# GOBLET

## Working towards FAIR bioinformatics training

*Celia van Gelder*
*DTL/ELIXIR-NL, BioSB, GOBLET*

NETTAB Conference, October 26 2016, Rome

# What is a standard?

- **In essence, a standard is an agreed way of doing something**

**Technical:** A standard provides the requirements, specifications, guidelines or characteristics that can be used for the description, interoperability, citation, sharing, publication, or preservation of all kinds of digital objects such as data, code, algorithms, workflows, software, or papers (Definition of BioSharing)

**Broader:** It could be about making a product, managing a process, delivering a service or supplying materials – standards can cover a huge range of activities undertaken by organizations and used by their customers.

- **Standards are the distilled wisdom and knowledge of people with expertise in their subject matter and who know the needs of the organizations they represent**

http://www.bsigroup.com/en-GB/standards/Information-about-standards/what-is-a-standard/

# GOBLET: Global Organisation for Bioinformatics Learning, Education & Training

- Established in 2012

- GOBLET members share interests in bioinformatics Education & Training, have similar missions and similar challenges

- Galvanised a group of scientists to address the problems on an international scale
  - to share, not duplicate effort
  - to share, not duplicate cost
    - to work together towards common solutions & a sustainable future

# GOBLET Mission

- **provide** a sustainable support structure for trainers/trainees
- **facilitate** bioinformatics capacity development in all countries
- **develop** standards & guidelines for bioinformatics E&T
- **act** as a hub for fund gathering
- **reach out** to high-school teachers & next-generation bioinformaticians
- **foster** the international community of bioinformatics trainers


**www.mygoblet.org**

# GOBLET: Who is in it?

- ~40 societies, networks, institutes/organisations, research groups, SMEs.
- Plus individual members (incl. students)

ASBCB · Computational Genomics Analysis and Training · EMBnet · CPGR · itico · HSCBB · ISB International Society for Biocuration · Bits Bioinformatics ITalian Society · Wellcome Genome Campus Advanced Courses and Scientific Conferences · SGBC · H3ABioNet · CSC · APBioNet · SEB Society for Experimental Biology · SIB Swiss Institute of Bioinformatics · University of Cambridge · TGAC The Genome Analysis Centre™ · Fundação Calouste Gulbenkian Instituto Gulbenkian de Ciência · bioinformatics.ca · BioSB research school · The Sainsbury Laboratory · vlsci Life Sciences Computation · ISCB International Society for Computational Biology · SolBio · Galaxy Training Network · Radboudumc · EMBL-EBI · SANBI

# GOBLET Governance

- Executive Board
- Operational Board: Exec Board + All Committee chairs

- Committees:
  - Learning, Education & Training Committee
  - Outreach & PR Committee
  - Standards Committee
  - Fund-Raising Committee
  - Technical Committee

# Activities & accomplishments (1)

- Website, training portal, newsletter
- Collaborative papers
- Presence at ISMB and ECCB:
  - Education Workshops,
  - Training Poster Track at ISMB & ECCB
  - Conference booth
- Computational Biology Education (CoBE) COSI
  - established in 2014
  - With ISCB Education Committee
  - A.o. work on defining competences
- Community surveys on training needs (paper in preparation)

ISCB
INTERNATIONAL SOCIETY FOR COMPUTATIONAL BIOLOGY
COMMUNITY OF SPECIAL INTEREST

# Activities & accomplishments (2)

- Defining minimal descriptors for training materials and events
- ELIXIR-GOBLET collaboration strategy
- Collaborating with CODATA-RDA , ELIXIR and H3ABioNet to launch bioinformatics ‘flavoured’ data science summer schools
- Applied for funding in several project proposals
  - e.g. CHARME, ICTP (with CODATA-RDA), OBTAIN, BD2K/NIH, several ITNs

