Six Monthly Progress Report

August 2009 to January 2010

(Month 42 to 48)

Project Number:	FP6-2005-IST-026996
Deliverable id:	D 1.1.8
Deliverable name:	Six Monthly Progress Reports
Submission Date:	28/07/10

Information Society Technologies

COVER AND CONTROL PAGE OF DOCUMENT	
Project Acronym:	ACGT
Project Full Name:	Advancing Clinico-Genomic Clinical Trials on Cancer: Open Grid Services for improving Medical Knowledge Discovery
Document id:	D 1.1.8
Document name:	Six Monthly Progress Reports
Document type (PU, INT, RE)	RE
Version:	1
Submission date:	28/07/2010
Editor: Organisation: Email:	Florence Pesce ERCIM florence.pesce@ercim.eu

Document type PU = public, INT = internal, RE = restricted

ABSTRACT:

This Deliverable presents the full range of project activities during the period from month 42 to month 48, including management activities, disseminations activities as well as technical and scientific activities in accordance with the Description of Work.

KEYWORD LIST: Progress report, Workpackages activity, achievements, deliverables

MODIFICATION CONTROL			
Version	Date	Status	Author
0.0	25/01/2010	Templates	Florence Pesce
0.1	01/03/2010-11/03/2010	Compilation of partners contributions	Florence Pesce
1.0	27/07/2010	Addition of dissemination table and PM figures	Jessica Michel

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Contents

Executive Summary

ACGT Objectives

ACGT's vision is to become a pan-European voluntary network connecting individuals and institutions to enable the sharing of data and tools and thereby creating a European Wide Web of cancer clinical research.

An initial architectural blueprint has been designed during the previous reporting period. During the current reporting period the project has focused on the (a) development of the core set of components up to a stage where they can effectively support in silico investigation and (b) set up cross-disciplinary task forces to propose guidelines concerning issues related to data sharing, for example legal, regulatory, ethical and intellectual property, and is developing enhanced standards for data protection in a web (grid) services environment. Initial prototypes have been useful in crystallizing requirements for semantics.

In addition the project is developing

- new, domain-specific ontologies, built on established theoretical foundations and taking into account current initiatives, existing standard data representation models, and reference ontologies;
- innovative and powerful data exploitation tools, for example multi-scale modelling and simulation, considering and integrating from the molecular to the systems biology level, and from the organ to the living organism level;
- standards for exposing the properties of local sources in a federated environment;
- a biomedical GRID infrastructure offering seamless mediation services for sharing data and data-processing methods and tools;
- advanced security tools including anonymisation and pseudonymisation of personal data according to European legal and ethical regulations;
- a Master Ontology on Cancer and use standard clinical and genomic ontologies and metadata for the semantic integration of heterogeneous databases;
- an ontology based Trial Builder for helping to easily set up new clinico-genomic trials, to collect clinical, research and administrative data, and to put researchers in the position to perform cross trial analysis;
- data-mining services in order to support and improve complex knowledge discovery processes;

Finally, the project has also focused with more emphasis on its dissemination activities, is engaging in a closer dialog with several of the relevant end-user communities, and is formulating a range of concrete exploitation plans.

Workpackage progress report over the period

Workpackage 1 - Project Management

- **Partner Responsible : ERCIM**
- **Contributing partner(s): ERCIM, FORTH**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

The objective of this Work package is to ensure a strong and coherent administrative and financial management as well as the Scientific Coordination of the project.

- Objectives during reporting period

The main objectives for the period were:

- The finalisation of the amendment request for the 6Month project extension
- The finalisation of the 4th implementation Plan (Month 36-54)
- The intermediate annual review held on 3rd December 2009

- Progress towards objectives

Significant efforts were devoted to the administrative tasks due to the fact that the project was preparing the final implementation plan and the annual review. In order to maximise budget allocation per partners for the last period, particular efforts were devoted to budget analysis and issues. The scientific management activities, since a range of activities are progressing was much more demanding, requiring continuous monitoring and full functioning of the Technical Management Committee that has been previously established.

- Main Activities & Tasks worked on

- Participation in all PMB meetings during the period
- Planning and participation in the conference calls
- Definition of the Agenda and issues to be discussed
- Close monitoring and follow up of deliverables and technical developments
- Identification of implementation bottlenecks and actions for their prompt resolution
- Coordination of efforts for the production of the DoW for the final implementation period.
- Preparation and coordination of the consortium meeting held in Homburg, Germany (2-5 November 2009)
- Preparation and coordination of the External Advisory Board organised in Homburg on November 4th 2009
- Coordination of the preparation of the project Review (Dec 2009)

Major Achievements towards planned objectives, identify main partners Involved

- The management has devoted significant efforts in making sure that this ambitious project will meet its annual objectives and address the recommendations of the annual review held in April 2009.

- **Deviations from the project work programme, and corrective actions taken/suggested**

- **List of deliverables, including due date and actual/foreseen submission date**

  D1.1.7 – Six Monthly Progress Report (T0+42) – submitted

- **List of milestones, including due date and actual/foreseen achievement date**

  N/A

Workpackage 2 – User Needs Analysis & Specifications

- **Partner Responsible : USAAR**
- **Contributing partner(s): Forth, UvA, Philips, IJB, SIB, LundU, UMA, UPM, FHG, Biovista, UOC, PSNC, Custodix, ICCS, USAAR, SIVECO, UOXF.BP, UHoK, IEO**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-The Workpackage has the following major objectives:

This WP continues to elaborate on the various requirements from a clinical point of view that are necessary for the proposed ACGT platform.

- To update guidelines for clinical trials (e.g. ICH and GCP), tools and software for the management of clinical studies and needs for clinico-genomic integration (including technological, legal issues, ethics, security, quality control, etc.).
- To refine requirements and assessment of the relevance (from the point of view of the clinical research) of the architectures and applications that are developed.
- To ensure the feasibility of implementing and to increase the number of clinical studies for cancer into ACGT based on specific clinicogenomic scenarios
- To define and implement usability criteria as part of the quality process for the evaluation of developed tools and software driven by clinicians and other endusers.
- To define criteria for a submission system for tools, software and data from an enduser perspective
- To define criteria for the selection of tools, software and data from a clinical perspective.
- To elaborate maintenance criteria for ACGT (together with WP16)

- Objectives during reporting period

The main focus was laid on clinical aspects of the project as done in the last periods. The search for new clinical trials that can run within ACGT was a major workload. The rhabdoid tumour registry will serve as a pilot trial for ObTiMA. In this respect the work was concentrated on the following major areas during the third period of ACGT:

1. Continuation of work regarding user requirements and functionality of the Ontology based clinical data management system (ObTiMA)
   a) User needs for clinicians and basic researchers for ObTiMA including the user friendly integration of the Master Ontology
   b) Clinico-genomic integration, including technological, legal and ethical issues, security and quality control within ObTiMA
   c) update of the GUI of ObTiMA according to usability criteria
   d) starting to bring ObTiMA from a research tool to a productive tool
2. Those specific clinico-genomic scenarios that were implemented in the clinical studies as defined in WP12 are further developed and discussed how to integrate them into the trial builder

- Progress towards objectives

Further progress was done in developing requirements and functionality of ObTiMA to get a tool for clinicians that will help to increase the number of clinical trials in ACGT.

- Tasks worked on and achievement made with reference to planned objectives, identify contractors involved.

The main tasks carried out by USAAR can be summarized in:

The main focus was laid on the user requirements and the functionality of ObTiMA and the search for new trials and scenarios for ACGT. This task is leaded by USAAR (Norbert Graf). Deliverables D2.5 was finished, submitted and is available at the BSCW Server. Over the entire period IFOMIS stayed in contact with Saarland University Hospital and FHG [IMBT] in order to discuss ontology related questions regarding the development of the Trial Builder. Major progress is done regarding the Clinical view and the maintenance of the Master Ontology. Multiple meetings and discussions about technical issues with project partners (FHG [IBMT], Hokkaido University, Custodix, IFOMIS, FORTH) took place to enhance feedback between developers of ObTiMA and the users.

This WP continued to elaborate on the various requirements from a clinical point of view that are necessary for the proposed ACGT platform. The main points of investigation as defined in the first two years were supplemented by defining criteria for the evaluation of developed software and tools.

As can be seen in the list of meetings and dissemination activities, ACGT and ObTiMA was presented to different clinical groups in different workshops and meetings for cancer. Special focus was given to SIOP and GPOH. The Rhabdoidtumour Registry will use the TrialBuilder as soon as there is a functioning prototype. The same will be done with the next SIOP nephroblastoma trial. At different meetings active participation of the WP2 leader (Norbert Graf) promoted ACGT to a greater and especially clinical auditorium.

Regarding the InSilico Oncology further progress is done regarding the workout of the scenarios and the need for clinical validation of the InSilico experiments. More anonymised DICOM data together with clinical data are available at ICCS for use in the simulator.

Together with WP16 the elaboration of criteria for maintenance of ACGT did continue. A proposal of STaRC (Study Trial and Research Centre) was elaborated and financial support is now given by the local government of the State of Saarland.

During this period the state of the art review was updated on a regular basis, regarding current guidelines for clinical trials, the assessment of tools and software for the management of clinico-genomic studies and trials. The user needs for clinico-genomic integration (including technological, legal issues, ethics, security, quality control, etc.) was consolidated within the corresponding WPs.

The main tasks carried out by IFOMIS can be summarized in:

IFOMIS was active in preparing more dissemination material on the ACGT Master Ontology, especially it took lead in preparing a major publication for a special issue on “Translational Ontologies” for the Journal of Biomedical Informatics”.

Furthermore, IFOMIS provided the liaison to the OBO Foundry and re-activated the communication with the Foundry on making the ACGT MO part of the Foundry. IFOMIS’ contact is Prof. Barry Smith, with whom a roadmap towards the submission procedure of the OBO Foundry was formulated. Frankly, the OBO Foundry lacks some clarity with respect to a administrational workflows concerning the submission of ontologies.

IFOMIS, namely Mathias Brochhausen, is counselling and guiding the process of further development and optimization of the ACGT MO.

The main tasks carried out by UPM can be summarized in:

UPM continued to gather and interpret user requirements for querying clinical databases (SIOP and TOP) using SQL predefined queries. Natural language is used for the interpretation of concepts contained in the SIOP and TOP databases

The main tasks carried out by UMA can be summarized in:

UPM group has developed a requirement gathering process involving the mapping tool and query tool user interfaces. It has been a main goal to make these interfaces user-friendly. The requirements were gathered from different points of view, with the aim of generating personalized interface for different profiles. UPM has worked closely with end-users as well in defining use-case scenarios for demonstration purposes.

The main tasks carried out by UvA can be summarized in:

Continuous work in designing and visualization of the OncoSimulator experiments

The main tasks carried out by ICCS can be summarized in:

ICCS contributed to the definition of the Oncosimulator particular module specifications and their interdependencies from both the end user (clinician, basic researcher, general public) point of view - in tight collaboration with the clinical partners (USAAR, IJB) - and from the technical point of view in tight collaboration with the technical partners (UvA, INRIA, FORTH, FHG, PSNC, UHok et al.)

The main tasks carried out by UoC can be summarized in:

UoC, in close collaboration with FORTH, has participated into the formation of a scenario that is based on the Prognochip clinico-genomic study and aiming at extending pathological characterization of samples, completing clinical information about the patients and capturing the requirements for deployment of the ACGT infrastructure.

The main tasks carried out by Biovista can be summarized in:

Experiments performed with Biovista lit mining tools in collaboration with University of Oxford to determine utility in their workflow. This is an ongoing effort. The question of how to maintain ObTiMA is part of the dissemination task.

The main tasks carried out by SIB can be summarized in:

SIB conducted an analysis of bioinformaticians/data miners' requirements in the context of the scenarios adopted for demonstration and testing:

- TOP/PseudoTOP: Data mining on breast cancer data (in-depth analysis of data collected at a single site)
- MCMP multi-centric multi-platform scenario (integration of datasets collected at two different sites and using different microarray platforms in clinical research)
- SIOP (integration of ObTiMA with the ACGT data mining environment)

The user requirements for the SIOP clinical trial (Wilms tumor) was continued and will end in a complete integrated scenario that will be presented at the International Wilms Tumour Meeting in Banff in March 2010.

The main tasks carried out by Custodix can be summarized in:

The different use case scenarios were evaluated and possible needs were discussed with end-users. Further user needs analysis through the results of the evaluation sessions in Homburg was done.

The main tasks carried out by UOXF can be summarized in:

In the framework of WP2, they continued to develop research activities in the context of the MCMP scenario described in WP12 and more generally methods for the development and validation of prognostic/predictive signatures, and meta-analysis of publicly available datasets. Furthermore, they have been assessing feasibility and usability of the ACGT platform in the context of genomic clinical studies and trials carried out at OXF.

The main tasks carried out by IEO can be summarized in:

The activity of IEO has been focused to the definition of some models for the better interpretations of the poosed scenarios. Namely, IEO is developing a model that describes phenomena of resistance to chemotherapy alone or in combination with antiangiogenic therapies that are related to the interplay between extrinsic noise and nonlinear interactions between cellular populations (tumour cells and endothelial cells).

Moreover, IEO is designing a module to be integrated in the oncosimulator for the modeling of anti angiogenic therapies, by implementing a hybrid model coupling the stochastic multiscale model of oncosimulator with a sipler model describing the global dynamics of vessels.

- **Deviations from the project work programme, and corrective actions taken/suggested**

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No deviations

- **List of deliverables, including due date and actual/foreseen submission date**

D2.5 Report on requirements for an ontology submission system and for the selection of tools, software and data within ACGT was finalized in April 2009 an delivered in time.

