16) for the change were greater employment opportunities (4.2), freedom to pursue research (4.1) and salary/wages (4.1).

These figures confirm the persistence of a peculiarity of the Italian system, by which most scientific and technical research is carried out in the public sphere, especially in universities. It comes as no surprise to discover that transitions to and from the private sector are few. In the Life Sciences field in particular, not only is the level of involvement of Italian private enterprise low, and in certain areas such as pharmaceuticals, it has even declined sharply over the past ten years.

Factors of sector mobility

Table ITA16 shows the general framework of motivation for career moves.

Tab. ITA16 - Motivations for career moves – Italy

	Public to private	Public to Public	Private to Public	Private to private
Number of responses	18	82	27	13
	Mean of scale (1:not important. 5: very important)			
Access to leading technologies	3.8	3.5	3.0	3.8
Employment opportunities	4.1	4.0	3.6	4.2
Freedom to pursue research	3.2	4.4	4.7	4.1
Networking	2.7	3.3	3.9	3.4
R&D funding	3.6	3.4	3.0	3.5
Salary/wages	4.1	3.1	2.5	4.1
Working condition	3.2	3.4	3.3	4.0

Source: WP3 survey of life scientists, July 2007

International mobility

A majority of the interviewees (54.7%) have experience of working abroad. Amongst those who do not, the main reasons given for low mobility were: family responsibilities in Italy (in 77.2% of cases this was ranked between rather and very important; corresponding to 4.1 of importance of table 13); job opportunities in country of birth (3.8of importance) the presence of good working conditions in Italy (3.5 of importance); better social and cultural living conditions in Italy (3.5 of importance); the absence of employment opportunities abroad (2.5 of importance) Table ITA17).

Tab. ITA17 - Factors influencing the decision to not seek employment abroad – Italy

Number of responses	**126**
Share of responses	**42,4%**
	Mean of scale (1:not important. 5: very important)
Lack of financial incentive(s) outside country of birth	2.6
Lack of employment opportunities outside country of birth	2.5
Lack of research freedom outside country of birth	2.1
Lack of networking opportunities outside country of birth	2.3
Lack of R&D funding outside country of birth	2.3
Administrative and legal barriers outside country of birth	2.6
Job opportunities in country of birth	3.8
Working conditions in country of birth	3.5
Family responsibilities in country of birth	4.1
Social and cultural living conditions in country of birth	3.5

Source: WP3 survey of life scientists, July 2007

Only 17% of the interviewees that have had a mobility experience, declare that they are currently working outside their country of birth. Once again, the low number renders the responses statistically insignificant. Even so, we can say that the main reasons seem to be connected with work opportunities (4.6 of importance), funding (4.2), freedom of research (3.9), and access to leading technologies (3.9) (Table ITA18).

Tab. ITA18 - Factors influencing the choice of employment abroad - Italy

	Currently employed abroad	In the past employed abroad
Number of responses	17	133
Share of responses	5,7%	44,8%
	Mean of scale (1: not important. 5: very important)	
Access to leading technologies	3.9	4.3
Employment opportunities	4.6	3.2
Freedom to pursue research opportunities	3.9	4.1
Networking	3.3	3.7
R&D funding	4.2	3.9
Salaries/wages	3.6	3.3
Working conditions	3.8	3.2
Social and cultural living conditions	3.3	3
Family related reasons	2.2	1.8

Source: WP3 survey of life scientists, July 2007

Some 44.8% of the respondents report that they worked abroad in the past and later returned to Italy. The reasons given for their initial migration away from the country (see table 15) were better access to leading technology (considered 4.3of importance), greater research freedom (4.1) and funding (3.9). The factors influencing the decision to return to Italy were family-related (3.7), the termination of the employment contract abroad (3.1) and a desire for the social and cultural living conditions of Italy (3.1) (Table ITA19).

Tab. ITA19 - Factors influencing return to the country of birth – Italy

Number of responses	**133**
Share of respondents	**44,8%**
	Mean of scale (1: not important. 5: very important)
Lack of financial incentive(s)	1.7
Lack of employment opportunities	1.9
Lack of research freedom	1.6
Lack of networking opportunities	1.5
Lack of R&D funding	1.7
End of employment term/contract	3.1
Family responsibilities	3.7
Social and cultural working conditions	3.1

Source: WP3 survey of life scientists, July 2007

Of the sample, 29% intend to move abroad for work in the future. Their main motivations (see table 16) are greater research freedom (3.9), better R&D funding (4.1), access to leading technologies (4.3), salary considerations (3.9), networking opportunities (3.8) and attractive working conditions (3.7) (Table ITA20).

Tab. ITA20 - Factors influencing plans to work abroad – Italy

Number of responses	**75**
Share of respondents	**25,2%**
	Mean of scale (1: not important. 5: very important)
Access to leading technologies	4.3
Employment opportunities	3.9
Freedom to pursue research opportunities	4.3
Networking	3.8
R&D funding	4.1
Salaries/wages	3.9
Working conditions	3.7
Social and cultural living conditions	3.4
Family related reasons	2.8

Source: WP3 survey of life scientists, July 2007

With reference to those who declared no intention of going abroad for work, family considerations (Table ITA21) were considered 4.3of importance, the social and cultural conditions of Italy 3.6, working conditions in Italy 3.4 and employment opportunities in Italy 3.3.

Tab. ITA21 - Factors influencing plans to stay in current country – Italy.

Number of responses	**184**
	Mean of scale (1: not important. 5: very important)
Lack of financial incentive(s) outside current country of employment	2.4
Lack of employment opportunities outside current country of employment	2.2
Lack of research freedom outside current country of employment	1.8
Lack of networking opportunities outside current country of employment	1.8
Lack of R&D funding outside country of birth	2.0
Administrative and legal barriers outside current country of employment	2.4
Job opportunities in current country of employment	3.3
Working conditions in current country of employment	3.4
Family responsibilities in current country of employment	4.3
Social and cultural living conditions in current country of employment	3.6

Source: WP3 survey of life scientists, July 2007

5.1.3 Job Satisfaction

This set of questions was intended to discover the expectations of research scientists regarding their current working conditions at the moment the survey was taken. A notable fact to emerge was that whereas very few (15.7%) declare themselves very satisfied, relatively few (20.6%) declare themselves very or completely dissatisfied. Most respondents (63.7%) are therefore moderately satisfied with their current situation. The satisfaction ratings, however, vary considerably from one field to another.

A majority (3.7of importance) is somewhat or very satisfied with their level of responsibility. Similarly, many are satisfied with their job security (3.7of importance), and

a smaller but still significant number give a overall satisfaction rating (3.4). Salary levels are considered poor (very or rather unsatisfactory 2.6). The level of commitment of employers to R&D is also considered too low by respondents (2.9 average), while 36.5% are not satisfied with the training opportunities available (2.9). Opportunities for professional development are regarded as moderately good (considered by respondents 3.3) (Table ITA 22).

Tab. ITA22 - Job satisfaction – Italy

	Number of responses	Mean of scale (1: not important. 5: very important)
Working conditions	267	3.4
Responsibilities	266	3.7
Salary/compensation	270	2.6
Job security	265	3.7
Recognition for contributions	260	3.0
Employer's commitment to R&D	249	2.9
Training opportunities	252	2.9
Professional development	262	3.3
Overall satisfaction	265	3.4

Source: WP3 survey of life scientists, July 2007

The education provided prior to the respondents' current employment position is considered 3.9 of importance respect to specific scientific and subject-matter skills. As regards the adequacy of preparation in general problem-solving skills, the judgement remains positive, though slightly lower (3.6). Oral communication skills of university educators are graded as 3.4 by the respondents and their teaching skills as 3.3. The level of preparation for collaboration and team work skills is considered by our sample us 3.5, while believe their degree programme offered adequate or very adequate preparation for establishing contacts with other colleagues is considered us 3.4. Almost the entire sample, however, is dissatisfied with the administrative and management skills offered by their

university/educational institute, considered 2.4 of importance. The overall preparation offered by the educational programme was rated 3.4 (Table ITA23).

