

COST Action Progress Report at 24 months

CA15203: Mitochondrial mapping: Evolution - Age - Gender - Lifestyle - Environment (12/09/2016 to 12/09/2018)

This report is submitted by the Action Rapporteur in fulfilment of the requirements of the rules for COST Action Management, Monitoring and Final Assessment and is confidential to the COST Association and the Management Committee of the Action.

Summaries

Main aim/ objective

include Evolution, Age, Gender, Lifestyle and Environment (EAGLE) in studies of mitochondrial function. MITOEAGLE develops harmonisation protocols towards generating a data repository on mitochondrial respiratory function. A data management system will interrelate various study-results and set them into a multidimensional context, to better diagnose mitochondrial respiratory defects

During its first two years the Action progressed the achievement of this as described below

The Working Group and MC Meetings held in conjunction with the last MitoEAGLE Conference in Jurmala (LV) provided an excellent summary of the major results obtained in the course of COST Action 15203.

* WG1: MitoEAGLE protocols, terminology, documentation

Recommendations on terminology and an overview on normalization of mitochondrial and cellular respiration were published as a MitoEAGLE preprint on 'Mitochondrial respiratory states and rates' with 42 sequential open access versions and a track record on contributions and discussions among the nearly 400 co-authors:

** http://www.mitoglobal.org/index.php/MitoEAGLE_preprint_2018-02-08 and discussion page.

An overview on 'Mitochondrial respiratory control by fuel substrates and specific inhibitors of respiratory enzymes' was presented as Part 2 in the series of MitoEAGLE position papers:

** http://www.mitoglobal.org/index.php/Gnaiger_2018_MiP2018

Harmonisation protocols and a training programme for inter-laboratory proficiency tests were developed, as a basis for generating a data repository on mitochondrial respiratory function as influenced by Evolution, Age, Gender, Lifestyle and Environment (EAGLE).

A training and knowledge management concept is in an advanced state of development and will be put into action at the MitoEAGLE/MiPschool Tromso-Bergen 2018:

** http://www.mitoeagle.org/index.php/MiPschool_Tromso-Bergen_2018

The report on ECI, ITC and gender balance in the COST Action MitoEAGLE was presented by Nina Krako Jakovljević, proudly summarizing the success in fully adhering to the COST guidelines in our expanding network.

* WG2: MitoEAGLE data repository in skeletal and cardiac muscle

An international 'Inter-laboratory proficiency test including harmonization of protocols for mitochondrial function evaluation in permeabilized muscle fibers' and 'Inter-laboratory study on human permeabilized myofibres: effects of fibre preparation, respiration buffer, and blebbistatin on mitochondrial respiratory capacity and oxygen limitation' were presented by Carolina Doerrier:

** http://www.mitoglobal.org/index.php/Doerrier_2018_MiP2018a

** http://www.mitoglobal.org/index.php/Doerrier_2018_MiP2018c

The Working Group 2 report on 'Generating mitochondrial respirometry reference values from permeabilized mouse soleus muscle fibers' was presented by Pablo Garcia-Roves:

** http://www.mitoglobal.org/index.php/Garcia-Roves_2018_MiP2018b

* WG3: MitoEAGLE data repository: adipose, liver, neuronal

Zuzana Cervinkova summarized the achievements on coordination of collecting data - WG3 liver tissue.

* WG4: MitoEAGLE data repository for blood cells and cultured cells

A manuscript on an 'Interlaboratory guide through procedures for mitochondrial respiratory studies with intact and permeabilized peripheral blood mononuclear cells and platelets' was prepared during a series of working group meetings, which will be extended by a summary of experimental results forming the foundation of a database:

** http://www.mitoglobal.org/index.php/MitoEAGLE_blood_cells_1

Nicoleta Moiso summarized the state on 'Integrating published data of mitochondrial function in cell lines as models of neurodegenerative disease'.

A data management system will interrelate various study-results and set them into a multidimensional context, to better diagnose mitochondrial respiratory defects.

The Rapporteur summarised the Action's major outcomes, impacts and successes as follows

The second progress report assessment of the Action CA15203 between 2016 to 2018 indicates that all of the objectives stated in the Memorandum of Understanding (MoU) are on schedule: the progress towards most of the objectives is estimated at around 50% or more, while the progress towards the four out of thirteen objectives is between 26 and 50%. The prerequisite for starting work on objectives that seemingly lag behind is consortia formation and production of joint experimental results.

