



ΠΑΝΕΠΙΣΤΗΜΙΟ  
ΠΑΤΡΩΝ  
UNIVERSITY OF PATRAS



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# E-learning experiences from an engineering school: Training in Biotechnology

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HW & SW Embedded Systems, CPS, IoT  
eHealth, Smart Farming, Smart Cities

Presentation of our experience in:

- KA2: Cooperation for innovation and the exchange of good practices - Sector Skills Alliances / Human Health and Social Work Activities
- «Digital Skills on Computational Biology for Health Professionals - BioS»
- 1/1/2018 – 31/12/2020

# Project aim

Erbil, Duhok, April 2019

**BioS produces an open access e-learning course in computational biology & bioinformatics according to the rules of European Digital harmonization.**

**To cover an unmet need of European Medical and Health Professionals communities.**

**The extension and empowering of such expertise is required in Europe and worldwide.**



# BIOINFORMATICS AND COMPUTATIONAL BIOLOGY BACKGROUND

- **Bioinformatics links biological data with techniques for information storage, distribution, and analysis** to support multiple areas of scientific research, including biomedicine.
- It is fed by **high-throughput data-generating experiments**, including genomic sequence determinations and measurements of gene expression patterns
- Databases **curate and annotate** the data and then distribute them via the World Wide Web. Mining these data leads to scientific discoveries and to the identification of new clinical applications.
- **Computational Biology** which includes many aspects of bioinformatics, is the science of **using biological data to develop algorithms or models to understand** biological systems and relationships.



# GOALS

- Develop a tool for **widening knowledge and skills** among European Health Professionals
- **Diffuse** information among Stakeholders and potentials users
- **Provide** clear, realistic, verifiable and sustainable answers to questions coming from stakeholders and potential users
- **Support** the answers explicitly by a course

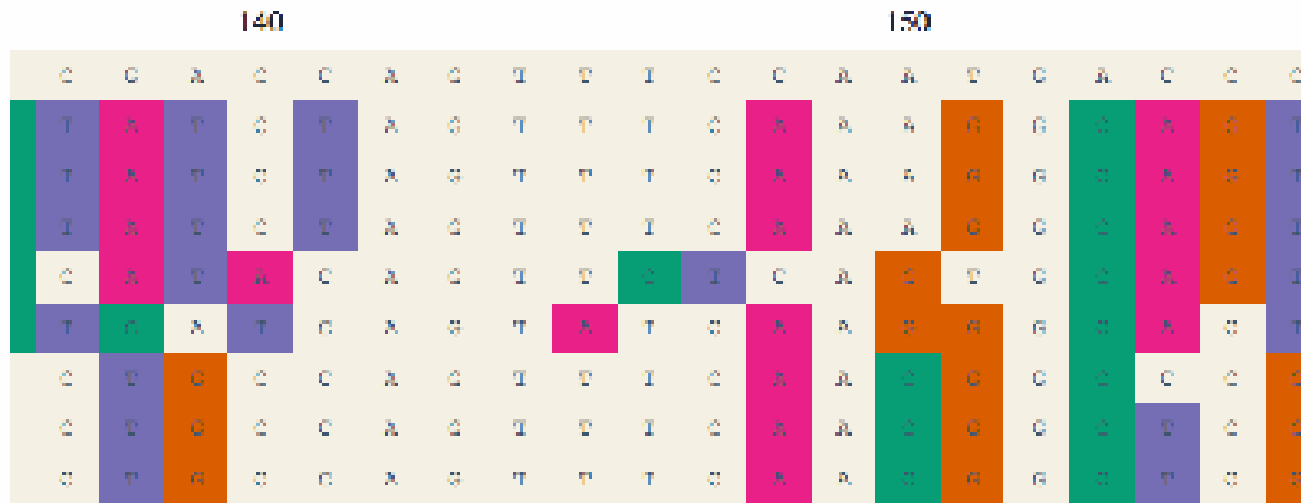


# ADVANTAGES

- Shortage of health professionals with this specific expertise
- Improvement of health care by this approach
- New career opportunities
- Insufficient bioinformatics courses and curricula are currently available



