



**Nalecz Institute of Biocybernetics and Biomedical Engineering
Polish Academy of Sciences**

Human Resources Strategy for Researchers incorporating
the European Charter for Researchers

and

the Code of Conduct for the Recruitment of Researchers

INTERNAL GAP ANALYSIS AND ACTION PLAN

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1. INTRODUCTION

In recent years, biomedical engineering as a discipline has been rapidly growing on many levels worldwide. Consistent with medical, scientific and technical opportunities, biomedical engineering employs principles from applied science (including mechanical, electrical, electronic and chemical engineering, material, computer science), as well as pure sciences (including physics, chemistry, mathematics) and their utilization in biology and medicine.

The Nalecz Institute of Biocybernetics and Biomedical Engineering of Polish Academy of Sciences (IBBE PAS) was established in 1975. Currently it is the largest centre of biomedical engineering in Poland. The Institute has a long history of training and granting of several young generations of experts in the biomedical engineering. The IBBE PAS is empowered to confer on doctoral and post-doctoral degrees. In 2007 the Institute has established doctoral studies programme related to biomedical engineering (14 PhD students in 2015).

The IBBE PAS mission is to develop and implement new technologies, devices and supportive theoretical tools for medical diagnosis and treatment aimed at prolonged and improved quality of life of patients with chronic and civilization diseases.

The research carried out in the Institute is focused on fusion of engineering and the life sciences that promotes scientific discoveries and the invention of new biomedical technologies. The Institute also coordinates initiatives leading to advanced research and education in the field of biocybernetics and biomedical engineering.

The research activities of the Institute are focused on 4 main areas: (1) biomeasurements, computer data processing and analysis for improvement of medical diagnosis and therapy, (2) support and substitution of lost functions of the organism, (3) techniques of micro- and nanoencapsulation and (4) mathematical/physical modelling and computer simulations of selected physiological processes and organs functions. All these fields are related to many sub-disciplines: biomeasurements, biomechanics, artificial organs, biomaterials, bioinformatics, medical informatics, biomedical imaging and biosystems modelling (nervous, muscles, blood circulation systems, *etc.*). The most important outcome of the Institute is an impact of bioengineering on emerging clinical diagnostics and therapies, such as repair and personal medicine.

The IBBE PAS has been a coordinator of the nationwide scientific network carrying studies in the field of biomedical engineering (BIOMEN), as well as a coordinator and co-implementer of the nationwide Foresight project concerning "Scenarios of Medical Technologies' Development until 2020 in Poland". According to comprehensive evaluation of scientific units performed by The Committee for Evaluation of Scientific Units (KEJN) of Ministry of Science and Higher Education, our Institute classified to the first category scientific units (category A).

In 2008 IBBE PAS in cooperation with five bio-tech-med institutes formed a new consortium BioCenter Ochota (Biocentrum Ochota). Besides our Institute, the consortium associates:

Institute of Experimental Biology PAS, Institute of Biochemistry and Biophysics PAS, Institute of Experimental and Clinical Medicine PAS, Institute of Fundamental Technological Research PAS and International Institute for Molecular and Cellular Biology. IBBE PAS is also a member of the Centre for Preclinical Research and Technology (CePT) consortium led by Medical University of Warsaw.

In October 2015 the IBBE PAS celebrated its 40th anniversary. On this occasion the Marshal of the Mazovia Voivodeship honored Institute the Medal „PRO MASOVIA”. The Institute has been granted in 2012 the Prix Galien award in the first Polish edition of the prestigious international Prix Galien award contest. The Institute was awarded in “Innovative research” category for an artificial cardio-pulmonary patient that was designed and developed by a research team led by prof. Marek Darowski.

The Institute is an owner of the Journal of Biocybernetics and Biomedical Engineering published by Elsevier. The journal is indexed and abstracted in Thomson Reuters Science Citation Index Expanded (SciSearch®), Journal Citation Reports and in Elsevier Bibliographic Databases: SCOPUS and EMBASE. Impact factor of the journal for year 2015 is 0.808.

