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Contributors: *UPF, BSC, UNIGE, UvA*

| | | |
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| Dissemination Level | | |
| PU | Public | YES |
| CO | Confidential, only for members of the consortium (including the Commission Services) | |
| CI | Classified, as referred to in Commission Decision 2001/844/EC | |

Disclaimer

The content of this deliverable does not reflect the official opinion of the European Union. Responsibility for the information and views expressed herein lies entirely with the author(s).

Table of Contents

| | | |
|------|--------------------------------------------|----|
| 1 | Version Log..... | 3 |
| 2 | Contributors | 3 |
| 3 | Definition and Acronyms..... | 4 |
| 4 | Executive Summary | 5 |
| 5 | Introduction | 5 |
| 5.1 | Dissemination Reports | 6 |
| 5.2 | Dissemination Funds | 6 |
| 6 | Target Audiences..... | 6 |
| 6.1 | Academia..... | 7 |
| 6.2 | Industry | 7 |
| 6.3 | The Clinic | 8 |
| 6.4 | Regions with Fewer HPC Resources | 10 |
| 6.5 | General Audiences | 10 |
| 7 | Branding and Dissemination Materials | 11 |
| 7.1 | Project Logo..... | 11 |
| 7.2 | Leaflets | 12 |
| 7.3 | Posters..... | 13 |
| 7.4 | Presentations | 13 |
| 7.5 | Scientific Papers | 14 |
| 7.6 | Other Dissemination Materials | 14 |
| 8 | Dissemination Channels | 14 |
| 8.1 | The CompBioMed Website..... | 14 |
| 8.2 | Social Media | 15 |
| 8.3 | Mailing lists..... | 15 |
| 8.4 | Related Projects | 16 |
| 9 | Events..... | 16 |
| 9.1 | Event Organisation | 16 |
| 9.2 | Event Participation | 17 |
| 10 | Training..... | 18 |
| 11 | Associate Partner Engagement | 18 |
| 12 | Reporting of Dissemination Activity | 18 |
| 13 | Output Measurement | 19 |
| 13.1 | Key Performance Indicators | 20 |
| 14 | After the Project..... | 20 |
| 15 | Conclusions | 20 |

List of Tables and Figures

| | |
|----------------------------------------------------------|----|
| Figure 1: The CompBioMed Logo ('standard' version) | 12 |
| Figure 2: The CompBioMed Logo ('header' version) | 12 |
| Figure 3: CompBioMed Slide Template | 13 |
| Figure 4: The CompBioMed Twitter Account..... | 15 |

1 Version Log

| Version | Date | Released by | Nature of Change |
|---------|------------|-------------|------------------|
| V1.0 | 01/12/2016 | Hugh Martin | First Draft |
| V1.1 | 15/12/2016 | Hugh Martin | Second Draft |
| V1.2 | 21/12/2016 | Pragna Kiri | Final Draft |

2 Contributors

| Name | Institution | Role |
|---------------------|-------------|--------|
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3 Definition and Acronyms

| Acronyms | Definitions |
|----------|------------------------------------------------|
| CoE | Centre of Excellence |
| WP | Work Package |
| KPI | Key Performance Indicator |
| HPC | High Performance Computing |
| SME | Small and Medium Enterprise |
| R&D | Research and Development |
| COST | European Cooperation in Science and Technology |
| MoU | Memorandum of Understanding |

4 Executive Summary

Computational methods, based on human biology, are now reaching maturity in the biomedical domain, rendering predictive models of health and disease increasingly relevant to clinical practice by providing a personalized aspect to treatment. Computer based modelling and simulation is well established in the physical sciences and engineering, where the use of high performance computing (HPC) is now routine. CompBioMed is a user-driven Centre of Excellence (CoE) in Computational Biomedicine, designed to nurture and promote the uptake and exploitation of high performance computing within the biomedical modelling community. Our user communities come from academia, industry and clinical practice.

The CompBioMed Centre of Excellence in Biomedical Computing is distributed in nature, relying on collaboration within the project, and also with external stakeholders. To this end, CompBioMed will develop and coordinate dissemination activities that enable us to engage external stakeholders in academia, healthcare and industry with the activities of the project. The success of CompBioMed relies on its messages, developments, activities, and results being disseminated into the biomedical community, as well as growing and interacting with its user communities.

This deliverable, D3.2: Dissemination Action Plan, acts as a detailed and comprehensive report on the dissemination actions that will be carried out by the project. This deliverable is linked to CompBioMed's Task 3.1: Production of a Dissemination Action Plan, and the release of it is also Milestone 2 in the project.

This action plan is a 'living document' that will be updated throughout the project, as required.

5 Introduction

Dissemination and outreach will play an important role in the CompBioMed Centre of Excellence. We will promote the project's outcomes (publications, codes, white papers, press releases, flyers, posters, etc.) to stakeholders, be they members of the scientific community, user communities, vendors, other industries, regulatory authorities, and related international projects.