- **List of milestones, including due date and actual/foreseen achievement date**

N/A

Workpackage 3 – Architecture and Standards

- **Partner Responsible : PSNC**
- **Contributing partner(s): FORTH, Philips, LundU, UMA, UPM, FHG, BIOVISTA, Custodix, LUH, USAAR**
- **Reporting Period:** 0101/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-The Work package has the following major objectives:

This WP will design the architecture of the ACGT environment with special emphasis on the design of the distributed data access, ontology mediation services and 'secure' grid technology. The development of an appropriate architecture will provide the guidelines for integrating the technological components of ACGT into a powerful environment for cancer trials. The WP will consider the existing grid architectures and toolkits, such as UNICORE and Globus. Gaps in these architectures that do not allow for the support of topic ontologies to be treated in a uniform way inside the grid will be identified. For example, it would seem appropriate to add some semantic data services next to the basic grid functions, such as GRAM, GridFTP and MDS, as well as a plug in for an arbitrary ontology to complement with the generic grid services layer. This WP will take into account and will strongly collaborate with WP2 aiming to use grids to solve interoperability problems, which is a new idea. The ACGT project will work with respect to this goal within the GIN initiative. Current state of the art in interoperability, in general, and in the biomedical sector, in particular, will be studied. This will be based, in part, on work done in some of the FP5 projects, such as ROADCON, ICCI, caBIG, and others. State of the art in grids in other domains will also be continuously reviewed. This WP also aims to include methodological state of the art, such as a study of the design methodologies for web-services and grids.
The objectives of this WP are therefore:

- to invent and define the reference grid architecture to support complex project collaboration and to provide a blueprint for grid implementations in this project and beyond.
- to design the overall architecture of a grid based interoperability system for the biomedical sector and make a substantial contribution to standards.

- Objectives during reporting period

The most important activities planned for the WP3 are:

- evaluation and validation of the ACGT environment architecture including taking care of the consistency of the architecture and providing guidelines for the services developers: we need to take care of the new services and scenarios that are developed in ACGT, and provide the guidelines for them to be compliant with the overall ACGT system.
- monitoring of standards development: it is ongoing work focused on the new achievements in the standard development, and trying to adopt the some work in that area for the ACGT infrastructure
- research on interoperability issues in a context of ACGT architecture design: we need to answer the question how flexible is the proposed architecture in the context of replacing particular components of whole layers; that is very important issue in the context of transferring the ACGT technologies (bio-medical oriented) to the other grid environment, or just using external resources for the ACGT users.

- Progress towards objectives

Having defined the initial layered, ontology driven and grid enabled service architecture during the previous periods, the activities performed in this Workpackage during this reporting period include:

- Focus on verification of the architecture. Towards this objective we monitor very carefully all technical decisions taken regarding the implementation of the services at the various layers of the architecture.
- Continue defining use cases: based on the requirements, but also on the project scope, while talking to users, we proceeded to define indicative usecases.
- Continue working on scenarios: We focused on the developed scenarios for all user/actors groups, usually involving more than one actor. We investigated the various scenarios and explored their implications for the architectural decisions already taken.
- Taking into consideration the initial implementation experiences as well as new requirements coming out from the newest scenarios to be supported as well as the final legal and security requirements, as defined in WP10, we have extended and modified the original architecture.
- Since we foresee that the final architecture of the ACGT system will not change dramatically from the current version of the architecture, we decided not to spend much effort on this part of the WP, but to devote additional efforts in following the Grid standardization efforts, but also on the biomedical standards works.

- Main Activities & Tasks worked on

The most important activity of the reporting period was to investigate interoperability issues, and the problem that may occur, when trying to replace the particular components of the ACGT infrastructure with the other of the same or similar functionality.

- Major Achievements towards planned objectives, identify main partners Involved

- **Deviations from the project work programme, and corrective actions taken/suggested**

No deviations

- **List of deliverables, including due date and actual/foreseen submission date**

In the reporting period ongoing work on final architecture specification deliverable took place.

- **List of milestones, including due date and actual/foreseen achievement date**

All planned milestones was achieved in time.

Workpackage 4 – Biomedical Grid Technology Layer

- **Partner Responsible : PSNC**
- **Contributing partner(s):**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-The Workpackage has the following major objectives:

- to provide grid services that take advantage of the grid functionality, such as security, etc.
- to provide interfaces to state-of-the art grid databases
- to define and provide the information grid that is capable of secure, safe, semantically rich, and ontology committed information
- to enable an ontology aware biomedical grid infrastructure into which all biomedical information, handled by sector applications is stored
- to provide access capability to distributed computational resources, mainly relying on existing functionality of the grid toolkits, but taking into account the possible exploitation of the higher level semantics that will be built into the grid in WP7
- to extend existing toolkits with decentralized VO management tools and workflow systems based on widely adopted standards, such as BPEL.
- The infrastructure will mostly be based on the PSNC's Gridge bag of grid services, enriched with some other selected tools and features, such as workflows, VO management tools, services coordination tools.

- Objectives during reporting period

The most important activities for the WP4 were:

- grid infrastructure maintenance: taking care of the grid services deployed in the ACGT environment; managing all required updates and trying to add new machines to the testbed
- new test cases for grid/services monitoring portal: there were new services and scenarios developed in acgt, so it will be necessary to provide testing procedure for it, and incorporate it to the existing testing framework of ACGT.
- support in installation and configuration of Grid services: helping to use existing grid infrastructure for the new services developed within ACGT; supporting developers who are creating new services compliant with the ACGT infrastructure
- support in accessing grid services from different clients - Recipesheet and visualization services integration - new scenarios exploiting grid infrastructure (support coding of client part of the tools communicating with the grid)
- development of new and missing features in grid services: there are still new requirements for the grid services appears; to support them some changes in existing grid services are required.
- support and implementation of VO management portlets: the portlet is required for the administrators of resources to be able to design security policy for their resources. the work will be done with cooperation with WP10, WP14 and will be part of the ACGT security infrastructure.
- implementation of Oncosimulator Service - wrapping the execution of oncosimulator code with Grid Service interface: the current state of Oncosimulator application allows to use it as a standalone code submitted to the grid node by resource management system; the service access to application opens new scenarios of using the simulation code in a cooperation

with the other services and databases of ACGT; and provide the way for oncosimulator job submission in ACGT workflow environment.
- support for new scenarios of using Oncosimulator Service
- logging service - deployment of distributed logging service for ACGT infrastructure: the distributed logging service is required to debug workflows that are run in ACGT environment.

- Progress towards objectives

The objectives planned for the reporting period were achieved.
- grid testbed were maintained and extended with new resources to provide more computational power and storage space for the project
- logging service for ACGT environment was successfully deployed in the testbed
- all ACGT service developers were supported in implementation of ACGT compliant services with regard to web services technology and security mechanisms
- support in implementation of clients for the grid services
- continuous work on the improvement of the grid services responsible for resource management, data management and authorization decisions.
- ongoing work on integration of DMS service with global authorization framework and VO management,
- design and implementation of new security policies in the context of Virtual Organization management,
- design and implementation of the new scenarios for the Oncosimulator application submission in the grid environment including integration with visualization environment and results presentation layer

- Main Activities & Tasks worked on

The main activity of the workpackage in a reporting period was focused on introducing loging service for ACGT environment. Toth logging service is a distributed facility that can be used for storing and presenting debug messages generated by miscellaneous services in a distributed environment. It fits perfectly to the overall design of the ACGT architecture. It is compliant with the rest of the services in a context of interface and security mechanisms.

The other very important activity was connected with the support of WP8 activity – Oncosimulator application runs in a grid environment. We have implemented command line tools for accessing grid services (Data Management and Resource Management) from GUI application OncoRecipeSheet. The application provides ability to browse the results of previous runs of the application in a graphical way using pictures generated by visualization service. It can also play a role of gatway to ACGT grid infrastructure by submitting new jobs as the new results are needed.

- **Deviations from the project work programme, and corrective actions taken/suggested**

No deviations

- **List of deliverables, including due date and actual/foreseen submission date**

Distributed logging service for ACGT environment - report

- **List of milestones, including due date and actual/foreseen achievement date**

All planned milestones was achieved in time.

Workpackage 5 – Distributed Data Access and Applications

- **Partner Responsible : PHILIPS**
- **Contributing partner(s):**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

To provide seamless and interoperable data access services to the distributed data sources, by developing a set of compatible software key modules/services based on Web Services

To provide services for ontology-based ubiquitous interoperability within the integrated ACGT environment (developed in WP9)

To define a generic architecture that enables distributed access to all relevant patient data across the clinical trial sites

- Objectives during reporting period

- Implementation of the data access services

- Implementation of tools for the creation, management and monitoring of clinical trials and biobanks

- Definition and evaluation of the neoBIG scenario

- Guidelines and recommendations for database management systems to be integrated with the ACGT infrastructure

- Progress towards objectives

Elaboration of guidelines and recommendations for integrating clinical data sources into the ACGT platform. The results of this task were captured in deliverable D5.7.

Evaluation of the neoBIG scenario and of the suitability of the ACGT tools and solutions for the NeoBIG programme. The results of this task were captured in deliverable D5.6.

Further development of all ObTiMA modules for enhancing of the ObTiMA usability and performance:

- New solution for integration of the Trial Outline Builder (TOB) with Obtima

- GCP compliancy:

  a. Further development of validation for CRFs

  b. Handling of Informed Consent

- Browser independency

- Secure network access to ObTiMA (https)

Support for ObTiMA Users:

a. Handling of requests for an ObTiMA account and for a new trial

b. Handbooks for Trial Chairman, for physician

c. Integration of a TRAC system for bug tracking

Demonstration of ObTiMA:

- September 14th - 15th 2009 - demonstration of ObTiMA on the Workshop in Sapporo (Japan)

- November 2nd– 4th 2009 - demonstration of ObTiMA on the consortium meeting in Homburg (Germany) - incl. evaluation session

- December 3d 2009 - demonstration of Obtima on the International Review in Brussels

Further development of the data access services. Due to the complexity of the database scheme used in the obtima database, the generated sql queries (as produced by the SPARQL endpoint) became too complex for the Postgresql database (resulting in either extremely slow or non-terminating queries). The Data Access Services were modified in order to provide better performing sql queries. Subsequently, we assisted the other partners which also host data access services to incorporate the performance enhancements.

Contribution to the integration activities and to troubleshooting issues in the cooperation between the workflow editor, mediator, the data access services, and the associated security infrastructure.

Contribution to the preparation of the demonstrator for the integrated scenario in ACGT:

- Implementation of importing of the clinical trial for breast cancer (MCMP scenario) in Obtima

- Integration of OGSA DAI services for accessing the Obtima database for the MCMP trial

- Extension of the data access services, integration in the demonstrator and troubleshooting of the integration issues

- Main Activities & Tasks worked on

- Implementation of the data access services

- Implementation of tools for the creation, management and monitoring of clinical trials and biobanks

- Definition and evaluation of the neoBIG scenario

- Guidelines and recommendations for database management systems to be integrated with the ACGT infrastructure

- Integration and demonstration activities

- Major Achievements towards planned objectives, identify main partners Involved

Deliverables D5.6, D5.7 have been completed, a paper was published and presented in the HEALTHINF 2010 Conference. (Philips)

Further development of Obtima (FHG)

Requirements collection and analysis for the neoBIG scenario (Philips, IJB)

Elaboration of guidelines and recommendations for database management systems to be integrated with the ACGT infrastructure (Philips)

Contribution to the demonstrators for the December review and to the evaluation sessions in Homburg (all)

- **Deviations from the project work programme, and corrective actions taken/suggested**

No deviations

- **List of deliverables, including due date and actual/foreseen submission date**

D5.6 Requirements analysis and consolidation of the neoBIG scenario (month 42/submitted Nov 2009)

D5.7 Guidelines and recommendations for open source database management systems to be used with the ACGT integration platform (month 44/ submitted Nov 2009)

- **List of milestones, including due date and actual/foreseen achievement date**

N/A

Workpackage 6 – Data Mining and Knowledge Discovery Tools

- **Partner Responsible : FHG**
- **Contributing partner(s):**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

The objectives of this WP are to provide an integrated analysis environment for clinical data analysis and knowledge discovery. Specifically:

1. To adapt standard analysis modules for statistics, data mining and knowledge discovery to the ACGT environment.
2. To adapt advanced data mining and text mining modules to the ACGT use case.
3. To provide an innovative and user-friendly interface to the analysis tasks

- Objectives during reporting period

- Implementation of integrated demonstrators in collaboration with WPs 4,5,7 & 9
- Progress towards implementation of intelligent support for knowledge discovery using rich meta data

- Progress towards objectives

In the reporting period, several additional data mining services have been set up, and many existing services have been improved. These services have been presented in several demonstrators. A model for integrated meta data based on the Open Provenance Model has been drafted.

- Main Activities & Tasks worked on

- Major Achievements towards planned objectives, identify main partners Involved

FHG was responsible for the main coordination of the work package. In addition, the following tasks were performed

- Evaluation of the Open Provenance Model for metadata storage (in collaboration with UMA)
- Demonstration of the ACGT Knowledge Discovery Tools and Services for the ACGT Advisory Board.
- Setup of ACGT demonstrators.

FORTH implemented a number of web services for a complete genotype to phenotype scenario using a SNP selection algorithm. The integrated methodology enables the discovery of genotype-to-phenotype associations and predictive models, and supports genotype to phenotype association studies. The implemented ACGT services are:

- Data extraction web service from ArrayExpress (publicly available databases for functional genomics experiments supported by EMBL-EBI) using keywords for queries.
- Mediator web service which compiles data in ArrayExpress format and creates a homogenized file with the clinical and genotype data.

- Discretization web service which discretizes and transforms the experiment data to Attribute-Relation File Format (ARFF, a well known format for data mining)
- SNP selection web service which implements an algorithm based on feature reduction and selection approach the (two-valued) SNP feature.

The tasks performed by **UMA** in WP6 are:

- Development of a new Qnormalization method which implements the Ben Bolstad method quantile normalization of high density oliglonucleotide array data. We are currently preparing a parallel prototype for exploiting HPC and specialized hardware architectures to address high-throughput experiments.
- Study of the Open Provenance Model (OPM) as a possible technology to enable sharing of ACGT provenance metadata.
- Assisting development of a portlet for service discovery using Magallanes libraries. This includes in-exact matching of strings in service descriptions and input for service and workflow discovery. Additionally, the portlet learns from the selections made by users and adapts results accordingly.
- Development of gene-expression web-services (as CommandLine services) using functionality from Prep+07 (http://chirimoyo.ac.uma.es/prep/index.html) and Engene (https://chirimoyo.ac.uma.es/engenet/)
    - Gene-expression pre-processing services including plots, reading GE data etc.
    - Gene-expression post-processing services including clustering, statistical analysis and projection methods

UvA has further extended their visualization services with functionality to represent different types of data, including graphs/networks, vector fields.