Since 1975 the Institute organized thirteen National Conferences on Biocybernetics and Biomedical Engineering. In 1988 the International Centre of Biocybernetics (ICB) associated with the Institute began its activity.

Over the years the Nalecz Institute of Biocybernetics and Biomedical Engineering PAS participated in the implementation of many national and international projects. Between years 2009-2016 the IBBE PAS participated in the 12 international projects from the Operational Programme Innovative Economy, Framework Programme 7, Horizon 2020-Marie Skłodowska-Curie Innovative Training Networks (MSCA-ITN), Joint Programming in Neurodegenerative Disease Research (JPND III), The European Social Fund (ESF), European Cooperation in Science and Technology (COST).

At present the Institute has 130 employees, including 14 professors, 10 associate professors, 37 senior researchers, 13 senior technical staff.

The Institute has succeeded in creating of the interdisciplinary research teams that co-operate with medical, biological, and technical centres involved in several fields related to biocybernetics and biomedical engineering. A stimulating research or research training environment was created. The adequate human resources and infrastructure are provided to support the training program at the Institute.

2. PROCESS DESCRIPTION AND METHODOLOGY

Director of IBBE PAS has decided to implement the recommendations of the European Commission enclosed in the European **Charter** for Researchers and the **Code** of Conduct for the Recruitment of Researchers. During the Charter & Code (**C&C**) implementation process the IBBE PAS evaluated its operations, policies and procedures against the Charter & Code

principles. First step was to establish the HR Working Group and its members to define the basis of current level of implementation of C&C rules in IBBE PAS. HR Working Group was established with participation of representatives of scientific and administrative the Institute's workers: 1) Assoc. Prof. Dorota Pijanowska, Phd, DSc – coordinator, Plenipotentiary Director of External Scientific Projects & Research; 2) Prof. Andrzej Chwojnowski, PhD, DSc – Head of Doctoral studies; 3) Elżbieta Zachara, MSc – Chief Accountant; 4) Magdalena Antosiak-Iwańska PhD – secretary of the Group.

At first the HR Working Group defined the internal gap based on analysis the provisions of the European **Charter** for Researchers and the **Code** of Conduct for the Recruitment of Researchers (**C&C**) and the regulations obligatory at the IBBE PAS. The analysis was conducted internally on the basis of the following IBBE PAS documents:

- national law;
- the IBBE PAS Statute;
- the IBBE PAS Regulation;
- Polish Academy of science Acts;
- Interviews with projects coordinators and staff.

The internal gap analysis was a two-step process. In large extent the recommendations of the Charter & Code have been already implemented in the Polish legislation so that also in the regulations of the IBBE PAS.

The below shown four issues taken from Charter and Code:

- I. Ethical and professional responsibility of researchers,
- II. Recruitment,
- III. Working conditions,
- IV. Research career training and development,

were discussed and analysed by HR Working Group. Based on that analysis, the final questionnaire for all IBBE PAS workers was prepared. The questionnaire was distributed to all researchers and other staff of the IBBE PAS and during seven days, after three calls, there were 53 respondents that sent filled in files (breakdowns of respondents are presented in graphs below).

In order to organise efficient analytical processes with direct access to collected data we used Polish service - "PROFITEST", to carry out surveys, competency tests, checking the level of knowledge and online questionnaires.

The questionnaire was prepared in Polish to ensure full coverage of the target groups. The information about Polish version of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers was send in first announcement before survey

sending. The questionnaire was prepared according to the **Template for the Internal Analysis** (<http://ec.europa.eu/euraxess/rights>). The statements and questions covered the Rules of European Charter and a few additional aspects were included which were necessary for understanding of the possibility to execute and incorporate the Rules in IBBE PAS.

