Maria Sklodowska Curie Actions - Research and Innovation Staff Exchange

H2020-MSCA-RISE-2015 - FORMILK
Final project meeting

9th November 2019, Loft Hotel, Štefánikova 4, 811 05 Bratislava, Slovakia

The meeting was opened by the project coordinator, Prof. Tibor Hianik, Comenius University, who welcomed all participants and also the guest Prof. Paulo J. Oliveira, the coordinator of the RISE project mtFOIE GRAS. The coordinator pointed out that the final project meeting and agenda have been announced well in advance. The meeting started on time and was conducted in the presence of the majority of principal investigators (PI) as well as consortium members (26 consortium members participated including 8 PIs). Prof. J. Wang (UCSD) informed the coordinator in advance that he was unable to participate due to other commitments and therefore has been excused. Breda O' Driscoll (Sonas) did not participate and did not inform coordinator prior the meeting that she will not participate. V. Buckin (UCD) mentioned that he will present the contribution of Sonas to the Work package No. 3, but could not explain why Breda O' Driscoll did not attend the meeting. The agenda of the meeting (Annex 1) has been presented by project coordinator who mentioned, that the meeting of steering committee has been included. He asked the participants for comments or additions. V. Buckin challenged the late addition of the steering committee meeting to the agenda. There were no comments and agenda has been accepted unanimously. The meeting then continued according to the agenda.

1. Welcome and general overview of the project achievements and problems encountered

The project coordinator briefly explained the main purpose and objectives of the FORMILK project. Due to problems in understanding of the principles of RISE and redistribution of the secondments by V. Buckin (UCD), he explained again the principles of this action. He mentioned that the key point is the research and innovation through staff exchange, i.e. secondments. A key output of the research performed during secondments should be joint publications. If some of the partners declare that they are unable to perform all secondments, those should be redistributed to other partners that have additional operational capacity. This has been clearly explained before by the FORMILK project officer.

Then coordinator presented the overall results of the secondments performed by the partners. Most of the partners successfully completed the planned secondments. However, serious problems were encountered with Sonas. To date this partner performed only 3 researcher months (RMs) secondments out of 19 that were planned. From 3 performed secondments only 1 was finished according to the rules. For the secondments performed in June-July 2018 in Comenius University (CUB) and in July-August 2018 in University of Toronto (UTR) B. O' Driscoll did not submit to date the reports despite several reminders provided by the project

coordinator. This is a serious breach of the Grant Agreement, according to which researchers have to submit reports on secondments to the project coordinator no later than 10 days after the secondment is completed. The coordinator concluded that this partner did not fulfill project objectives, therefore according to the Grant Agreement the budget was reduced and Sonas has been requested to reimburse corresponding money to CUB in order to give the possibility to other partners to perform additional secondments. Unfortunately, Sonas did not collaborate with the consortium in this important issue despite the clear decision of the steering committee. Given the fact that money has not been reimbursed, the project partner Powertec (PTEC) cannot perform an additional possible 4 secondments. In contrast to Sonas, Z. Keresztes, PI of RCNS informed the coordinator in advance that due to her Institute's reorganization she cannot conduct 5 RMs secondments. This has been accepted by the coordinator and, accordingly, RCNS promptly reimbursed funds to CUB.

Most partners properly managed and submitted researcher's declarations through participant portal. Problems have been, however, encountered by UCD. For example declaration of Mark Dizon (UCD) for secondments in PTEC surpassed the allowable number (12) of RMs, which was indicated by validation error at participant portal. V. Buckin has been reminded by coordinator about this problem several times and asked for improving this. The problem for this partner consisted also in delay with submission of researchers declarations. For example the secondment of PhD student from UCD, R. Lynch in UTR was finished on October 7, 2019, however V. Buckin did not submitted the declaration so far. At the same time according to Grant agreement the researcher declaration has to be submitted not later than 20 days after this is finished V. Buckin explained that the actual dates of travel were uploaded to participation portal. This generated Error message for some viewers due to a few days excess of the max 12 month secondments allowable or each of the staff member. He commented that the actual dates are determined by accommodation and travel arrangements. The claimed dates will be sorted when the currently performed secondments are completed. He also added that he had problems with the participant portal at times. T. Hianik mentioned that other partners did not indicate such a problem and recommended V. Buckin to visit participant portal more often.

The co-coordinator then concluded that from 273 RMs secondments planned for EU beneficiaries 263 RMs secondments were realized, which is a very good result.

The coordinator also presented an overview of the contribution of the partners on hosting researchers. No principal problems were encountered here. He expressed special thanks to HDRI and PTEC as well as to UTR, CNMS and UCSD for their outstanding work for hosting and supervising PhD students and researchers.

