

# INFOBIOMED Training Challenge: una novedosa iniciativa de formación multidisciplinaria impulsada por la Red de Excelencia INFOBIOMED

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La Red de Excelencia INFOBIOMED ([www.infobiomed.net](http://www.infobiomed.net)), financiada por la Comisión Europea, pretende estructurar la Informática Biomédica promoviendo su consolidación como disciplina científica integradora, situada en la confluencia de la bioinformática y la informática médica, que ofrece excelentes oportunidades para el progreso de la medicina personalizada.

El avance de las disciplinas que forman la informática biomédica (bioinformática, informática médica y campos afines) se ha venido desarrollando de forma independiente. Frente a ello, la informática biomédica pretende explotar las sinergias entre estas disciplinas, integrando la información biológica generada por la bioinformática y la informática médica de manera que se facilite la traslación de los resultados de la investigación biológica en información clínica. La Red de Excelencia INFOBIOMED está integrada por 16 organizaciones europeas de máximo prestigio que durante 3,5 años unen sus esfuerzos en la consecución de los objetivos mencionados.

En el plan de actividades de INFOBIOMED, las iniciativas de formación ocupan un lugar destacado, puesto que son de importancia capital para contribuir a la formación de la capacidad investigadora necesaria para el afianzamiento de la informática biomédica como disciplina crucial en el ámbito de la salud. Entre éstas, destaca por su enfoque novedoso el INFOBIOMED Training Challenge, que presentamos a continuación.

Esta innovadora experiencia formativa consiste en reunir a diez jóvenes científicos, de nacionalidades diversas, provenientes de instituciones diferentes y con formaciones distintas (biólogos, químicos, médicos, informáticos, etc.), para que trabajen jun-

tos, durante cinco días, en la resolución de un determinado caso práctico relacionado con la salud.

Los objetivos de esta iniciativa son participar en un entorno formativo basado en la investigación multidisciplinaria, así como aprender las dificultades de cruzar las barreras relacionadas con el lenguaje propio de cada disciplina científica en el contexto de un problema específico de investigación. Además, con este encuentro se busca conocer los contenidos de otras disciplinas y su particular enfoque de un mismo problema, y utilizar la propia habilidad para avanzar en el conocimiento científico en el área que concierne al caso práctico.

El último día, cada grupo es evaluado por un jurado internacional, que realiza un análisis de los puntos fuertes y débiles de los planes de trabajo presentados por cada uno de los equipos. Se trata de conseguir una mejor integración de las distintas disciplinas que forman la informática biomédica. Los miembros del equipo que desarrolla un enfoque más integrador y de mejor calidad reciben una beca de intercambio consistente en una estancia científica en una de las organizaciones que forman parte de la Red de Excelencia INFOBIOMED ([www.infobiomed.net](http://www.infobiomed.net)).

Con este curso se intenta aproximar lenguajes y estrategias de trabajo hacia un objetivo común: la consolidación, a medio plazo, de la informática biomédica, base para el avance de la medicina personalizada.

En su primera edición, el INFOBIOMED Training Challenge fue premiado por Diario Médico como "Mejor idea del año 2005". Además, gracias a esta iniciativa, la eHealth Unit escogió el Proyecto INFOBIOMED como el mejor proyecto del mes de febrero de 2006.

# INFOBIOMED training challenge: A novel multidisciplinary training initiative fostered by the INFOBIOMED Network of Excellence

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The INFOBIOMED Network of Excellence ([www.infobiomed.net](http://www.infobiomed.net)), funded by the European Commission, aims to structure biomedical informatics on a European level by promoting its consolidation as an integrative scientific discipline centered on the intersection between bioinformatics and medical informatics, and by offering excellent opportunities for the advancement of personalized medicine.

The advance of the disciplines that constitute Biomedical Informatics (Bioinformatics, Medical Informatics and allied fields) has been taking place on an independent basis. To counter this, Biomedical Informatics intends to make use of the synergies between these disciplines by integrating the biological information generated by bioinformatics and medical informatics and thus help facilitate the translation of biological research results into clinical information. The INFOBIOMED Network of Excellence includes 16 acknowledged European organizations which, over the past 3.5 years, have been uniting efforts to achieve these goals.

Training initiatives hold a prominent place in the INFOBIOMED plan of activities. Indeed, these initiatives are of capital importance for training the investigation skills required to consolidate biomedical informatics as a crucial discipline in the healthcare environment. Among these initiatives, the INFOBIOMED Training Challenge has a novel approach, and is presented below.

This novel training experience consists in gathering together 10 young scientists of different nationalities, different institutions and different professions (biologists, chemists, doctors, informaticians,

etc.) and have them work together for 5 days on the resolution of a healthcare-related practical case.

The objectives of this initiative are to enable these scientists to participate in a multidisciplinary research-based training environment, as well as to become aware of the difficulties involved in crossing the language barriers derived from the specific language of each scientific discipline in the context of a particular research problem. This meeting also makes it possible to look into the content of other disciplines and their particular view of the same problem, as well as to use one's own skills to advance scientific knowledge in the area concerning that particular practical case.

On the last day, each group is evaluated by an international jury that analyzes the strong and weak points of the work plans submitted by each team. The aim is to achieve a better integration of the different disciplines that form biomedical informatics. The members of the team developing the most integrative, best-quality approach are granted an exchange fellowship consisting of a scientific stay at one of the organizations included in the INFOBIOMED Network of Excellence ([www.infobiomed.net](http://www.infobiomed.net)).

This course aims to bring languages and work strategies together for a common goal: the mid-term consolidation of biomedical informatics, a base for the advancement of personalized medicine.