Thirty COST member countries have accepted the MoU; the Inclusiveness Target Countries are well represented. Other participants include institutions from Egypt, USA and Palestinian Authority. There is an impressive list of scientists from all continents who have expressed an interest in harmonisation of protocols to measure mitochondrial respiratory function to work towards the bigger goal to link the standardised mitochondrial parameters to other measurable physiological parameters of healthy and diseased cells, tissues and organisms. Protocols harmonization and database formation is a large step for achieving these higher goals. The added value of the COST network is inclusiveness and training of early career investigators (ECI), which will be able to continue this process also after the action. The main industrial stakeholder, Oroboros Instruments, actively participates in development of standardised protocols and training of researchers. In addition to contributing to the above-mentioned goals, this bridges the gap between industry and academia.

The Action Chair has described their plans for addressing issues identified in their report as follows

Financial support will be more stringently focussed on direct output to fulfill the Actions mission in terms of multi-authored position statements, joint publications on standard operating procedures, databases for WG2 to WG4. This will apply to STSMs and WG retreats on joint projects and completion of manuscripts.

The Rapporteur summarised the Actions's plans for addressing issues identified in the report

The Action Chair has identified the topics that need more attention and was planing to stimulate the work also with financial support and other resources in order to maximise the chances of the Action achieving its MoU Objectives.

Achievement of MoU objectives, deliverables and additional outputs/ achievements

MoU objectives

The Action reported progress of the following objectives.

MoU objective	Level of progress	Rapporteur assessment
Intensify the dissemination of updated knowledge and know-how among the partners.	51 - 75%	CONFIRMED
Build and improve collaborative relationships among the participating groups of the Action and interested end-users.	51 - 75%	CONFIRMED
Optimally harmonise protocols across research groups.	51 - 75%	CONFIRMED
Foster coordinated research activities of scientific proposals in the European Research Area.	51 - 75%	CONFIRMED
Increase the number of active participants in the course of the COST Action.	76 - 100%	CONFIRMED
Form a unique well-coordinated network of senior researchers and young investigators.	51 - 75%	CONFIRMED
Include well established stakeholders.	51 - 75%	CONFIRMED
Establish a spirit of mentorship and collaboration in contrast to fierce competition which characterised early decades of bioenergetics.	51 - 75%	CONFIRMED
Initiate applications for funding to support international collaborative research projects.	26 - 50%	CONFIRMED
Present and publish results of collaborative research projects within the COST Action, particularly related to STSMs supported by the Action.	26 - 50%	CONFIRMED
MITOEAGLE recommendations: The goal is to increase the value and reduce the noise in mitochondrial research. Prespecified and time-stamped protocols are needed in practice, and researchers need to be introduced into adhering to publicly deposited protocols in practice. MITOEAGLE recommendations will provide practical guidelines for students, scientists and stakeholders.	26 - 50%	CONFIRMED
A monitored database – centres of excellence: The MITOEAGLE database will provide an invaluable tool for mitochondrial studies in the transition from exploratory preclinical research to clinical and pharmacological applications. Centres of excellence will emanate from the project's working groups providing training programmes and diagnostic services.	26 - 50%	CONFIRMED
Training: Enhance the rigorous training activities particularly for PhD students and young researchers (STSMs, Schools, Workshops, Conferences) in order to establish the practical guidelines introduced by MITOEAGLE and to enhance research results in the long term.	76 - 100%	CONFIRMED

Rapporteur assessment of the level of progress reported by the Action.

The Rapporteur confirmed the level of progress reported by the Action for all objectives.

Action explanation regarding MoU objectives reported as 25% or less achieved

The table below shows the Action's explanation and the Rapporteur's analysis thereof for any MoU objectives that the Action reported as 25% or less achieved.

MoU Objective that was reported as 25% or less achieved	Action's explanation	Rapporteur's analysis
The Action did not report any objectives as 25% or less achieved.		

General Assessment of MoU objectives

The level of ambition of the MoU objectives was **High**.
Overall, **all MoU Objectives are progressing appropriately**.

Deliverables

Progress on delivery of deliverables reported by Action.