A combination of dedicated media work, participation in conferences, preparation and distribution of information material, and event organization will be used to implement our impact objectives. During the project, we will maintain the CompBioMed website for the external world and for internal project communication, and develop a social media presence (LinkedIn, Twitter, etc.). We will organise three training events (which will be addressed in detail in D3.3: Training Plan) and a workshop which we will attach to a large conference (such as ISCxy, SCxy, and so on). The events will promote CompBioMed results and success stories. We will also produce dissemination materials such as white papers, which will be communicated to standards bodies and relevant international events.

The dissemination activities will encompass many different aspects of the use of 'computing beyond the desktop' within the biomedical sciences community. Where possible, we will use

existing material and courses, and early in the project a detailed training plan will be formulated that furnishes full details.

The CompBioMed Consortium will actively seek participation in all the relevant concertation activities organised by and for the Commission in the e-infrastructure domain.

5.1 Dissemination Reports

Three further deliverables will be produced during the project lifetime that will track and report on the dissemination activity in CompBioMed:

- D3.4 (and Milestone 10): First report on dissemination and training material, month 12
- D3.5: Second report on training and dissemination, month 24
- D3.6: Final training and dissemination report, month 36

Each of these deliverables reports on the dissemination and training material and activity produced by the project, and will trigger updates to the CompBioMed training plan and dissemination action plans. The final report will describe a reusable set of training materials, as developed by and used during the project.

5.2 Dissemination Funds

CompBioMed has allocated funds for the consortium to use for dissemination purposes, as follows:

- €6,000 - Covering CompBioMed's attendance at relevant conferences; these funds are held at UvA
- €24,000 (3 x €8,000) - To run training events; these funds are held at UvA
- €10,000 – To organise the workshop and produce dissemination materials; these funds are held at UvA
- €15,000 - For annual project meetings; these funds are held at UCL

6 Target Audiences

Through our dissemination actions, we will disseminate the project's outcomes to our various stakeholders, be they members of the scientific community, user and healthcare communities, vendors of hardware and software, other industries, regulatory authorities, and related international projects.

The research areas that CompBioMed will investigate and directly impact via the CoE include cardiovascular, neuro-musculoskeletal, and molecular medicine domains that account for a substantial percentage of computational biomedicine. However, through our inclusive outward facing agenda and our strong training activities, we will actively improve access to such computing applications and expertise in the wider biomedical community, spawning many new collaborative activities and innovative projects which all require access to high end computing capabilities.

Through our CoE, we will create a hub that promotes high quality modelling and simulation, including the effective use of high performance computing across academia, industry and, clinical practice, meaning that the impact will be wide-ranging.

6.1 Academia

CompBioMed's activities will naturally target academia, including students, researchers, and professors. Our dissemination channels, organized events, and event participation (described in Sections 8 and 9) will reach a wide range of academic audiences. This will be strengthened through our academic core partners: University College London, the University of Amsterdam, the University of Edinburgh, SURFsara, Barcelona Supercomputing Center, the University of Oxford, the University of Geneva, the University of Sheffield, and Universitat Pompeu Fabra.

Our ever-growing list of associate partners also includes many academic institutions, including Birmingham City University, Brunel University, Rutgers University, Leibniz Supercomputing Centre, University of Leeds, the VPH Institute, Zayed University, Heidelberg Institute for Theoretical Studies, and the Hartree Centre. These will be leveraged to disseminate CompBioMed's mission and activity.

6.2 Industry

CompBioMed will target the HPC and biomedical (including pharmaceutical) industries, including software and hardware resource users, resource providers, developers, researchers, CEOs and other leaders.

The CoE will be to act as an innovation incubator. Academia will work with industry to exploit the CoE's capabilities by raising awareness of and providing support within industrial contexts especially, but by no means exclusively, in SMEs. This is a key activity to ensure the wider impact of HPC in this sector. It will include meaningful intellectual engagement between experts working in academia and users based in industry, with knowledge of HPC and an ability to facilitate access to the appropriate scale of resources required. Our dissemination channels and involvement in events (described in Sections 8 and 9) will also target industry stakeholders.

The pharmaceutical industry is represented by our engagement with core partners Evotec and Janssen, as well as our associate partners Convergence and GSK. Also included in our consortium are LifeTec Group, an innovative medical device development and contract R&D SME; Acellera, an R&D company that provides new technologies for the study of biophysical phenomena; and DNAnexus, a company that provides a global network for sharing and management of computational tools running in a highly secure environment for industrial and clinical applications.