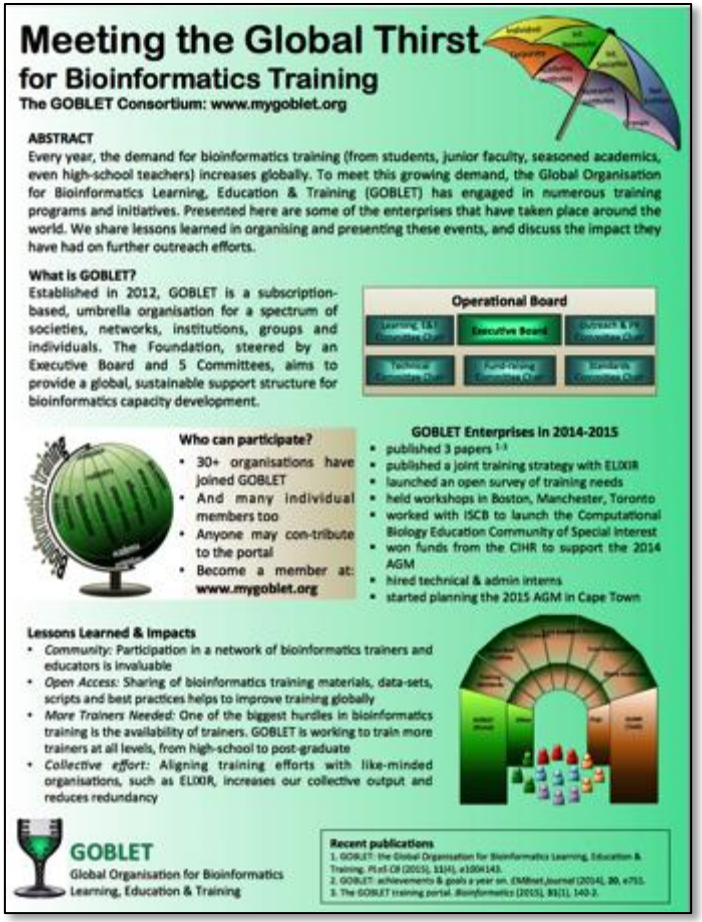
# GOBLET & Standards

**By sharing best practices and putting these into practical solutions, standards are in fact implicit in many of the GOBLET activities!!**

- GOBLET brings together the global bioinformatics training community with all its expertise and from that can distill the best practices to help other trainers all over the world
- GOBLET wants to set the standard for good quality training materials, that are well-described and can be found and (re-) used by all
- GOBLET joins forces with all players in the field, to together work towards good, sustainable solutions for training

# GOBLET & Standards: Collaborative publications

## Conference posters



Meeting the Global Thirst for Bioinformatics Training

The GOBLET Consortium: www.mygoblet.org

ABSTRACT

Every year, the demand for bioinformatics training (from students, junior faculty, seasoned academics, even high-school teachers) increases globally. To meet this growing demand, the Global Organisation for Bioinformatics Learning, Education & Training (GOBLET) has engaged in numerous training programs and initiatives. Presented here are some of the enterprises that have taken place around the world. We share lessons learned in organising and presenting these events, and discuss the impact they have had on further outreach efforts.

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GOBLET Enterprises in 2014-2015

- published 3 papers [1-3]
- published a joint training strategy with ELIXIR
- launched an open survey of training needs
- held workshops in Boston, Manchester, Toronto
- worked with ISCB to launch the Computational Biology Education Community of Special Interest
- won funds from the CIHR to support the 2014 AGM
- hired technical & admin interns
- started planning the 2015 AGM in Cape Town

Lessons Learned & Impacts

- *Community:* Participation in a network of bioinformatics trainers and educators is invaluable
- *Open Access:* Sharing of bioinformatics training materials, data-sets, scripts and best practices helps to improve training globally
- *More Trainers Needed:* One of the biggest hurdles in bioinformatics training is the availability of trainers. GOBLET is working to train more trainers at all levels, from high-school to post-graduate
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Global Organisation for Bioinformatics Learning, Education & Training