Tab. ITA23 - Adequacy of degree for career preparation – Italy

	Number of responses	Mean of scale (1: not adequate. 5: very adequate)
Scientific/subject matter skills	268	3.9
General problem solving skills	263	3.6
Oral communication skills	263	3.4
Teaching skills	264	3.3
Collaboration and team work	262	3.5
Establishing contacts with colleagues in field	265	3.4
Management/administrative skills	263	2.4
Overall	247	3.4

Source: WP3 survey of life scientists, July 2007

As regards methods for increasing the attractiveness of a scientific career, a large majority of interviewees (84.1%) agree that higher salaries would constitute a persuasive means (4.3). Greater transparency in recruitment procedures is also ranked highly by 87.0% of the sample (4.5), while 85.9% attach importance to raising public awareness of science and promoting young people's interest in the field (4.4). In any case, all the proposed solutions met with approval from the respondents, with 77.1% of our sample also in favour of the proposal to improve scientific training (notably Masters/Doctoral degree programmes)(4.2), and 74.1% in favour of the facilitation of international mobility (4.1) (Table ITA24).

Tab. ITA24 - Measures to improve scientific career attractiveness – Italy

	Number of responses	Mean of scale (1: not satisfied, 5:very satisfied)
Increase salary/benefits	265	4.3
Improve job security	256	3.4
Improve working conditions	262	3.9
Improve family/career	242	3.8
Facilitate inter-sector mobility	252	3.5
Facilitate international mobility	259	4.1
Increase transparency and competition in recruitment procedures	262	4.5
Improve scientific training	262	4.2
Increase public awareness of science promote young people's interest in science	262	4.4

5.2 Portugal

The online questionnaire was sent out to 721researchers in Portugal working in Life Sciences. It was answered by 189 scientists, of whom 164 answered all the questions. We included also the researchers who partially answered the questionnaire in our consideration. Our sample is composed by 172 researchers (Table POR1).

Tab. POR1 - Survey response rates, Portugal

Number of e-mails in the sample	721
Number of responses	189
Of which fully completed	164
Of which partially completed	25
Response rate – fully + partially complete	26.2%
Response rate – fully complete	22.8%

Source: WP3 survey of life scientists, July 2007

5.2.1 A profile of the personal and education characteristics of the researchers

Gender

As for the gender distribution, most respondents are women (53.5%) and only 46.5% are men.

Age

The age profile shows that respondents younger than 40 years make up 38.2% of the total; less than half (46.5%) are aged between 40 and 54. Most of the respondents therefore fall into the intermediate age category. Table 2 shows that number of female are in any age groups exceeds the one of man, except in the age groups 40-44 and 55-59. (Table POR2).

Tab. POR2 - Age distribution of life scientists by gender – Portugal

	Total	Men	Women
Number of responses	172	80	92
		Percent	
Total	100.0	100.0	100.0
Under 35	23.8	20.0	27.2
35-39	17.4	15.0	19.6
40-44	20.9	28.8	14.1
45-49	16.9	15.0	18.5
50-54	8.7	8.8	8.7
55-59	8.1	10.0	6.5
60-64	2.9	1.3	4.3
>=65	1.2	1.3	1.1

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Civil status

As for the civil status in our sample the large majority of the interviewees (71.3%) have family (only 20.5% were single), and 63.7% have children (Table POR3).

Tab. POR3 - Civil status - Portugal

	Total	Men	Women
Number of responses			
		Percent	
Total	100.0	100.0	100.0
Single			
Without children	19.3	16.5	21.7
With children	1.2	-	2.2
Married			
Without children	15.2	13.9	16.3
With children	56.1	63.3	50.0
Divorced or widowed			
Without children	1.8	1.3	2.2
With children	6.4	5.1	7.6

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Country of birth and country of citizenship

Portugal is the place of birth for almost all the respondents (83.0%). Most of foreign nationalities come from the EU (7.0%) and from Angola (4.1%) and Mozambique (3,5%). Similarly, 90.7% of the respondents either hold Portugal citizenship only or else selected Portugal as their primary nationality. Only ten marked their primary citizenship as being of countries other than Portugal (Table POR4).

Tab. POR4 - Country of birth by gender – Portugal

	Total	Men	Women
Number of responses	171	79	92
		Percent	
Country of birth – Portugal	83.0	74.7	90.2
Other EU	7.0	11.4	3.3
All other countries	9.9	13,9	6,5
Top five foreign countries (of birth)			
Angola	4.1	6.3	2.2
Mozambique	3.5	5.1	2.2
Spain	1.8	3.8	-
Netherlands	1.2	2.5	-
United Kingdom	1.2	1.3	1.1

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Bachelor/1st professional degree

As regards academic qualifications, more respondents hold degrees in biology than in any other field (38.4%) followed by chemistry (14.5%) and biophysics (13.4%). The sample also encompasses a significant number of graduates from many other disciplines, though no single discipline accounts for more than a few examples. Almost all the interviewees (90.1%) graduated before 2000. Table POR5 shows the groups of scientific fields in which the respondents have obtained their bachelor degree or their professional degree, divided by gender. The women are more numerous in biology and in chemistry than male colleagues.

Tab. POR5 - Field of bachelor/1st professional degree by gender – Portugal

	Total	Men	Women
Number of responses	172	80	92
		Percent	
Total	100.0	100.0	100.0
Life sciences	60.5	58.8	62.0
Physical sciences	17.4	16.3	18.5
Health/welfare	11.6	12.5	10.9
Engineering, mfg, constr	6.4	8.8	4.3
Agriculture	4.1	3.8	4.3

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 200

Tab. POR5.1 - Year of degree by gender and showing share without a doctorate - Portugal

	Total	Men	Women
Bachelor/1st professional			
Number of responses	171	79	92
		Percent	
Total – all years	100.0	100.0	100.0
Before 1970	4.1	3.8	4.3
1970-1975	7.0	7.6	6.5
1976-1979	5.8	5.1	6.5
1980-1985	18.1	17.7	18.5
1986-1989	18.1	21.5	15.2
1990-1995	22.2	24.1	20.7
1996-2000	18.7	12.7	23.9
2001-2006	5.8	7.6	4.3
Doctorate			
Number of responses	152	69	83
Percent with a doctorate	93.0	91.3	94.6
Percent without a doctorate	7.0	8.8	5.4
Year of doctorate		**Percent**	
Total – all years	100.0	100.0	100.0
Before 1970	0.7	1.4	
1970-1975	-	-	-
1976-1979	1.3		2.4
1980-1985	9.2	15.9	3.6
1986-1989	6.6	8.7	4.8
1990-1995	25.0	18.8	30.1
1996-2000	24.3	27.5	21.7
2001-2006	32.9	27.5	37.3

Table POR5.1 presents the year of degree by gender and showing share without a doctorate. In most cases the doctoral degree has been awarded in the nineties.
In 70.3% of cases, the doctorate was awarded in Portugal. A significant percentage (20.8%) of our sample reports having a doctoral degree in biology, the number of doctorates is also significant in the fields of biophysics (17.6%) chemistry (10.7%), microbiology (9.4%) and genetics (6.9) (Table POR6).

Tab. POR6 - Field of 1st doctorate by gender – Portugal

	Total	Men	Women
Number of responses	159	72	87
		Percent	
Total	100.0	100.0	100.0
Life sciences	69.2	63.9	73.6
Physical sciences	17.6	15.3	19.5
Health/welfare	6.3	9.7	3.4
Engineering, mfg, constr.	3.1	5.6	1.1
Agriculture	1.9	2.8	1.1
All other	1.9	2.8	1.1

Source: WP3 survey of life scientists. July 2007

Country of degree

In Portugal most titles are reported to be obtained in the same country of birth, 80.1%, while Doctorate obtained abroad seem to be more frequent, as Portugal as country of doctorate has been reported in 74.5%of cases. All percentages exceed 90%. (Table POR7).

Tab. POR7 - Country where respondents obtained their degree

	Total	Men	Women
Number of respondents	156	72	84
		Percent	
Different country between Bachelor/1st professional degree and 1st doctorate	19.9	23.6	16.7
Portugal as country of Bachelor/1st professional degree	89.8	82.1	96.6
Other EU as country of Bachelor/1st professional degree	8.4	15.4	2.2
Other countries as country of Bachelor/1st professional degree	1.8	2.6	1.1
Portugal as country of first Doctorate	74.5	70.8	77.6
Other EU as country of first Doctorate	23.6	25.0	22.4
Other countries as country of first Doctorate	1.9	4.2	

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Analysis of financial support

Over half researchers with doctoral degrees (74.3%) report that they obtained scholarships from government sector sources and 18.4% from higher education sector. A significant number (24.3%). on the other hand received some form of stipend for research work carried out during their post-graduate studies or else received income from teaching at a university (70.3%). The ladies received financial support more as research assistant than male colleagues. The situation is opposite as regarding teaching assistant. (Table POR8).