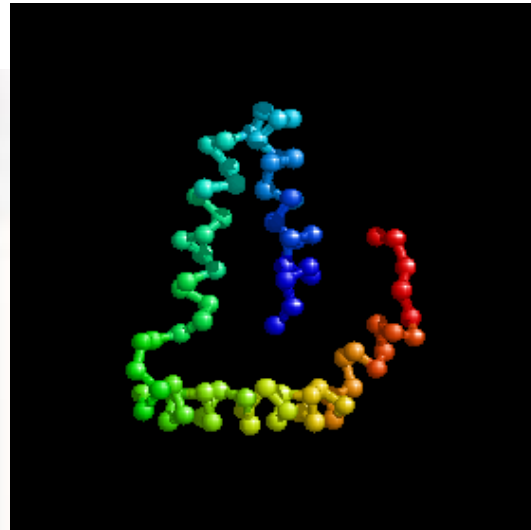
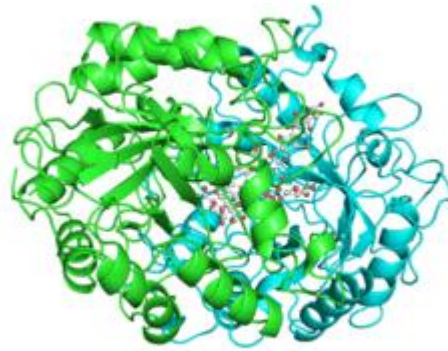
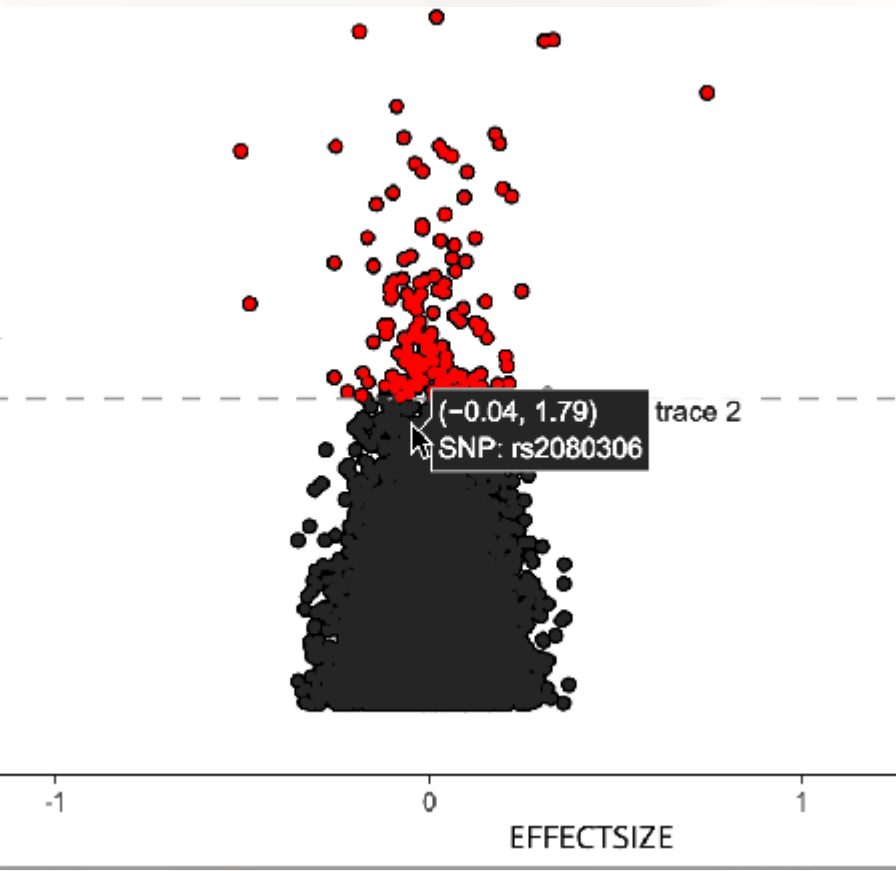
# We are facing a new medicine