Recent publications

1. GOBLET: the Global Organisation for Bioinformatics Learning, Education & Training. PLoS Cb (2015), 11(4), e1004143.
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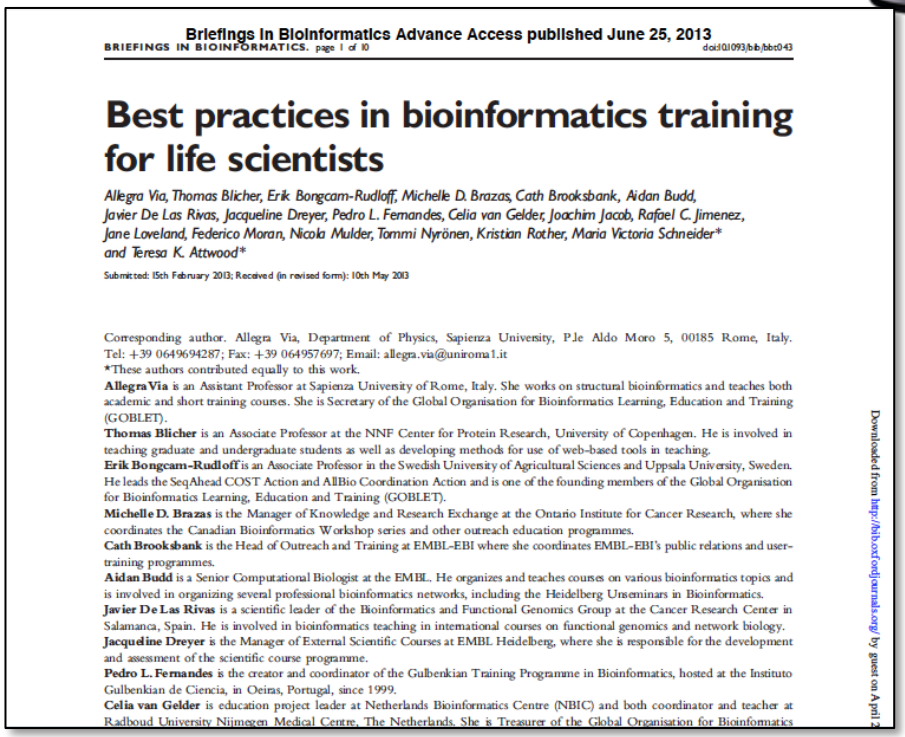
3. The GOBLET training portal. Bioinformatics (2015), 31(1), 140-2.

## Journal Publications



Briefings in Bioinformatics Advance Access published June 25, 2013

BRIEFINGS IN BIOINFORMATICS. page 1 of 10 doi:10.1093/bib/bbt043

# Best practices in bioinformatics training for life scientists

*Allegra Via, Thomas Blicher, Erik Bongcam-Rudloff, Michelle D. Brazas, Cath Brooksbank, Aidan Budd, Javier De Las Rivas, Jacqueline Dreyer, Pedro L. Fernandes, Celia van Gelder, Joachim Jacob, Rafael C. Jimenez, Jane Loveland, Federico Moran, Nicola Mulder, Tommi Nyrönen, Kristian Rother, Maria Victoria Schneider* and Teresa K. Attwood**

Submitted: 15th February 2013; Received (in revised form): 10th May 2013

Corresponding author. Allegra Via, Department of Physics, Sapienza University, P.le Aldo Moro 5, 00185 Rome, Italy. Tel: +39 0649694287; Fax: +39 064957697; Email: allegra.via@uniroma1.it

*These authors contributed equally to this work.

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# GOBLET & Standards: Collaborative publications

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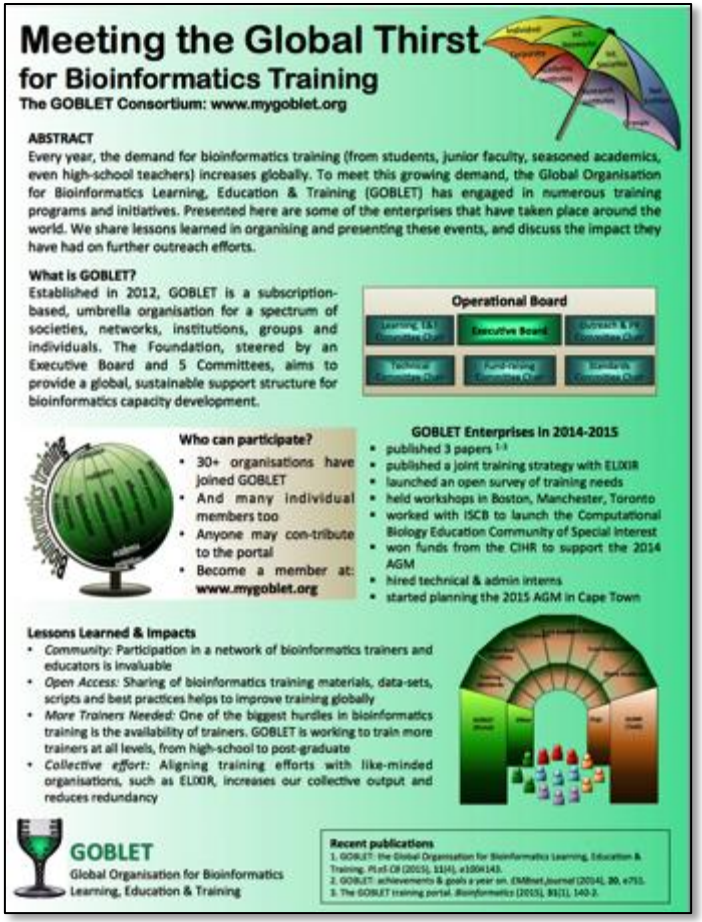