Deliverable	Month deliverable due	Delivery status	Rapporteur Comment
Guidelines for future research and recommendations for the evaluation of respiratory characteristics in human respirometric samples (WG1).	46	Not delivered, but expected before end of Action	Some guidelines and recommendations are summarised already in the preprint paper "Respiratory rates and states".
A database on mt fitness evaluated with humans' cells and tissues (WG1).	47	Not delivered, but expected before end of Action	This delivery of WG1 depends on the work completed by the other three work groups. WG2 and WG4 have generated databases already, while WG3 is lagging behind. Task, milestones and deliverables are described for the WG3. Would it help to re-assess and add the deadlines for implementation?
Training of researchers towards improved reproducibility of sample preparation and respirometric evaluation (1/3 - WG1).	11	Delivered	TS Obergurgl consisted of lectures by experts in the field and younger scientists; the trainees had also the opportunity to present the data. The interactions of participants was facilitated during the mid-day breaks at Walk and Talk and poster sessions and during a Meet the Experts session (TS Programme). The feedback from 9 participants (trainees and trainers included) was favourable.
Training of researchers towards improved reproducibility of sample preparation and respirometric evaluation (2/3 - WG1).	26	Delivered	This TS was planned to enable close interactions between the participants and experts in small groups and one-to-one sessions. The participants were invited to comment and join as co-authors of the manuscript- preprint on Mitochondrial respiratory states and rates; an opportunity for the ECI.
Training of researchers towards improved reproducibility of sample preparation and respirometric evaluation (3/3 - WG1).	35	Not delivered, but expected before end of Action	Action Chair reported that training of researchers will continue at TS Coimbra and will be improved on the basis of evaluation of previous TS. An entrance test may help to select the candidates who will efficiently use the knowledge after the TS. Introductory lectures and critical discussions could improve the theoretical knowledge of the trainees. Would the additional laboratory (practical) training help to achieve these goals?

Qualitative and quantitative evaluation of results obtained in ongoing studies by comparison with a reference sample (WG1).	44	Not delivered, but expected before end of Action	Please provide a summary of the ongoing studies and preliminary qualitative and quantitative evaluations.
An expanded MitoEAGLE database (WG1).	48	Not delivered, but expected before end of Action	Please provide a progress report on the MitoEAGLE database expansion in a separate file.
A joint publication documenting the results of the MitoEAGLE-PT (WG1).	42	Not delivered, but expected before end of Action	Professor Gneiger has hosted 12 STSM so far and has previous publications on the topic. It is therefore likely that the joint publication will be delivered.
A multi-authored publication towards a unification of concepts and nomenclature in mitochondrial physiology (1/3 - WG1).	15	Delivered	The MitoEAGLE has enabled an impressive platform for established researchers and ESR's to contribute in an all-inclusive discussion and formation of position statement to unify the concepts and nomenclature in the field of mitochondrial physiology.
A multi-authored publication towards a unification of concepts and nomenclature in mitochondrial physiology (2/3 - WG1).	26	Delivered	The paper "Mitochondrial respiratory states and rates", is a position statement in the frame of COST Action CA15203 MitoEAGLE. It is published as an open access from the MitoEAGLE web page open to all scientists for comments and improvements. Quality is appropriate for a work in progress.
A multi-authored publication towards a unification of concepts and nomenclature in mitochondrial physiology (3/3 - WG1).	35	Not delivered, but expected before end of Action	Phase 3 of the manuscript "Mitochondrial respiratory states and rates" is not yet delivered consistent with the proposed schedule.
A library of protocols for sample preparation and examination by respirometry (WG1).	39	Not delivered, but expected before end of Action	An updated library of protocols for sample preparation and examination by respirometry is not yet delivered, however the additions on the protocol library can be monitored at http://www.mitoeagle.org/index.php/MitoPedia:_Sample_preparations .
A multi-authored publication with recommendations of comparable standard protocols and procedures (WG1).	45	Not delivered, but expected before end of Action	A multi-authored publication with recommendations of comparable standard protocols and procedures is not delivered. Plans described by the action are highly likely to result in the delivery on schedule.
Guidelines as to the optimum use of a reference sample for determination of respiration and related parameters of interest (WG1).	47	Not delivered, but expected before end of Action	The work on the guidelines for the optimum use of a reference sample for determination of respiration is in progress. The plans described by the action are highly likely to result in the