We will track work done by the American Society of Mechanical Engineers (ASME) sub-committee on the verification and validation of modelling and simulation for the design and assessment of biomedical products (V&V-40), and the related USA FDA Fast Track initiative, for the use of computer modelling and simulation results in regulatory processes. We

will also monitor the work of the European Federation of Pharmaceutical Industries and Associations (EFPIA) with the European Medicine Agency (EMA) in relation to pharmaceutical products. We will track work done by the ASME sub-committee V&V-40 on the verification and validation of modelling and simulation for the design and assessment of biomedical products, and the related USA FDA Fast Track initiative, for the use of computer modelling and simulation results in regulatory processes. We will also monitor the work of the European Federation of Pharmaceutical Industries and Associations (EFPIA) with the EMA in relation to pharmaceutical products.

Through the involvement of our industry partners, we also expect to disseminate the importance of computer based, predictive, multiscale mechanistic modelling and how it can impact on drug design in an increasingly personalised environment, and to co-design industry-oriented added-value workflows that will contribute to the long-term sustainability of the CoE. The importance of serious compute capability is represented through our partnership with Bull/ATOS.

Despite the inexorable advances in medical science, the cost of discovery and bringing to market of new drugs is now verging on the prohibitive. The pharma R&D model is under more pressure to implement cost cutting efficiencies than ever before. Compounding this is the trend toward stratification and patient specific medical treatment, meaning for any given ailment one should in future expect to have on offer multiple drugs, each being optimised for a group of individuals, based on their genotypic and phenotypic profile. Our molecular medicine exemplar research strand aims to assist with this new approach, showing how it is becoming possible, based on modern HPC capabilities, to accelerate the discovery of new drugs, while paying close attention to genetic profiling.

Our partner Evotec is a drug-discovery alliance and development partnership company focused on rapidly progressing innovative product approaches with leading pharmaceutical and biotechnology companies. It has several significant long-term discovery alliances with well-established industry players such as Bayer, Boehringer Ingelheim, the CHDI Foundation, Genentech, Janssen Pharmaceuticals, AstraZeneca and Ono Pharmaceuticals. Evotec will be responsible for integration of our state-of-the-art GPCR modelling technology with an HPC platform. This expertise will be made available within the CoE and to third parties seeking assistance from the CoE, and directly from Evotec. The adaptation of these computational drug discovery protocols to HPC will make the GPCR drug-discovery process much more efficient and cost effective, potentially having a large effect on the entire pharmaceutical sector given the central importance of GPCR based drug targets. Evotec will disseminate the results of the work to partner pharmaceutical and biotechnology companies in order to stimulate follow-on research, making written publications and also encouraging company presentations at international conferences.

6.3 The Clinic

CompBioMed will also target its clinical stakeholders, including health care professionals such as doctors and surgeons and those working with IT in healthcare.

We expect that computational modelling of the human body and physiology will impact the field of biomedicine by fundamentally altering the basis for the diagnosis and treatment of disease into a personalised, predictive, participatory and preventative process. In the future,

medical innovation will be directed towards optimising treatments using integrated functional simulation *in silico*, assembling a customised computer model of a patient's condition across multiple organ systems and length scales (from molecular to human to population), across timescales from nanoseconds to years, and allowing for the influence of the environment.

The quality and usability of our software will put us in an influential position in terms of promoting modelling and associated software standards internationally. The presence of clinical partners within our bid will ensure that we exploit any potential impact of these modelling tools in a clinical context. Through integration in clinical decision support systems, computer based modelling and simulation will be furnish advisory courses of action ahead of treatments, including interventions, which will lead to improved outcomes for patients and enhance the health and wellbeing of the citizens of European Union as well as globally.

An important impact of the *in silico* technologies we are promoting will be to reduce, refine and eventually replace animal experimentation in biomedical research, putting simulation on an equal footing with sequencing and imaging. Various computational biomedicine projects that have developed advanced technologies are struggling to move to clinical trials phases because the technological expertise is lacking within many research hospitals. However, once any one of these computational workflows is established and put in use in a clinical setting, it is possible to amass hundreds of patient-specific simulations. Even if the primary data might need to be destroyed on grounds of privacy, these data can be used to identify input parameter distributions that characterise well *in silico* populations, with respect to the particular pathophysiological process captured by the simulation. If these data can be combined with a simulation of an intervention, what we obtain are so-called '*in silico* clinical trials', wherein a new surgical procedure, the insertion of a new medical device, or the treatment with new drugs is simulated within models of hundreds or thousands of "virtual" patients and/or real people. Likewise, interpolations can be performed over the input parameter distributions that represent realistic individual patients with high fidelity.

This cutting-edge biomedical R&D technology, involving collaboration between industry and academia, is set to play a key role in promoting EU prosperity and growth. There is real potential to increase the amount of internationally funded R&D taking place within the EU, which could stimulate a reshaping of the EU-wide pharmaceutical industry. In a more specific sense, our CoE will provide a unique opportunity to generate new networks and partnerships and to promote current biomedical research and its applications within drug discovery. A major impact of this research will be the discovery of more effective medicines that are clear of harmful side effects and improve the health and lives of people both within the EU and across the globe. In addition, only this kind of research can lead to the reduction and eventual removal of animal testing in research.