Key part of questionnaire present in brief the Rules and defines general tasks of a respondent in two contexts:

Context I: **Importance**. To what extent respondent agrees with those statements, using following responses:

- 1 – I totally disagree
- 2 – I disagree
- 3 – neither agree, nor disagree
- 4 – I rather agree
- 5 – I totally agree

Context II: **Realisation**. What is their knowledge and opinion related to level of implementation of the Rules in IBBE PAS at the date of survey, using following responses:

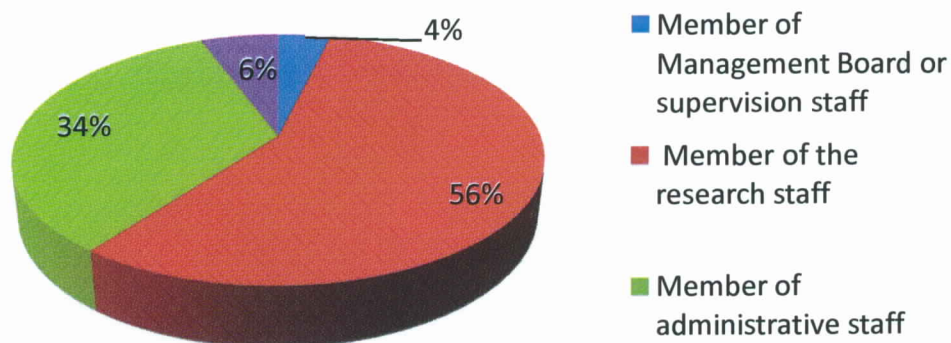
- 1 – New to the Institute (unknown)
- 2 – It is known but still out of formal regulation
- 3 – Dead record but exist in formal regulations
- 4 – Implemented but executed irregularly
- 5 – Fully implemented and respected

After preliminary analysis of the received data, survey results were presented and thoroughly discussed within HR Working Group. On the basis of the results obtained by the HR Working Group has prepared document consisting of Internal Gap Analysis and an Action Plan of Improvement.

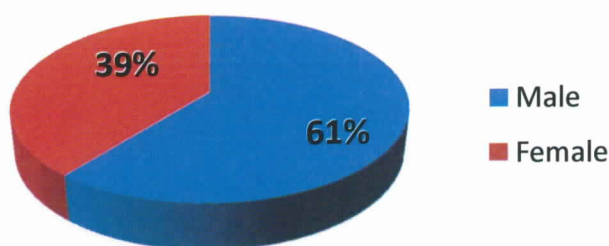
3. RESULTS

3.1. Breakdowns of respondents:

Among the 53 respondents the 76% were research staff including PhD students and member of Management Board) and 24% administrative staff (graph 1). Among all respondents - 61% were women (graph 2).



Graph 1. Constitution of the respondents in the institute.