			delivery.
The MitoEAGLE data management system (WG1).	48	Not delivered, but expected within 2 years after the end of the Action	The MitoEAGLE data management system is expected to be delivered 2 years after the end of the Action with additional financial support. It is very likely that the grant application will be prepared by the MitoEAGLE consortium. What are the alternative funding sources if the above grant application is not granted in the first attempt?
A continuously updated MitoEAGLE database for the use as reference data and guideline towards application of optimised protocols, ultimately leading towards standardisation (WG1).	48	Not delivered, but expected before end of Action	The guideline preparations seem to be progressing, especially towards the generation of reference values for mitochondrial respirometry in permeabilized skeletal muscle sample.
A joint publication on the use of the MitoEAGLE database and management system (WG1).	48	Not delivered, but expected before end of Action	It is not clearly written how this deliverable will be implemented. Please elaborate.
An education programme for the use of MitoEAGLE database and management system (WG1).	48	Not delivered, but expected before end of Action	It is not clearly written how this deliverable will be implemented. Please elaborate.
A MitoEAGLE database on muscle tissue from humans and model organisms (WG2).	38	Not delivered, but expected before end of Action	The parts contributing to the MitoEAGLE database on muscle tissue from humans and model organism have been described by the Action Chair. The deliverable can be achieved provided the work on it continues.
A set of guidelines for future studies on mitochondrial bioenergetics in muscle tissue (WG2).	47	Not delivered, but expected before end of Action	The parts that could form the basis for the guidelines on mitochondrial bioenergetics in muscle tissue were described. The deliverable can be achieved provided the work on it continues.
A draft of the review manuscript (WG2).	38	Not delivered, but expected before end of Action	In the preparatory phase. It is likely to be delivered if the work on it continues.
Guidelines for future research and recommendations for the evaluation of respiratory characteristics in fat tissue (WG3).	48	Not delivered, but expected before end of Action	This work seems at the early stage according to the Action Chair. Revision of the plan and timepoints/deadlines and their implementation may help to speed up the work. Difficulties were anticipated (Risk and contingency plans: http://www.mitoEagle.org/index.php/COST_Action_MitoEAGLE#Implementation) "Even in the very large consortium the availability of data, e.g. on mitochondrial respiratory function in human adipose tissue, may be limited and not yet suitable for a data repository. In this case, the consortium might decide for WG3

			to (a) focus on model organisms, or (b) select a different tissue or tissues, or (c) be cancelled in favor of strengthening the other WGs."
A database on mt-fitness evaluated with fat tissue from humans and model organisms and post-study reports (PubMed Commons) (WG3).	48	Not delivered, but expected within 2 years after the end of the Action	The possible difficulties were anticipated in Risk and contingency plans at http://www.mitoeagle.org/index.php/COST_Action_MitoEAGLE#Implementation
A draft of the review manuscript (WG3).	44	Not delivered, but expected before end of Action	There are no specific data provided to assess the progress, however there are two more years for delivery completion.
SOPs for blood cell separation and respirometric characterisation open for the research community (WG4).	35	Not delivered, but expected before end of Action	The work is progressing, delivery can be completed if the work continues (publication in preparation).
MitoEAGLE data repository for comparative data evaluation, planning of future studies data mining (WG4).	48	Not delivered, but expected before end of Action	The information needs to be summarised in a repository or a separate document to be assessed. The next delivery no. 27 depends on this delivery no. 26, therefore this delivery has to be completed as soon as possible. Would it help to review and adjust the deadlines?
Publication with a set of reference data (WG4).	36	Not delivered, but expected before end of Action	This delivery depends on the delivery 26, therefore the previous one has to be completed as soon as possible. Would it help to review and adjust the deadlines?

General Assessment of deliverables

The level of ambition of the deliverables was **high**.
Overall, **most deliverables are progressing appropriately**.

Additional outputs / achievements

Co-authored Action publications

The Action reported 5 publications on the topic of the Action, co-authored by at least two Action participants from two countries participating in the Action. The full list of publications appears in Annex I.

The:

- quality of the Action's co-authored publications is excellent.
The publications are published in excellent/very good journals, one is available only as a preprint.
- significance of the Action's co-authored publications is very good.
The authors are either from COST member countries or the collaborations are extended to other countries. The latter is the opportunity to widen collaborations and invite additional speakers to the COST events. It is expected that the papers published early in the action are authored by smaller groups because of the time constraints.
- relevance to the Action of the Action's co-authored publications is excellent.
The COST 15203 Action is acknowledged in all manuscripts, which all contribute to the Action's goals to a different degree.
- quantity of the Action's co-authored publications is excellent.
As it takes time to coordinate collaborations, obtain data and complete the peer review process, the four published papers are an excellent achievement for the two years period.