We will also target the clinic through our associate partner, the Avicenna Alliance. Avicenna is a Support Action co-funded by the European Commission which kicked off its activities in October 2013 with the goal of creating a Roadmap for *in silico* clinical trials. The Avicenna community includes 37 companies, mostly SMEs, which provide *in silico* clinical trials services of some kind to the biomedical industry. Most of these companies should prove to be natural business partners for CompBioMed, as they can market their services in an enhanced manner if supported by our CoE.

In addition, our dissemination channels and involvement in events (described in Sections 8 and 9) will also target clinical stakeholders where appropriate.

6.4 Regions with Fewer HPC Resources

To perform outreach to and engagement with countries and regions within the EU and associated states with fewer HPC resources, CompBioMed will collaborate with the COST (European Cooperation in Science and Technology – see www.cost.eu) platform, through trans-European networking of research. COST is based on a European intergovernmental framework for Co-operation in Science and Technology with 36 Member Countries and one Co-operating State. It also encourages active participation by institutions from Near Neighbour Countries and International Partner Countries. Near neighbour countries include Armenia, Russia, Ukraine; Lebanon, Libya, Palestine Authority, Jordan, Syria, Tunisia, Egypt and Algeria, while Turkey is currently seeking membership. Bosnia & Herzegovina are also being considered. Several CompBioMed partners (e.g UCL, UvA) are already participants in the OpenMultiMod COST Action CA15120 on Open Multiscale Systems Medicine and plan to co-organise meetings in order to promote increasing interactions in this domain. We shall also work with other funded CoEs and the EXDCI project to achieve impact so as to raise the profile of and facilitate access to HPC in such countries.

Another important aspect is the wider international outreach of CompBioMed, which is assured through the strong links of many partners with USA, Latin American and South East Asian countries, especially in the biomedical research domain. In addition to the aforementioned projects and initiatives (EU-Brazil, JLESC, etc.) it is also worth mentioning the existence of many direct research links of CompBioMed partners with non-European regions through teaching, training, MoUs, agreements with hospitals and biomedical organizations, hosting of PhD students and postdocs, etc. These links are particularly relevant for the case of less developed Latin American countries.

BSC is a founding member of the Joint Laboratory for Extreme-Scale Computing (JLESC, <http://publish.illinois.edu/jointlab-esc/>) which focuses on software challenges arising in extreme scale high- performance computers, including biomedical research. JLESC reach goes well beyond the European scientific ecosystem: it includes international partners such as RIKEN (Japan), KISTI (South Korea), University of Illinois, NCSA and Argonne National Lab (USA). Additionally, BSC takes part in several EU-Brazil joint projects. Notably, it is a partner in the EUBrazil-CloudComputing project, where together with LNCC (Brazil) it is working on a use case for the cardiovascular system.

6.5 General Audiences

CompBioMed will target general audiences (high school students, general public, etc). The general public will no doubt be interested in how computational biomedicine can connect to the clinic and benefit themselves as potential clinical patients, while high school students will also be interested in computational biomedicine as an educational pathway.

The CompBioMed Associate Partner, the Science Museum, is a major museum in South Kensington, London. The Science Museum has a substantial online presence on top of its physical location in London where various events and actions connecting science to the general public occur. The presents powerful opportunities for CompBioMed to harness, and we will take full advantage of this relationship.

We are considering several approaches for targeting general audiences. We will, for example, produce content for popular science magazines such as New Scientist, and participate in general public events such as the Royal Society Exhibition in London.

7 Branding and Dissemination Materials

The CompBioMed brand will be used in all of our dissemination materials, be it in the form of leaflets, posters, white papers etc. Templates will be created for each dissemination material type in order to encourage recognition of the CompBioMed brand and therefore the project and its aims. The templates are currently available on the CompBioMed website intranet for project deliverables to the European Commission. Consortium members are required to inform CBK of content produced using these templates. All presentation slides from meetings and conferences will become available on the CompBioMed website intranet subsequent to the events taking place, which may be used as templates for future presentations on the CompBioMed project. Consortium members are permitted to modify the templates but the final product must contain the CompBioMed logo, the statement acknowledging the European Commission, and the European Flag.

Task 3.3 is concerned with the production of dissemination materials and runs throughout the project. During the course of the project CompBioMed will create White Papers (in collaboration with task 4.2) as well as other dissemination materials and will make them available via the web. CompBioMed will also disseminate, via the website and other channels, the scientific publications resulting from the project's research. Additionally, flyers and posters will be produced and made available at workshops and conferences such as Supercomputing Conference, International Supercomputing Conference, Virtual Physiological Human Conference, and International Conference on Computational Science.

