



# PROJECT Publishable Summary

**Grant Agreement number: 229920**

**Project acronym: MOLMEDREX**

**Project title: Molecular Medicine Regional Centre of Excellence**

**Funding Scheme: Coordination and Support Action**

**Date of latest version of Annex I against which the assessment will be made: -**

**Periodic report:**                    1<sup>st</sup>    2<sup>nd</sup> **X**    3<sup>rd</sup>     4<sup>th</sup>

**Period covered:**                    from 01. 11. 2010.                    to 31. 12. 2013.

**Name, title and organisation of the scientific representative of the project's coordinator<sup>1</sup>:**

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<sup>1</sup> Usually the contact person of the coordinator as specified in Art. 8.1. of the grant agreement

<sup>2</sup> The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: [http://europa.eu/abc/symbols/emblem/index\\_en.htm](http://europa.eu/abc/symbols/emblem/index_en.htm) ; logo of the 7th FP: [http://ec.europa.eu/research/fp7/index\\_en.cfm?pg=logos](http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos)). The area of activity of the project should also be mentioned.



## Declaration by the scientific representative of the project coordinator

I, as scientific representative of the coordinator of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;
- The project (tick as appropriate) <sup>3</sup>:
  - has fully achieved its objectives and technical goals for the period;
  - has achieved most of its objectives and technical goals for the period with relatively minor deviations;
  - has failed to achieve critical objectives and/or is not at all on schedule.
- The public website, if applicable
  - is up to date
  - is not up to date
- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 3.4) and if applicable with the certificate on financial statement.
- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 3.2.3 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

<sup>3</sup>

If either of these boxes is ticked, the report should reflect these and any remedial actions taken.



Name of scientific representative of the Coordinator:

**Dr László Nagy**

Date: **13 / 06 / 2013.**

For most of the projects, the signature of this declaration could be done directly via the IT reporting tool through an adapted IT mechanism.



## Publishable summary

### Summary description of the project objectives



The Research Center for Molecular Medicine (RCMM) is committed to implement biomedical research in the Eastern part of Hungary. The RCMM's role is outstanding in the region and in Hungary, as it has been awarded "Centre of Excellence" (Contract No.: QLG2-CT-2002-90329) in the field of Molecular Medicine. Its 16 research laboratories, Genomics, Imaging and HTS (High-throughput Screening) core facilities represent the highest concentration of biomedical research in the Eastern part of Hungary and the only research institute dedicated to carry out research in the field of molecular medicine in the country. It is also worth mentioning that the Centre includes basic research units, core facilities and clinical departments.

The MOLMEDREX (MOLEcular MEDicine Regional Centre of EXcellence) project focused on enhancing the international visibility of RCMM (MOLEcular three key areas:

- genomics;
- advanced imaging;
- academic high throughput screening
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The project's objective was to strengthen the S&T potential, improve human resources, upgrade the research equipment, and enhance the visibility and impact via the Action Plan, which included six work packages:

WP1 *Twinning and Partnership*

WP2 Recruitment

WP3 Equipment Upgrade

WP4 Workshops, courses

WP5 Conferences

WP6 Management.

Due to the twinning and strategic partnerships with institutions in old Member States we could successfully implement two-way mobility and the recruitment of young and experienced researchers.

Besides this, numerous conferences, workshops and practical courses has been organised in RCMM. These tools and occasions have enabled us to fulfil the aim of mobilization of human resources of the RCMM as well as to facilitate exchanges with other institutions.

Via the targeted dissemination we managed to enhance the RCMM's visibility and introduce its activities not only to the European scientific community but also to the local community and patient groups.



Although due to the MOLMEDREX project we were able to make considerable progress in increasing our competitiveness, visibility, there is still yet to be achieved in the future to maintain the progress and keep up with the dynamically changing areas of biomedical research, make investments to continuously upgrade its technical capacity to meet further challenges in the continuous development of scientific life. We also find it crucial to represent competitiveness and set its further objectives in line with EU Cohesion Policy.

The RCMM succeeded in improving the three key areas of the project. These are:

- ***Genomics, Next Generation Sequencing (NGS) and personalized medicine***  
At RCMM a Genomics Centre was established in 2000 and has been successful in providing genomic services (sequencing, SNP analyses) and carrying out collaborations with academic groups and with the biotech and pharmaceutical industry in the area of genomics of complex diseases. The **challenge** in this field is the incorporation of genome-wide analyses such as epigenetics and Next Generation Sequencing into the portfolio of the genomic centre. The latter one allows sequencing large segments of the human genome and carrying out large scale disease association studies. A particularly important goal for RCMM is to better use the clinical resources available, and also to better serve the needs of the community locally and in the region and, via this, to earn European and international recognition.
- ***Advanced imaging***  
Biophysics and advanced microscopy have been among the strengths of the RCMM of the University of Debrecen over the last two decades. This led to the establishment of the Imaging Core Facility. The facility hosts a set of different microscopic techniques: confocal, electron and atomic force microscopy, which cover a wide range of spatial resolution (5-200 nm) and serve a broad palette of applications. RCMM is the only institute in Hungary equipped with fluorescence correlation spectroscopy, a sensitive molecular dynamic technique. Recent **challenge** in the field is the emergence of several new techniques for single cell live imaging breaking the diffraction limit, such as Photo-Activated Localization Microscopy (PALM).
- ***High-throughput screening in an academic setting***  
The last couple of years have shown a clear trend, in which universities and research institutes set up high-throughput screening facilities to provide their research units with the capacity to screen small molecule libraries. This allows finding compounds capable of perturbing biological processes that lead to the identification of new pathways and target proteins using the research paradigms of chemical genomics. RCMM established its HTS core facility three years ago. The current **challenge** is to improve the laboratory's capacity to provide a wider array of cell-based assays.