Tab. POR8 - Source of financial support for doctorate studies by gender – Portugal

	Total	Men	Women
Number of scholarship	127	58	69
	Percent		
From higher education institution	18.4	17.7	18.9
From government	74.3	74.2	74.3
From business/private sector	0.7	1.6	0.0
From private non profit	6.6	6.5	6.8
Number of employment income	73	35	38
Teaching assistant salary/fees	70.3	80.0	61.5
Research assistant salary/fees	24.3	17.1	30.8
Other employment income	5.4	2.9	7.7
Number of respondents with funding from employer	9	3	6
Number of respondents with funding from loan	0	0	0
Number of respondents with personal savings	7	4	3
Number of respondents with funding from family	8	3	5

Source: WP3 survey of life scientists. July 2007

All other form of financial support either coming from employer or personal savings are negligible or even not existing such as loans.

5.2.2 Career characteristics

Of the respondents. 95.8% currently work in Portugal. Portuguese researchers working abroad are located mainly in Spain and United Kingdom, none of our sample works currently outside the EU. (Table POR9).

Tab. POR9 - Country of current employment by gender – Portugal

	Total	Men	Women
Number of responses	167	77	90
		Percent	
Total	100.0	100.0	100.0
Same as country of birth	95.8	93.5	97.8
Employed in other - EU country	4.2	6.5	2.2
Employed in other country (outside of the EU)	-	-	-

Source: WP3 survey of life scientists. July 2007

More than three quarters of the interviewees work in universities: 68.4% of respondents and of which 20.5% have non-tenured university positions. A further 12.3% work in the government sector. Only 1.2% work for private companies while the private non-profit sector accounts for 8.2% of the respondents. 9.9% of the sample eclared themselves unemployed (Table POR10).

Tab. POR10 - Sector of current employment by gender - Portugal

	Total	Men	Women
Number of responses	171	80	91
		Percent	
Total	100.0	100.0	100.0
Higher education sector	68.4	73.8	63.7
With tenure	48.0	55.0	41.8
Not tenured	20.5	18.8	22.0
Government sector	12.3	11.3	13.2
Business enterprise sector	1.2	0.0	2.2
Private non profit	8.2	3.8	12.1
Not currently employed	9.9	11.3	8.8

Source: WP3 survey of life scientists. July 2007

Current occupation

The percentage of the respondents working as university teachers is 56.6% and those working as researchers in Life Sciences are 32.2%, in other scientific fields such as Physics, Chemistry etc. are to be found 5.9%. Women number is more significant in research (32.4% men, 43.2% women) than in teaching activities (62.0% men, 51.9% women). (Table POR11).

Tab. POR11 - Current occupation by gender – Portugal

	Total	Men	Women
Number of responses	152	71	81
		Percent	
Total	100.0	100.0	100.0
Legislators/managers	2.6	4.2	1.2
Physicists, mathematical and engineering science professionals	5.9	2.8	8.6
Life sciences and health professionals	32.2	29.6	34.6
- life science professionals	30.2	28.2	32.1
- health professionals	2.0	1.4	2.5
Teaching professionals	56.6	62.0	51.9
All other professionals	2.6	1.4	3.7

Source: WP3 survey of life scientists. July 2007

Time elapsed from highest degree to 1st permanent employment in R&D

Only 12.9% of the respondents waited five years or more for their first permanent position, while over one third, 35.9% obtained a permanent position within one year of completing their highest degree. Between these two extremes lie those who waited under four or five years (1.8%), three and four years (1.8%). and two and three years (5.9%). Women do not suffer more than men from the waiting queue before obtaining a permanent position (Table POR12).

Tab. POR12 - Time elapsed from highest degree to 1st permanent employment in R&D by gender – Portugal

	Total	Men	Women
Number of responses	170	80	90
		Percent	
Total	100.0	100.0	100.0
Less than 6 months	30.6	23.8	36.7
6 months to 1 year	5.3	6.3	4.4
Under 2 year	5.3	6.3	4.4
Under 3 year	5.9	6.3	5.6
Under 4 year	1.8	3.8	0.0
Under 5 year	1.8	3.8	0.0
5 years or more	12.9	13.8	12.2
Did not obtain a permanent position in R&D	36.5	36.3	36.7

Source: WP3 survey of life scientists. July 2007

Time use

More than half the respondents dedicate a good deal of time to research work — 59.1% of respondents. The 22.7% spend their time in teaching and the 15.7% into administrative activities. There is not a significant difference between men and women except for a slight percentage in research activities. (Table POR13).

Tab. POR13 - Time use and research by gender - Portugal

	Total	Men	Women
Number of responses	163	75	88
		Mean of shares (percent)	
Time spent on doing research %	59.1	57.1	60.7
Time spent on teaching %	22.7	24.0	21.6
Time spent on management/administration %	15.7	14.9	16.4
Other %	1.9	2.7	1.3

Source: WP3 survey of life scientists. July 2007

Sector Mobility

Almost all the sample (92.9%) has remained in the public sector without entering the private sector. Indeed, only 12 people made the transition.

Tab. POR14 - Moves from public to private sector – Portugal

	Total	Men	Women
Number of respondents	170	79	91
		Percent	
No	92.9	97.5	89.0
Yes	7.1	2.5	11.0

Source: WP3 survey of life scientists, July 2007

Tab. POR15 - Moves from private to public sector – Portugal

	Total	Men	Women
Number of respondents	167	79	88
		Percent	
No	90.4	91.1	89.8
Yes	9.6	8.9	10.2

Source: WP3 survey of life scientists, July 2007

We may note that the main reason seems to be connected with employment opportunities (3.2), R&D funding (2.6) networking (2.4). (Table POR16).

Very few of the interviewees have made the trip in the other direction either (from the private to the public sector). Here too the number of cases was a mere 16. The responses given were sufficiently homogenous to allow us to say that the main reason for the decision seems to have been a desire for greater freedom in research (4.6). followed by the employment opportunities (3.6) and networking (3.3).

On the other hand 35 respondents have moved from one public sector institute to another. The main reasons for the decision seem to be linked to freedom to pursue research (3.8) and employment opportunities (3.3).

There are no significant numbers to comment cases of scientists moving within the private sector.

Tab. POR16 - Motivations for career moves – Portugal

	Public to private	Within public	Private to public	Within private
Number of responses	12	35	16	1
	Mean of scale (1:not important, 5: very important)			
Access to leading technologies	1.8	2.9	3.3	5.0
Employment opportunities	3.2	3.2	3.6	5.0
Freedom to pursue research	2.3	3.8	4.6	3.0
Networking	2.4	2.5	3.3	4.0
R&D funding	2.6	2.6	3.1	4.0
Salary/wages	2.3	2.3	3.1	5.0
Working condition	2.3	2.7	3.2	5.0

Source: WP3 survey of life scientists. July 2007

International mobility

A majority of the interviewees (35.9%) have experience of working abroad. Amongst those who do not. the main reasons given for low mobility were: family responsibilities in Portugal (3.9), job opportunities in country of birth (3.0), social and cultural living conditions in country of birth (corresponding to 3.3), (Table POR17).

Tab. POR17 - Factors influencing the decision to not seek employment abroad – Portugal.

Number of responses	107
Share of respondents	62.2%
	Mean of scale (1:not important, 5: very important)
Lack of financial incentive(s) outside country of birth	1.6
Lack of employment opportunities outside country of birth	1.8
Lack of research freedom outside country of birth	1.2
Lack of networking opportunities outside country of birth	1.4
Lack of R&D funding outside country of birth	1.4
Administrative and legal barriers outside country of birth	1.4
Job opportunities in country of birth	3.0
Working conditions in country of birth	2.7
Family responsibilities in country of birth	3.9
Social and cultural living conditions in country of birth	3.3

Source: WP3 survey of life scientists. July 2007

Only 20 people of the interviewees that have had a mobility experience declare that they are currently working outside their country of birth. Once again. the low number renders the responses statistically insignificant. Even so. we can say that the main reasons seem to be connected with family related reasons (3.5 of importance) freedom of research (2.7) (Table POR18).

Tab. POR18 - Factors influencing the choice of employment abroad – Portugal

	Currently employed abroad	In the past employed abroad
Number of responses	20	38
Share of respondents	11.6%	22.1%
	Mean of scale (1:not important, 5: very important)	
Access to leading technologies	2.2	4.1
Employment opportunities	1.9	2.6
Freedom to pursue research opportunities	2.7	3.5
Networking	2.3	2.9
R&D funding	2.3	3.5
Salaries/wages	2.0	2.3
Working conditions	2.5	3.4
Family related reasons	3.5	1.6
Social and cultural living conditions	2.5	2.3

Source: WP3 survey of life scientists. July 2007

The reasons given for their initial migration away from the country were better access to leading technology (considered 4.1 of importance). greater research freedom (3.5) and funding (3.5).