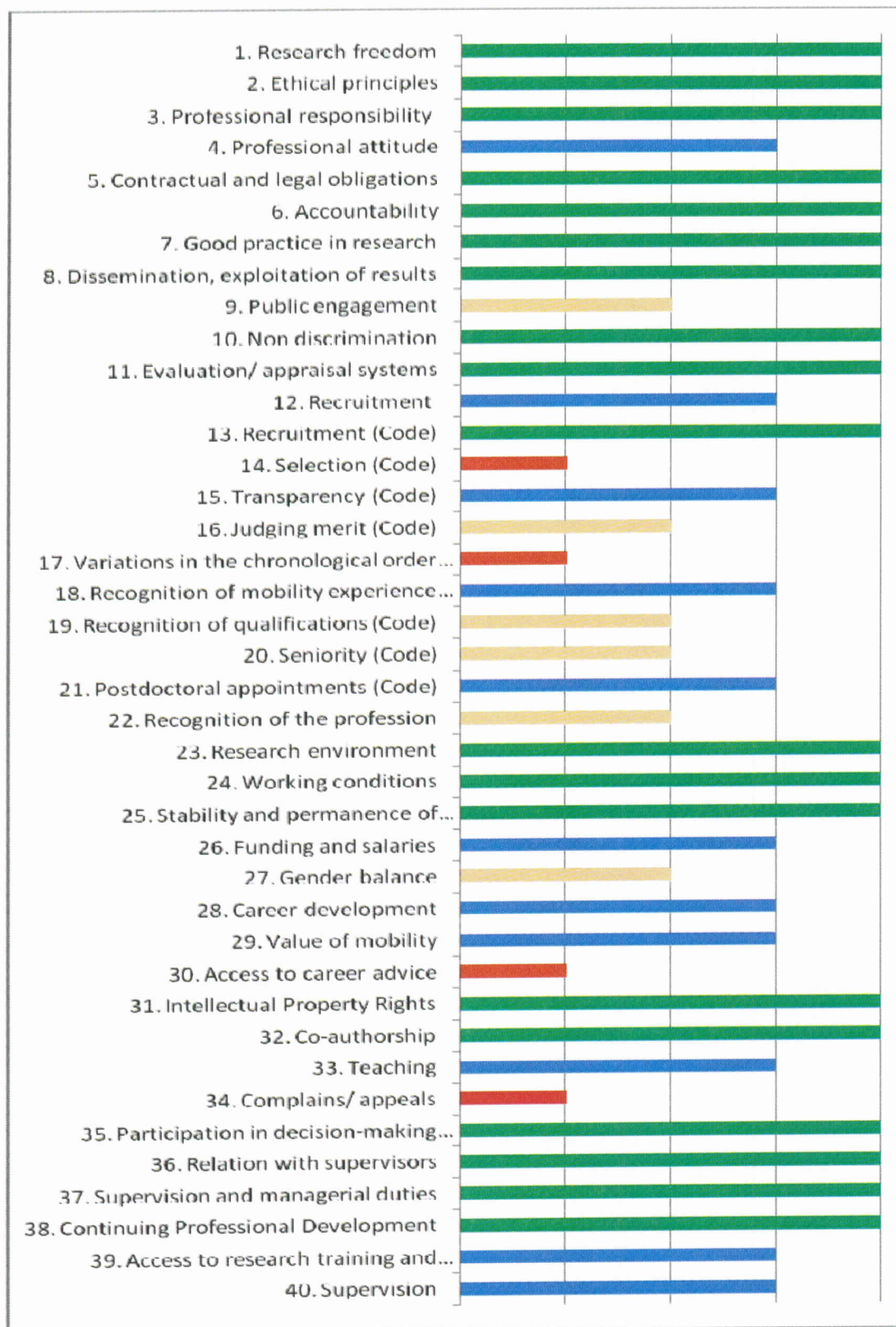


Graph 2. Gender of the respondents.

The total group of 53 respondents consists of representatives of all sub-group of staff employed IBBE PAS so it allows to general conclusions and further recommendations to action plan.

3.2. Current level of implementation of C&C rules

After analysing the questionnaire answers the HR Working Group evaluated the actual level of **importance** and **realisation** of the C&C rules according to IBBE PAS personnel. Items were identified as strength - for realisation up to 70% (marked in green), weakness - realisation under 50% (red), opportunities - realisation between 60-70% (blue) and challenges - realisation between 50-60% (orange). The current levels of implementation of C&C rules are presented in graph 3.



Graph 3. The current levels of implementation of C&C rules.