## Description of the work in details

To reach the best implementation of the goals and expected results of the MOLMEDREX project, it was built up on 6 work packages (WP1-WP6). Each work package was managed by a well-experienced WP leader. The University of Debrecen and staff of the University served as project co-ordinator and was responsible for the project management.

The work package leaders were the following:

WP No.	Work package title	Work Package leader
WP1	Development of the research potential in strategic areas by twinning and partnership	Dr. László Nagy
WP2	Increasing human potential of RCMM	Dr. Tamás Bíró
WP3	Upgrading infrastructure	Dr. György Vámosi
WP4	Establishing RCMM as a regional knowledge centre	Dr. László Virág
WP5	Dissemination of knowledge	Dr. Tamás Bíró
WP6	Project management	Dr. László Nagy

1. table: Work packages of the MOLMEDREX project

### Main tasks in the first period of the MOLMEDREX project by Work Packages:

#### *Work Package 1: Development of the research potential in strategic areas by twinning and partnership*

RCMM twinned with EMBL and DKFZ and formed strategic partnerships with 14 leading universities and research institutions in Europe to expand its RTD capacity and to gain further expertise and new technologies in three key areas of research: genomics/gene expression regulation, imaging/advanced microscopy and academic high-throughput screening. These had been supported by bilateral collaborations via secondments, joint lab meetings, visits, PhD thesis examinations, lectures and seminars.

#### *Work Package 2: Increasing human potential of the RCMM*

The main goal of WP2 had been to increase the human potential of RCMM (and hence to reinforce its S&T competitiveness and upgrade its RTD capability), especially in those new, highly competent research fields (e.g. personalized medicine, stem cell research, molecular imaging) which establish a forefront of RTD world-wide and are also becoming central in the research activity of RCMM.

#### *Work Package 3: Upgrading infrastructure*

The RCMM hosts genomics, imaging and HTS Core Facilities concentrating advanced technologies. We managed new acquisitions or upgrades of existing equipment in all three areas to broaden the scope of methods and improve efficiency. The equipments purchased are unique in the region and nationwide. We implemented special courses as well related to the purchased equipments and distributed the knowledge necessary for using the new technologies.



#### ***Work Package 4: Establishing RCMM as a regional knowledge centre***

The purpose of this work package was to establish the Centre as a transnational regional knowledge Centre in the field of biomedical research (with special regard to advanced genomics, cell signalling and HTS) via training courses, conferences and workshops. Taking advantage of the extensive networking activities of our Centre we had established RCMM as a regional research knowledge centre in the field of Molecular Medicine attracting trainees not only from Eastern Hungary but also from Central-Eastern Europe. Our tools for reaching this goal had been to intensify our dissemination activities by organizing several high profile research training courses, scientific meetings and symposia. These extracurricular training activities were solely dedicated to advance the knowledge and laboratory skills of participants in their research field. Travel support was offered to selected external (non RCMM) attendees with special regard to those coming from neighbouring countries (to strengthen the regional influence of the Centre), EU member and associated countries.

#### ***Work Package 5: Dissemination of knowledge***

To increase the visibility of the RCMM and its RTD projects, the work package leader managed all activities associated with dissemination, marketing, and promotion of results of the RCMM. Target groups included regional, national, EU, and global research facilities both in academia and industry (Biotech, Pharma); policy-makers, politicians, and legislative bodies; selected patient groups; as well as multiple sectors of the lay public.

#### **Achieved results and their impact**

The RTD capacity and capability of RCMM had been upgraded as a result of the several above-mentioned objectives and tools. We made the following list to highlight the successful output of the project:

- improved human potential
- We managed to employ 4 senior and 8 junior researchers who contributed to enhance the scientific visibility and capacity of RCMM and helped to create a better-trained research staff at the University of Debrecen.
- upgraded infrastructure  
We successfully acquired 9 pieces of equipment, which are unique in the region. We run two training courses to support the efficient equipment upgrade and maintain it in the long run. Via buying accessories to the equipment we succeeded in providing the equipment's long-term efficiency.)
- successful dissemination activities and enhancing visibility to the local audience  
As it will be listed below we would emphasize the successful organization of our international practical courses (FEBS, EMBO, EBSA), international workshops (GroSeq), international (EMDS) and national (HSPP) conferences. In addition, we managed to fulfill the dissemination among the local public and youth (Researcher's Night, Meet the Scientist, etc.)
- integration via strategic partnerships and contribution to regional capacity building;



Via active networking and receiving or joining other grants we were able to ensure the continuous development and maintain the impact we have already achieved. We would emphasize the importance of the following grants and networks: ESGI, Nuclear Receptor Network, Lendület, TÁMOP, NEKIFUT, Research University

In other words, the RCMM has become a more potent, innovative and competitive research centre in the Eastern part of Hungary with an improved human and infrastructural capacity and the region is able to benefit from its positive outcome on the long-run.



### **Project public website and contact details**

Project web page: <http://www.molmedrex.med.unideb.hu>

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