The factors influencing the decision to return to Portugal were family-related (3.7). and concerning the termination of the employment contract abroad (2.8) (Table POR19).

Tab. POR19 - Factors influencing return to the country of birth – Portugal

Number of responses	38
Share of respondents	22.1%
	Mean of scale (1:not important, 5: very important)
Lack of financial incentive(s)	1.3
Lack of employment opportunities	1.4
Lack of research freedom	1.1
Lack of networking opportunities	1.1
Lack of R&D funding	1.3
End of employment term/contract	2.8
Family responsibilities	3.7
Social and cultural working conditions	2.4

Source: WP3 survey of life scientists. July 2007

Within our sample. 24.0% intend to move abroad for work in the future. Their main motivations are better R&D funding (4.3) greater research freedom (4.1) access to leading technologies (3.8), employment opportunities (3.8). (Table POR20).

Tab. POR20 - Factors influencing plans to work abroad – Portugal

Number of responses	35
Share of respondents	20.3%
	Mean of scale (1:not important, 5: very important)
Access to leading technologies	3.8
Employment opportunities	3.8
Freedom to pursue research opportunities	4.1
Networking	3.6
R&D funding	4.3
Salaries/wages	3.7
Working conditions	3.4
Family related reasons	1.7
Social and cultural living conditions	2.7

Source: WP3 survey of life scientists. July 2007

With reference to those who declared no intention of going abroad for work. family considerations were considered of the highest importance 4.3, followed by the social and cultural conditions of Portugal 3.0. working conditions in Portugal 2.8 and employment opportunities in Portugal 2.5 (Table POR21).

Tab. POR21 - Factors influencing plans to stay in current country – Portugal

Number of responses	111
	Mean of scale (1:not important, 5: very important)
Lack of financial incentive(s) outside current country of employment	1.3
Lack of employment opportunities outside current country of employment	1.2
Lack of research freedom outside current country of employment	0.9
Lack of networking opportunities outside current country of employment	1.0
Lack of R&D funding outside country of birth	1.0
Administrative and legal barriers outside current country of employment	1.1
Job opportunities in current country of employment	2.5
Working conditions in current country of employment	2.8
Family responsibilities in current country of employment	4.3
Social and cultural living conditions in current country of employment	3.0

Source: WP3 survey of life scientists. July 2007

5.2.3 Job Satisfaction

This set of questions was intended to discover the expectations of research scientists regarding their current working conditions at the moment the survey was taken. A notable fact to emerge was that whereas very few (10.4%) declare themselves very satisfied, 14.1% of respondents declare themselves very or completely dissatisfied. Most respondents (75.4%) are therefore satisfied and moderately satisfied with their current situation (Table POR22).

Tab. POR22 - Job satisfaction – Portugal

	Number of responses	Mean of scale (1:not satisfied,5: very satisfied)
Working conditions	163	3.5
Responsibilities	164	3.7
Salary/compensation	163	2.9
Job security	162	3.1
Recognition for contributions	161	2.9
Employer's commitment to R&D	160	3.3
Training opportunities	161	3.4
Professional development	163	3.3
Overall satisfaction	172	3.3

Source: WP3 survey of life scientists. July 2007

Many are satisfied with their level of responsibility (3.7 of importance) and working conditions (3.5)

Similarly a smaller but still significant number refer to training opportunities 3.4 professional development (3.3) and overall satisfaction (3.3). Salary levels are considered poor (2.9) and get the lower score togjeter with recognition of contributions.

The education provided prior to the respondents' current employment position is considered relevant as it gets the highest score respect to specific scientific and subject-matter skills. As regards the adequacy of preparation in general problem-solving skills, the judgement remains positive, though slightly lower (3.8). The level of preparation for collaboration and team work skills is considered adequate by our sample 3.5 and they believe their degree programme offered adequate or very adequate preparation for establishing contacts with other colleagues around 3.5 Almost the entire sample, however, is dissatisfied with the administrative and management skills offered by their university/educational institute, considered 2.5 in the scale of importance (Table POR23).

The oral communication skills of university educators are graded as 3.4 by the respondents and their teaching skills as 3.1.

The overall preparation offered by the educational programme was rated 3.5.

Tab. POR23 - Adequacy of degree for career preparation – Portugal

	Number of responses	Mean of scale (1:not important, 5: very important)
Scientific/subject matter skills	172	4.0
General problem solving skills	172	3.8
Oral communication skills	172	3.4
Teaching skills	172	3.1
Collaboration and team work skills	172	3.5
Establishing contacts with colleagues in field	172	3.5
Management/administrative skills	172	2.5
Overall	172	3.5

Source: WP3 survey of life scientists. July 2007

As regards methods for increasing the attractiveness of a scientific career, a large majority of interviewees agree that Increasing transparency and competition in recruitment procedures would be the better way (4.0) together with improving of job security (3.9) and the improvement of working conditions (3.8). Many researchers attach the highest importance to raising public awareness of science and promoting young people's interest in the field (4.1) (Table POR24).

Tab. POR24 - Measures to improve scientific career attractiveness – Portugal

	Number of responses	Mean of scale (1:not important. 5: very important)
Increase salary/benefits	172	3.7
Improve job security	172	3.9
Improve working conditions	172	3.8
Improve family/career commitment	172	3.7
Facilitate inter-sector mobility	172	3.5
Facilitate international mobility	172	3.6
Increase transparency and competition in recruitment procedures	172	4.0
Improve scientific training	172	3.7
Increase public awareness of science, promote young people's interest in science	172	4.1

Source: WP3 survey of life scientists. July 2007

5.3 Spain

The online questionnaire was sent out to 1,239 persons in Spain working in Life Sciences. It was answered by 305 scientists, of whom 268 answered all the questions. We decided to consider also the researchers who partially answered the questionnaire. Our sample is composed by 285 researchers (Table SPA1).

Tab. SPA1 - Survey response rates, Spain

Number of e-mails in the sample	1,239
Number of responses	305
Of which fully completed	268
Of which partially completed	37
Response rate – fully + partially complete	24.6%
Response rate – fully complete	21.6%

Source: WP3 survey of life scientists, July 2007

5.3.1 A profile of the personal and education characteristics of the researchers

Gender

Regarding the gender, most respondents are men (70.5%) and only the 29.5% are women.

Age

Respondents younger than 40 years make up 23,9% of the total more than half (60.0%) are aged between 40 and 54. Most of the respondents therefore fall into the intermediate age category. The age profile of respondents is enough balanced. Table 2 shows that number of females are less than the group of male respondents in the class over 50 (Table SPA2).

Tab. SPA2 - Age distribution of life scientists by gender – Spain

	Total	Men	Women
Number of responses	285	201	84
		Percent	
Total	100.0	100.0	100.0
Under 35	10.2	9.0	13.1
35-39	13.7	13.4	14.3
40-44	23.9	25.4	20.2
45-49	21.8	20.9	23.8
50-54	15.1	15.4	14.3
55-59	9.5	10.0	8.3
60-64	4.6	5.0	3.6
>=65	1.4	1.0	2.4

Source: WP3 survey of life scientists, July 2007

Civil status

A large majority of the interviewees (77.8%) have family (only 19.4% were single), and 67% have children (Table SPA3).

Tab. SPA3 - Civil status - Spain

	Total	Men	Women
Number of responses	284	200	84
		Percent	
Total	100.0	100.0	100.0
Single			
Without children	17.6	13.0	28.6
With children	1.8	1.0	3.6
Married			
Without children	15.1	14.5	16.7
With children	62.7	67.5	51.2
Divorced or widowed			
Without children	0.4	0.5	-
With children	2.5	3.5	-

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Country of birth and country of citizenship

Almost all the respondents (92.7%) were born in Spain. Only 15 were born elsewhere. Similarly, 96.9% of the respondents either hold Spain citizenship only or else selected Spain as their primary nationality. Only seven marked their primary citizenship as being of countries other than Spain and only three respondents reported triple citizenship (Table SPA4).