Projects and proposals resulting from Action activities

The Action reported the following projects resulting from Action activities involving at least one Action participant.

Title	Main proposer name	Funder
NextGen-O2k H2020 SME Phase 1	Oroboros Instruments	H2020

In addition the Action reported 4 proposals resulting from Action activities involving at least one Action participant, and for which the Action networking was necessary.

Relevance of the Action's proposals and/ or projects is **excellent**.

Quantity of the Action's proposals and/ or projects is **very good**.

Other outputs / achievements

The table below shows the other outputs / achievements.

Other Output / Achievement reported by Action	Significance of the output
As direct output results of the COST Action the following achievements can be considered: Preprint, Impact Flyer (will be published shortly after the MitoEAGLE Preprint), Website, Harmonization protocols of working groups, continuous exchange of knowledge and methods during meetings and passing on of know-how during STSMs.	High

The quality and quantity of the other outputs/ achievements was assessed as follows.

The quality of Other Outputs and Achievements can be commented on when they are delivered.

Impacts

The Action reported the following impacts (the short- to long-term scientific, technological, and / or socioeconomic changes produced by a COST Action, directly or indirectly, intended or unintended) that have resulted, or might result, from the Action.

Description of the impact	Type of impact	Timing of impact
<p>STSMs at working group meetings, where the participants were doing experiments and working on the protocols will have an impact on all participants who can share their know-how and/or expand their knowledge.</p> <p>Also, other impacts are that new collaborations within the COST MitoEAGLE Action result in opportunities such as lectures at various events, e.g.:</p> <p>Prof. Charles Hoppel gave a lecture at the Charles faculty in November</p> <p>Dr. Nicoleta Moisoï gave a lecture at: Dementia Conference 17th of May 2017</p> <p>Dr. Nicoleta Moisoï and Dr. Lisa Chakrabarti gave a lecture at: Parkinson's UK East Midlands - Researcher's Meeting</p> <p>Dr. Erich Gnaiger plenary lecture at: EBEC 2018, Budapest, Hungary</p>	<ul style="list-style-type: none"> Scientific / Technological 	Achieved
<p>Validity, relevance and significance (in particular importance and timeliness) of the impact reported by the Action: The described impacts are valid, relevant and significant as described by the Action's chair.</p>		

The extent to which the Action has advanced the careers, skills and networks of researchers including ECIs (as described by the Action) is **excellent**.

Stakeholder engagement
<p>A large number of stakeholders represented by academic and industry-based scientists are listed as host institutions offering their labs for STSMs and forming a network of mitochondrial research centres: http://www.mitoeagle.org/index.php/Short-Term_Scientific_Missions_MitoEAGLE#MitoEAGLE_host_institutions Oroboros Instruments Corp (SME, Innsbruck, Austria) offers training courses with the participation of several members of the COST Action, both as trainees and as trainers. NeuroVive (Pharmaceutical AB, Sweden) who will be crucial for disseminating the developed standards (protocols, ring tests) through their contacts and networks: http://wiki.oroboros.at/index.php/NeuroVive</p>
The Rapporteur's comment on the Action's description of the Stakeholder engagement
<p>An industry-based laboratory open for STSM is an advantage especially for the ECI, which seems possible because of the Oroboros' Instruments policy to offer rigorous training along with their instrument.</p>

General assessment of impacts

The Action's impacts are best described as follows:

Multiple highly significant impacts are reasonably foreseen, at least one of which is already observed [Excellent]

Dissemination and exploitation of Action results (other than co-authored Action publications listed previously)

Dissemination

Dissemination meetings funded by the Action

Action website

<http://www.mitoglobal.org/index.php/MITOEAGLE>

The:

- openness and user-friendliness of the Action website are very good
- content of the Action website (programmes and minutes of all events present, all outputs/deliverables accessible from website) is excellent

The Action website was an effective means of disseminating the Action.

Rapporteur's comment on the website

MitoEAGLE web site is a part of Oroboros Instruments web site. The advantage is that it is more visible to researchers interested in bioenergetics. Also the MitoEAGLE achievements are therefore more likely to be regularly updated and disseminated even after the end of the Action.