7.1 Project Logo

The CompBioMed logo has been designed to be clean, clear, and recognisable, with a strong image and style. The logo aims for simplicity while subtly hinting at CompBioMed's mission of computational (represented by the classic 'computer' font) biomedical research (hinted at through the DNA representation) related to the human body (represented by a human figure). The logo is shown below:

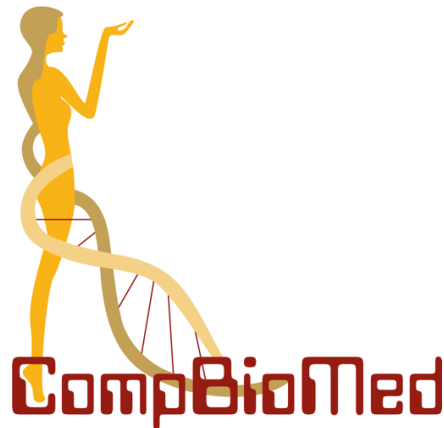


Figure 1: The CompBioMed Logo ('standard' version)

In some circumstances, the text in the logo may need to be relatively larger within the image, for instance when there is not much height available, but plenty of width. For those circumstances, an alternate 'header' version of the logo has been prepared, this is shown below:

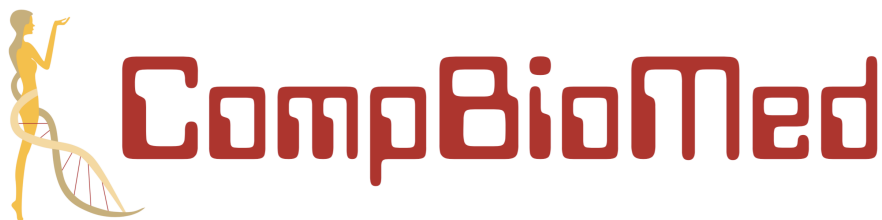


Figure 2: The CompBioMed Logo ('header' version)

The logos are available in .png graphical format and .ai vector format, in high and low resolution.

7.2 Leaflets

Leaflets have been and will continue to be made and handed out to stakeholders at various events (conferences, workshops, seminars etc), with the purpose of making them aware of the project or particular aspects of it. In particular, one leaflet summarises CompBioMed and its aims, and it contains the following:

- CompBioMed logo
- A URL to the CompBioMed website
- A link to the CompBioMed twitter account
- The funding line "This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 675451."
- An image of the European flag
- A summary of the CompBioMed project
- The expected outcomes
- The expected impact
- Images of CompBioMed research

7.3 Posters

CompBioMed posters are already being prepared to present at events such as conferences and workshops. These will display specific aspects of CompBioMed research and outcomes and will require a CompBioMed consortium member to explain further what appears on the poster, which will contain:

- The CompBioMed logo
- A URL to the CompBioMed website
- The funding line “This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 675451.”
- An image of the European flag
- Images of CompBioMed research
- Summaries of CompBioMed research and outcomes

7.4 Presentations

Members of the CompBioMed consortium will attend and present talks at various conferences, workshops and seminars throughout the project. Where appropriate, the slides for such talks will contain a section or slide which summarises the CompBioMed project. These will contain:

- CompBioMed logo
- A URL to the CompBioMed website
- The funding line “This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 675451.”
- An image of the European flag

In other cases, it will be appropriate to theme all of the talk slides as CompBioMed related. In these instances, a template is available that displays the CompBioMed logo on each page, and the rest of the slide aesthetic has been adjusted to match that of the logo, as shown below:

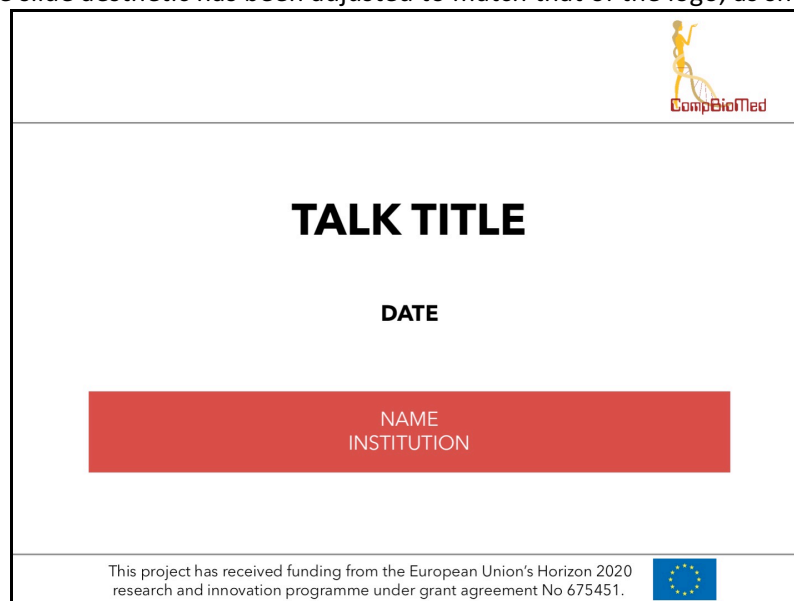


Figure 3: CompBioMed Slide Template

7.5 Scientific Papers

Throughout the project, the CompBioMed consortium will publish numerous scientific, peer-reviewed papers, conference proceedings, and chapters in books. Such publications will contain the following passage:

“This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 675451.”