Tab. SPA4 - Country of birth by gender - Spain

	Total	Men	Women
Number of responses	285	202	83
		Percent	
Total	100.0	100.0	100.0
Country of birth – Spain	94.6	95.4	92.6
Other EU	3.2	2.5	4.8
All other countries	2.2	2.1	2.6
Top five foreign countries (of birth)			
Cuba	0.7	1.0	-
Italy	0.7	0.5	1.2
Portugal	0.7	-	2.4
Venezuela	0.7	1.0	-
Bosnia and Herzegovina	0.4	-	1.2

Source: WP3 survey of life scientists, July 2007

Field of degree

As regards academic qualifications, more respondents hold degrees in biology than in any other field (30.7%) followed by medicine (19.0%), chemistry (15.3%) and biophysics (5.6%). The sample also encompasses a significant number of graduates from many other disciplines, though no single discipline accounts for more than a few examples. Almost all the interviewees (93.7%) graduated before 2000. Table SPA5 shows the groups of scientific fields in which the respondents have obtained their bachelor degree or their professional degree, divided by gender. The women are more numerous in the group of physical sciences than male colleagues.

Tab. SPA5. - Field of bachelor/1st professional degree by gender – Spain

	Total	Men	Women
Number of responses	286	202	84
		Percent	
Total	100.0	100.0	100.0
Life science	52.8	52.5	53.6
Physical sciences	17.8	15.3	23.8
Health/welfare	19.2	21.8	13.1
Veterinary	3.5	4.5	1.2
Engineering, mfg, constr	2.1	2.0	2.4
Agriculture	3.1	3.5	2.4
All other	1.3	0.5	3.6

Source: WP3 survey of life scientists, July 2007

In 93.7% of cases, the degree was awarded in Spain. A significant percentage (64.0%) of our sample reports having a doctoral degree in specialist areas of life sciences. The number of doctorates is also significant in the fields of biology (17.4%), chemistry (12.5%), and microbiology (9.4%).

Tab. SPA5.1 - Year of degree by gender and showing share without a doctorate -Spain

	Total	Men	Women
Bachelor/1st professional			
Number of responses	283	201	82
		Percent	
Total – all years	100.0	100.0	100.0
Before 1970	3.9	3.5	4.9
1970-1975	12.7	13.4	11.0
1976-1979	11.3	11.4	11.0
1980-1985	25.1	24.4	26.8
1986-1989	19.8	20.4	18.3
1990-1995	13.1	13.9	11.0
1996-2000	11.7	10.4	14.6
2001-2006	2.5	2.5	2.4
Doctorate			
Number of responses	268	188	80
Percent with a doctorate	90.3	98.5	97.6
Percent without a doctorate	1.7	1.5	2.4
Year of doctorate		**Percent**	
Total – all years	100.0	100.0	100.0
Before 1970	1.1	1.1	1.3
1970-1975	4.9	5.3	3.8
1976-1979	8.2	9.0	6.3
1980-1985	18.3	18.1	18.8
1986-1989	14.2	12.8	17.5
1990-1995	25.0	26.1	22.5
1996-2000	15.7	15.4	16.3
2001-2006	12.7	12.2	13.8

Tab. SPA6 - Field of 1st doctorate by gender – Spain

	Total	Men	Women
Number of responses	272	192	80
		Percent	
Total	100.0	100.0	100.0
Life sciences	64.0	64.1	63.8
Physical sciences	16.2	12.5	25.0
Mathematics/statistic	0.4	0.5	0.0
Engineering, mfg, constr	1.5	2.1	0.0
Agriculture	1.5	1.6	1.3
Veterinary	2.2	3.1	0.0
Health/welfare	13.2	15.6	7.5
All other	1.1	0.5	2.5

Source: WP3 survey of life scientists, July 2007

Country of degree

In Spain most titles are reported to be obtained in the same country of birth, 94.4%, also Doctorate obtained abroad seem to be less frequent, as Spain as country of doctorate has been reported in 92.3% of cases. All percentages exceed 90%. (Table SPA7).

Tab. SPA7 - Country where respondents obtained their degree

	Total	Men	Women
Number of respondents	254	178	76
		Percent	
Different country between Bachelor/1st professional and first Doctorate	6.6	6.8	6.2
Percent of total that reported Spain as country of bachelor/1st professional degree	94.4	95.0	92.9
Other EU as country of Bachelor/1st professional degree	2.8	1.5	4.3
Other countries as country of Bachelor/1st professional degree	2.8	3.5	2.8
Spain as country of Doctorate	92.3	91.6	93.8
Other EU as country of first Doctorate	5.8	5.8	4.9
Other countries as country of first Doctorate	1.9	2.6	1.3

Note: Figures may not add to 100% due to rounding

Source: WP3 survey of life scientists, July 2007

Analysis of financial support

Over half researchers with doctoral degrees (68.8%) report that they obtained scholarships from government sector sources, and 21.2% from higher education sector. A significant number (32.7%), on the other hand, received some form of stipend for research work carried out during their post-graduate studies, or else received income from teaching at a university (51.3%) (Table SPA8).

Tab. SPA8 - Source of financial support for doctorate studies by gender – Spain

	Total	Men	Women
Number of scholarship	250	179	71
		Percent	
From higher education institution	21.2	21.8	19.7
From government	68.8	67.6	71.8
From business/private sector	4.4	5.0	2.8
From private non profit	5.6	5.6	5.6
Number of employment income	113	82	31
		Percent	
Teaching assistant salary/fees	51.3	53.7	45.2
Research assistant salary/fees	32.7	30.5	38.7
Other employment income	15.9	16.9	16.1
Number of respondents with funding from employer	10	10	0
Number of respondents with funding from loan	0	0	0
Number of respondents with personal savings	15	13	2
Number of respondents with funding from family	21	16	5

Source: WP3 survey of life scientists, July 2007

All other form of financial support either coming from employer or personal savings are negligible or even not existing, such as loans.

5.3.2 Career characteristics

Of the respondents, 95.3% currently work in Spain. It is interesting to observe that only a few of those who work abroad do so in countries considered leaders in the field of science (such as the USA), while a number work also in Netherlands and Portugal (Table SPA9).

Tab. SPA9 - Country of current employment by gender – Spain

	Total	Men	Women
Number of responses	274	195	79
		Percent	
Total	100.0	100.0	100.0
Country of current employment same as country of birth	95,3	95,4	94,9
Employed in other - EU country	2,9	2,1	5,1
Employed in other country (outside of the EU)	1,8	2,6	0,0

Source: WP3 survey of life scientists, July 2007

Almost three quarters of the interviewees work in universities: 60.6% of respondents and of which 7.7% have non-tenured university posts. A further 32.9% work in the government sector. Only 2.9% work for private companies while the private non-profit sector accounts for 2.5% of the respondents, 1.1% of the sample declared themselves unemployed (Table SPA10).

Tab. SPA10 - Sector of current employment by gender - Spain

	Total	Men	Women
Number of responses	277	198	79
		Percent	
Total	100.0	100.0	100.0
Higher education sector	60.6	60.6	60.8
With tenure	52.7	52.5	53.2
Not tenured	7.9	8.1	7.6
Government sector	32.9	32.3	34.2
Business enterprise sector	2.9	3.0	2.5
Private non profit	2.5	3.0	1.3
Not currently employed	1.1	1.0	1.3

Source: WP3 survey of life scientists, July 2007

Current occupation

The percentage of the respondents (44.7%) working as university teachers and as researchers in Life Sciences (44.5%) or in other scientific fields such as Physics and Chemistry (8.7%), almost equals, with a significant gender difference concerning the employment of women in teaching activities, their number is in fact more relevant in teaching occupations (52.0) rather then in research ones (37.3) (Table SPA11).

Tab. SPA11 - Current occupation by gender – Spain

	Total	Men	Women
Number of responses	264	189	75
		Percent	
Total	100.0	100.0	100.0
Legislators/management	0.8	1.1	0.0
Physical, mathematical and engineering science professionals	8.7	8.5	9.3
Life scientists and health professional	44.3	47.1	37.3
- life science professionals	33.7	36.5	26.7
- health professionals	10.6	10.6	10.7
Teaching	44.7	41.8	52.0
All other professionals	1.5	1.6	1.3

Source: WP3 survey of life scientists, July 2007

Time elapsed from highest degree to 1st permanent employment in R&D

More than one third of the respondents (38.6%) waited five years or more for their first permanent post, but a fair number (20.2%) obtained a permanent post within one year of completing their highest degree. Between these two extremes lie those who waited between four and five years (7.7%), three and four years (7.4%), and two and three years (8.1%). Certainly, in recent years, the expectations of young researchers have increased above all the ladies. Women suffer much more than men from the long waiting queue before obtaining a permanent position. Over 10% points divide the male from the female sample of those that waited much longer for this kind of contract: 35.4% men versus 46.8% women waited over five years (Table SPA12).