Strengths

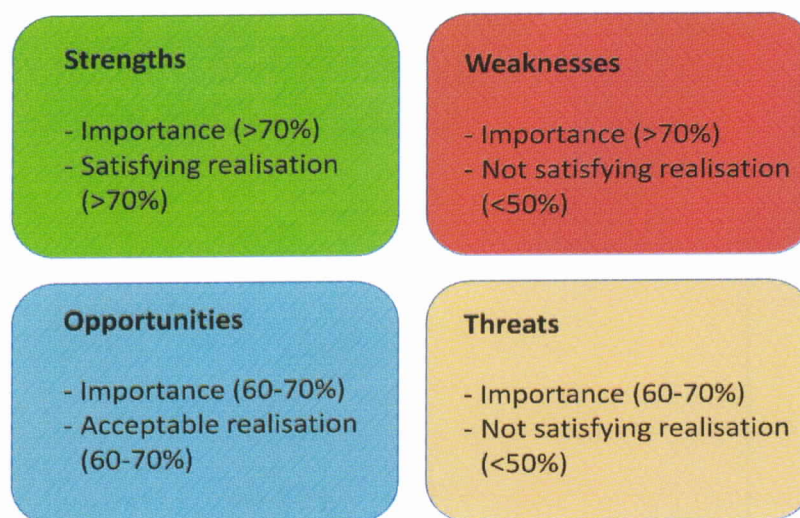
Weakness

Opportunities

Treats

4. ANALYSIS OF THE STRENGTHS AND WEAKNESS

SWOT (Strengths, Weakness, Opportunities, Threats) analysis was applied to evaluate results of the survey and to prepare action plan (graph 4).



Graph 4. SWOT analysis diagram.

4.1. Strengths

The most highlighted items were defined for cases when the group of respondents with positive answer concerning **implementation** at IBBE PAS exceed 70%. Therefore as the strengths the following item were identified: **(7)** Good practice in research (*realization*-88.7%), **(24)** Working conditions (for 84.9%), **(8)** Dissemination, exploitation of results (for 83.0%), **(10)** Non discrimination, **(13)** Recruitment (Code) (for 79.2%) **(1)** Research freedom (for 77.4%), **(2)** Ethical principles for (77.4%), **(3)** Professional responsibility (for 77.4%), **(5)** Contractual and legal obligations (for 77.4%), **(11)** Evaluation/appraisal systems (for 77.4%), **(36)** Relation with supervisors (for 77.4%), **(38)** Continuing Professional Development (for 77.4%), **(23)** Research environment (for 75.5%), **(25)** Stability and permanence of employment (for 75.5%), **(31)** Intellectual Property Rights (for 75.5%), **(6)** Accountability (for 73.6%), **(32)** Co-authorship (for 69.8%), **(37)** Supervision and managerial duties (for 69.8%), **(35)** Participation in decision-making bodies (for 67.9%).

The high level of **importance** (>70%) of these items was evaluated by the 60% of respondents.

4.2. Weakness

As weakness, items evaluated below the 40% from the point of view of **realisation** (<50%) at IBBE PAS and **importance** level (>70%) included the following: **(30)** Access to career advice (realization - 28.3%), **(34)** Complains/appeals (for 37.7%), **(17)** Variations in the chronological order of CVs (Code) (for 43.4%), **(14)** Selection (Code) (for 47.2%).

4.3. Opportunities

For the C&C rules implementation defined as **important** (60-70%) and **satisfied realisation** (between 60-70%) was classified as opportunities and included the following: **(18)** Recognition of mobility experience (Code) (realization - 71.7%). **(4)** Professional attitude (for 71.4%), **(28)** Career development (for 62.3%) **(21)** Postdoctoral appointments (Code) (for 64.2%), **(12)** Recruitment (for 62.3%), **(29)** Value of mobility (for 62.3%), **(39)** Access to research training and continuous development (for 62.3%), **(26)** Funding and salaries (for 60.4%), **(33)** Teaching (for 60.4 %), **(40)** Supervision (for 58.5%), **(27)** Gender balance (for 54.7%).

4.4. Threats

The last group of answers defined as not **important** (60-70%) and **unsatisfying realisation** (50-60%) was classified as treats and included the following: **(9)** Public engagement (realization 52.8%), **(16)** Judging merit (Code). **(20)** Seniority (Code), **(22)** Recognition of the profession, **(19)** Recognition of qualifications (Code) (for 56.6 %), **(15)** Transparency (Code) (for 58.5%). The results of SWOT analysis of the most important points are shown in Table 1.