Uhok collaborated with UvA on the design and control of visualisation services, in connection with the work on the OncoSimulator.

SIB contributed the following work:

- Development of a new R package for gene set analysis (mygsea2). This package implements a fast testing procedure to assess the enrichment of a list of genes in a larger, ranked list of genes. The empirical testing procedure is based on the Kolmogorov-Smirnov statistic, and uses a permutation of ranked genes to assess significance.
- Associated to the function assessing significance, a complete gene annotation framework was developed. This framework has three major aspects, namely 1) a relational database containing a representation of the various gene annotation files available at NCBI, 2) sets of related genes (e.g. GO terms, KEGG pathways) and 3) a series of wrapper functions which implements the most common queries made by bioinformaticians.
- Unlike most tools found in the literature addressing the problem of gene sets, the package is not based on gene symbols to identify genes. (Official gene symbols are maintained by the Human Genome Nomenclature Committee and undergo continuous changes, which creates inconsistencies between analyses over long perdiod of time.) Instead, NCBI's Entrez Gene IDs are used, as those have prooven to be most stable in time. The mapping between Entrez Gene IDs and official gene symbols is made on-the-fly using recent annotations available in the database.
- Besides GO and KEGG categories, mygsea2 also support custom made lists of genes, such as prognostic signatures in cancer.

- All features of the mygsea2 package has been used in the context of the SIOP scenario to assess the significance of the association between genes associated to specific clinical parameters and KEGG pathways. The prototype gene annotation database is located on the ACGT server Iapetus at FORTH.

Biovista contributed to the following tasks:

- Developed Web service calls
- Genes combinatorial: rewrote using new table layouts and deprecating older methods and tables. The new implementation is faster.
- Started implementing getGeneNamesFromGeneSymbol() and get getGeneSymbolFromGeneName(). These webservices are designed to address the gene polysemy problem. The main idea behind these functions is to try to solve the polysemy problem piecewise, merging genes from different animals that are close to each other. For example the current (not yet released) implementation merges humans, rat and mouse but leaves out insects and plants.
- Managed jar dependencies (transient or not) in a centralized manner that can be properly distributed through the version control system
- Upgraded WS stack to newest apache-cxf 2.2.6

IEO's activity in WP6 in these six months has been strictly linked to the activity of WP8, where a model for assessing the influence of a realistic bounded extrinsic noise on the inteplay between tumour-immune systems (d'Onofrio, Phys Rev E, 2010). This assessment requires the running of multiple independent simulations, each mimicking a specific random pattern of time-varying changes of the parameters. This is an ideal scenario for a parallel implementation and in particular for the testing of the extended language gridR.

- **Deviations from the project work programme, and corrective actions taken/suggested**
  None

- **List of deliverables, including due date and actual/foreseen submission date**

  D6.6 - Interoperability of ACGT knowledge discovery services with existing bioinformatics tools (T0+48) - Foreseen T0+50

  D6.7 - Prototype and report rof the final the ACGT analysis environment (To+50) - Foreseen T0+52

- **List of milestones, including due date and actual/foreseen achievement date**

  MWP6.7 The integrated ACGT analysis environment (month 50)

Workpackage 7 – Ontologies and Semantic Mediation Tools

- **Partner Responsible : UPM**
- **Contributing partner(s): FORTH, FHG, PHILIPS, OXFORD, BIOVISTA, USAAR, IFOMIS, UPM**
- **Reporting Period**: 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives**:

To provide, through the Master Ontology, a formal description of the knowledge domain of the clinical trials on cancer included in ACGT.

To develop a semantic mediation layer that integrates distributed and heterogeneous biomedical databases. This mediator is supported by the ACGT Master Ontology, which provides the necessary semantic background by modelling the domain.

To fully exploit powerful languages, such as OWL, in order to provide mediation services across a wide range of information sources, resulting in the implementation of the ACGT semantic mediation tools and services.

The core of the ACGT platform is formed by the semantic mediation layer. This is composed of several mediation services, and supported by the ACGT Master Ontology. The services will be provided to a number of tools developed inside the ACGT project, as well as end-users, who will get access to a query system that integrates a great number of biomedical sources concerning clinical trials on cancer

To, ultimately, develop the mediation technologies required for achieving a vertical integration among many different levels of granularity (molecular, cellular, tissue, organ, individual and population)

- Objectives during reporting period:

To demonstrate the viability of the approach through the implementation and testing of different clinical scenarios.

To validate the different functionalities developed during the past period.

To test new features of the clinico-genomic integration scenario using the ArrayExpress wrapper.

- Main Activities & Tasks worked on:

- Preparing more dissemination material on the ACGT Master Ontology, especially it took lead in preparing a major publication for a special issue on “Translational Ontologies” for the Journal of Biomedical Informatics”. (IFOMIS)
- Furthermore, IFOMIS provided the liaison to the OBO Foundry and re-activated the communication with the Foundry on making the ACGT MO part of the Foundry. IFOMIS’ contact is Prof. Barry Smith, with whom a roadmap towards the submission procedure of the OBO Foundry was formulated. Frankly, the OBO Foundry lacks some clarity with respect to a administrational workflows concerning the submission of ontologies.

- IFOMIS, namely Mathias Brochhausen, is counselling and guiding the process of further development and optimization of the ACGT MO.
- The integration of the OGSA-DAI and Dynamic Data Access Services with the ACGT workflow environment and testing and validating this integration. (FORTH)
- Technical contribution for the development of ObTIMA, being responsible for the implementation of the user administration, security, and roles and rights of ObTIMA. (FORTH)
- Research ontology evolution (FORTH)
- Extension of the Web Interface for the submission tool. (FORTH)
- Continuous review of ontology/methods and discussion (OXFORD)
- Updating of OGSA DAI services for better usability and performance. (FhG-IBMT)
- Importing of the clinical trial for breast cancer (MCMP scenario) in Obtima including creation of mapping files for the Ontology Query Tool and for the OGSA DAI service. (FhG-IBMT)
- Updating interface of the Semantic Mediation Layer to support secure Obtima wrappers .(UPM)
- Optimization of Semantic Mediator performance for large queries. (UPM)
- Inclusion of credential delegation functionality in the Query Tool. (UPM)
- Improvements in the Query Tool interface. (UPM)
- Enhancements in the Mapping format to support new cases of heterogeneity. (UPM)
- Supporting the preparation of new scenarios to test and demonstrate the ACGT platform. (UPM)
- Developing of a new debugging system for the Semantic Mediator, enabling more accurate trace of incoming activities. (UPM)
- Design of functional descriptions for our gene-expression web-services in the ACGT service description taxonomy (functional descriptions), see service tree under “GeneExpression” (development repository). (UMA)
- Development of two new features for the Ontology Viewer. The search ontology feature provides a more comprehensive search of the Ontology. The search string is looked up not only on the labels of Ontology nodes but also data associated with these nodes, via properties etc. The result of the search describes where in the nodes information the search string was found. (BIOVISTA)
- The publication trends of a node's label in biomedical literature can be graphed. For hose ontology nodes whose labels can be disambiguated to valid entities, present on Biovista's entity database, the frequency of biomedical articles published mentioning the entity over the years may be obtained as a graph. The graph is obtained by performing the trend analysis followed by graph generation using standard Java libraries and finally streaming it over the net to the client for display, GWT-RPC communication. (BIOVISTA)
- Extensive code cleanup and refactoring. Introduction of standard logging using
- Log4j simplifying the task of application deployment and website administration. Restructuring of some parts of the client & server code, GWT, to utilize the Generics support introduced in GWT 1.7 (previously Ontology Viewer was using GWT 1.5). (BIOVISTA)

- **Deviations from the project work programme, and corrective actions taken/suggested**

  Deliverable D7.8 was intentionally delayed in order to include a more detailed description of the experiments carried out related to clinico-genomic data integration.

- **List of deliverables, including due date and actual/foreseen submission date**
  N/A

- **List of milestones, including due date and actual/foreseen achievement date**
  N/A

Workpackage 8 – Technologies and Tools for In Silico Oncology

- **Partner Responsible : ICCS**
- **Contributing partner(s): FORTH, INRIA, UvA, IJB, FHG, ICCS, UdS, UHok, IEO, UOXF (informal contributor)**
- **Reporting Period**: 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-The Workpackage has the following major objectives:

The objective of this WP is to develop the "Oncosimulator", a technologically advanced and user friendly system able to spatiotemporally simulate within well defined reliability limits tumour growth and tumour and normal tissue response to chemotherapy for the cases of breast cancer and nephroblastoma in the patient's individualized context.

- Objectives during reporting period:

- Completion of the numerical study of the simulation models behaviour
- Provision of an advanced integrated version of the simulation and the technological modules constituting the Oncosimulator
- Use of further real inhomogeneous medical data in order to adapt, optimize and validate the Oncosimulator (simulation and technological modules)
- Integration of the "Oncosimulator" service into the entire ACGT platform

- Progress towards objectives:

- **Main Activities & Tasks worked on**

T8.1 Completion of the numerical study of the simulation models behaviour

i. A thorough study of the convergence of the algorithms and codes concerning both Wilms tumour and breast cancer

ii. A comprehensive study of the stability/sensitivity of the algorithms and codes concerning both Wilms tumour and breast cancer with respect to several critical parameters

T8.2 Provision of an advanced integrated version of the simulation and the technological modules constituting the Oncosimulator

The following activities have taken place in order to further advance the integration of the simulation and the technological modules:
i. Optimization of the simulation codes and their execution.
ii. Extension of image processing tools for aided segmentation, interpolation, 3D reconstruction and registration of tumour images (e.g. MRI, CT etc.)
iii. Parallel execution of the simulation codes
iv. Automation of the execution of different instances of the simulation code on a grid via a portal (OncorecipeSheets) completed for the Wilm's tumor and in progress for the breast cancer code.

v. Execution and parametric exploration of the simulation code through the development of subjunctive interfaces in progress

T8.3 Use of further real inhomogeneous medical data in order to adapt, optimize and validate the Oncosimulator (simulation and technological modules)

This task is being implemented in tight collaboration with WP12. Eight further multiscale datasets have been exploited for the case of Wilm's tumor.

T8.4 Integration of the "Oncosimulator" service into the entire ACGT platform

The process of the Oncosimulator's integration into the overall ACGT platform is underway.

- Major Achievements towards planned objectives, identify main partners involved

The major achievements towards objectives include the following (partners involved are given in parentheses):

- achievement of an improved integration level of the various simulation and technological modules of the Oncosimulator (ICCS, UHok, UdS, UvA, IJB, INRIA, FHG, FORTH, IEO).
- exploitation of further sets of real multiscale medical data for the adaptation and optimization of the Oncosimulator. Initial predictive trends have been identified (ICCS, UdS, IJB, UvA, FHG).

- Deviations from the project work programme, and corrective actions taken/suggested

  No major deviations have been identified.

- List of deliverables, including due date and actual/foreseen submission date

  None in the reporting period.

- List of milestones, including due date and actual/foreseen achievement date

  N/A

Workpackage 9 – The Integrated ACGT Environment

- **Partner Responsible : FORTH**

- **Contributing partner(s): UvA, Philips, IJB, SIB, LundU, UMA, UPM, FHG, BIOVISTA, UoC, PSNC, Custodix, ICCS, UHok**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

- To demonstrate large scale system integration within the ACGT environment
- To implement the workflow layer for achieving composability of applications and services
- To investigate the evolution of the ACGT integrated platform proposing enhancements to all levels with respect to functionality and performance

- Objectives during reporting period

During the reporting period emphasis was given to increase the user friendliness of the workflow environment by incorporating distributed logging facilities, semantic discovery and automatic workflow building, and third party service integration.

- Progress towards objectives

The work has been progressed according to the objectives by incorporating a distributed logging service and providing user feedback based on its contents, enhancing the "intelligence" of workflow environment, and increasing the stability of integration with the Biomoby services.

- Main Activities & Tasks worked on

- Integration of the Biomoby service registries has been reimplemented and further enhanced so that the workflow editor has more service related information to exploit during workflow construction
- The Magallanes tool has been incorporated through a web service interface to offer a semi automatic (partial) workflow construction.
- The TOTH distributed logging facility has been integrated in the ACGT workflow environment
- Initial design for the ACGT Provenance (metadata) information
- Stability enhancements and user feature requests have been considered and implemented (ongoing work).
- Work on handling of complex data structures (e.g. "arrays"/"lists") has been started.

- **Major Achievements towards planned objectives, identify main partners Involved**

Main tasks carried out by FORTH

- Development on the ACGT Workflow Editor. New features include:
  - More informative messages in the cases of errors or other exceptional events.

    - Integration of the Magallanes discovery and automatic workflow composition tool of UMA for helping the user in the partial construction of the workflows based on semantics.
- Enhancements to the Generic Proxy for the Biomoby services.
- Initiate work on the Provenance information. Survey of the existing approaches and adopt the Open Provenance Model as the underlying model for the ACGT provenance data.
- Continue the development on the Proxy Services framework for making possible the secure, authenticated, and authorized invocation of Grid ACGT Services from within BPEL Workflow Enactors. The changes include the deployment of the TOTH infrastructure from PSNC for the distributed logging facility and the improved event handling and reporting.
- Initial work for handling complex data structures in the workflow editor through the support of semantically enriched JSON Schemas.
- Perform the usual responsibilities implied by the leading of a WP such as the preparation of the necessary paper work.

Main tasks carried out by UPM

- Developing interfaces to enhance the integration between Obtima and the Semantic Mediator.
- Integrating the Query Tool in the ACGT portal.
- Enabling security in the Query Tool.

Main tasks carried out by UVA

UvA together with Hokkaido University and NTUA are continuing their work on the environment that integrates (resp.) visualization services, Recipe sheet and Oncosimulator. UvA's visualization services are wrapped into easily accessible "RESTful" services that allow easy integration into third party applications and webpages. Several performance improvements have been made in the process.