In addition, the publication activity has been analyzed. The coordinator pointed out, that publications and especially joint publications with project partners represent an important deliverable of the project. Most of the partners worked properly in this respect. However, problems were encountered with UCD. This partner published so far only 3 papers, but none was actually based on the joint work on the secondments in this Institute. V. Buckin has been notified that should be more active in this respect and submit additional papers related to the project. V. Buckin commented that more than three papers were completed and as those papers are substantial in the size and amount of material, it did not make sense to split them into large number of small papers.

The co-coordinator also mentioned that in collaboration with HDRI a proposal for possible patent application on the assay for detection plasmin activity in milk is currently considered by an expert on patenting. This development has been also presented in the Innovation Radar Questionnaire. The coordinator mentioned that recently he had phone call with Dr. Gunar Brink, who is reviewer of REA for this document and that Dr. Brink will attend the general discussion of the meeting that will be related also to IPR.

The coordinator then pointed out that results obtained in the work packages (WPs) will be presented by respective WPs leaders. He mentioned that another important objective of the Formilk project - the organization of workshops and summer schools was very successful. 5 workshops were organized out of 4 planned and all 3 summer schools planed were well organized by CUB, UCD and RCNS. He especially appreciated the workshop in Budapest, 2018, organized by Z. Keresztes (RCNS) where several industrial partners, and potential end-users participated.

T. Hianik also mentioned that most of the deliverables were submitted on time. The deliverables Protocol of enzyme assay in a volume (D1.1) and Protocol of enzyme assay at surfaces (D2.2) were prepared and will be soon submitted through participant portal.

The communication with most of the partners was good. This has been performed by phone call, Skype or through e-mail.

T. Hianik also discussed the meeting of the steering committee during the period of September 1st to September 9, 2019. The steering committee decided by substantial majority of its member on redistribution of the secondments and on reimbursement of money from Sonas to CUB. Unfortunately, Sonas did not fulfill decision of steering committee concerning returning of unused money, and additionally, did not fulfill the request on remediation of a serious breach of Consortium agreement by Sonas, submitted by coordinator to Sonas on September 25, 2019 with deadline of October 24, 2019. This caused substantial difficulties for other partners in performing additional secondments.

The coordinator also mentioned that the project management was very good, and that all deliverables were completed. He also pointed out that most of PI attended the project meetings or provided substitutes. However, a problem has been encountered with Sonas. This partner did not participate at 3rd project meeting in Budapest in June 2018. B. O' Driscoll informed the coordinator that she will not participate at this meeting only one day prior the meeting. In addition, she did not provide a substitute and report on WP3.

The coordinator also positively evaluated the activities on the visibility of the Formilk project towards the public. However, only CUB and RCNS were involved in these activities. The meeting then continued with the reports of the various WP leaders on the results of work packages.

2. Progress in work packages

2.1. Progress in WP1

V. Buckin outlined the progress achieved in work package No. 1. His presentation covered the developed methodologies for monitoring of enzyme activities in milks, instrumentation applied and developed optimal measuring regimes for this instrumentation, development and verification of theoretical background for quantitative monitoring of enzyme activities in milks, calibration and verification

methods. He stated that HRUS measurements provide real time precision information of hydrolytic activities of enzymes in milks expressed through concentrations of covalent bonds hydrolyzed, degree of polymerisation, degree of hydrolysis, evolution of molar masses of substrates (proteins, lactose) and osmotic pressure. He has covered the detection technology based on gold nanoparticles modified with peptides developed by RCNS. He also presented training, networking and transfer of knowledge activities and analysis of participation of various partners in WP1 (CROSS, SONAS, HDRI, CUB, RCNS, UTR, PTEK, UCSD) and dissemination activities, which included international workshops and conferences organized, dissemination of the results among dairy manufacturers, more than 20 presentations at international conferences four papers completed to date. T. Hianik asked about tasks 1.1 and 1.2 that are focused on detection plasmin in buffer and in milk, respectively. V. Buckin mentioned that there is no principal difference between plasmin and other proteases. T. Hianik, however, argued, that principal difference is in plasmin detection in milk due to the fact that plasmin is partially associated with casein micelles. He therefore recommended that this effect should be taking into account for solving the corresponding tasks of this WP. Z. Keresztes pointed out that progress has been made in plasmin activity detection with the application of gold nanoparticle – protein/peptide conjugates related to Task 1.1 and 1.2. Even if this work is not published yet, the manuscript is under preparation and will be submitted with Formilk acknowledgement. Activity enhancement of given proteolytic enzymes resulted from different enzyme encapsulating steps have been proven by HR-US technique. In response to the earlier comments on number of papers published V Buckin commented that four (not three) papers were completed and a number of papers are in preparation. He also commented that the published papers are substantial in the size and amount of material, they cover the developed fundamentals, novel theoretical background and large number of experimental results and their interpretation, including comparison with other techniques. Although possible, it did not make sense to split them into large. T. Hianik, however argued, that no paper was published so far based on the secondments preformed in UCD. The coordinator asked V. Buckin to provide a pdf file of the 4th paper mentioned that was prepared in collaboration with K. Byrne and submitted to the Food Chemistry. He pointed out that all publications with acknowledgment to Formilk project has to be uploaded at the participant portal.