Tab. SPA12 - Time elapsed from highest degree to 1st permanent employment in R&D by gender – Spain

	Total	Men	Women
Number of responses	272	195	77
		Percent	
Total	100.0	100.0	100.0
Less than 6 months	15.4	17.4	10.4
6 months to 1 year	4.8	5.1	3.9
Under 2 year	7.4	7.2	7.8
Under 3 year	8.1	8.7	6.5
Under 4 year	7.4	6.2	10.4
Under 5 year	7.7	9.2	3.9
5 years or more	38.6	35.4	46.8
Did not obtain a permanent position in R&D	10.7	10.8	10.4

Source: WP3 survey of life scientists, July 2007

Time use

More than half the respondents dedicate a good deal of time to research work — 58.1% of respondents. The 19.3% spend their time in teaching and the 18.4% into administrative activities. Women are asked to carry put less managerial and administrative activities than man (15.5% versus 19.5%) while they spend more time in teaching and R&D (Table SPA13).

Tab. SPA13 - Time use and research by gender – Spain

	Total	Men	Women
Number of responses	271	194	77
	Mean of shares (percent)		
Time spent on doing research	58.1	57.8	59.1
Time spent on teaching	19.3	18.1	22.4
Time spent on management/administration	18.4	19.5	15.5
Other	3.8	4.1	3.0

Source: WP3 survey of life scientists, July 2007

Sector Mobility

Almost all the sample (88.2%) has remained in the public sector without entering the private sector. Indeed, only 32 people made the transition.

Tab. SPA14 - Moves from public to private sector – Spain

	Total	Men	Women
Number of respondents	272	195	77
		Percent	
No	88,2	88,2	88,3
Yes	11,8	11,8	11,7

Source: WP3 survey of life scientists, July 2007

Tab. SPA15 - Moves from private to public sector – Spain

Number of respondents	Total	Men	Women
	272	195	77
		Percent	
No	87,1	85,6	90,9
Yes	12,9	14,4	9,1

Source: WP3 survey of life scientists, July 2007

We may note in passing that the main reason seem to be connected with employment opportunities, access to leading technology, freedom to pursue research and salaries.

Very few of the interviewees have made the trip in the other direction either (from the private to the public sector). Here too, the number of cases was a mere 35. The responses given were sufficiently homogenous to allow us to say that the main reason for the decision seems to have been a desire for greater freedom in research, followed by the employment opportunities and networking.

On the other hand, almost one third of respondents 86 have moved from one public sector institute to another.

There were very few cases of scientists moving within the private sector (only 7 cases).

Factors of sector mobility

The chief motivations for the change were greater research freedom and better employment opportunities. Other factors, particularly salary and networking were accorded much lower importance (Table SPA16).

Tab. SPA16 - Motivations for career moves – Spain

	Public to private	Private to public	Within public	Within private
Number of responses	32	35	86	7
	Mean of scale (1:not important, 5: very important)			
Access to leading technologies	2.8	3.3	3.3	3.29
Employment opportunities	3.6	3.6	3.8	3.86
Freedom to pursue research	2.8	4.3	3.8	3.57
Networking	2.4	3.5	2.8	3.71
R&D funding	2.4	3.0	3.2	3.43
Salary/wages	2.7	2.3	2.8	3.29
Working condition	2.3	3.1	3.3	3.29

Source: WP3 survey of life scientists, July 2007

International mobility

A majority of the interviewees (59.2%) have experience of working abroad. Amongst those who do not, the main reasons given for low mobility were: social and cultural living conditions in country of birth (corresponding to 4.0 of importance of table 13); job opportunities in country of birth (3.6 of importance) the presence of good working conditions in Spain (3.4 of importance); family responsibilities in Spain (3.4 of importance); the absence of employment opportunities abroad (2.3 of importance) (Table SPA17).

Tab. SPA17 - Factors influencing the decision to not seek employment abroad - Spain

Number of responses	111
Share of respondents	38.7%
	Mean of scale (1:not important, 5: very important)
Lack of financial incentive(s) outside country of birth	2.3
Lack of employment opportunities outside country of birth	2.3
Lack of research freedom outside country of birth	1.7
Lack of networking opportunities outside country of birth	2.0
Lack of R&D funding outside country of birth	2.0
Administrative and legal barriers outside country of birth	2.1
Job opportunities in country of birth	3.6
Working conditions in country of birth	3.4
Family responsibilities in country of birth	3.4
Social and cultural living conditions in country of birth	4.0

Source: WP3 survey of life scientists, July 2007

Only 11.8% of the interviewees declare that they are currently working outside their country of birth. Once again, the low number renders the responses statistically insignificant. Even so, we can say that the main reasons seem to be connected with work opportunities (3.8 of importance), freedom of research (3.7) and R&D funding (3.4) (Table SPA18).

Tab. SPA18 - Factors influencing the choice of employment abroad - Spain

	Currently employed abroad	In the past employed abroad
Number of responses	19	139
Share of respondents	6.6%	48.4%
	Mean of scale (1: not important, 5: very important)	
Access to leading technologies	3.05	4.1
Employment opportunities	3.84	3.1
Freedom to pursue research opportunities	3.74	3.4
Networking	2.84	3.0
R&D funding	3.47	3.3
Salaries/wages	3.26	2.7
Working conditions	3.21	2.8
Social and cultural living conditions	2.58	2.6
Family related reasons	2.47	1.8

Source: WP3 survey of life scientists, July 2007

Some 139 of the respondents report that they worked abroad in the past and later returned to Spain. The reasons given for their initial migration away from the country were better access to leading technology (considered 4.1 of importance), greater research freedom (3.4) and funding (3.3). The factors influencing the decision to return to Spain (see table 15) were a desire for the social and cultural living conditions of Spain (3.3) family-related (3.0), the termination of the employment contract abroad (2.7) (Table SPA19).

Tab. SPA19 - Factors influencing return to the country of birth – Spain

Number of responses	**139**
Share of respondents	**48.4%**
	Mean of scale (1: not important, 5: very important)
Lack of financial incentive(s)	1.5
Lack of employment opportunities	1.6
Lack of research freedom	1.4
Lack of networking opportunities	1.4
Lack of R&D funding	1.4
End of employment term/contract	2.7
Family responsibilities	3.0
Social and cultural working conditions	3.3

Source: WP3 survey of life scientists, July 2007

Within our sample, 19.9% intend to move abroad for work in the future. Their main motivations (see table 16) are access to leading technologies (3.9), networking opportunities (3.4), greater research freedom (3.2) better R&D funding (3.1) (Table SPA20).

Tab. SPA20 - Factors influencing plans to work abroad – Spain

Number of responses	**50**
Share of respondents	**17.4%**
	Mean of scale (1: not important, 5: very important)
Access to leading technologies	3.9
Employment opportunities	2.7
Freedom to pursue research opportunities	3.2
Networking	3.4
R&D funding	3.1
Salaries/wages	2.6
Working conditions	2.4
Social and cultural living conditions	2.2
Family related reasons	2.4

Source: WP3 survey of life scientists, July 2007

With reference to those who declared no intention of going abroad for work, family considerations (see table 17) were considered of the highest importance 4.1, followed by the social and cultural conditions of Spain 3.5, working conditions in Spain 3.2 and employment opportunities in Spain 2.9 (Table SPA21).

Tab. SPA21 - Factors influencing plans to stay in current country – Spain

Number of responses	**201**
	Mean of scale (1: not important, 5: very important)
Lack of financial incentive(s) outside current country of employment	1.7
Lack of employment opportunities outside current country of employment	1.7
Lack of research freedom outside current country of employment	1.5
Lack of networking opportunities outside current country of employment	1.4
Lack of R&D funding outside country of birth	1.4
Administrative and legal barriers outside current country of employment	1.9
Job opportunities in current country of employment	2.9
Working conditions in current country of employment	3.2
Family responsibilities in current country of employment	4.1
Social and cultural living conditions in current country of employment	3.5

Source: WP3 survey of life scientists, July 2007

5.3.3 Job Satisfaction

This set of questions was intended to discover the expectations of research scientists regarding their current working conditions at the moment the survey was taken. A notable fact to emerge was that whereas very few (17.3%) declare themselves very satisfied, relatively few (9.4%) declare themselves very or completely dissatisfied. Most respondents (65.1%) are therefore satisfied and moderately satisfied with their current situation (Table SPA22).