Main tasks carried out by UMA

- Development of a web-service interface for semi-automatic workflow composition with Magallanes. The service takes input and output datatypes and generates possible workflows (by composing existing web-services from metadata repository). This service will be made available via the workflow editor as a way to quickly generate interesting workflows for later editing and improvements in the editor.
- Initial discussions of how to include command-line services in the workflow editor/enactor
- Integration of GAS within the metadata repository

Main tasks carried out by BIOVISTA

- Preparation of Literature Mining and Ontology Viewer applications for demonstrators at reviews
- Added biovista webservices to ACGT portal
- Bug reports to ACGT portal in order to make biovista services readily available. All reported bugs have been fixed
- Bug reports to workflow editor in order to make it compatible with biovista services. All reported bugs have been fixed.
- Added methods in order to work around the problem of passing arrays as parameters. This is a very serious problem that limits the usefulness of all webservices offered by the system as most users are working around the problem either by reading and writing files in the Grid or by changing the signatures of their services effectively.

- Rewrote the combinatorial webservices to return HTML so the workflow editor can display it directly which helps immediate overview.

- **Deviations from the project work programme, and corrective actions taken/suggested**

  None in the reporting period

- **List of deliverables, including due date and actual/foreseen submission date**

  None in the reporting period

- **List of milestones, including due date and actual/foreseen achievement date**

  None in the reporting period

Workpackage 10 – Ethics, Legal and QA issues

- **Partner Responsible : LUH**

- **Contributing partner(s): LUH, Custodix, UH, USAAR, IJB, UOXF, FUNDP**

- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

- Objectives during reporting period

1. Negotiation of contracts between partners exchanging data via the ACGT network and the consortium
2. Risk analysis regarding the data security
3. Risk analysis regarding data protection
4. Signing of contracts between partners exchanging data via the ACGT network and the consortium.
5. Survey on patients' perspectives and needs regarding informed consent and data protection
6. Production of a contract between the Certification Authority and the Registration Authorities

- Progress towards objectives

1. Discussion with hospitals to have the contracts signed; Modifications to the contracts following these discussions
2. Risk analysis concerning the data security and data protection framework is in progress.
3. Contacts with Jules Bordet Institute to finalize the contracts which has been signed at the end of January 2010 (FUNDP). The work continues with Oxford.
4. Analysis of Institut Jules Bordet's consent form;
5. Deeper research on the consent and the validity of it in matter of research;
6. Administrative work for the non profit organization CDP;
7. In depth analysis on the way ACGT has chosen to work on the contracts and isolate the lessons learned from the possible errors.
8. Conduction of the empirical survey

- Main Activities & Tasks worked on

- In depth analysis of legal risks regarding the data security and data protection framework is in progress (Custodix, LUH)
- Meetings with ACGT-partners (especially with WP11) took place for the analysis of risks regarding the data security and data protection framework. Status of preparatory work was discussed. Approach of deliverable was discussed.Table of content was defined and agreed. (Custodix, FUNDP, LUH, USAAR)

- Discussions on the contracts to be signed by participants exchanging data via the ACGT network (FUNDP, Custodix, LUH, IJB, UOXF)
- Analysis of Institut Jules Bordet's consent form (FUNDP)
- Deeper research on the consent and the validity of it in matter of research (FUNDP)
- Administrative work for the non profit organization CDP (FUNDP)
- In depth analysis on the way ACGT has chosen to work on the contracts and isolate the lessons learned from the possible errors (FUNDP)
- Co-operations with the clinical ACGT-partners (IJB, UOXF, UOC, USAAR), the German Childhood Cancer Registry, the West German Study Group, three German rehabilitation centres for families of children affected by cancer (Rehabilitationsklinik Katharinenhöhe, Syltklinik, Nachsorgeklinik Tannheim), and four German hospitals who are participating in the MINDACT-study in Germany (coordinator: West German Study Group, Klinikum Böblingen, St. Elisabethkrankhenhaus/Koeln, St. Johannes Hospital/Dortmund, Marien Hospital/Witten) were continued (UH).
- The distribution of the questionnaires has nearly ended. We received right now:
- 1121 filled questionnaires of German parents (809 from parents whose children fell ill in the year 2005, 312 from parents visiting rehabilitation centres together with their child)
- 237 filled questionnaires of breastcancer patients (159 from Jules Bordet Institute/Belgium, 13 from University Hospital of Heraklion, 37 from Oxford University Hospital, 28 from German hospitals)
- The distribution continues due to the delayed beginning at Oxford University Hospital and at the German breastcancer centres (UH).
- Data processing of the received questionnaires has been finished, data analysis has already started (UH).
- Improving the requirements for roles and rights in the Trial Builder in cooperation with the Fraunhofer Institute, UHok, Custodix, FORTH (USAAR)
- Internal discussion of the contracts regarding data protection, data security and ethical issues at USAAR and discussion with Custodix how to implement security issues in ObTiMA (USAAR)

- Major Achievements towards planned objectives, identify main partners Involved

- Analysis of legislation and literature regarding the analysis of legal risks regarding the data security and data protection framework is in progress (LUH).
- Cooperation with WP11 regarding the analysis concerning the data security and data protection framework (LUH, CUSTODIX).
- Contracts signed by Institute Jules Bordet (FUNDP, IJB).
- The approval by the ethics committees of the Oxford Radcliffe Hospitals NHS Trust and the National Research Ethics Service (NHS) regarding the survey at the Oxford University Hospital were obtained on 9th of December 2009 and on 11th of January 2010 (UH).

- **Deviations from the project work programme, and corrective actions taken/suggested**
  None

- **List of deliverables, including due date and actual/foreseen submission date**
  - D10.6.2 Results of the international and national empirical survey on patients' and parents of minor patients' perspectives and needs (due/foreseen month 51) (UH) is in progress
  - D10.8 Risk analysis concerning the data security and data protection framework (due month 49) is in progress

- **List of milestones, including due date and actual/foreseen achievement date**
  MWP10.4 Risk analysis concerning the data security and data protection framework (due month 49)

Workpackage 11 – Trust and Security

- **Partner Responsible : CUSTODIX**

- **Contributing partner(s): IJB, UMA, UPM, Fraunhofer, LUH, PSNC, Custodix, FUNDP, UH**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

- Workpackage objectives

The main objective of WP11 is to create a working environment in which sensitive patient data processing for research is compliant with the relevant regulations "by default". Using provided documentation and guidelines the developers can create services that will live up to the data protection expectations. Additionally the task of monitoring ACGT security and privacy requirements remains important and are revisited and evolved based on feedback acquired during the project.

In this final stage of the project evaluation and monitoring of services has come more to the foreground. Improved usability of the (security) tools and management of security will enable end users and administrators to use the ACGT infrastructure safely and effectively.

- Progress towards objectives

- Reviewed and updated the registration site and applet, new functionality includes registration of server and service certificates.
- Managing and maintaining the security infrastructure, including ACL, credential storage, PKI and authorization service.
- Work on D11.5: Finalized ACGT security architecture (Merged with D3.3: The ACGT technical architecture: Final Specifications).
- Work on D11.6: ACGT guide with administrative documentation of ACGT security and VO management has continued.
- An additional evaluation session of the ACGT infrastructure, including the registration process and login has been performed during the consortium meeting in Homburg. The findings of the evaluation session have been used to improve the usability of the registration process and login process.
- Continuous support has been given to partners for further integration of new services in ACGT and troubleshooting bugs.
- Continuous integration sessions through skype provide a constant source for feedback and allow quick action when problems are encountered.
- Further development of the ObTiMA security functionality
    - Further development of role based user management in ObTiMA.
    - Initial implementation for Anonimization of clinical data on CRFs
    - Handling of Informed Consent
    - A technical plan for the integration of PESF (Privacy Enhanced Storage Framework) into Obtima (i.e.by some called "CAT-on-the-fly") has been created

- Updating of OGSA DAI services for accessing the Obtima database for the MCMP trial

- **Deviations from the project work programme, and corrective actions taken/suggested**

  There has only been a small deviation to the work programme as a delay of “D11.5 Finalized ACGT security architecture“(Which is merged with D3.3 "The ACGT technical architecture: Final Specifications"). This document will be available before the next CM of April.

- **List of deliverables, including due date and actual/foreseen submission date**

  D11.5 – Finalised ACGT security architecture due T0+48 – Foreseen T0+50

- **List of milestones, including due date and actual/foreseen achievement date**

  None for this period

Workpackage 12 – Clinical Trials

- **Partner Responsible : IJB - FORTH – IMBB**
- **Contributing partner(s): UHANN, UH, USAAR, Biovista, EIO, UOXF, UoC, SIB, Custodix, FUNDP.**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

- Implement the ACGT post-genomic clinical trials collecting multilevel clinical information for the validation of the ACGT infrastructure.
- Identify and address the various harmonization issues related to cross-platform and multi-centric post-genomic data collection.
- Implement various advanced post-genomic analyses including expression profiling, genotyping, proteome and metabolome profiling methodologies.
- Promote post-genomic medicine according to the ethical, regulatory and technical requirements.

- Progress towards objectives

(a) Two clinical trials were previously selected as the ACGT clinical trials:

1. The TOP trial: This multi-centric trial, which is coordinated by IJB, investigates pre-operative chemotherapy treatment and responses in order to identify indicative individualized patients' profiles. The accrual of this trial has been closed in August 2008. Gene expression analyses have been carried out on the 121 with available gene expression profiles which led to the identification of a gene expression signature which was associated with response to epirubicin. This signature was also validated in two independent datasets. These results were presented at large international conferences and the manuscript is under review at the Lancet Oncology. Genome-wide copy number variation analysis and methylation profiling is currently being done on 70 patients. The re-consent procedure is still ongoing and 59 patients have re-consented up to now. This trial is also contributing data for the oncosimulator on an ongoing basis and a first publication is now in press.
   It has also been decided that the identification of molecular markers predicting the efficacy of epirubicin in the TOP trial would serve as scenario for the final demonstration.

2. The SIOP trial: The Nephroblastoma study and trial protocol 2001 started accrual in June 2001 and is coordinated by USAAR. In 2006 the first patient did enter the ACGT Nephroblastoma trial after approval of an amendment of the SIOP 2001/GPOH trial by the ethical committee (Landesärztekammer des Saarlandes). During the reporting period, the enrolment of patients into the SIOP nephroblastoma trial and the antigen scenario trial was ongoing. 13 antigens are characterised and the results from laboratory findings undergo statistical analysis at the moment. Lot of work was spent for the contribution of clinical and imaging data from this SIOP trial for the oncosimulator (for more details see WP 8). In addition ontology based CRFs were developed within ObTiMA to start using ObTiMA with real clinical data and use them as a source for IT scenarios. One scenario is currently developed to join and analyse clinical and outcome data of patients with gene array data and data from the open access database

KEGG (Kyoto Encyclopedia of Genes and Genomes) to find disrupted pathways in tumour samples of nephroblastoma patients and correlate them with outcome. This scenario will be demonstrated at the 7th International Meeting on the Biology of Childhood renal Tumors taking place in Banff/Canada from the 1st to the 3rd of March. A validation of the scenario is possible as the analysis of the gene array data with outcome is already published by our group and the same data will be used in this scenario (Zirn B, Hartmann O, Samans B, Krause M, Wittmann S, Mertens F, Graf N, Eilers M, Gessler M: Expression profiling of Wilms tumors reveals new candidate genes for different clinical parameters. Int J Cancer: 118:1954–1962, 2006). This activity is done with tremendous efforts from many partners demonstrating an integrated scenario with highest clinical importance.

The clinical partners are also continuously interacting with the other WPs to answer all the questions they may have regarding these trials.

(b) The Multi-centric multi-platform scenario: Clinical partners in ACGT own a unique data set of gene expression, namely RNA extracts from biopsies of 73 patients have been hybridized each on two different microarray platforms (Illumina and Affymetrix). This data set is called Multi-Centric Multi-Platform (MCMP). A signal scaling method developed in the context of this project (quantile-scaling) showed that signal from these two different technological platforms can be combined when a suitable signal preprocessing step is applied. A classical cross-validation procedure showed that biologically consistent gene-expression signatures can be derived from the mixture of raw signal issued from different platforms without requiring complex meta-analytical approaches. This work is still conducted jointly by SIB, UOXF and IJB.

(c) Identification of scenarios for testing: In order to validate the ACGT data-mining environment, simple yet clinically realistic scenarios have to be identified for as actual implementation. Taking into account the IT development requirements (most importantly that anonymization cannot be formally guaranteed while the infrastructure is in development), a previously published dataset from the Transbig clinical trial has been recast into an "ACGT clinical trial". The scenario for the final demonstration is currently being defined based on the hypotheses to be answered in the TOP trial.

(d) ACGT pursued the collaboration with the Breast International Group (BIG) to investigate whether ACGT could help with data-sharing issues linked with their new research program (cfr deliverable from WP5).

- **Deviations from the project work programme, and corrective actions taken/suggested**

None.

- **List of deliverables, including due date and actual/foreseen submission date**

No deliverable was planned during this period.

- **List of milestones, including due date and actual/foreseen achievement date**

No milestones were foreseen during the reporting period.

Workpackage 13 – Evaluation & Validation

- **Partner Responsible : SIB**
- **Contributing partner(s): SIB, FhG, FORTH, Philips, Siveco, UPM, UMA, LundU, UvA, INRIA, IJB, Biovista, PSNC, Custodix, ICCS, UHok, USaar, UOXF**
- **Reporting Period:** 01/08/2009 – 31/01/2010
- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

The objectives of WP13 for the reporting period are:

- Formulate evaluation criteria, verification procedures and feedback reports guidelines.
- Coordinate local validation activities and feedback reports.
- Coordinate formal usability evaluation of the ACGT platform.

- Objectives during reporting period

During the reporting period the efforts in WP13 were focused on the following areas:

- Development of scenarios illustrating the progress of the development of the ACGT platform.
- Conduct regular testing of the platform based on scenarios designed for earlier reviews.
- Organize and conduct continuous evaluation activities of the platform.