In its first edition, the First INFOBIOMED Training Challenge was awarded the "Best idea of the year 2005" prize by *Diario Médico*. Also thanks to this initiative, the eHealth Unit chose the INFOBIOMED Project as the best project of February 2006.

## Diapositivas / Slides

### INFOBIOMED NETWORK OF EXCELLENCE



#### INFOBIOMED: Structuring European Biomedical Informatics (BMI) to Support Individualised Healthcare

- 36 months. Official start date 1-Jan-04.
- 16 institutions.
- Main objective: "Set a durable structure for BMI at the European level that supports its consolidation as an integrative scientific discipline that exploits the synergies between BI and MI" (BI and MI have been separate disciplines up to now).
- Specific objectives can be broadly divided in 2 groups:
  - **"Community"**: education, training, mobility, spreading knowledge, creating a self-sustainable structure.
  - **"Scientific"**: progress in data interoperability, interfacing of methods, technologies and tools, pilot applications.

6<sup>th</sup> June 2006, Santiago de Compostela

### INTEGRATIVE BMI CURRICULUM



#### STUDY OF THE AMERICAN COLLEGE OF MEDICAL INFORMATICS AND SCIENTIFIC ADVISORY BOARD RECOMMENDATIONS

- **Integrating** of experiences in the **computational sciences** and **application domains** rather than just concatenating them.
- **Diversity among trainees**, with individualized, interdisciplinary cross-training allowing each trainee to develop key competencies that he or she does not initially possess
- Direct immersion in **research and development activities**.
- Exposure across the wide range of basic informational and computational sciences.
- Training efforts in BMI addressed to:
  - Attract people as **early** in their academic careers as possible.
  - Design **collaborative efforts** for medical doctors, medical informaticians, biologists and bioinformaticians.

6<sup>th</sup> June 2006, Santiago de Compostela

## INFOBIOMED TRAINING CHALLENGE



- **Objective:** to promote the exchange of views and dialogue between disciplines, which is key for the future development of Biomedical Informatics, in the context of a specific research problem, to help focus the effort towards a tangible target.
- **Innovative format:** 2 groups of 5 students with different backgrounds work in a case study that can benefit from an integrative approach for one week.
- 2 editions of the ITC have been celebrated:
  - *1<sup>st</sup> edition:* 12-16 September in Viladrau and Barcelona.
  - *2<sup>nd</sup> edition:* 29 May – 2 June in Les Avellanes and Barcelona.
- A *3<sup>rd</sup> edition* is planned for October 2006 in Edinburgh.

6<sup>th</sup> June 2006, Santiago de Compostela

## INFOBIOMED TRAINING CHALLENGE



- **Pharmainformatics** was the subject of the first and second editions.
- **Multidisciplinary teams:** biologists, immunologists, computer engineers, mathematical modellers, epidemiologists, pharmacists, bioinformaticians, medical doctors, etc.
- **Multidisciplinary case studies** submitted by the students
- **Competition between teams:** winning team was to be awarded a mobility grant for each member to one of the INFOBIOMED partner organisations.
- **3 Tutors** guided the teams, experts were available for advice.
- Besides working in a specific case study the participants learnt to work in a multidisciplinary team, each one contributing with their own expertise and taking advantage of the other participants knowledge.

6<sup>th</sup> June 2006, Santiago de Compostela



**FIRST EDITION OF THE ITC**

- 2 international teams of 5 students.
- 7 different nationalities
- Gender balance: 4 men, 6 women
- Average age: 27,9 years old
- Average experience in research: 3,5 years
- 2 Case Studies:
  - 1- The modeling of genetic regulatory networks in cancer
  - 2- Targeting EGFR signal transduction pathway by anticancer drugs.

6<sup>th</sup> June 2006, Santiago de Compostela**INFOBIOMED TRAINING CHALLENGE**

- Work in teams for 4 days in Viladrau, guided by 3 tutors.




- Final presentation session in Barcelona in front of an international jury.



- The prize was awarded ex-aequo to both teams.

6<sup>th</sup> June 2006, Santiago de Compostela

INFOBIOMED TRAINING CHALLENGE



### SATISFACTION SURVEY

The participants scored high most of the aspects of the Training Challenge.

- Overall satisfaction with the Training Challenge (1-5 scale): 4,50
- Would recommend the ITC to colleagues: 100%
- Usefulness compared with "traditional" training events. More useful: 100%

The Best

- Integration with people from different backgrounds. Discovering new areas of science.
- Collaborative team work.
- Learn new skills, new ideas.
- The possibility to ask anything you want.
- The location.

The Worst

- Stress because of the competition.


What should change

- Drop the competition. Put less stress on the competitive part.
- More internet connections.
- More focused case studies.



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6<sup>th</sup> June 2006, Santiago de Compostela

SECOND EDITION OF THE ITC



- 2 international teams of 5 students.
- 2 Case Studies:
  - 1- Modelling of lipid genetic and metabolic pathways in response to infection and immune stimulation.
  - 2- Commonalties of, and differences between hormonal pathways in breast, endometrium, and prostate cancer.
- The First team won the ITC. 2 members of the second team were also awarded.

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6<sup>th</sup> June 2006, Santiago de Compostela

## EVALUATION CRITERIA



### **Team work**

- Degree of integration of disciplines
- Degree of collaboration between team members
- Degree of balance between disciplines

### **Scientific soundness**

- Will patients benefit from the proposed approach?
- Mechanistic understanding, genetic variation
- Therapeutic intervention:
  - possibilities for existing therapies
  - possibilities for new drug classes.

### **Project plan**

- Degree of consistency of the future research plan proposed
- Argue necessity of participants mobility

### **Quality of the presentation**

- Does the presentation reflect a team work?
- Does the next aspects emerge from their team work?

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6<sup>th</sup> June 2006, Santiago de Compostela