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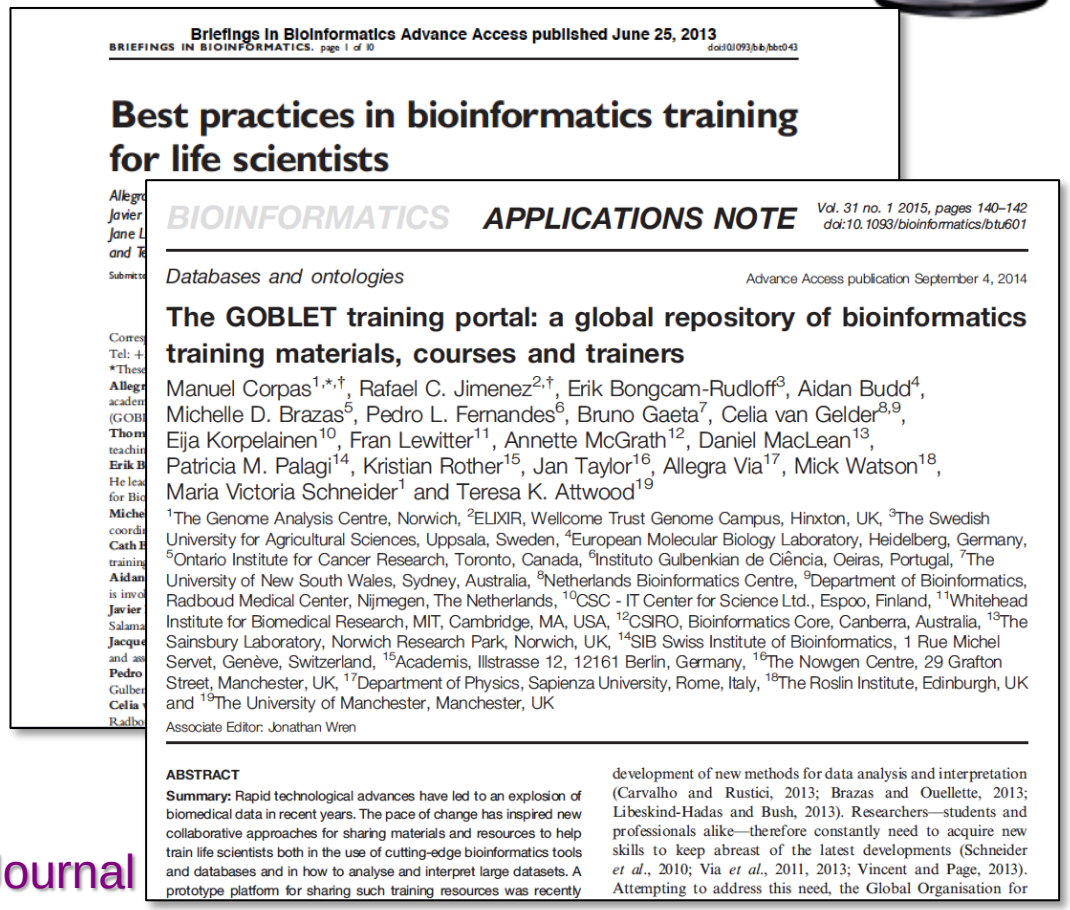