- Progress towards objectives

- Testing and evaluation scenarios of increasing complexity have been designed over the period. In the Hokkaido series, various scenarios involving the different data access services of the ACGT platform have been implemented. The Hokkaido series is based on published breast cancer gene-expression data, which have been stored on the BASE server, and of clinical/demographics data which have been recast in the form of simplified CRFs implemented on ObTiMA.
- By the end of the period a new scenario based on a published subset of data from the SIOP trial has been initiated. In this scenario, genuine trial CRFs are used, aiming at illustrating the capacity of the system to work in a realistic context. This demonstrator should form the base of a contribution of ACGT to the 7th International Meeting on the Biology of Childhood Renal Tumours, to be held in Banff in March 2010.
- Discussions related to the scenarios for the final evaluation and to be demonstrated during the final review have been initiated.
- As the platform undergoes continuous development, regular testing was conducted by periodic execution of preexisting workflows. If issues are uncovered, those are immediately addressed through on-the-fly, Skype-based meetings. Used in conjunction with the Request Tracker system installed in the previous reporting period, this approach proved very efficient to solve problems involving multiple developer groups.
- An evaluation session was organized during the consortium meeting held in Homburg in November 2009. Both non-ACGT and ACGT bioinformaticians, data managers and clinicians from the University of Saarland, of IEO in Milano and of University of Oxford were involved in the evaluation. The evaluators executed various targeted mini-scenarios with the ACGT platform, from the setup of clinical forms with ObTiMA to the execution of an analysis scenario with GridR and the workflow environment. Sessions were recorded by the ACGT usability engineer. Transcripts and usability reports are currently being written down.
- In the period the ACGT ontology was under a continuous review, through the various requests for extension in view of supporting the new scenarios.

- Main Activities & Tasks worked on

See above.

- Major Achievements towards planned objectives, identify main partners involved

- SIB is coordinating the work package, is involved in the design of scenarios and is conducting periodic execution of preexisting workflows to monitor the availability of the platform. SIB is also reviewing documents produced in the context of WP13.
- USaar is involved in the development of the ACGT ontology and in the validation of its suitability for the scenarios. USaar has contributed continuously and significantly to the evaluation effort, notably during and after the Homburg evaluation session. Significant improvements to the user interface were proposed. USaar is also providing the material and insight in view of the implementation of one of the final review scenarios (based on SIOP).
- FhG has completed the transcription and analysis of the evaluation and usability testing session that took place in Oxford (previous reporting period). Videos and interviews collected during the Homburg session have been partly analyzed and demonstrated significant improvements in the ergonomy of the platform, although demonstrating also the need for proper training prior to usage.
- UXOF and IJB have contributed in the definition of scenarios for two of the final demonstrator scenarios, illustrating a bioinformatics-oriented approach (UOXF) and another more clinical-research oriented (IJB).
- FORTH is contributing to the implementation of evaluation and demonstration scenarios. It is hosting and maintaining the various databases required for the evaluation and validation workshops, as well as maintaining the source code repository and issue tracking tools. SIB and FORTH are de facto coordinators of the Skype debugging sessions, the latter ensuring the overall monitoring of the execution status.
- UPM is testing and validating the queries designed for the new scenarios, and has validated the integration with the public microarray repository ArrayExpress.
- UMA has tested and validated the jOrca and Magallanes applications, which are candidates for future integration in the ACGT infrastructure. Web-services for the integration of gene-expression data processing have been tested and validated in the development version of the metadata repository.
- Biovista's Adverse Event prediction algorithms were evaluated in view of their use by FDA, in particular regarding the predictive accuracy of the approach on specific examples. (The work resulted in a contract between the FDA and a related press release.)
- Technical partners involved in the workflow environment have participated to Skype-based debugging sessions on a regular basis (FhG, FORTH, Philips, Siveco, UPM, UMA, PSNC, Custodix).
- The activity of IEO in WP13 has been devoted to the testing and reporting on the usability and effectiveness of the tools developed in the project, such as Obtima and GridR. Data managers, medical doctors, biostatisticians and system biologists have been involved in this task.

- **Deviations from the project work programme, and corrective actions taken/suggested**

The actions occurring in WP13 depend on the developments that take place in other WPs (notable technical WPs). Progress is in-line with the rest of the project.

- **List of deliverables, including due date and actual/foreseen submission date**

Deliverable D13.5: "Specification of scenarios for a range of integrated demonstrators of the ACGT platform" was initially planned for December 2009. As it has been put as a goal for

the final demonstrator to use genuine clinical data, instead of data derived from published material has introduced a delay in the definition of these scenarios.
Deliverable D13.6: "Final evaluation report" is due July 2010.

- **List of milestones, including due date and actual/foreseen achievement date**

  No WP13-related milestone was set in the reporting period.

Workpackage 14 – Training and Portal

- **Partner Responsible : SIVECO**
- **Contributing partner(s): FORTH, SIB, UMA, FHG, BioVista, Custodix, HealthGrid, ICCS, USaar**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

The Workpackage has the following major objectives:

- To develop the ACGT Portal, based on the GridSphere Portal platform that provides a grid-enabled integrated, customizable, multi-lingual, and user-friendly interface to end-users.

- To develop a uniform, grid enabled, training platform for biomedical data analysis by providing professional training tools to end-users (physicians, biologists, etc.) as to perform individual and cross-disciplinary data analysis and clinico-genomic trials design, monitoring and evaluation, thereby paving the way towards the advance of Clinico-Genomic Trials in Practice.

- Objectives during reporting period

- The integration at the interface level of the ACGT services into the ACGT Portal

- The development of online training modules and other electronic training materials - accesible from the ACGT Portal (for guests and registered ACGT users)

- Formal training sessions for end-users

- Progress towards objectives

- Enhancement of the VO Management Portlets (SIVECO, Custodix, PSNC)
- Setup of the ACGT Distributed Logging System in the Portal (SIVECO, PSNC)
- Upgrade of the Metadata Repository Portlets; continuous work on the integration of a secure version of the Metadata Repo Portlet (SIVECO, UMA)
- Enhancement of the ACGT Login and Registration (SIVECO, Custodix, SIB)
- Enhancement of the User Interface- both public and private areas of the Portal (SIVECO)
- Design of the OncorecipeSheet portal, which is to serve as the main access to the Oncosimulator (ICCS)
- The ACGT Handbook has been continuously updated to provide consortium and user-community reviewed content. The content was used for other online and offline training materials supporting training sessions and for the ACGT Competiton (as online available documentation) (SIVECO, Healthgrid)
- Handbook wiki maintenance: installation and update of new extensions/configuration to facilitate creation of training content (Healthgrid)
- 6 new training materials have been published as resources in the ACGT Portal (SIVECO)
- training scenarios and training documentation was developed for Obtima; full integration in the ACGT Handbook scheduled in the next reporting period (FHG)
- additional tutorials for jOrca and Magallanes (UMA)

- A formal training session was held in Homburg (hosted by USaar) with trainees from SIVECO, SIB and FHG, materials prepared by SIB and tested by SIVECO and Healthgrid.
- A official call for proposals for the ACGT Video was prepared and published Jan 2010 (FORTH)
- Scenario and draft of the script of the ACGT Video (Biovista)
- Preparation of the ACGT Competition Wiki and other competition materials (for end-users and service-providers). Integration of competition Wiki with ACGT Handbook (Biovista, SIVECO).

- **Main Activities & Tasks worked on**

T14.2 Final implementation of the ACGT Portal

- During the reporting period, this task was more focused on enhancements of the *ACGT* Portal. Enhancements were done to the VO Management Portlets and the Metadata Repo Portlets. General enhancements were made to the user-friendliness of the interface, especially for the registration and login processes, following the evaluation reports from evaluation and training sessions.
- The ACGT distributed logging system developed by PSNC was added in the ACGT portal as a critical component needed in case of a higher-load of the system e.g. during the ACGT Competition.

T14.3 Training modules for Clinical and Biological investigators and students

- 6 training modules were developed as SWF Flash movies with corresponding ACGT Handbook pages *(First time user: Register and get your ACGT Passport; Login with your Passport / Visa; Querying clinical data; Register and access external databases; Register and use GridR services; Create and use workflows)*
- A complete end-to-end scenario "From Trial Management to Data Mining" (http://handbook.eu-acgt.org/EX:ACGT_End_to_End_Scenario) was documented in the ACGT Handbook as step-by-step procedures which cover most uses of the ACGT platform. The scenario was also covered in the training modules.
- All the pages in the ACGT Handbook were updated and split between *User Interface pages* (that are continuously updated to accomodate changes in the UI) and *task-oriented pages* (that tend to have a longer lifespan before requiring major updates). A complete Overview of the ACGT environment covers both (UI and task-oriented pages) (http://handbook.eu-acgt.org/HB:ACGT_Data_Mining_Tools)
- During the ACGT Competion, editorial rights were restricted to wiki Administrators only (SIVECO, Healgrid, SIB) to prevent accidental or malevolent changes in online documentation (e.g. bot-spam).
- Preparation of the ACGT Competition Wiki and other competition materials for service-providers. Integration of competition Wiki with ACGT Handbook.

T14.4 Organisation of Summer School and Scientic Workshops

- A formal training sessions was scheduled and held in Homburg (hosted by USaar) with 3 trainers from SIVECO, SIB and FHG and 4 trainees (volunteers from USaar and IEO)
- Based on the experiences accumulated during the past implementation period, the emphasis of the task was focused in planning organisation of various dissemination events in conjunction with other "clinical" oriented events and conferences, so as to bring ACGT achievements closer to its end-user community.
- The new scenarios for training sessions in the next reporting period will be based on the the scenarios established in D13.5

T14.5 ACGT Educational Video

- This task aims to coordinate the production of the ACGT video. The ACGT video will have a significant training and educational purpose of both individuals (citizens) as well as clinicians. A scenario and draft of the script of the ACGT Video has been prepared and an official call for proposals for the ACGT Video was prepared and published Jan 2010. The subcontractor will be selected (March 2010) and the interviews and videos will be shot in the next reporting period.

- Major Achievements towards planned objectives, identify main partners Involved

- The main achievement of this reporting period was the first formal training session hosted by USaar using training materials from a collaborative effort (SIVECO, SIB, HealthGrid, FORTH, UPM, FHG) and trainers from SIVECO, SIB and FHG.
- Continuous editing of the ACGT Handbook has led to several user-friendly driven improvements of the User Interface of the ACGT Portal (portlets and applets). Some of these improvements have been noted in the Commision review – december 2009.

- **Deviations from the project work programme, and corrective actions taken/suggested**

- Previous deviations from the project work programme concerning training workshops and availability of up-to-date training materials were corrected in the final DIP for M37 to 48. The ACGT Handbook initiative (editorial effort coordinated by SIVECO, hosted & maintained by HealthGrid) has proven to be successful in providing an up-to-date and easy-to-update documentation. Training materials generated from the ACGT Handbook have been more focused on the user needs revealed by demonstration and evaluation activities.
- No deviations are foreseen for the next reporting period.

- **List of deliverables, including due date and actual/foreseen submission date**

No deliverable was planned during this period.

- **List of milestones, including due date and actual/foreseen achievement date**

No milestones were foreseen during the reporting period.

Workpackage 15 - Dissemination

- **Partner Responsible : HEALTHGRID**
- **Contributing partner(s): All WP15 partners**
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-The Workpackage has the following major objectives:

This work package aims to spread the project's goals and results to the final users and stakeholders active in post genomic clinical trials. To ensure the quality of the information, this work package works closely with the editorial board and technical work package leaders. The objectives of this WP are:

- To disseminate the results of the project widely in Europe and elsewhere in the world in order to attract new users and communities;
- To keep the users informed about the project advancement and achievement, through the organisation of dissemination events and the production of the project's Newsletter;
- To provide tools for developing and maintaining a strong community around the project.

- Objectives during reporting period

The objectives of WP15 during the reporting period are:

- Production of a winter newsletter and implementation of monitoring metrics.
- Extension of target audience for the newsletter
- Maintenance of the website to keep the users informed about the events/news related to cancer clinical research, eHealth and grid technology.
- Support to the project with production of dissemination material to be presented during meetings and conferences where ACGT is represented
- Update the dissemination material according to new ACGT management and advancements in the project
- Extend the public awareness of ACGT through the website and the HealthGrid initiative
- Mainstreaming activities with WP16 exploitation
- Submit a work plan for WP15 activities for the final project's period to the project management plan.

- Progress towards objectives

Towards above objectives, WP15 has performed the following progresses:

- 1 Newsletter produced: Winter edition with 200 more organisation in mailing lists, lists provided in collaboration with the WP16 on exploitation activities. HealthGrid also made possible that the newsletter appears on the EC e-health newsletter for information to wider audience
- Installation of a newsletter management tool allowing metrics
- 2 leaflets updated
- 1 leaflet produced
- Production of Wikipedia article about the ACGT project
- Dissemination material provision for the partners going to attend conferences

- Work plan submitted to the management committee

- **Main Activities & Tasks worked on**

- **Summer newsletter:** was sent in August with sending to the mailing lists of the project and further dissemination to the European Commission e-health newsletter.
- **Winter newsletter:** Due to the partner's duties for the project review in December, it was decided to release only one newsletter during the reporting period. The newsletter presents an update on the status of the activities and the tools that have been developed by the ACGT consortium. The ACGT competition is described in the winter 09 newsletters with a special call for collaborations with organizations and individuals interested on this major event.
- **Leaftet design, update, production**

  The generic leaflet has been updated to support the partner's dissemination and exploitation efforts

  A leaflet was produced to support the Saporo dissemination workshop in Japan

  An update of the Oncosimulator leaflet was made in collaboration with the WP in charge
- **Participation to Homburg project management meeting Germany:** Presentation of the dissemination activities to date, discussion with the project management partners and action plan for the next period on dissemination activities, decisions on how to best support the WP16 on exploitation
- **Participation to the advisory board meeting in Homburg (Germany) with production of dissemination material:** production of material for the purpose of disseminating about the project results.
- **Edition of the ACGT website:** inclusion of new materials in the website including latest advances and partners requests for the message to fit the purpose of the project. This means regular update and changes in the relevant web pages.
- **Maintenance of the ACGT website:** HealthGrid systems administrators have been maintaining the website. This maintenance is mainly about making updates of security and functions on the website tools, improving the performances. Maintenance is also about user support desk when needed.
- **Publications in scientific journals**

  Publications accepted: 14

  Publications submitted: 7
- **Publication in conferences: conference papers and proceedings**

  Conference papers accepted: 16

  10 conferences in Europe and 6 conferences outside Europe (USA, Mexico)

  One conference paper accepted for the next MedInfo 2010 in South Africa
- **Presentations in conferences and workshops**

  Presentations in conferences/workshops: 14

  6 conferences in Europe, 8 outside Europe (Canada, Japan, Dubai)
- **One poster** has been presented during the workshop in Sapporo

  Partner 18 has participated to an **International Book**
- **Demonstrations**

  The Ontology-based Clinical Trial Management System (ObTiMA) Software has been demonstrated two times during the reporting period in the workshop in Sapporo and during the meeting with the External Advisory Board

  The ACGT visualization services have been demonstrated during 3 meetings.