Other dissemination activities

The following other dissemination activities reported by the Action were effective and added value

Item/activity	MitoEAGLE website ensures continuous dissemination of the MitoEAGLE Action progress. http://www.mitoglobal.org/index.php/MitoEAGLE
Target Audience	The target audience is everyone who is interested in knowledge on mitochondrial function in health and disease related to Evolution, Age, Gender, Lifestyle, and Environment.
Outcome of the activity	The open access of the website leads to a steadily growing MitoEAGLE network. In particular, the active members work together on harmonization of protocols and improving the knowledge on mitochondrial research.
Hyperlink	http://www.mitoeagle.org/index.php/MitoEAGLE

Item/activity	Participation at various events worldwide, not only by the Chair of the Action but also by the members. Our COST Action members disseminate the actions aims and objectives, which motivates new participants to join as members and will help us to reach out to stakeholders.
Target Audience	Conference and Meeting participants who are interested in mitochondrial research.
Outcome of the activity	New cooperations were established, new members joined the action, received opinions from scientists all over the world on MitoEAGLE topics in order to fight the reproducibility crisis and to establish advanced standards in mitochondrial functional diagnostics.
Hyperlink	http://www.mitoglobal.org/index.php/MitoGlobal_Events

Item/activity	Another tool used by our dissemination coordinators is Facebook, where current events, project results and general ideas related to MitoEAGLE are announced.
Target Audience	Again MitoEAGLE members and also friends of MitoEAGLE members who can see shared MitoEAGLE posts.

Outcome of the activity	Steadily growing MitoEAGLE network and interested new members who want to participate in events or open calls.
Hyperlink	https://www.facebook.com/costmitoeagle/?ref=bookmarks

Item/activity	The Research gate website is used to disseminate the MitoEAGLE Action, where other members can add their publications.
Target Audience	Scientists who are registered on Research gate and can access the MitoEAGLE page.
Outcome of the activity	Exchange by MitoEAGLE members who share their work on the Research gate website.
Hyperlink	https://www.researchgate.net/project/Cost-Action-MITOEAGLE-Evolution-Age-Gender-Lifestyle-Environment

Item/activity	Our MitoEAGLE website is mentioned on several MitoEAGLE member institution web pages or on conference websites who organized MitoEAGLE sessions, such as EBEC2020, WISE3 in Szeged or MitoEST in Estonia.
Target Audience	Members and cooperation partners from different MitoEAGLE member institutions and also participants from conferences which are organized by MitoEAGLE members and disseminate the MitoEAGLE Action.
Outcome of the activity	New members joined the MitoEAGLE network. New cooperations between MitoEAGLE members and conference attendees were a result which also lead to new members.
Hyperlink	http://portal.research.lu.se/portal/en/projects/eu-fp-horizon-2020-cost-action-ca15203-mitoeagle(06fb61a9-eeef-49de-beeb-fea139bb6b28).html

Exploitation activities

The following activities to ensure exploitation (use, in particular in a commercial context) of the Action's achievements reported by the Action were effective and added value

Item/activity	Interlaboratory testing of mitochondrial diagnostic protocols sets new standards for quality control, based on instrumental platforms developed and distributed by participating companies. These companies benefit from the multi-author reports and publications which present instrumental applications on an international and unbiased basis.
Target Audience	Researchers who are interested in improving our knowledge on mitochondrial function in health and disease with regard to Evolution, Age, Gender, Lifestyle, and Environment. The training schools help to introduce instrumental platforms used for diagnosis of mitochondrial function to a specifically targeted audience.
Outcome of the activity	The large MitoEAGLE network provides strong support to increase the scientific and public awareness on the importance of mitochondrial functional diagnostics, which helps all involved commercial stakeholders in their marketing strategies. Interrelating results of studies performed world-wide with the help of a MitoEAGLE data management system. Providing standardized measures to link mitochondrial and physiological performance to understand the myriad of factors that play a role in mitochondrial physiology.

Assessment of Action dissemination and exploitation activities

The effectiveness of the Action's dissemination and exploitation approach (other than co-authored

publications) is assessed as follows

The MitoEAGLE web page is seamless with Oroboros Instruments web pages. It is designed as a big portal for information dissemination and facilitation of scientific discussions. Information is also disseminated through a nice Facebook profile and Research Gate page. Dissemination is efficient also through the extensive MitoEAGLE network of European scientists and the colleagues from the other five continents. Seamlessness of the MitoEAGLE web page with the commercial one ensures an efficient exploitation of results.