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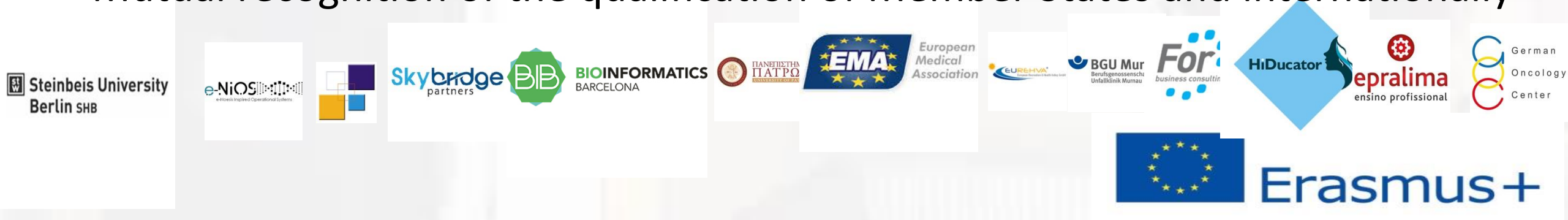
# Easier diagnosis by the use of computational biology



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# OUTCOME

- A comprehensive e-learning MOOC course
- Open source
- Authorship, developers and producers of learning content and objects are credited of high degree of accuracy, completeness, up-to-dateness and reliability.
- Feature of blended learning – tutoring and mentoring -
- Multi-language as much as possible, but mainly in English
- Mutual recognition of the qualification of Member States and internationally



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# CONSORTIUM EXPERTISE

- Within the Consortium, previous experience in these advanced fields of vocational scientific education, i.e. in e-learning and bioinformatics, is present.
- This action and methods are aimed to overcome barriers in education and practice: these are due to several factors, which caused unsatisfactory achievements of knowledge and skills in other contexts worldwide.



# STAKEHOLDERS

Several relevant stakeholders are already targeted

- Deans of the European Schools of Medicine and Allied Health Professions
- Current and former Parliaments Members
- Public and private managers of health facilities
- Health-related associations and organizations.

 Steinbeis University  
Berlin SHB

 e-NiOS  
e-NiOS Inspired Operational Systems



Skybridge  
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European  
Medical  
Association



BGU Mur  
Berufsgenossenschaft  
Unfallklinik Murnau



 epralima  
ensino profissional

 German  
Oncology  
Center



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# STAKEHOLDERS

- **AMSE (Association of Medical Schools in Europe) promotes and develops the co-operation between Medical Schools in Europe, it also enhances and ensures the quality of their activities.**
- **The BioS Project, developed as a key Erasmus Plus intervention, will increase quality of curricula and competitiveness of the School of Medicines that will be ready for accepting within their curricula the free e-learning course on bioinformatics.**



# CHALLENGES

- **Limited awareness of the appropriateness of including bioinformatics and computational biology** knowledge and training in medical doctors and health professionals curricula.
- Explicit interventions to scientific and health literacy regarding **bioinformatics and computational biology** are needed (i.e., social media)
- **THE CONTRIBUTION AND THE ENDORSEMENT OF THE DEANS OF THE EUROPEAN SCHOOL OF MEDICINE IS WARRANTED**



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European  
Medical  
Association



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# Flow chart – dissemination

Knowledge and skills in Computational Biology-informatics. Which shortage and which evidence of increased quality of health care by its practical application



Teaching-training Needs in Europe



E-learning courses already available  
evidence of effective teaching, which enhancement of professional attractiveness of the end-users