The literature mining has been demonstrated two times in Switzerland and USA.

- **Interviews:**

  One interview in Spanish national TV from WP15 partners in Spain (UMA)

  Two interviews in Spanish newspaper from WP15 partners in Spain (UMA)

- **Events and relevant articles/publications inserted on the website:** All interesting events and articles have been inserted on the website, after approval from editorial board
- **Conference/workshop organization**

  A dissemination workshop had been organized in Japan in September 2009 with the ACGT management board, leaders of academic and industrial research teams, and strategy planners

- **Participation in AGT related projects (UMA):**

  1-"Identificación de "dianas genéticas" en la interacción fresa-Colletotrichum útiles en Programas de Mejora Genética"; Junta de Andalucía (P07-AGR-02482); (2009 / 2012); IP. Dr.José Luis Caballero (U.Córdoba)
  -"Rede Sul Americana e Iberoamericana de Bioinformática (Red SurAmericana e Iberoamericana de Bioinformatica)"; Assessoria de Cooperaçäo Internacional - ASCIN/CNPq – Programas Multilaterais (PROSUL). Programa Sul-Americano de Apoio às Atividades de Cooperação em Ciência e Tecnologia. Edital CNPq Nº 011/2008 Chamada I – Redes Temáticas; (01/01/2009 - 31/12/2010); IP. Dra. Ana Teresa Vasconcellos (Brasil)
  3-"Computación de alto rendimiento aplicada a las tecnologías de secuenciación de nueva generación (High Performance Computing applied to Next Generation Sequencing technologies)";
  Programa Nacional de Internacionalización de la I+D; Subprograma: Acciones Integradas 2009;
  Ministerio de Ciencia e Innovación. Referencia AT2009-0025; (01/01/2010 - 31/12/2011); IP. Dr.Oswaldo Trelles

- Major Achievements towards planned objectives, identify main partners Involved

- Dissemination during workshops (cf. dissemination table document)
- Update of dissemination materials according to project status
- Release of 2 newsletters showing the progresses of work and impact from ACGT
- Publication of newsletters on the EC e-health newsletter

Deviations from the project work programme, and corrective actions taken/suggested

None

List of deliverables, including due date and actual/foreseen submission date

D15-5 Final report and analysis on dissemination activities report will be due at the end of the project month 42(June 2010). This is an update of the previous D15-5.

List of milestones, including due date and actual/foreseen achievement date

None

Workpackage 16 – Market Investigation & Exploitation

- **Partner Responsible : BIOVISTA**
- **Contributing partner(s):** IJB, USAAR, CUSTODIX, FHG, FORTH
- **Reporting Period:** 01/08/2009 – 31/01/2010

- **Workpackage objectives and starting point of work at beginning of reporting period**

-**The Workpackage has the following major objectives:**

The overall objective of this work package is to consider and where appropriate implement the exploitable results of the project. During the preceding periods 2 updates of the Exploitation Plan have been delivered and actions recommended therein have been taken. The ACGT Certification initiative that was proposed in an earlier version of the plan has been abandoned due to the complexities involved and the lack of resources necessary to support it. As a result of the work carried out and the annual reviews of the project, an objective that has been added is the preparation of a document that will capture the lessons learned from ACGT at a 'strategic' level with a view to making this knowledge available to subsequent effort in the field of multi-centric clinical trial support.

- Objectives during reporting period

The main objective during the reporting period has been the organization of the ACGT competition which is seen both as a test of the viability and utility of the ACGT infrastructure and as a promotional instrument to the larger ICT community and, more importantly, the end-user community that ACGT targets. A second objective has been to explore the broader space of interest of ACGT to identify exploitation opportunities both in a strictly commercial and academic/R&D context. Finally the ACGT Video has also been worked on.

- Progress towards objectives

During the reporting period the following progress has been achieved:

1. The ACGT Competition has been launched and supporting infrastructure is in place
2. Select exploitation activities have taken place (and continue on an ongoing basis)
3. Work relating to the ACGT Video has been pursued.

- Main Activities & Tasks worked on

1. ACGT Competition
2. ACGT Video
3. Select exploitation actions

- Major Achievements towards planned objectives, identify main partners Involved

- All primary ACGT Competition supporting materials have been prepared (Siveco, IAIS, Biovista, FORTH)

- Procedures have been agreed and set up in connection with the support of ACGT competition entrants. (Siveco, IAIS, Biovista, FORTH)
- Supporting infrastructure has been set up – namely 2 dedicated WIKIs, one on general competition issues and one to support all technical issues the entrants may have. (IAIS, Biovista)
- Work has been carried out on follow-on proposals and on promoting certain ACGT technologies (e.g Obtima, Literature mining, CAT, etc.) (Biovista, USAAR, Custodix)
- At the company level Custodix:
  - Is examining the possibilities for converting CAT into a boxed solution upon request of prospects.
  - Plans have been made to integrate Custodix' commercial PESF solution into ObTiMa
- Maintenance and sustainability of ACGT are fundamental issues that were addressed in ACGT during the last 6 months more intensively. The conception of STaRC (Study, Trial and Research Centre) was further developed. Since the end of January 2010 the local government of the Saarland in Germany gives financial support for this enterprise for 2 years, starting in April this year. This money will help to maintain and further develop ObTiMA and to establish a business plan for mainatenance.
- A new initiative has been launched towards the end of this period with the goal of submitting a large integrated project in ICT-2009.5.3 (Virtual Physiological Human) part b) ICT tools, services and specialised infrastructure for the biomedical researcher in FP7. This initiative is named p-medicine and aims to promote personalized medicine from data sharing and integration via IT-technologies and training.
- Preparation of data sets for the ACGT competition. Data sets used in previous demonstrators (MCMP/Hokkaido and SIOP) have been reviewed, documented and made available to competitors.

- **Deviations from the project work programme, and corrective actions taken/suggested**

The exploitation plan foresaw that the ACGT Competition be announce in December 2010. In view of the project extension, and at the request of the technical partners, it was decided to push that back to February 2010, to allow for the creation of a more robust platform for the competition entrants and the preparation of the necessary supporting materials and infrastructure. The request was accepted the ACGT Competition was officially announced on February 18th 2010.

- **List of deliverables, including due date and actual/foreseen submission date**

No deliverables are foreseen for the reporting period.

- **List of milestones, including due date and actual/foreseen achievement date**

Based on the original project duration, January 2010 would have seen the final version of the Exploitation deliverable. This has now been rescheduled for July 2010, the new end of the project.

Consortium Management

➢ Project Meetings *(including WP technical meetings)*

Title	*Place and Date*	*Main conclusions*
Discussion on D10.8 Risk Analysis	1/9/2009 Custodix, Merlbeke, Belgium	Status of preparatory work was discussed. Approach of deliverable was discussed. Table of content was defined and agreed.
Multiscale cancer modelling and in silico oncology as a subject of the Euro-Japanese research collaboration.	Sapporo,Hokaido, Japan, 14 Sept 2009	Strategic steps aiming at enhancing the Euro-Japanese collaboration in the field of multiscale cancer modelling and in silico oncology.
ACGT Dissemination Workshop and MB meeting in Japan	UHok (Sapporo, Japan), 14th-16th September 2009	Management Board and UHok team presented and discussed the project with leaders of academic and industrial research teams, and strategy planners from a national funding agency.
Consortium Meeting	Homburg, 2nd-´to 5th November 2009	
Training Session	Homburg, 5th November 2009	First formal training session: 3 trainers (Overview, Data Mining, Trial Management) – 4 trainees (3 bioinformaticians & 1 clinician). Training materials used: Presentations of the project (slides); Live demonstrations of the Data Mining and Trial Management platforms; Handouts of a ACGT End to End Scenario from the ACGT Handbook. User feedback was collected for further WP13 – Evaluation analysis.
WP8 technical meeting	Homburg, 5 Nov 2009	Steps to be taken in view of the completion of the ACGT project
WP5: research visit for ObTiMA/Trial Outline Builder integration	FhG IBMT (Sankt Ingbert, Germany), 6th-13th November 2009	Rationalised the integration of the TOB facilities with the ObTiMA front-end and database, towards a test deployment of ObTiMA (through USAAR) on the Rhabdoid trial.
ACGT Review	Brussels, 2nd – 3rd December 2009	

PESF – ObTiMA integration meeting	26/01/2010 - 28/01/2010 Custodix, Sint-Martens-Latem, Belgium	A technical workplan for the integration of PESF and ObTiMA has been worked out.
WP8: research visit for OncoSimulator enhancement and planning	ICCS (Athens, Greece), 25th January – 2nd February 2010	Collaboration on upgrading the overall OncoSimulator architecture to handle BRCA simulations. Progress review and follow-on planning for WT/BRCA simulator validation and calibration phase.
WP5: research visit for Trial Outline Builder user evaluation	USAAR (Homburg, Germany), 15th-19th February 2010	User evaluation and negotiation of design enhancements for the TOB's trial-chairman and treating-clinician interfaces. Detailed specification of research-clinician interface as extension to implemented prototype.

- **Local meetings:**

Title	*Place and Date*	*Main conclusions*
ObTiMA Meeting	Homburg, 31st July 2009	Improvements regarding GUI
Wilms Tumour Lecture	Berlin, 4th August 2009	Demonstration of ObTiMA
STaRC preparation, Meeting with the local government of Saarland	Saarbrücken, 13th August, 2009	STaRC might help to maintain ACGT, financial support will be further discussed
Embryonal Tumour meeting	Cologne, 2nd September 2009	Demonstration of ObTiMA
Cooperation with NoE for Paediatric Oncology	Telephone conference, 22nd September 2009	Dissemination of ACGT
ACGT Presentation to TIF and Interfusion Ltd.	Nicosia, CY,15 Oct. 2009	Invitation to TIF and Interfusion Ltd. to join ACGT Competition
ObTiMA Meeting	Homburg, 21st October 2009	Improvements regarding
Embryonal Tumour meeting	Cologne, 5th-6th November 2009	Demonstration of ObTiMA
ObTiMA Meeting	Homburg, 10th November 2009	Improvements regarding GUI
ACGT - Univ. Patras collaboration	Athens, Biovista, 6 November 2009	Prepare a proposal to be submitted to the FDA

ObTiMA Meeting	Hannover, 23rd November 2009	Cooperation with GPOH for the use of ObTiMA (Holger Stenzhorn from USAAR attended this meeting)
ObTiMA Meeting	Homburg, 30th November 2009	Improvements regarding GUI, CAT on the Fly
ObTiMA Meeting	Homburg, 7th December 2009	Improvements regarding GUI, CAT on the Fly
STaRC preparation, Meeting with EURICE	Saarbrücken, 7th January, 2010	financial support will be further discussed
Amsterdam School of Oncology Seminar	Amsterdam 13th-14th January	Dissemination of ObTiMA
STaRC preparation, Meeting with the local government of Saarland	Homburg, 19th January, 2010	financial support is given to STaRC
Joint work for the extension of the OncorecipeSheet to the case of breast cancer, and related issues (ICCS, UHok).	ICCS-NTUA 25Jan -3 Feb 2010	Initial version of the breast cancer branch of the OncorecipeSheet.
Meeting with Custodix	Gent, Belgium, 26th – 28th January 2010	Discussion about pseudonymisation within ObTiMA, use of CAT

Use and Dissemination

Scientific Publications:

Material	Title	Authors	Journal	Date	Volume/Pages
Journal Paper	Chemotherapy of vascularised tumours: role of vessel density and the effect of vascular <<pruning>>	A. d'Onofrio (Corr Auth) and A. Gandolfi,	the Journal of Theoretical Biology		doi:10.1016/j.jtbi.2010.01.023
Journal Paper	Delay-induced oscillatory dynamics of tumour–immune system inter	Alberto d'Onofrio (corr auth), Francesca Gatti, Paola Cerrai, Luca Freschi	*Mathematical and Computer Modelling*		Volume 51, Issues 5-6, March 2010, Pages 572-591
Publication	Clinical and molecular features in patients with atypical teratoid rhabdoid tumor or malignant rhabdoid tumor	Kordes U, Gesk S, Frühwald MC, Graf N, Leuschner I, Hasselblatt M, Jeibmann A, Oyen F, Peters O, Pietsch T, Siebert R, Schneppenheim R	Genes Chromosomes Cancer	February 2010	49(2):176-81
Journal Paper	Tumour evasion from immune system control as bounded-noise induced transition	A. d'Onofrio	Physical Review E	févr-10	81 art.n. 021923 (2010)
Publication	Amplification of LAPTM4B and YWHAZ contributes to chemotherapy resistance and recurrence of breast cancer.	Li Y, Zou L, Li Q, Haibe-Kains B, Tian R, Li Y, Desmedt C, Sotiriou C, Szallasi Z, Iglehart JD, Richardson AL, Wang ZC.	Nature Medicine	Fev-10	16(2):214-8

Publication	A fuzzy gene expression-based computational approach improves breast cancer prognostication.	Haibe-Kains B, Desmedt C, Rothe F, Piccart M, Sotiriou C, Bontempi G	Genome Biology	Fev-10	11(2):R18
Publication	"ACGT - Evolution of a Semantic Grid Infrastructure"	Hoppe, A., Tsiknakis, M.	Ercim News 80	January 2010	p7- Special theme: Digital Preservation
Journal Paper	Metamodeling the learning-hiding competition between tumours and immune system: a kinematic approach	C. Cattani, A. Ciancio and A. d'Onofrio (Corr. Auth.)	*Mathematical and Computer Modelling*	jan-10	doi:10.1016/j.mcm.2010.01.012
Publication	MOWServ: a web client for integration of bioinformatic resources	Sergio Ramírez, Antonio Muñoz, Johan Karlsson, Maximiliano García, M. Gonzalo Claros and Oswaldo Trelles	Nucleic Acid Research (2010 NAR Web Server Issue)	submitted, Jan 2010	
Publication	Mixing samples before or after expression analysis determines the final outcome	Antonio Muñoz-Mérida, Elizabeth Tamayo and Oswaldo Trelles	EMBnet.news Bioinformatics	submitted, Jan 2010	
Publication	mAPI: A modular framework for the integrated use of distributed resources	Sergio Ramirez; J. Rios; M. Garcia; J. Karlsson and Oswaldo Trelles	ACM Transactions on Software Engineering and Methodology	submitted, Dic. 2009	
Publication	WTX inactivation is a frequent, but late event in Wilms tumors without apparent clinical impact	Wegert J, Wittmann S, Leuschner I, Geissinger E, Graf N, Gessler M	Genes Chromosomes Cancer	December 2009	48(12):1102-11