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Best practices in bioinformatics training for life scientists

BIOINFORMATICS APPLICATIONS NOTE Vol. 31 no. 1 2015, pages 140–142 doi:10.1093/bioinformatics/btu601

Databases and ontologies

Advance Access publication September 4, 2014

The GOBLET training portal: a global repository of bioinformatics training materials, courses and trainers

Manuel Corpas[1,*,†], Rafael C. Jimenez[2,†], Erik Bongcam-Rudloff[3], Aidan Budd[4], Michelle D. Brazas[5], Pedro L. Fernandes[6], Bruno Gaeta[7], Celia van Gelder[8,9], Eija Korpelainen[10], Fran Lewitter[11], Annette McGrath[12], Daniel MacLean[13], Patricia M. Palagi[14], Kristian Rother[15], Jan Taylor[16], Allegra Via[17], Mick Watson[18], Maria Victoria Schneider[1] and Teresa K. Attwood[19]

[1]The Genome Analysis Centre, Norwich, [2]ELIXIR, Wellcome Trust Genome Campus, Hinxton, UK, [3]The Swedish University for Agricultural Sciences, Uppsala, Sweden, [4]European Molecular Biology Laboratory, Heidelberg, Germany, [5]Ontario Institute for Cancer Research, Toronto, Canada, [6]Instituto Gulbenkian de Ciência, Oeiras, Portugal, [7]The University of New South Wales, Sydney, Australia, [8]Netherlands Bioinformatics Centre, [9]Department of Bioinformatics, Radboud Medical Center, Nijmegen, The Netherlands, [10]CSC - IT Center for Science Ltd., Espoo, Finland, [11]Whitehead Institute for Biomedical Research, MIT, Cambridge, MA, USA, [12]CSIRO, Bioinformatics Core, Canberra, Australia, [13]The Sainsbury Laboratory, Norwich Research Park, Norwich, UK, [14]SIB Swiss Institute of Bioinformatics, 1 Rue Michel Servet, Genève, Switzerland, [15]Academis, Illstrasse 12, 12161 Berlin, Germany, [16]The Nowgen Centre, 29 Grafton Street, Manchester, UK, [17]Department of Physics, Sapienza University, Rome, Italy, [18]The Roslin Institute, Edinburgh, UK and [19]The University of Manchester, Manchester, UK

Associate Editor: Jonathan Wren

ABSTRACT

**Summary:** Rapid technological advances have led to an explosion of biomedical data in recent years. The pace of change has inspired new collaborative approaches for sharing materials and resources to help train life scientists both in the use of cutting-edge bioinformatics tools and databases and in how to analyse and interpret large datasets. A prototype platform for sharing such training resources was recently

development of new methods for data analysis and interpretation (Carvalho and Rustici, 2013; Brazas and Ouellette, 2013; Libeskind-Hadas and Bush, 2013). Researchers—students and professionals alike—therefore constantly need to acquire new skills to keep abreast of the latest developments (Schneider *et al.*, 2010; Via *et al.*, 2011, 2013; Vincent and Page, 2013). Attempting to address this need, the Global Organisation for