2.2. Progress in WP2

T. Hianik informed in detail about the main results and difficulties in the solution of the tasks of WP2. He mentioned that a substantial component of WPs objectives was fulfilled. The difficulties took place with application of short peptides for plasmin detection due to lower sensitivity. The focus was therefore on the application of casein layers as a substrate for protease detection. This approach was successful and several important results were obtained by acoustics method of detection protease activity at surfaces. The collaboration of CUB with CNMS resulted in application of high current harmonics of an acoustic sensor and machine learning of the analysis of protease activity at surfaces. Using a machine learning algorithm it was possible to distinguish between plasmin and trypsin. Improved enzyme substrate immobilisation on high surface area electrodes have been developed by RCNS in collaboration with CNMS. Collaboration of UTR with CUB and RCNS resulted in development of EMPAS biosensor for detection plasmin with an advantageous limit

of detection. Collaboration of CUB and HDRI resulted in development of the effective assay for plasmin detection. In addition to the main project objectives also new directions of research have been started, such as development of biosensors for detection of aflatoxin M1 in milk. CUB and UCSD collaborated also on training of researchers in preparation of micro/nanomotors for sensing applications. Electrochemical sensing possibility based on gold nanoparticle -peptide conjugates have been elaborated in RCNS and UCSD collaboration (Task 2.1). He mentioned that 9 research papers have been published in per-reviewed Journals and 2 chapters in monographs. 5 research papers were based on joint works with other project partners. More than 30 contributions at conferences have been presented. Thus, the objectives of this WP have been fulfilled.

2.3. Progress in WP3

Results of WP3 have been presented by V. Buckin instead of B. O' Driscoll, despite the fact he did not present a clear mandate for doing this. He mentioned that he did not know why B. O' Driscoll did not attend the meeting. V. Buckin then presented a report on fulfillment the tasks of this WP. The presentation covered the progress within the Tasks of WP3, 3.1-3.4 and participations of UCD, CUB, RCNS, HDRI UTR, CROSS, PTEK, UCSD and external to the project industrial and academic collaborators. This included preparation of database of end users, Stage 1 (database of milk companies) and Stage 2 (A focused database of end users tailored to milk/dairy); progress in validation of developed assay, performed in UCD in collaboration with HDRI, CROSSCARE and Teagasc Dairy Research Centre (Ireland) CUB in collaboration with HDRI; Demonstration of novel methods to end-users, such as Collaborative project of SONAS with Nutricia Research (Danone, Netherlands) using Nutricia milk protein systems, utilization of HR-US 102 spectrometers (SONAS) for improvement of method of application (reduction of incubation time) and QA/QC assessment of Colief lactase formulation for infants, collaborative project with Carrig Brewing Co. (Ireland) on HR-US monitoring of enzyme catalyzed hydrolytic processes, information flyer 'High-Resolution Ultrasonic Spectroscopy for Real-Time Non-Destructive Monitoring of Bioprocesses in Dairy Industry', outlining the results of the project within WP1, distributed among EU dairy industrial and academic research institutes and manufacturers in English, Hungarian, Slovak and Czech languages, workshops and schools for end users. The presentation has also outlined the contribution of SONAS in reduction costs & resolving challenges of partners through provision of HR-US instrumentation on-site and installation of a small volume (0,03 ml) ultrasonic cell. For task 3.1. dealing with the preparation of database of end-users, T. Hianik mentioned that this has been performed by Comenius University. T. Hianik argued that CUB was not involved in this task, but this task needs to be managed by Sonas. However, despite several reminders by the project coordinator Sonas did not prepare this database. Therefore it was necessary for Comenius University to perform this task in order to fulfill project objectives. Z. Keresztes pointed out the meeting of potential end-users with representatives of consortium has been organised by RCNS and HDRI at the workshop in Budapest in 2018 fulfilling Task 3.3.

2.4. Progress in WP4

Z. Keresztes (RCNS), the leader of this WP presented results on the organization of workshops, summer schools and on dissemination of the project results. The

presentation was clear and is evidence that the objectives of this WP have been successfully fulfilled.

2.5. Progress in WP5, deliverables, publications, final report, and further collaboration

The coordinator presented results of implementation of WP5. He mentioned that all deliverables of this WP have been completed. The project web page was regularly updated; all reports and deliverables were submitted through participant portal.