Publication	An advanced discrete state - discrete event multiscale simulation model of the response of a solid tumor to chemotherapy. Mimicking a clinical study	G.S.Stamatakos, E.A.Kolokotroni, D.D.Dionysiou, E.C.Georgiadi, C.Desmedt	Submitted to the Journal of Theoretical Biology	December 2009	
Journal Paper	Tumour suppression by Immune system through stochastic oscillations	G. Caravagna(equal contributor and corr auth), A. d'Onofrio (equal contributor), P. Milazzo and R. Barbuti	Submitted to the Journal of Theoretical Biology	December 2009	
Publication	Treatment of relapsed Wilms tumors: lessons learned	Spreafico F, Pritchard Jones K, Malogolowkin MH, Bergeron C, Hale J, de Kraker J, Dallorso S, Acha T, de Camargo B, Dome JS, Graf N	Expert Rev Anticancer Ther. 2009	December 2009	9(12):1807-15
Publication	Intellectual Property Rights in e-Health: Balancing out the interests at stake? A Herculean task?	M. Corrales, E. Egermann, N. Forgó, T. Kruegel	Legal Discourse in Cyberlaw and Trade	nov-09	307-321
Publication	The ACGT Master Ontology and ist Application - Towards an Ontology-Driven Cancer Research and Management System	M. Brochhausen, A.D. Spear, C. Cocos, G. Weiler, L. Martin, A. Anguita, H. Stenzhorn, E. Daskalaki, F. Schera, S. Sfakianakis, S. Kiefer, M. Dörr, N. Graf, M. Tsiknakis	Submitted to the Journal of Biomedical Informatics	Okt 09 (rev. Jan 10)	
Publication	BASE - 2nd generation software for microarray data management and analysis	Johan Vallon-Christersson, Nicklas Nordborg, Martin Svensson and Jari Häkkinen	BMC Bioinformatics	October 2009	10:330
Publication	Improvement of the clinical applicability of the Genomic Grade Index through a qRT-PCR test performed on frozen and formalin-fixed paraffin-embedded tissues.	Toussaint J, Sieuwerts AM, Haibe-Kains B, Desmedt C, Rouas G, Harris AL, Larsimont D, Piccart M, Foekens JA, Durbecq V, Sotiriou C	BMC Genomics	sept-09	10;10:424

Publication	The Gene expression Grade Index: a potential predictor of relapse for endocrine-treated breast cancer patients in the BIG 1-98 trial.	Desmedt C, Giobbie-Hurder A, Neven P, Paridaens R, Christiaens MR, Smeets A, Lallemand F, Haibe-Kains B, Viale G, Gelber RD, Piccart M, Sotiriou C.	BMC Med Genomics	juil-09	2;2:40
Journal Paper	On the interaction between the Immune System and an exponentially replicating Pathogen	A. d'Onofrio	Mathematical Biosciences and Engineering		In press
Publication	jORCA: Easily integrating bioinformatics Web Services	Martín-Requena Victoria, Rios Javier; García Maximiliano, Ramírez Sergio, and Trelles Oswaldo	Bioinformatics	in press	DOI*:10.1093/bioinformatics/btp709*)
Publication	Secondary neoplasms after Wilms' tumor in Germany	Nourkami N, Furtwängler R, Alkassar M, Graf N; SIOP/GPOH Nephroblastoma Trials Group	Strahlenther Onkol	38564	185 Suppl 2:11-2
Publication	Introduction of Hypermatrix and Operator Notation into a Discrete Mathematics Simulation Model of Malignant Tumour Response to Therapeutic Schemes In Vivo. Some Operator Properties Cancer Informatics	G.S.Stamatakos, D.D. Dionysiou	Cancer Informatics	2009	7, 239 - 251.
Publication	Disclosure of research results in clinico-genomic cancer trials: Challenges, classification, and criteria for decision-making	Regine Kollek and Imme Petersen	Journal for Medical Ethics	Submitted	

Material	Title	Authors	Conf/Proceedings	Date	Venue
Conference Paper	In silico oncology: a top-down multiscale simulator of cancer dynamics. Studying the effect of symmetric stem cell division on the cellular constitution of a tumour.	G.S.Stamatakos, E.Kolokotroni, D.Dionysiou, E.Georgiadi, S.Giatili	World Congress 2009 on Medical Physics and Biomedical Engineering. O. Doessel and W.C. Schlegel (Eds.): WC 2009, IFMBE Proceedings 25/IV	Sept 7-12, 2009	Munich, Germany
Conference Paper	A Static Analysis Technique to Detect Unsatisfiable Conditions in Ontology-based Workflows	Gabriele Weiler, Arnd Poetzsch-Heffter and Stephan Kiefer	4th International Applications of Semantic Technologies Workshop	October 2009	Lubeck
Conference Paper	A data mining based approach to reliable distributed systems	Michael Mock, Dennis Wegener	2nd International Workshop on Dependable Network Computing and Mobile Systems, DNCMS 2009, in conjunction with 28th IEEE International Symposium on Reliable Distributed Systems	September 27-30, 2009	New York, U.S.A
Conference Paper	Toolkit-Based High-Performance Data Mining of Large Data on MapReduce Clusters	Dennis Wegener, Michael Mock, Deyaa Adranale, Stefan Wrobel	Proceedings of the 2009 IEEE International Conference on Data Mining Workshops, ICDM 2009	December 2009	Miami, FL,USA
Conference Paper	Generation of genomic tools for teh study of Olive tree	Gonzales-Plaza, J.J.; Sámchez-Sevilla, J.F.; Muñoz-Mérida A.; Dominguez M.C., Trelles O., Bjelaj A.; De la Rosa R.; Botella M.A., Valpuesta V., Beuzon C.R.	Plant & Animal Genome XVIII. Española de Genética	January 9-13. 2010	San Diego, California, USA

Conference Paper	Molecular dissection of defense-related pathways against Colletotrichum acutatum in strawberry (Fragaria x ananassa)	Francisco Amil-Ruiz, Sonia Encinas-Villarejo, Berta de los Santos, Antonio Muñoz- Mérida, José A. Mercado, Oswaldo Trelles, Fernando Pliego-Alfaro, Fernando Romero, Juan Muñoz-Blanco, and José L. Caballero.	The "8th Plant Genomics European Meeting" (Plant GEM)	7-10 October. 2009	Lisboa, Portugal
Conference Paper	Generación de herramientas bioinformáticas para el estudio del Olivo	Gonzales-Plaza, J.J.; Sámchez-Sevilla, J.F.; Muñoz-Mérida A.; Dominguez M.C., Trelles O., Bjelaj A.; De la Rosa R.; Botella M.A., Valpuesta V., Beuzon C.R.	XXXVII Congreso de la Sociedad Española de Genética	29 Sept / 2 de Oct. 2009	Torremolinos, Spain
Conference Paper	Mixing samples before or after expression analysis determine the final result	Elizabet Tamayo; Antonio Muñoz-Mérida and Oswaldo Trelles	International Conference & Meetings EMBnet-RIBio 2009: Bioinformatics for High Throughput Technologies and the Interface of Bioinformatics and Systems Biology	Sept.2009	Mexico
Conference Paper	Pooling versus individual samples: a comparative analysis	Muñoz, A.; Tamayo, E.; Fernández, R.; Granell, A. y Trelles O.	Tomato Genomics; EU-SOL workshop “New tools for improvement of yield and quality”	2009	Toledo, Spain
Conference Paper	Web Services across an European Biomedical GRID Infrastructure	Maximiliano García, Johan Karlsson, Sergio Ramirez and Oswaldo	Jornadas de Bioinformática	November 3-6, 2009	Lisboa, Portugal

		Trelles			
Conference Paper	Towards closing the gap between user data and standardized input	Alfredo Martínez; Paul Gordon; Christoph W. Sensen and Oswaldo Trelles	Network Tools and Applications in Biology (NETTAB 2009)	June 10 / 13, 2009	Catania, Sicily Italy
Conference Paper	Patient Empowerment by Ontology-based Multilingual Systems	M. Brochhausen, L. Slaughter	IFMBE Proceedings	September 13 – 18, 2009	Munich Germany
Conference Paper	Supporting genotype-to-phenotype association studies with grid-enabled knowledge discovery workflows,	Lefteris Koumakis, Vassilis Moustakis, Manolis Tsiknakis, Dimitris Kafetzopoulos, George Potamias	31st Annual International IEEE EMBS Conference (EMBC09)	September, 2-6, 2009	Minneapolis, Minnesota, USA
Conference Paper	A semantically aware platform for the authoring and secure enactment of bioinformatics workflows	Manolis Tsiknakis, Stelios Sfakianakis, George Zacharioudakis, Lefteris Koumakis, Alexandros Kanterakis, George Potamias, Dimitris Kafetzopoulos	31st Annual International IEEE EMBS Conference (EMBC09)	September, 2-6, 2009	Minneapolis, Minnesota, USA
Conference Paper	Scientific discovery workflows in bioinformatics: A scenario for the coupling of molecular regulatory pathways and gene-expression profiles	Alexandors Kanterakis, George Potamias, George Zacharioudakis, Lefteris Koumakis, Stelios Sfakianakis, Manolis Tsiknakis	13th World Congress on Medical and Health Informatics Medinfo 2010	12-15th September 2010 (accepted)	Cape Town, South Africa
Conference Paper	„What do cancer patients expect from genomics? Individual donor feedback in the light of clinico-genomic	Imme Petersen and Regine Kollek	international conference “Vital Politics III"	September 2009	London

	research"				
Conference Paper	High-level Model Definition for Microarray Data in a Future Clinico-genomic EHR	A. Bucur, J. van Leeuwen, R. Vdovjak and J. Vrijnsen	Proc of HEALTHINF 2010 Conf.	janv-10	Valencia, Spain

Material	Title	Authors	Journal/Conf/Proceedings	Date	Venue
Poster Presentation	From Research Prototype to a Tool for Science: Multi-site, Multi-disciplinary Cooperation in Supporting Multi-scenario Exploration	A. Lunzer	3rd Intl Symp on Global COE Program of Center for Next-Generation Information Technlogy Based on Knowledge Discovery and Knowledge Federation	January 2010	Sapporo, Japan

Material	Title	Speakers	Journal/Conf/Proceedings	Date	Venue
Presentation	Immune reponse pattern in wilms tumour patients: new biomarkers for early diagnosis of malignant childhood tumours	N. Nourkami	7th International Meeting on the Biology of Childhood Renal Tumors	March 1-3, 2010	Banff, Alberta, Canada
Presentation	Identification of serological markers and generation of autoantibody signatures to improve differential diagnosis of Wilms and non-Wilms tumors	Sabrina Heisel	7th International Meeting on the Biology of Childhood Renal Tumors	March 1-3, 2010	Banff, Alberta, Canada

Presentation	Advanced Wilms Tumour Scenario using the ACGT environment	Norbert Graf	7th International Meeting on the Biology of Childhood Renal Tumors	March 1-3, 2010	Banff, Alberta, Canada
Presentation	Literature Based Discovery: The Biovista Platform for Clinical Outcomes Analysis	Andreas Persidis (invited)	The 2nd International Conference on Drug Discovery & Therapy (ICDDT 2010)	1-4 Feb 2010	Dubai, UAE
Presentation	Is consent the best way to conduct medical/clinical trials with regard to personal data protection?	Jean-Marc Van Gyseghem	Conférence organized by EAHL (European Association of Health Law)	October 14-16th 2010	Edinburgh, UK
Presentation	Intellectual Property Rights in e-Health: Balancing out the interests at stake? A Herculean task?	Marcelo Corrales	4th International Conference on Legal, Security and Privacy Issues in IT Law (LSPI) and 3rd International Law and Trade Conference (ILTC)	November, 3-5, 2009	Sliema, Malta
Presentation	Law, ethics and security for networked medical data	Tina Krügel	Workshop on European-Japanese Research Collaboration in Medical ICT	September 14-15, 2009	Hokkaido, Japan
Presentation	Vertrauen in einer vernetzten Welt	Nikolaus Forgó	Alpbacher Wirtschaftsgespräche, Europäisches Forum Alpbach	September 2nd, 2009	Alpbach, Austria
Presentation	Einatmen. Ausatmen. Vom Schutz der Intimität im elektrischen Zeitalter	Nikolaus Forgó	Sommerhochschule, Universität Wien	August, 7th, 2009	Strobl, Austria
Presentation	Presentation of ACGT to the scientific advisory board	Nikolaus Forgó	VPH NoE Annual Event 2009	September, 9-11, 2009	Brussels, Belgium
Presentation	Scientific Visualization of (Bio-)medical Image Data	Robert Belleman	Master's course on visualization and virtual reality	16-sept-09	Amsterdam, NL

Presentation	ObTiMA: a new ontology-driven tool for managing multi-site trials	N. Graf, F. Schera, M. Kuwahara	Workshop on European-Japanese Research Collaboration in Medical ICT	September 14-15, 2010	Sapporo, Japan
Presentation	Architecture of the Trial Outline Builder	Y. Tanaka	Workshop on European-Japanese Research Collaboration in Medical ICT	September 14-15, 2010	Sapporo, Japan
Presentation	Multi-scale modelling and the ACGT OncoSimulator	G. Stamatakos, A. Lunzer	Workshop on European-Japanese Research Collaboration in Medical ICT	September 14-15, 2010	Sapporo, Japan