Table 1. Table of results of SWOT analysis

Strengths	Weaknesses
important (>70%) and satisfying (>70%) realisation	important (>70%) and not satisfying (<50%) realisation
7. Good practice in research 24. Working conditions 8. Dissemination, exploitation of results 10. Non discrimination 13. Recruitment (Code) 1. Research freedom 2. Ethical principles 3. Professional responsibility 5. Contractual and legal obligations 11. Evaluation/appraisal systems 36. Relation with supervisors 38. Continuing Professional Development 23. Research environment 25. Stability and permanence of employment 31. Intellectual Property Rights 6. Accountability 32. Co-authorship 37. Supervision and managerial duties 35. Participation in decision-making bodies	30. Access to career advice 34. Complains/ appeals 17. Variations in the chronological order of CVs (Code) 14. Selection (Code)

Cont. Table 1. Table of SWOT analysis (development)

Opportunities important(>70%) and acceptable realisation (60-70%)	Threats mildly important (60-70%) and not satisfying realisation(50-60%)
18. Recognition of mobility experience (Code) 4. Professional attitude 28. Career development 21. Postdoctoral appointments (Code) 12. Recruitment 29. Value of mobility 39. Access to research training and continuous development 26. Funding and salaries 33. Teaching 15. Transparency (Code) 40. Supervision 27. Gender balance	9. Public engagement 16. Judging merit (Code) 20. Seniority (Code) 22. Recognition of the profession 19. Recognition of qualifications (Code) 15. Transparency

In order to improve the IBBE PAS competitiveness on international labour market it is necessary to start discussion with employees and implement changes, especially those that are recognized as weaknesses.

5. ACTIONS TO BE CARRIED OUT

Based on the outcome of the internal gap analysis, the members of the HR Working Group selected principles that require support and improvement at the institutional level.

For each such principle, the HR Working Group, proposed relevant corrective actions (improvement plan), appointed by the relevant personnel, and settled on a timeframe for implementation of these improvements. Suggested **Action Plan** is presented in the table below (table 2).

Table 2. Gaps identification and the Action Plan

Item 30. Access to career advice <i>Employers and/or funders should ensure that career advice and job placement assistance, either in the institutions concerned, or through collaboration with other structures, is offered to researchers at all stages of their careers, regardless of their contractual situation.</i>	
IDENTIFIED Gap - Weakness	Improvement plan
Access to career advice (new/unknown for 62.3% respondents)	Better dissemination of information on the role of the Institute services and

These point is related to career development and advice and were assessed as new/unknown. This specific area should not be formalized. The natural role of Group Leaders is to be mentors for their co-workers. However, a number of actions are planned to show the junior staff various paths of career development and strengthen their skills in career planning.	their initiatives/actions is needed.
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Item 34. General principle: Complaints/appeals.

Employers and/or funders of researchers should establish, in compliance with national rules and regulations, appropriate procedures, possibly in the form of an impartial (ombudsman-type) person to deal with complaints/appeals of researchers, including those concerning conflicts between supervisor(s) and early-stage researchers. Such procedures should provide all research staff with confidential and informal assistance in resolving work-related conflicts, disputes and grievances, with the aim of promoting fair and equitable treatment within the institution and improving the overall quality of the working environment.

IDENTIFIED Gap – Weakness	Improvement plan
<p>Complains/ appeals (new/unknown for 56.6% respondents);</p> <p>Disputes/appeals should be solved individually by independent person/supervisor.</p>	<p>It is needed to establish an ombudsman. It is necessary to define the characteristics of a candidate. The information on new procedures should be spread among the employees (emails, training on demand).</p>

Item 14. Selection (Code)

Selection committees should bring together diverse expertise and competences and should have an adequate gender balance and, where appropriate and feasible, include members from different sectors (public and private) and disciplines, including from other countries and with relevant experience to assess the candidate. Whenever possible, a wide range of selection practices should be used, such as external expert assessment and face-to-face interviews. Members of selection panels should be adequately trained.