Tab. SPA22 - Job satisfaction – Spain

	Number of responses	Mean of scale (1: not important, 5: very important)
Working conditions	266	3.6
Responsibilities	265	3.9
Salary/compensation	265	3.0
Job security	264	4.0
Recognition for contributions	263	3.3
Employer's commitment to R&D	256	3.3
Training opportunities	260	3.2
Professional development	263	3.5
Overall satisfaction	287	3.3

Source: WP3 survey of life scientists, July 2007

Many are satisfied with their job security (4.0 of importance), a big quantity (3.9 of importance) is somewhat or very satisfied with their level of responsibility.

Similarly a smaller but still significant number refer to working conditions (3.6), professional development (3.5) and overall satisfaction (3.3). Salary levels are considered poor (3.0) and get the lower score.

The education provided prior to the respondents' current employment position is considered 3.5 of importance respect to specific scientific and subject-matter skills. As regards the adequacy of preparation in general problem-solving skills, the judgement remains positive, though slightly lower (3.2). The level of preparation for collaboration and teamwork skills is considered adequate by our sample 3.1, and they believe their degree programme offered adequate or very adequate preparation for establishing contacts with other colleagues around 3.0. Almost the entire sample, however, is dissatisfied with the administrative and management skills offered by their university/educational institute, considered 2.3 in the scale of importance (Table SPA23).

The oral communication skills of university educators are graded as 2.9 by the respondents and their teaching skills as 2.8.

The overall preparation offered by the educational programme was rated 2.9

Tab. SPA23 -Adequacy of degree for career preparation – Spain

	Number of responses	Mean of scale (1: not adequate, 5: very adequate)
Scientific/subject matter skills	287	3.5
General problem solving skills	287	3.2
Oral communication skills	287	2.9
Teaching skills	287	2.8
Collaboration and team work skills	287	3.1
Establishing contacts with colleagues in field	287	3.0
Management/administrative skills	287	2.3
Overall	287	2.9

Source: WP3 survey of life scientists, July 2007

As regards methods for increasing the attractiveness of a scientific career, a large majority of interviewees agree that higher salaries would constitute a persuasive means (3.9). Greater transparency in recruitment procedures is also ranked highly by 74.9% of the sample (3.9), while many researchers attach importance to raising public awareness of science and promoting young people's interest in the field (4.0) (Table SPA24).

Tab. SPA24 - Measures to improve scientific career attractiveness – Spain

	Number of responses	Mean of scale (1: not satisfied, 5:very satisfied)
Increase salary/benefits	287	3.9
Improve job security	287	3.5
Improve working conditions	287	3.8
Improve family/career commitment	287	3.8
Facilitate inter-sector mobility	287	3.3
Facilitate international mobility	287	3.6
Increase transparency and competition in recruitment procedures	287	3.9
Improve scientific training	287	3.7
Increase public awareness of science, promote young people's interest in science	287	4.0

Source: WP3 survey of life scientists, July 2007

In any case, all the proposed solutions met with approval from the respondents also in favour of the proposal to improve scientific training (notably Masters/Doctoral degree programmes) (3.7), and in favour of the facilitation of international mobility (3.6).

6. References

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Van Looy, Bart, du Plessis, Mariëtte and Magerman, Tom, "Data Production Methods for Hamonized Patent Statistics: Patentee Sector Allocation" (2006). KUL Working Paper No. MSI 0606 Available at SSRN: http://ssrn.com/abstract=944464

7. Technical Annex - The Survey Questionnaire

E-survey of Life Scientists

Welcome to the e-survey of life scientists in Europe. We would like to invite you to share with us information on your education, your career development and your own views on scientific training and careers.

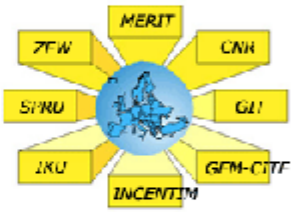
We remind you all of the information collected on the e-survey is handled in a strictly confidential basis. in Europe. We would like to invite you to share with us information on your education, your career development and your own views on scientific training and careers. The data collected will be used in aggregate format for internal purposes. Any and all publication of the results of the survey will be in aggregate format only.

The final report will be published on the European Commission/Joint Research Centre) web site. You can find additional information on IPTS and this work at http://www.jrc.es/activities/research-and-innovation/hrek.cfm.

Reminder: If you would like to be notified of when and where the results of this survey are available, please fill in your e-mail address at the end of the survey.

Information on the participating research institutes can be obtained by click on the links to the right.

The e-survey will take 15 to 20 minutes of your time. We thank you very much for your participation.



Section 1. Personal and education statistics

In this section we seek information on your personal characteristics and education.

1 / 18. Gender

You are a

- man
- woman

2 / 18. Age

You are currently

- <25
- 25-29 years of age
- 30-34 years of age

- 35-39 years of age
- 40-44 years of age
- 45-49 years of age
- 50-54 years of age
- 55-59 years of age
- 60-64 years of age
- 65 years of age or older

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3 / 18. Civil status

You are currently

- Single without children
- Single with children
- Married/co-habiting without children
- Married/co-habiting with children
- Divorced or widowed without children
- Divorced or widowed with children

---

4 / 18. Country of birth

Your country of birth is:

choose

---

5 / 18. Country of citizenship

Your country/countries of citizenship is/are: (If you have more than three citizenships, please indicate the most recent).

(i) choose

(ii) choose

(iii) choose

6(a) / 18. Education – degree(s)

The field of your Bachelor/1st professional/university degree (if more than one,

please provide information on your first Bachelor/1st professional/university degree)

is in:

choose field

awarded in:

choose year

in:

choose country

6(b) / 18. Education – degree(s)

The field of your earned doctorate (if more than one, please provide information on your first earned doctorate)

is in:

choose field

awarded in:

choose year

in:

choose country

☐ I do not have an earned doctorate.

---

7 / 18. Please indicate which of the following sources provided financial support during your doctorate studies. Please mark all that apply.

Scholarship

- ☐ From higher education institution (e.g. university, place of learning)
- ☐ From government
- ☐ From business/private sector employer
- ☐ From private not for profit

Employment income

- ☐ Teaching assistant salary/fees
- ☐ Research assistant salary/fees

- [ ] Other employment income
- [ ] Employer (e.g. support, re-imbursement)
- [ ] Loan
- [ ] Personal savings
- [ ] Spouse, partner, family
- [ ] Other, please specify:

Section II. Career characteristics

This section asks you about your current employment.

8 / 18. Country of current employment

You are currently employed in:

choose country

9 / 18. Sector of current employment

You are currently employed in the

Higher education sector
- ( ) Tenured
- ( ) Non-tenured

( ) Government sector

Business enterprise sector
- ( ) Manufacturing industries

- Services industries

- Private non-profit sector
- I am not currently employed

---

10 / 18. Current occupation

Your are currently working in the occupation of

- Legislators, senior officials and managers

  Professionals

  Physical, mathematical and engineering science professionals
  - Physicists, chemists, related professionals
  - Mathematicians, statisticians and related professions
  - Computing professionals
  - Architects, engineers and related professionals

  Life sciences and health professionals
  - Life science professionals
  - Health professionals (except nursing)
  - Nursing and midwifery professions

  Teaching professionals
  - College, university and higher education teaching professionals
  - Secondary education teaching professionals
  - Primary and primary education teaching professionals
  - Special education teaching professionals
  - Other teaching professionals

  Other professionals
  - Business professionals
  - Legal professionals
  - Archivists, librarians and related information professionals
  - Social science and related professionals
  - Writers and creative or performing artists
- Technicians and associated professionals
- Clerks
- Service workers and shop and market sales workers
- Skilled agricultural and fishery workers
- Craft and related trades workers
- Plant and machine operators and assemblers
- Elementary occupations
- Armed forces
- Not currently employed

11 / 18. Time elapsed from highest degree to 1st permanent employment in R&D

Please indicate the time elapsed from when you earned your highest degree to the time you obtained a permanent position in research.

- ○ Less than 6 months
- ○ 6 months to 1 year
- ○ More than 1 year but less than 2 years
- ○ 2 years or more but less than 3 years
- ○ 3 years or more but less than 4 years
- ○ 4 years or more but less than 5 years
- ○ 5 years or more
- ○ I did not obtain a permanent position in research

12 / 18. Total time spent in research

In this question we ask you about the amount of time you spend in research.

In your current employment, do you carry out research?

- ○ yes

Time spent on doing research		%
Time spent on teaching		%
Time spent on management/administration		%
Other		%
		%

- ○ no

In the following questions we ask you about your inter-sector mobility experience during your career.

13(a) / 18. Have you ever moved from employment in the public sector to employment in the private sector?