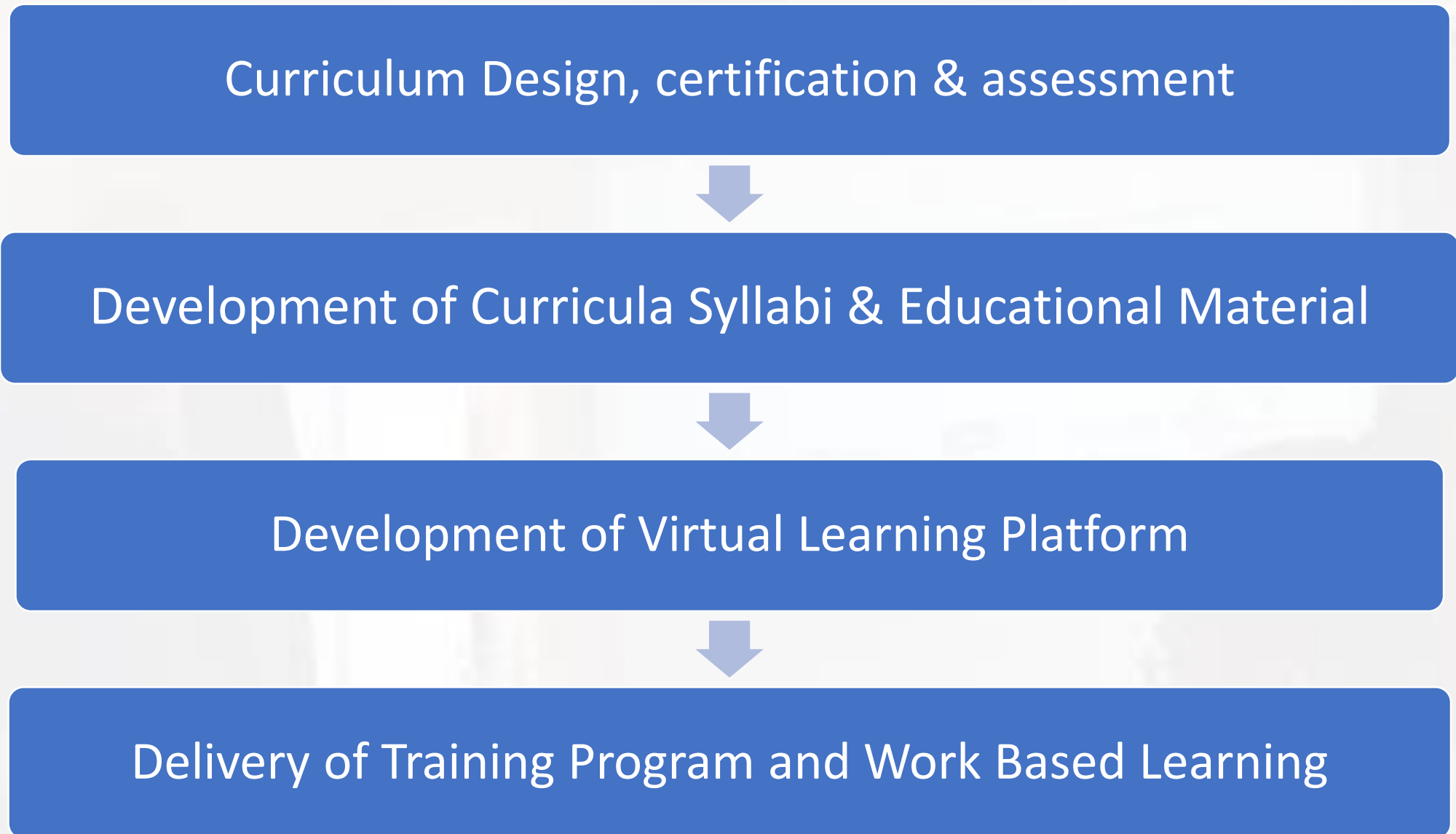


Sustainable strategy of dissemination: media, social networks, scientific venues.



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# Flow chart – overview of the project -





## Development of Curricula Syllabi & Educational Material

Module 1: Introduction to Bioinformatics

Module 2: Computational Statistics for clinical doctors

Module 3: Commercial personalized genomics services in patient care

Module 4: Quality Improvement in Healthcare



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## Development of Virtual Learning Platform

- Use ICT and OPENedX
- BioS VLE will create an accessible Vocational Open Online Course (VOOC) that will contain the training and assessment material and a “practice area”, where trainees will be able to access real working-life multimedia cases (case-based learning) and real working-life video for trainees to gain hands-on experience through work-based learning

## BioS VOOC, in accordance with ECVET/EQF/EQAVET

**ECVET: European Credit System for Vocational Education and Training**

**EQAVET: European Quality Assurance in Vocational Education and Training**

**EQF: European Qualifications Framework**



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# DISSEMINATION ACTIONS

- Medical Schools, health service and health care organisations, and relevant national and international authorities
- Professions allied to medicine and their links with Medical Schools
- Medical Schools in post-graduate and continuing professional development
- Medical Schools in research and research training

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# GLAD TO BE HERE!!!



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