Then he presented detailed instruction concerning remained deliverables, preparation of list of publications and final report. The deadlines are presented in Annex 2.

The coordinator pointed out that a financial report will be based on submitted researcher's declaration through the participant portal. Therefore he recommends that all PI to check accurately all researcher declarations, the dates of the secondments and submit declarations through participant portal.

Concerning future collaboration, the coordinator stated that the Formilk consortium has been invited to participate on the presentation of the cluster of five foods oriented RISE projects at ESOF, Trieste, 2020. The proposal was submitted in July 2019. The results of this evaluation are expected.

He than expressed his thanks to all PI and researchers who contributed to the success of Formilk project as well as to his team at Comenius University for help with preparation of project meetings, workshops and summer school as well as for technical and financial management of the project.

3. General discussion

T. Hianik emphasized that Formilk can be considered as a successful project despite certain difficulties. Then he asked the participants for their opinion. Prof. Paulo Oliveira presented his experience with the RISE project mtFOIE GRAS. He informed about the structure of the consortium and the role of the partners as well as on the secondments. He also emphasized that in framework of the project they organized workshops and schools as well as symposia. V. Buckin informed about his experience with secondments. He pointed out that he can perform secondmemts mainly during the summer period due to the teaching commitments. He positively evaluated possibility for his PhD students to perform secondments abroad as well as having researchers from other Institution in his lab. He also mentioned positive role of Sonas in providing technical support of secondments. He expressed his thanks to researches of all organizations participated in WP1.

The discussion was then focused on IPR issues. Dr. Gunar Brink, the reviewer of REA participated on this discussion through Skype. He explained his role in evaluation of the proposal presented in the Innovation Radar Questionnaire by CUB and HDRI focused on novel assay of plasmin detection in milk. He also asked V. Buckin for explanation of possible patenting of lactose assay in volume. V. Buckin responded that this issue is currently in pre-mature stage, but pointed out advantage of ultrasonic spectroscopy that can be applied for not transparent liquids such as milk. T. Hianik then responded to Dr. Bring to his advice concerning possible extension of patent to other techniques that can monitor the enzyme activity at surfaces. The question concerning the effectiveness of the assay to minimize the lost of milk due to high activity of plasmin needs more time for response. R. Kocsis, the project partner and director of HDRI mentioned that soon they should a have meeting

with corresponding staff from the milk industry and will discuss this question in further detail. T. Hianik than expressed his many thanks to Dr. Brink for most useful comments and advice.

At the end of discussion T. Hianik thanked all PI and Formilk researchers for their participation at the final project meeting. Then he announced a 5 min break would occur after which the meeting of steering committee was started in the library of Hotel Loft. The meeting of consortium body was closed at 17:30

T. Hianik Bratislava, November 9, 2019

Annex 1

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Final project meeting

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AGENDA

12:00-14:00 Registration and coffee

14:00 - 14:30 Welcome and general overview of the project achievements and problems encountered (T. Hianik)

Progress in WPs

14:30-15:00 WP1 (V. Buckin)

15:00-15:30 WP2 (T. Hianik)

15:30-16:00 **Coffee break**

16:00-16:15 WP3 (B. O' Driscoll)

16:15-16:30 WP4 (Z. Keresztes)

16:30-17:00 WP5, deliverables, publications, final report, further collaboration

(T. Hianik)

17:00-17:30 General discussion

17:30-18:00 Meeting of steering committee

19:00 **Dinner**

Annex 2

Important deadlines for deliverables and final report of FORMILK project

1. **List of publications and abstract to the conferences with acknowledgments to the FORMILK** - sent to coordinator before **December 16, 2019**. Responsible: All PIs.
2. **Report on Secondments** - sent to coordinator before **December 16, 2019**. Responsible: All PIs.
3. **Report on construction of miniature potentiostat**, software and sensor - sent to coordinator before **December 9, 2019**. Responsible M. Donoval (PTEC).
4. **Control dates of secondments** and perform corrections at participant portal, if necessary. Deadline: **December 9, 2019**. Responsible: All PIs.
5. **Submit all researchers' declaration** through participant portal. Deadline: **December 16, 2019**. Responsible: All PIs.
6. **Submit all reports and notebooks of secondments** not submitted so far to the coordinator. Deadline: **December 16, 2019**. Responsible All PIs.
7. **Contribution to the project technical report**. Deadline: **December 16, 2019**. responsible: All PIs.
8. **Financial report**. Submit to the coordinator through participant portal. Deadline: **January 7, 2020**. responsible All PIs (EU beneficiaries only).
9. **Publications after end of the project**: All publications including abstracts at the conferences raised from the results of Formilk should include acknowledgement to the project. The pdf of these publications should be sent to the project coordinator immediately after publication appears in Scopus or in Book of Abstracts. Responsible: All PIs (continuously).