7.6 Other Dissemination Materials

CompBioMed will harness novelty branded items that will be distributed at various events during the project. This will act to enhance the awareness of the project. Such items will include custom stress balls in various medical shapes, pens, mugs, and/or USB sticks; each will be branded with the CompBioMed logo.

8 Dissemination Channels

In this section the various dissemination channels available to CompBioMed are described. In general, we aim to make maximum use of already established partner, national, and European dissemination channels such as E-infrastructure specialist groups, thus maximising the impact to cost ratio of our dissemination activities in work package 3.

As a principle of practice we will employ leverage in dissemination wherever we find the opportunity – in engaging channels and mechanisms previously funded by EU investment, and/or already established in the partner institutions and in professional associations and working groups where the key members of CompBioMed are already present.

Task 3.2: Maintaining the CompBioMed Online Presence, is connected to harnessing CompBioMed’s dissemination channels. The task primarily concerns the project website and twitter account, and runs throughout the project. Also related is Deliverable D3.1 (and Milestone 3): Website Release, which was submitted in month 2 of the project.

8.1 The CompBioMed Website

At the core of our dissemination activity is the CompBioMed website, where the project is described, its various partners are listed, its activities are reported, helpful contact details are provided, and where there is a repository for the project’s training programme and for project-related documents generally. The website can be accessed at the URL <http://www.compbioimed.eu/>. The website is addressed in details in D3.1: Website Release, which is available on the websites intranet.

8.2 Social Media

CompBioMed aims to have an effective social media presence. At the forefront of this is the CompBioMed Twitter account, which can be found at @bio_comp. The twitter account will be used to disseminate our events and activity, and that of our core and associate partners. We will consider other potential social media avenues such as LinkedIn and Youtube. The project's Twitter account is show below:



Figure 4: The CompBioMed Twitter Account

8.3 Mailing lists

CompBioMed mailing lists have been set up to aid communication within the project. These allow communication to everyone in the consortium and to everyone within a particular work package. We will add additional mailing lists as required. The mailing lists are shown below:

| | |
|----------------------------|------------------------------|
| All CompBioMed partners: | combiomed-all@ucl.ac.uk |
| Executive board: | combiomed-exec@ucl.ac.uk |
| Principal Investigators: | combiomed-pis@ucl.ac.uk |
| General Assembly: | combiomed-ga@ucl.ac.uk |
| Innovation Advisory Board: | combiomed-ia-board@ucl.ac.uk |
| Work Package 1: | combiomed-wp1@ucl.ac.uk |
| Work Package 2: | combiomed-wp2@ucl.ac.uk |
| Work Package 3: | combiomed-wp3@ucl.ac.uk |
| Work Package 4: | combiomed-wp4@ucl.ac.uk |

PU

Page 15

Version 1.1

| | |
|---------------------------------------|--------------------------------|
| Work Package 5: | compbiomed-wp5@ucl.ac.uk |
| Work Package 6: | compbiomed-wp6@ucl.ac.uk |
| High Performance Computing Discussion | compbiomed-hpc@ucl.ac.uk |
| Core Partners: | compbiomed-core@ucl.ac.uk |
| Associate Partners: | compbiomed-associate@ucl.ac.uk |

8.4 Related Projects

As described in Subsection 6.4, we have partnered with the COST action “Open Multiscale Systems Medicine”, abbreviated as OpenMultiMed, which will also act as a wide reaching dissemination channel for CompBioMed. Other related projects that we have partnered with and will harness as dissemination channels include:

- BioExcel - a Centre of Excellence for provision of support to academic and industrial researchers in the use of high-performance computing (HPC) and high-throughput computing (HTC) in biomolecular research.
- ETP4HPC - the European Technology Platform (ETP) in the area of High-Performance Computing (HPC). It is an industry-led think-tank comprising of European HPC technology stakeholders: technology vendors, research centres and end-users.
- EXDCI – The European Extreme Data & Computing Initiative to support the development and implementation of a common strategy for the European HPC Ecosystem.
- MaX - A user-focused, problem-oriented European Centre of Excellence, which works at the frontiers of current and future High Performance Computing (HPC) technologies, to enable the best use and evolution of HPC for research and innovation.