# GOBLET & Standards: Collaborative publications

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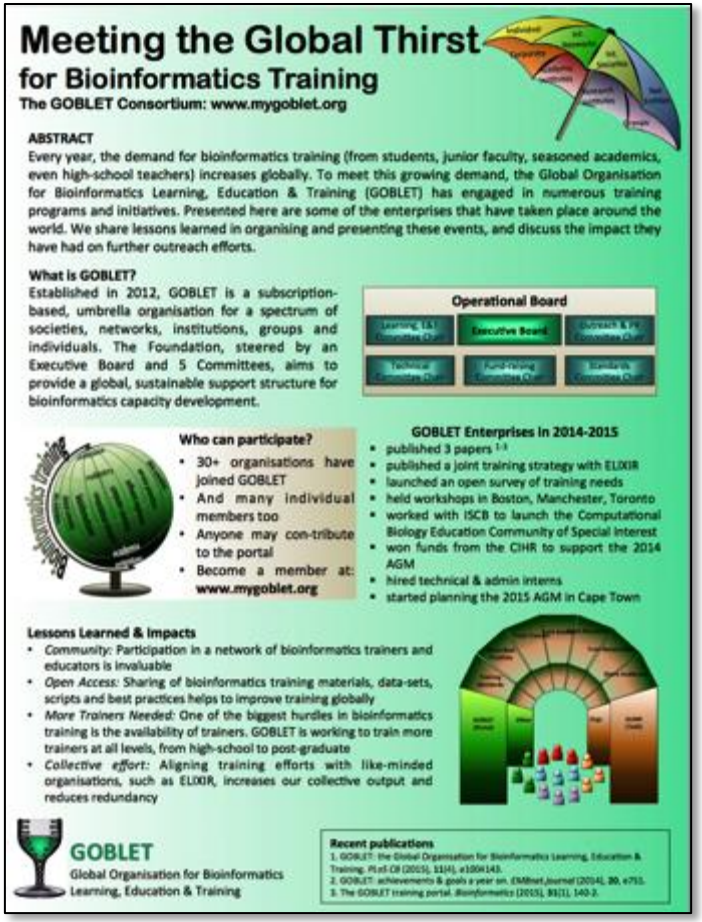

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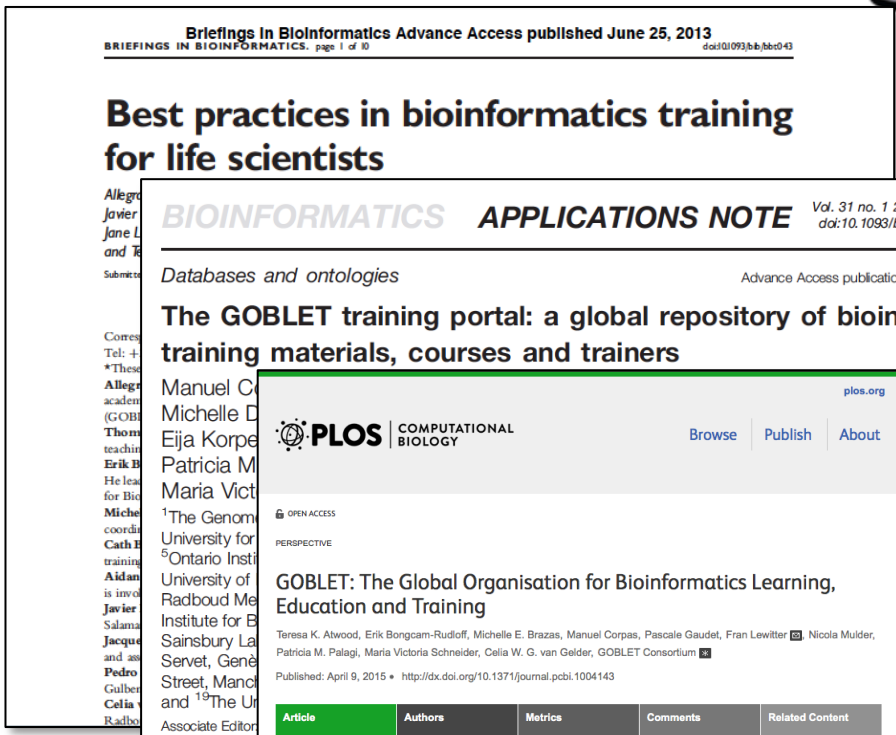