- ○ yes
- ○ no

13(a) / 18. Please indicate the factors that influenced your most recent move from employment in the public sector to employment in the private sector.

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Access to leading technologies	○	○	○	○	○
Employment opportunities	○	○	○	○	○
Freedom to pursue research opportunities	○	○	○	○	○
Networking	○	○	○	○	○
R&D funding	○	○	○	○	○
Salaries/wages	○	○	○	○	○
Working conditions (including hours of work and work environment).	○	○	○	○	○
Other	○	○	○	○	○

13(b) / 18. Have you moved from employment in the public sector to elsewhere in the public sector?

○ yes

○ no

13(b) / 18. Please indicate the factors that influenced your most recent move from employment in the public sector to employment elsewhere in the public sector.

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Access to leading technologies	○	○	○	○	○
Employment opportunities	○	○	○	○	○
Freedom to pursue research opportunities	○	○	○	○	○
Networking	○	○	○	○	○
R&D funding	○	○	○	○	○
Salaries/wages	○	○	○	○	○
Working conditions (including hours of work and work environment).	○	○	○	○	○
Other	○	○	○	○	○

13(c) / 18. Have you moved from employment in the private sector to employment in the public sector?

- yes
- no

13(c) / 18. Please indicate the factors that influenced your most recent move from employment in the private sector to employment in the public sector.

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Access to leading technologies					
Employment opportunities					
Freedom to pursue research opportunities					
Networking					
R&D funding					
Salaries/wages					
Working conditions (including hours of work and work environment).					
Other					

3(d) / 18. Have you moved from employment in the private sector to elsewhere in the private sector?

- yes
- no

13(d) / 18. Please indicate the factors that influenced your most recent move from employment in the private sector to elsewhere in the private sector.

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Access to leading technologies					
Employment opportunities					

Freedom to pursue research opportunities	○	○	○	○	○
Networking	○	○	○	○	○
R&D funding	○	○	○	○	○
Salaries/wages	○	○	○	○	○
Working conditions (including hours of work and work environment).	○	○	○	○	○
Other	○	○	○	○	○

14(a) / 18. Working abroad

In this question we ask about your work experience working abroad.

Have you ever been employed in a country that is not your country of birth?

○ yes

○ no

14(a) / 18. Please indicate the factors that influence your decision to not seek employment outside of your country of birth.

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Lack of financial incentive(s) outside country of birth	○	○	○	○	○
Lack of employment opportunities outside country of birth	○	○	○	○	○
Lack of research freedom outside country of birth	○	○	○	○	○
Lack of networking opportunities outside country of birth	○	○	○	○	○
Lack of R&D funding outside country of birth	○	○	○	○	○
Administrative and legal barriers (e.g. transfer of pension, work permit) outside country of birth	○	○	○	○	○
Job opportunities in country of birth	○	○	○	○	○
Working conditions in country of birth	○	○	○	○	○
Family responsibilities in country of birth	○	○	○	○	○
Social and cultural living conditions in country of birth	○	○	○	○	○
Other	○	○	○	○	○

14(b) / 18. Are you currently working abroad? By this we mean you are currently employed in a country that is not your country of birth.

- yes
- no

14(b) / 18. Please indicate the factors that influenced your choice to work in a country that is not the same as your country of birth.

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Access to leading technologies					
Employment opportunities					
Freedom to pursue research opportunities					
Networking					
R&D funding					
Salaries/wages					
Working conditions (e.g. hours, environment)					
Social and cultural living conditions					
Family related reasons (e.g. partner's job related move)					
Other					

14(c)/ 18. In the past, have you worked in a country other than your country of birth?.

- yes
- no

4(c)/ 18. (i) Please indicate the factors that influenced your choice to work in a country that is not the same as your country of birth (most recent employment in a foreign country).

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Access to leading technologies					
Employment opportunities					

Freedom to pursue research opportunities	○	○	○	○	○
Networking	○	○	○	○	○
R&D funding	○	○	○	○	○
Salaries/wages	○	○	○	○	○
Working conditions (e.g. hours, environment)	○	○	○	○	○
Social and cultural living conditions	○	○	○	○	○
Family related reasons (e.g. partner's job related move)	○	○	○	○	○
Other	○	○	○	○	○

(ii) Please indicate the factors that influenced your decision to return to your country of birth (most recent employment in a foreign country).

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Lack of financial incentive(s)	○	○	○	○	○
Lack of employment opportunities	○	○	○	○	○
Lack of research freedom	○	○	○	○	○
Lack of networking opportunities	○	○	○	○	○
Lack of R&D funding	○	○	○	○	○
End of employment term/contract	○	○	○	○	○
Family responsibilities	○	○	○	○	○
Social and cultural living conditions	○	○	○	○	○
Other	○	○	○	○	○

15(a) / 18. In this question we ask you about factors that might influence your decision to work abroad and if no plans, why not.

Do you have plans to work abroad?

○ yes

○ no

15(b) / 18. You have indicated you have plans to work abroad. Please indicate which factors influenced your decision to work abroad in the future.

Please mark all applicable	1=not important 5=very important

	1	2	3	4	5
Access to leading technologies	○	○	○	○	○
Employment opportunities	○	○	○	○	○
Freedom to pursue research opportunities	○	○	○	○	○
Networking	○	○	○	○	○
R&D funding	○	○	○	○	○
Salaries/wages	○	○	○	○	○
Working conditions (e.g. hours, environment)	○	○	○	○	○
Social and cultural living conditions	○	○	○	○	○
Family related reasons (e.g. partner's job related move)	○	○	○	○	○
Other	○	○	○	○	○

15(c) / 18. You have indicated you have no plans to work abroad. Please indicate which factors influence your decision to stay in your current country of employment .

Please mark all applicable	1=not important 5=very important				
	1	2	3	4	5
Lack of financial incentive(s) outside current country of employment	○	○	○	○	○
Lack of employment opportunities outside current country of employment	○	○	○	○	○
Lack of research freedom outside current country of employment	○	○	○	○	○
Lack of networking opportunities outside current country of employment	○	○	○	○	○
Lack of R&D funding outside current country of employment	○	○	○	○	○
Administrative and legal barriers (e.g. transfer of pension, work permit) outside current country of employment	○	○	○	○	○
Job opportunities in current country of employment	○	○	○	○	○
Working conditions in current country of employment	○	○	○	○	○
Family responsibilities in current country of employment	○	○	○	○	○
Social and cultural living conditions in current country of employment	○	○	○	○	○
Other	○	○	○	○	○

Section III. This section asks you about your job satisfaction.

16 / 18. Using your current employment, please rate your job conditions with expectations. Please indicate for each factor.

	1=not satisfied 5=very satisfied				
	1	2	3	4	5
Working conditions	○	○	○	○	○
Responsibilities	○	○	○	○	○
Salary/compensation	○	○	○	○	○
Job security	○	○	○	○	○
Recognition for contributions	○	○	○	○	○
Employer's commitment to R&D	○	○	○	○	○
Training opportunities	○	○	○	○	○
Professional development	○	○	○	○	○
Overall satisfaction	○	○	○	○	○

17 / 18. In terms of preparing you for your current job/career, how adequate was your highest degree program in each of the following areas?

	1=not adequate 5=very adequate				
	1	2	3	4	5
Scientific/subject matter skills	○	○	○	○	○
General problem solving skills	○	○	○	○	○
Oral communication skills	○	○	○	○	○
Teaching skills	○	○	○	○	○
Collaboration and team work skills	○	○	○	○	○
Establishing contacts with colleagues in field	○	○	○	○	○
Management/administrative skills	○	○	○	○	○
Overall	○	○	○	○	○

18 / 18. In your opinion, how can the attractiveness of scientific careers/jobs be improved?

	1=Fully disagree 5=Fully agree				
	1	2	3	4	5

Increase salary/benefits	○	○	○	○	○
Improve job security	○	○	○	○	○
Improve working conditions	○	○	○	○	○
Improve family/career commitment	○	○	○	○	○
Facilitate inter-sectoral mobility (e.g., public-private)	○	○	○	○	○
Facilitate international mobility	○	○	○	○	○
Increase transparency and competition in recruitment procedures	○	○	○	○	○
Improve scientific training (notably Master's/Doctoral degree programmes)	○	○	○	○	○
Increase public awareness of science, promote young people's interest in science	○	○	○	○	○
Other	○	○	○	○	○

You have reached the end of this survey. By clicking "Continue" your answers will be stored in our database. After that the survey will no longer be accessible.

If you would like to be notified of when and where the results of this survey are available, please enter your e-mail address:

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