9 Events

CompBioMed will organize and participate in many events throughout the project’s duration, including conferences, workshops, seminars, training events and more. CompBioMed’s event involvement is connected to Task 3.6: Conference/Workshop Planning, which runs throughout the duration of the project.

9.1 Event Organisation

WP3 will organise two major events. Firstly, we will coordinate with the EU funded COST Action: OpenMultiMod to co-organise a workshop with a theme that aligns with CompBioMed and OpenMultiMod. Secondly, we will organise one dedicated workshop on the use of HPC in computational biomedicine.

The dedicated workshop will be co-located with a larger international conference such as the biennial VPH conference, the yearly ICCS conference, or another major conference, to ensure our CoE’s activities within Europe and beyond. This is aided by the CoE partnership’s strong ties to the computational biomedicine community and knowledge of relevant events in their respective institutions. The dedicated CompBioMed workshop will have as objectives to promote CompBioMed results and success stories and to provide use cases to interested

audiences. This task includes the actual workshop organisation, including liaison with the host conference, making calls for papers, reviewing, and so on. We are also keen to include live demonstrator projects, using the most advanced HPC and Virtual Reality setups possible, to showcase what HPC has to offer to the community. In addition, we intend to create a special issue of a journal related to this workshop, and to create high impact outreach and dissemination material.

Beyond the major events described above, we will organise other events to meet CompBioMed's needs. One such event will occur within the first year of the project and will involve commercial HPC and Cloud providers (e.g. AWS, MS Azure, DNAnexus, Hartee Centre and so on) as well as conventional HPC providers in the project, along with the end users within the project to determine the needs and resources available *via* CompBioMed in terms of Cloud and HPC.

9.2 Event Participation

Work Package 3 is responsible for coordinating the participation of the CompBioMed consortium in various workshops and conferences. Events aligning with CompBioMed's aims will be identified and highlighted to the project consortium. Where appropriate, attendance at events of significance will be coordinated to include a strong contingent of CompBioMed representatives. Events in the first year of the project that we will consider participating in include:

- BioExcel, GROMACS hackathon 2016, 17 - 19 Oct 2016, Barcelona, Spain
- BioExcel: workflow training for computational biomolecular research 20 - 21 Oct, 2016, Barcelona, Spain
- e-COST OpenMultiMed MC meeting, 20-21 Oct 2016, Skopje, Macedonia
- 1st Conference of the European Association of Systems Medicine (EASyM), 26th – 28 Oct 2016, Berlin, Germany
- BioExcel all-hands meeting: 3-4 Nov 2016, Barcelona, Spain
- Supercomputing 2016 (SC16), 14-17 Nov 2016, Utah, USA
- E-CAM: Extended Software Development Workshop: Trajectory Sampling, 14- 25 Nov 2016, Traunkirchen, Austria
- Symposium in Advanced Nanomaterials for Biomedical Applications, 20-21 Feb 2017, Sheffield, UK
- The 5th International Conference on Computational and Mathematical Biomedical Engineering (CMBE17), 10 - 12 Apr 2017, Pittsburgh, USA
- European HPC Summit Week 2017 (plus PRACEdays), 15 – 19 May 2017, Barcelona, Spain
- Supercomputing 2017 (SC17), Denver, USA
- ICCS2017, 12– 14 Jun 2017, Zürich, Switzerland
- ISC2017, Jun 2017, Frankfurt, Germany

In the first year of the project, we will have significant participation in the European HPC Summit Week 2017, 15th to 19th May 2017, Barcelona, Spain and ISC2017, 18th to 22nd June, Frankfurt, Germany. For this, we will be assisting with the reviewing of abstracts and the advertising of the event, and we have been allotted a dedicated session for CompBioMed in the PRACEdays Scientific Parallel Track on Tuesday May 16th 2017.

Dissemination materials will be produced and made available at workshops and conferences such as Supercomputing, International Supercomputing, Virtual Physiological Human, and International Conference on Computational Science.

10 Training

Training events and materials are a major part of WP3 and of CompBioMed. We will develop training courses and online training materials in collaboration with project software developers and HPC experts. Additionally, CompBioMed will run hands on training courses, and raise awareness on the challenges and opportunities of HPC in the field of computational Biomedicine with all stakeholders, as well as provide tailored training to academic and industrial researchers, and clinical users.

CompBioMed's training plan will be addressed in detail in D3.3: Training Plan, which is due in month 6 of the project. The report will include both training events, means of delivery, and the partners responsible for the training.

11 Associate Partner Engagement

As mentioned throughout Section 6, CompBioMed's associate partners play a key role in our outreach to the project's stakeholders, in addition to providing their own resources and wisdom that will help the project deliver its goals. In order to maintain the associate partners' engagement in the project, we will offer various forms of involvement in CompBioMed, liaise with them regularly, and offer benefits to their partnership. These include:

- Access to and provision of certain HPC resources
- Access to software
- Access to training materials
- Invitation to future project meetings and workshops
- Industrial APs invited to be members of the industrial advisory board
- Participation in the Innovation Exchange Programme
- Participation in Incubator Coordination
- Distribution of a quarterly news bulletin

We have set up a mailing list for the associate partners as a channel to communicate with them.