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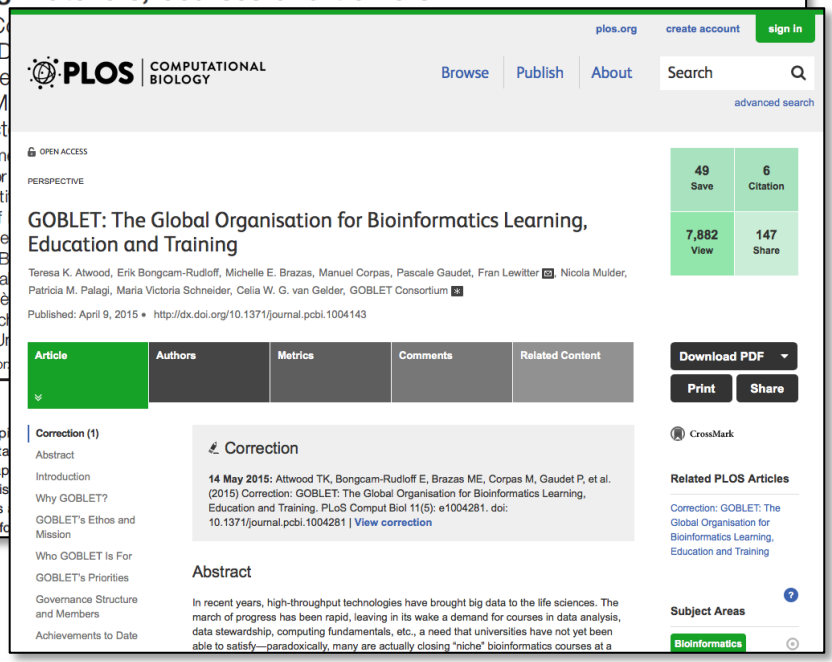

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PERSPECTIVE

GOBLET: The Global Organisation for Bioinformatics Learning, Education and Training

Teresa K. Attwood, Erik Bongcam-Rudloff, Michelle E. Brazas, Manuel Corpas, Pascale Gaudet, Fran Lewitter, Nicola Mulder, Patricia M. Palagi, Maria Victoria Schneider, Celia W. G. van Gelder, GOBLET Consortium

Published: April 9, 2015 • http://dx.doi.org/10.1371/journal.pcbi.1004143

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Correction (1)

Abstract

Introduction

Why GOBLET?

GOBLET's Ethos and Mission

Who GOBLET Is For

GOBLET's Priorities

Governance Structure and Members

Achievements to Date

Correction

14 May 2015: Attwood TK, Bongcam-Rudloff E, Brazas ME, Corpas M, Gaudet P, et al. (2015) Correction: GOBLET: The Global Organisation for Bioinformatics Learning, Education and Training. PLoS Comput Biol 11(5): e1004281. doi: 10.1371/journal.pcbi.1004281 | View correction

Abstract

In recent years, high-throughput technologies have brought big data to the life sciences. The march of progress has been rapid, leaving in its wake a demand for courses in data analysis, data stewardship, computing fundamentals, etc., a need that universities have not yet been able to satisfy—paradoxically, many are actually closing "niche" bioinformatics courses at a

CrossMark

Related PLOS Articles

Correction: GOBLET: The Global Organisation for Bioinformatics Learning, Education and Training

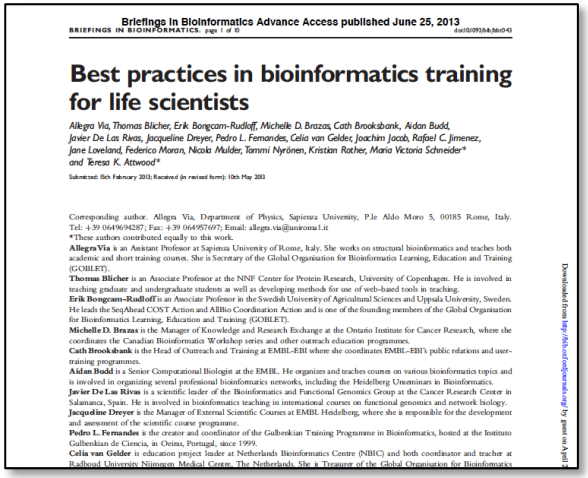
Subject Areas

Bioinformatics

# GOBLET & Standards: Collaborative publications

**Key points "Best practices" paper**

- Demand for bioinformatics training is increasing tremendously, largely owing to high-throughput data generation and the need for robust data analysis.
- In this context, achieving excellence in training is a considerable challenge.
- Here, we discuss training excellence and how it might be achieved.
- **We suggest working practices** to identify training needs, to articulate learning objectives and to ensure delivery of suitable training for given audiences, a quality-assurance process and a sound organizational framework.