IDENTIFIED Gap – Weakness	Improvement plan
<p>Selection (Code) (new/unknown for 45.3 % respondents);</p> <p>Candidates should be accepted on the basis of submitted documentation and a successful interview. Job should be offered to candidate for the relevant duration. The</p>	<p>The Institute should establish minimum criteria for Selection committees to evaluate adequate candidates for offered positions.</p>

obligatory documents should be submitted by candidate prior to the interview by e-mail.	
<p>Item 17. Variations in the chronological order of CVs (Code)</p> <p><i>Career breaks or variations in the chronological order of CVs should not be penalised, but regarded as an evolution of a career, and consequently, as a potentially valuable contribution to the professional development of researchers towards a multidimensional career track. Candidates should therefore be allowed to submit evidence-based CVs, reflecting a representative array of achievements and qualifications appropriate to the post for which application is being made.</i></p>	
IDENTIFIED Gap – Weakness	Improvement plan
<p>17. Variations in the chronological order of CVs (Code)</p> <p>(new/unknown for 57% respondents);</p> <p>IBBE PAS does not inform enough about methods and criteria of CV analysis and evaluation.</p>	<p>It is recommended to revise the existing Recruitment Rules and if needed, clear rules and criteria of CVs analysis will be created in order to establish employment policy.</p>
<p>Item 9. Public engagement</p> <p><i>Researchers should ensure that their research activities are made known to society at large in such a way that they can be understood by non-specialists, thereby improving the public's understanding of science. Direct engagement with the public will help researchers to better understand public interest in priorities for science and technology and also the public's concerns.</i></p>	
IDENTIFIED Gap - Threats	Improvement plan
<p>(new/unknown for 30.2% respondents, and known but not exist in official document for 24.5%)</p> <p>This rule is quite adequately implemented in IBBE PAS. Researchers obligations towards society are already codified in the existing regulations (Official Journal of Law of 2010, No. 96, item 619 – Act on Polish Academy of Sciences - Dz.U. nr 96 z dn. 04.06.2010r., poz.619).</p>	<p>Information on this aspect of scientific activity of the IBBE PAS employees should be better spread among the employeees.</p>

Item 16. Judging merit (Code)

The selection process should take into consideration the whole range of experience of the candidates. While focusing on their overall potential as researchers, their creativity and level of independence should also be considered. This means that merit should be judged qualitatively as well as quantitatively, focusing on outstanding results within a diversified career path and not only on the number of publications. Consequently, the importance of bibliometric indices should be properly balanced within a wider range of evaluation criteria, such as teaching, supervision, teamwork, knowledge transfer, management of research and innovation and public awareness activities. For candidates from an industrial background, particular attention should be paid to any contributions to patents, development or inventions.

IDENTIFIED Gap Threats**Improvement plan****Judging merit (Code)**

(new/unknown for 37.7% respondents);

This rule should be carefully observed.

It is necessary to ensure that existing procedures/principles give objective evaluation of the candidates. Their potential as a scientists or other employees (creativity, independence, responsibility, etc.).

Create tools to improve the evaluation of candidates and inform the candidates about criteria and the results of the selection process.

Item 20. Seniority (Code)

The levels of qualifications required should be in line with the needs of the position and not be set as a barrier to entry. Recognition and evaluation of qualifications should focus on judging the achievements of the person rather than his/her circumstances or the reputation of the institution where the qualifications were gained. As professional qualifications may be gained at an early stage of a long career, the pattern of lifelong professional development should also be recognised.

IDENTIFIED Gap - Threats**Improvement plan**

This rule is known but does not exist in official document.