12 Reporting of Dissemination Activity

In executing CompBioMed's dissemination plans there must be regular communication between all of the partners, in particular via CBK who are managing the dissemination aspects of WP3, to ensure that activity is correctly recorded. The following points define how this is implemented:

- In the first instance, key achievements, events, publications, media appearances, and any activities that should be disseminated, will be reported to CBK, directly via email to h.martin@cbkscicon.com.

- In order to monitor the above activity, CBK will use the monthly WP Leader Teleconferences to check on any unreported activity, allowing for it to be disseminated adequately.
- The monthly WP Leader Teleconferences will also be used for CBK to report all dissemination activity from that month to the principal investigator and project manager of CompBioMed.
- The annual dissemination reports will document all CompBioMed dissemination activity from that year, and will aid in the annual updating of this document, the CompBioMed Dissemination Action Plan.

Work package leaders will arrange summaries of deliverables and research outcomes to be delivered to CBK for distribution on CompBioMed's dissemination channels.

13 Output Measurement

At the end of the project we will want to get an idea of how effective our dissemination output has been. To get performance indicators, we will keep records of how many events we have participated in, who the audience was, how big the audience was, how big the audience was for our posters, how many took our leaflets, registered for our training events, how many white papers we produced, numbers for downloads of our software and publications, and gauge our influence in social media by tracking followers on the platforms we will participate in. We will also be able to track progress in attracting attendees to our workshops by benchmarking the second event against the first. The number of publications, their journals' impact factors, and the number of citations received will also give a measure of effectiveness. CompBioMed intends to gather as much information to measure impact as possible. We will continually research published best practice in impact measurement from Horizon 2020 projects and other sources to establish appropriate metrics for this measurement. For example, the European Commission lists the following as examples of output measurement:

- Evidence of debates in the media
- Evidence of new funders for your area
- Evidence of transfer of research and innovation into practice (patents, prototypes, licenses)
- Number and turnover of new products, practices or procedures developed, based on your research outcomes
- Number of articles in the press
- Number of people asking for feedback or more information
- Number of references in scientific publications
- Participation in project events and seminars
- Speaker evaluations from conference presentations
- Survey of end-users
- Trends in website visits

We will also consider using alternative metrics to gauge the reach of our publications. Altmeteric (www.altmetric.com) is a service that tracks non-journal citation impact; here a score is provided which acts as a quantitative measure of the attention that a publication or event has received via social media. The impact is measured in terms of the articles being mentioned or linked to in social media, articles, blogs and websites, and is adjusted according to the significance and relevance of that source.

13.1 Key Performance Indicators

In addition to the performance indicators mentioned above, CompBioMed is also committed to a list of Key Performance Indicators (KPIs). Three of these KPIs related to dissemination and are listed below:

- Number of people attending the two workshops events organised by WP3: 50 attendees per workshop.
- Number of publications in peer-reviewed international journals that acknowledge the support of CompBioMed. Target: by the end of the three-year deployment phase, at least 10 publications (two in impact factor ten or higher journals) from 5 different research groupings with the CoE.
- Number of companies engaged. Target: by the end of the three-year deployment phase, at least 20 companies, at least 30% being SMEs, have accessed CompBioMed services.

We will track these KPIs and report on them in each annual dissemination report.

14 After the Project

Aside from the dissemination activities conducted during the project, we will keep CompBioMed 'alive' in the community after the project's termination. We will do so by publicising our training material and encouraging participation of the consortium in future educational events. The members of the CompBioMed consortium will also be encouraged to present work conducted during the project at future conferences. Our publications and software will still benefit the community after the project ends, where the results will remain available on the website until 5 years after the project ends. We will also explore funding opportunities during the project that will allow us to continue the Centre of Excellence in a new phase or form, immediately following the conclusion of this project.

15 Conclusions

We believe that, through our dissemination activities, expected impacts will be accelerated and strengthened. Through the dissemination of CompBioMed's research findings and the distribution and awareness of its software to academia, industry and clinics alike, we will contribute to the strength and leadership of the EU in HPC technologies, also having an impact on the emerging HPC markets. Through the building of networks between our scientific community and the encouragement of collaboration activities, in addition to our training agenda, we will accelerate European excellence in software and algorithms in a multi-disciplinary fashion. Also, we believe that through the effective communication of our work to

standardisation bodies, we will be able to jointly develop new standards where they do not exist.

This action plan is a 'living document' that will be updated throughout the project, as required. We will adapt the dissemination activity of our Centre of Excellence in order to most effectively meet the challenges we face in carrying out our mission.