Material	Title	Authors	Event	Date	Venue
Demonstration	Ontology-based Clinical Trial Management System (ObTiMA) Software	Brochhausen M., Weiler G., Schera F., Rauch J., Graf N., Kiefer S.	Workshop on European-Japanese Research Collaboration in Medical ICT	September 14th - 15th 2009	Hokkaido University, Japan
Demonstration	Ontology-based Clinical Trial Management System (ObTiMA) Software	Brochhausen M., Weiler G., Schera F., Rauch J., Graf N., Kiefer S.	Meeting with the External Advisory Board	November 2nd–4th 2009	
Demonstration	Interactive Visualization of Complex Networks	R.G.Belleman, R.J. Strijkers	InTouch Meeting	38569	Amsterdam, NL
Demonstration	Visualization Services in the ACGT project	R.G.Belleman	Master's course on visualization and virtual reality	38636	Amsterdam, NL
Demonstration	Interactive Visualization of Complex Networks	R.G.Belleman	DynaNets meeting	38702	Amsterdam, NL

Demonstration	Literature Mining for AE prediction	A Persidis, S. Defteraios	Care Capital	24-sept-09	Princeton, USA
Demonstration	Literature Mining for AE prediction	A Persidis, K. Alevizopoulos	DebioPharm	30-nov-09	Lausanne, CH

Material	**Title**	**Authors**	**Editor**	**Date**
International Book	Multiscale Cancer Modeling	T. S. Deisboeck and G. S. Stamatakos Eds	Chapman & Hall/*CRC*	To be published September 14th 2010

Material	**Title**	**Authors**	**Where**	**Date**
Interview	Software para terapias	UMA	Saber (university newspaper)	published 9th February 2010
Interview	Sello UMA para el tratamiento personalizado del cáncer de mama	UMA	Málaga Hoy (newspaper)	published 25th of February 2010
Interview		UMA	Television programme "Tesis – Canal Sur 2 Andalucía"	

Person Month Status Report: 1 August 2009 - 31 January 2010

		All Partners - Eligible Person-month per Workpackage																								
		TOTALS	1-ERCIM	2-FORTH	3-INRIA	4-UVA	5-PHILIPS	6-JB	7-SIB	8-LUNDU	9-UMA	10-UPM	11-FHG	12-BIOVISTA	13-UOC	14-LUH	15-PSNC	16-CUSTODIX	17-HEALTHGRI	18-ICCS	19-USAAR	20-SIVECO	21-FUNDP	22-UH	23-UOXF-BP	24 (CPF25)-UHOK	25 (CPF 26) -IEO
WP1 - Consortium Management act	Act. WP total:	**8,36**	5,36	1,90								0,30	0,22				0,58										
Project Management	Plan. P total:	**9,31**	7,33	0,67								0,33	0,42				0,56										
WP2 - RTD/Innovation activities	Act. WP total:	**3,56**		0,33		0,50	2,00								0,33					0,07					0,33		
User Needs Analysis and Specificati	Plan. P total:	**4,27**		0,33		0,33	0,67	0,33	0,22			0,33		0,33	0,33					0,07	0,67				0,33		0,33
WP3 - RTD/Innovation activities	Act. WP total:	**5,62**		1,00		0,50	0,80										3,12			0,20							
Architecture and Standards	Plan. P total:	**5,64**		1,00		0,33	0,67					0,33					3,11			0,20							
WP4 - Demonstration activities	Act. WP total:	**0,62**															0,12					0,50					
Biomedical GRID technology Layer	Plan. P total:	**1,12**															0,12					1,00					
WP4 -RTD/Innovation activities	Act. WP total:	**12,11**		0,67	1,00						1,00						9,40			0,04							
Biomedical GRID technology Layer	Plan. P total:	**11,76**		0,67	0,67						1,00		0,33				8,89	0,16		0,04							
WP5 - Demonstration activities	Act. WP total:																										
Distributed Data Access, Tools and /	Plan. P total:																										
WP5 - RTD/Innovation activities	Act. WP total:	**30,57**		2,00			8,50	1,00		1,67		1,00	2,00		4,00					0,23	9,50				0,67		
Distributed Data Access, Tools and /	Plan. P total:	**20,24**		2,00	1,00		7,33	0,67		1,67		2,00	1,67	0,33	0,67					0,23	2,00				0,67		
WP6 - Demonstration activities	Act. WP total:	**0,33**											0,33														
Knowledge Management and Discov	Plan. P total:																										
WP6 - RTD/Innovation activities	Act. WP total:	**22,23**		2,00		0,20			2,00	3,33	5,00		0,52	7,50											1,68		
Knowledge Management and Discov	Plan. P total:	**23,34**		2,00	1,33	0,67			0,34	3,33	4,33	1,33	2,00	5,67											1,67		0,67
WP7 - Demonstration activities	Act. WP total:																										
Ontologies and Semantic Mediation	Plan. P total:																										
WP7 - RTD/Innovation activities	Act. WP total:	**28,33**		2,00			1,00			1,33	0,66	12,00	0,50	4,50	4,00						2,00				0,34		
Ontologies and Semantic Mediation	Plan. P total:	**21,10**		2,00			1,33		0,11	2,00	0,66	8,00	0,67	3,33	0,67						2,00				0,33		
WP8 - Demonstration activities	Act. WP total:	**1,38**				0,75														0,63							
Technologies and Tools for in-silico (	Plan. P total:	**1,00**				0,67														0,33							
WP8 - RTD/Innovation activities	Act. WP total:	**18,94**			3,50	6,00		0,33					0,11							5,00	4,00						
Technologies and Tools for in-silico (	Plan. P total:	**15,34**			3,66	3,00		0,67					1,67							3,67	0,67						2,00
WP9 - Demonstration activities	Act. WP total:	**3,35**		1,50		0,33								0,33			1,19										
The integrated ACGT Environment	Plan. P total:	**2,96**		1,33		0,33								0,33			0,97										
WP9 - RTD/Innovation activities	Act. WP total:	**14,93**		6,00		1,00	1,00			0,33	2,00	1,00		2,00				1,00		0,60							
The integrated ACGT Environment	Plan. P total:	**16,59**		6,00		1,00	0,67	0,33	0,67	0,33	2,00	1,00	0,66	2,00				1,33		0,60							
WP10 - RTD/Innovation activities	Act. WP total:	**16,30**						0,33							4,00	3,67		0,25			0,20		4,50	3,00	0,35		
Ethical, Legal and QA Issues	Plan. P total:	**15,17**						0,67							2,00	3,67		0,50			0,33		4,00	3,67	0,33		
WP11 - Demonstration activities	Act. WP total:	**0,50**																0,50									
Trust and Security	Plan. P total:	**0,67**																0,67									
WP11- RTD/Innovation activities	Act. WP total:	**2,09**						0,33					0,50				0,51	0,75									
Trust and Security	Plan. P total:	**4,78**						0,33			0,67	0,33	1,33				0,45	1,67									
WP12 - Demonstration activities	Act. WP total:	**0,50**																			0,50						
Clinical Trials	Plan. P total:	**1,33**						0,33						0,33							0,67						
WP12 - RTD/Innovation activities	Act. WP total:	**20,58**		1,00				2,00	1,50						12,00					0,23	0,50				1,35		2,00
Clinical Trials	Plan. P total:	**15,57**		1,00				2,00	1,33					0,33	6,00					0,23	0,67				1,34		2,67
WP13 - RTD/Innovation activities	Act. WP total:	**15,60**		1,00		0,50	1,50	0,33	1,25		0,67	0,60	2,00	1,00				0,57		0,13					1,05		5,00
Evaluation and Validation	Plan. P total:	**10,14**		1,00		0,67	0,67	0,67	1,67		0,67	0,67	0,33	0,67				0,66		0,13	0,33				1,00		1,00
WP14 - Training Activities	Act. WP total:	**13,36**		2,00	0,74								1,62	1,50				1,46	0,67	0,37	1,00	4,00					
Training	Plan. P total:	**9,16**		1,00	1,67					0,33				2,33				0,17	0,67	0,33		2,33	0,33				
WP14 - RTD/Innovation activities	Act. WP total:	**9,99**							0,25		1,00	2,00	0,50		4,00				0,24			2,00					
Training	Plan. P total:	**8,87**	0,33					0,33	1,00		1,00	1,67	0,33		1,33			0,18	1,33	0,04		1,33					
WP15 - RTD/Innovation activities	Act. WP total:	**12,30**	0,26	0,67	0,67	1,00	1,00		0,50	0,34	0,33		0,08	0,10	0,67			0,25	5,39	0,06			0,20	0,50	0,28		
Dissemination	Plan. P total:	**11,70**	0,66	0,67	0,67	0,33		0,33	0,33	0,33	0,33	1,33		1,00	0,67			0,33	2,00	0,06	0,33	0,67	0,33	1,00	0,33		
WP16 - RTD/Innovation activities	Act. WP total:	**5,78**							0,50					3,00	1,00	0,33		0,25		0,40	0,30						
Market Investigation and Exploitation	Plan. P total:	**9,05**	0,33	1,33			0,67	0,33	0,33					3,00	0,33	0,33		0,33	0,67	0,40	0,33	0,67					
	Actual total	**247,33**	**5,62**	**22,07**	**5,91**	**10,78**	**15,80**	**4,32**	**6,00**	**7,00**	**10,66**	**16,90**	**8,38**	**19,93**	**30,00**	**4,00**	**14,92**	**5,03**	**6,30**	**7,96**	**18,00**	**6,50**	**4,70**	**3,50**	**6,05**		**7,00**
Total PM	**Planned total**	**219,11**	**8,65**	**21,00**	**9,00**	**7,33**	**12,01**	**6,99**	**6,00**	**7,99**	**10,66**	**17,32**	**9,41**	**19,65**	**12,00**	**4,00**	**14,10**	**6,00**	**4,67**	**6,33**	**8,00**	**6,00**	**4,66**	**4,67**	**6,00**		**6,67**

		AC Partners - Own Staff																									
		TOTALS	1-ERCIM	2-FORTH	3-INRIA	4-UVA	5-PHILIPS	6-IJB	7-SIB	8-LUNDU	9-UMA	10-UPM	11-FHG	12-BIOVISTA	13-UOC	14-LUH	15-PSNC	16-CUSTODIX	17-HEALTHGRID	18-ICCS	19-USAAR	20-SIVECO	21-FUNDP	22-UH	23-UOXF.BP	24 (CPF25)-UHOK	25 (CPF 26) -IEO
WP1 - Consortium Management act	Act. WP total:	0,63															0,63										
Project Management	Plan. P total:																										
WP2 - RTD/Innovation activities	Act. WP total:	3,08				0,50															0,50				0,08		2,00
User Needs Analysis and Specificati	Plan. P total:																										
WP3 - RTD/Innovation activities	Act. WP total:	5,00															5,00										
Architecture and Standards	Plan. P total:																										
WP4 - Demonstration activities	Act. WP total:	0,20															0,20										
Biomedical GRID technology Layer	Plan. P total:																										
WP4 -RTD/Innovation activities	Act. WP total:	13,00															13,00										
Biomedical GRID technology Layer	Plan. P total:																										
WP5 - Demonstration activities	Act. WP total:																										
Distributed Data Access, Tools and /	Plan. P total:																										
WP5 - RTD/Innovation activities	Act. WP total:	8,91																			0,50				0,08	8,33	
Distributed Data Access, Tools and /	Plan. P total:	5,00																								5,00	
WP6 - Demonstration activities	Act. WP total:																										
Knowledge Management and Discov	Plan. P total:																										
WP6 - RTD/Innovation activities	Act. WP total:	1,83				0,50					1,00															0,33	
Knowledge Management and Discov	Plan. P total:	0,67																								0,67	
WP7 - Demonstration activities	Act. WP total:																										
Ontologies and Semantic Mediation '	Plan. P total:																										
WP7 - RTD/Innovation activities	Act. WP total:	0,08																							0,08		
Ontologies and Semantic Mediation '	Plan. P total:																										
WP8 - Demonstration activities	Act. WP total:																										
Technologies and Tools for in-silico (	Plan. P total:																										
WP8 - RTD/Innovation activities	Act. WP total:	7,84				2,00														1,50						1,34	3,00
Technologies and Tools for in-silico (	Plan. P total:	0,67																								0,67	
WP9 - Demonstration activities	Act. WP total:	1,50															1,50										
The integrated ACGT Environment	Plan. P total:																										
WP9 - RTD/Innovation activities	Act. WP total:																										
The integrated ACGT Environment	Plan. P total:																										
WP10 - RTD/Innovation activities	Act. WP total:	1,53														0,25							0,20	1,00	0,08		
Ethical, Legal and QA Issues	Plan. P total:																										
WP11 - Demonstration activities	Act. WP total:																										
Trust and Security	Plan. P total:																										
WP11- RTD/Innovation activities	Act. WP total:	0,80															0,80										
Trust and Security	Plan. P total:																										
WP12 - Demonstration activities	Act. WP total:	0,50																			0,50						
Clinical Trials	Plan. P total:																										
WP12 - RTD/Innovation activities	Act. WP total:	2,30																			0,50				0,80		1,00
Clinical Trials	Plan. P total:																										
WP13 - RTD/Innovation activities	Act. WP total:	5,42																			0,20				0,22		5,00
Evaluation and Validation	Plan. P total:																										
WP14 - Training Activities	Act. WP total:																										
Training	Plan. P total:																										
WP14 - RTD/Innovation activities	Act. WP total:																										
Training	Plan. P total:																										
WP15 - RTD/Innovation activities	Act. WP total:	1,50																						0,50		1,00	
Dissemination	Plan. P total:	0,67																								0,67	
WP16 - RTD/Innovation activities	Act. WP total:	0,58														0,25										0,33	
Market Investigation and Exploitation	Plan. P total:	0,33																								0,33	
	Actual total	54,70				3,00					1,00					0,50	21,13			1,50	2,20		0,20	1,50	1,34	11,33	11,00
Total PM	Planned total	7,34																								7,34	

	Actual total	302,03	5,62	22,07	5,91	13,78	15,80	4,32	6,00	7,00	11,66	16,90	8,38	19,93	30,00	4,50	36,05	5,03	6,30	9,46	20,20	6,50	4,90	5,00	7,39	11,33	18,00
Total PM	Planned total	226,45	8,65	21,00	9,00	7,33	12,01	6,99	6,00	7,99	10,66	17,32	9,41	19,65	12,00	4,00	14,10	6,00	4,67	6,33	8,00	6,00	4,66	4,67	6,00	7,34	6,67