This rule has been already applied however it should be well recognized among employees and candidates. It is recommended to include it in official documents.

Item 22. Recognition of the profession <i>All researchers engaged in a research career should be recognized as professionals and be treated accordingly. This should commence at the beginning of their careers, namely at postgraduate level, and should include all levels, regardless of their classification at national level (e.g. employee, postgraduate student, doctoral candidate, postdoctoral fellow, civil servants).</i>	
IDENTIFIED Gap – Threats	Improvement plan
This rule is known but not exist in official document.	This rule has been already applied, however, it should be well recognized among employees and candidates. It is recommended to include it in official documents.
Item 15. Transparency <i>Candidates should be informed, prior to the selection, about the recruitment process and the selection criteria, the number of available positions and the career development prospects. They should also be informed after the selection process about the strengths and weaknesses of their applications.</i>	
IDENTIFIED Gap - Threats	Improvement plan
Existing the recruitment procedure is not always clear to interpretation. The candidate is not informed on the strengths and weakness o+f his application. The procedure should be clearly presented.	It is recommended to modify the recruitment procedure and clarify this procedure in polish and english version and add them to Institute website. Moreover the candidate should receive the feedback information about the strengths and weaknesses of his/her application.

Conducted internal survey confirmed, that there is a need to improve HR processes in IBBE PAS. Interesting and valuable opinions were gathered when the employees considered positive and negative factors that may occur if Institute's Board of Directors decide to improve and execute Charter & Code principles. Key positive effects of the implementation of the survey's results are:

1. better contact between senior and young researchers with less domination of scientific position,
2. better contact between scientific groups inside the institute,
4. chance to closer involvement and development of young researchers in the Institute (as a result of mutual interest),

5. stronger support for career development,
6. introduction of clear rules of hiring, evaluation and awarding scientists as well as defined path for young scientists carriers.

Based on gathered opinions, it is crucial to ensure improvement in HR processes in IBBE PAS in accordance with Charter & Code principles.

6. IMPLEMENTATION ACT MONITORING PROCESS

To be more consistent with C&C principles, our aim is to improve our assessment in selected key aspects till the end of 2018. To make monitoring process of improvement plan easier/transparent, threats and weaknesses were grouped according to the Template HR analysis as follow:

- Ethical and professional aspects

As we know from the survey results, the Public engagement (item 9) is recognized as a threat since it is known by respondents but not existing in official documents of the institute. Therefore it is recommended to revise existing in IBBE PAS Regulations to address this issue for analysis by Human Research Strategy for Researcher (HRS4R) contact person. The rules should be also available on website of IBBE PAS (IT section duties). It will be analysed and incorporated by the end of 2017.

- Recruitment

Action plan concerning improvements eliminating threats (items 15, 16, 19, 20) and weaknesses (items 14 and 17) shown in the **Recruitment part** will be incorporated in the Institute by the end of 2017. The operational responsibility for these actions will be taken by a HR specialist in cooperation with Department of The *accounting and finance* and monitored by the Board of Directors.

- Working conditions and social security

Action plan concerning improvements eliminating threats (item 22) and weaknesses (items 30 and 34) shown in the **Working conditions** part will be incorporated by the end of 2018. First, the consultation with supervisors by Heads of Departments should be pursued. In the next step results of the consultations will be reported to the Board of Directors. It is important to recognise the necessity of existence of an ombudsman in our institute then the post will be established.

The HRS4R contact person in cooperation with Division of External Research Projects will be responsible for monitoring of the implementation of the action plan and reporting it to Board of Directors. In Dec. 2019 year the internal analysis of the action plan realization will be carried out and reported to Board of Directors. Graphical schedule of implementation process is shown in Graph 5.



Graph 5. Implementation process timeline.

Acceptance

This internal gap analysis and action plan was analyzed and accepted by IBBE PAS Board of Directors.

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