Assessment of Action dissemination and exploitation activities

There were many highly effective Action activities focusing on dissemination of Action results [Excellent]
There were many highly effective Action activities focusing on exploitation of Action results [Excellent]

Other matters

Difficulties in implementing the Action

The Action Rapporteur made the following observations regarding difficulties in implementing the Action: The Action Chair and MC members seemed to have taken an efficient corrective action by substituting an inactive WG leader and MC member with highly involved persons.

Emerging topics / developments in the field of the Action

The Action reported the following emerging topics / developments in the field of the Action.

- COST Action meetings will be organized to discuss joint grant applications (Marie Skłodowska-Curie Action, ITN) within the MitoEAGLE network, and in collaboration with COST Action CA16225 EU-CARDIOPROTECTION.

The Action Rapporteur made the following comment on the emerging topics / developments in the field reported by the Action.

- The Action is making an excellent progress at providing the networking opportunities and thus facilitates also the possibilities of joint grant applications (ITN and other funding mechanisms).

Action Rapporteur

This Second Progress Report was submitted on 2018-12-07 by:
Prof Irina Milisav
UL Faculty of Medicine
Slovenia

Annex 1: List of publications

The Action reported 5 publications on the topic of the Action, co-authored by at least two Action participants from two countries participating in the Action.

Co-authored Action publications - peer-reviewed

Title	Remodeling pathway control of mitochondrial respiratory capacity by temperature in mouse heart: electron flow through the Q-junction in permeabilized fibers
Authors	Hélène Lemieux; Pierre U. Blier; Erich Gnaiger
DOI	doi:10.1038/s41598-017-02789-8
Type	Journal article
Published in	Scientific Reports
Published by	Springer Nature
ISSN	2045-2322
Links	http://www.nature.com/articles/s41598-017-02789-8.pdf ; http://www.nature.com/articles/s41598-017-02789-8
Title	Biological Implications of Differential Expression of Mitochondrial-Shaping Proteins in Parkinson's Disease
Authors	Sara Rocha; Ana Freitas; Sofia Guimaraes; Rui Vitorino; Miguel Aroso; Maria Gomez-Lazaro
DOI	doi:10.3390/antiox7010001
Type	Journal article
Published in	Antioxidants
Published by	MDPI AG
ISSN	2076-3921
Link	http://www.mdpi.com/2076-3921/7/1/1/pdf
Title	The alteration of mitochondrial function is associated with the induction of endoplasmic reticulum stress autophagy and apoptosis by Sorafenib in liver cancer cells
Authors	Angeles Rodriguez-Hernández; Pavla Staňková; Raúl González; Ángel José De la Rosa; José María Álamo-Martínez; Luis Miguel Marin-Gómez; Ondřej Sobotka; Otto Kučera; Francisco Javier Padillo; Zuzana Červinková; Jordi Muntané
DOI	doi:10.1016/j.freeradbiomed.2018.04.353
Type	Journal article
Published in	Free Radical Biology and Medicine
Published by	Elsevier BV
ISSN	0891-5849
Subjects	Physiology (medical); Biochemistry
Links	https://api.elsevier.com/content/article/PII:S0891584918305185?httpAccept=text/xml ; https://api.elsevier.com/content/article/PII:S0891584918305185?httpAccept=text/plain
Title	Impairment of mitochondrial respiratory function as an early biomarker of apoptosis induced by growth factor removal

Authors	Helene Lemieux ; Patrick Subarsky; Christine Doblander; Martin Wurm; Jakob Troppmair ; Erich Gnaiger
DOI	doi:10.1101/151480
Type	Posted content
Published by	Cold Spring Harbor Laboratory
Link	https://syndication.highwire.org/content/doi/10.1101/151480
Title	Intracellular and Intercellular Signalling Mechanisms following DNA Damage Are Modulated By PINK1
Authors	Mihaela Temelie; Diana Iulia Savu ; Nicoleta Moiso
DOI	doi:10.1155/2018/1391387
Type	Journal article
Published in	Oxidative Medicine and Cellular Longevity
Published by	Hindawi Limited
ISSNs	1942-0900 ; 1942-0994
Subjects	Cell Biology; Biochemistry; Ageing; General Medicine
Links	http://downloads.hindawi.com/journals/omcl/2018/1391387.pdf ; http://downloads.hindawi.com/journals/omcl/2018/1391387.xml