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Allegra Via et al. Brief. Bioinform 2013
doi: [10.1093/bib/bbt043](https://doi.org/10.1093/bib/bbt043)

# GOBLET & Standards: Defining minimal descriptors

- GOBLET Standards Committee
  chair Pascale Gaudet, SIB Swiss Institute of Bioinformatics

- Goal: Develop standards and guidelines to support many different aspects of bioinformatics training

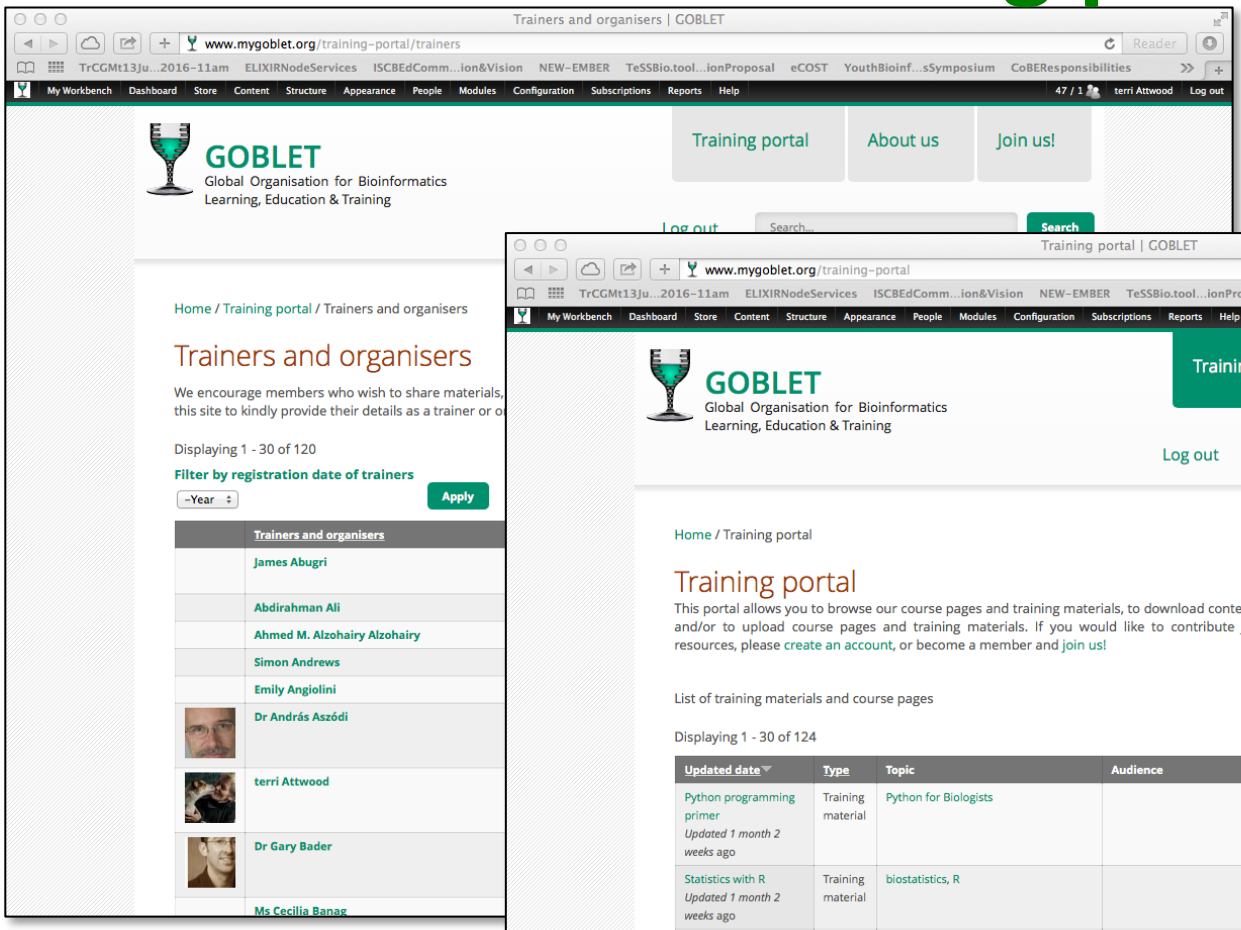
  More specifically:
  - Exploring accreditation mechanisms for learners and trainers
  - Developing guidelines for course material descriptions
  - Along with the Technical Committee, support SASI as needed

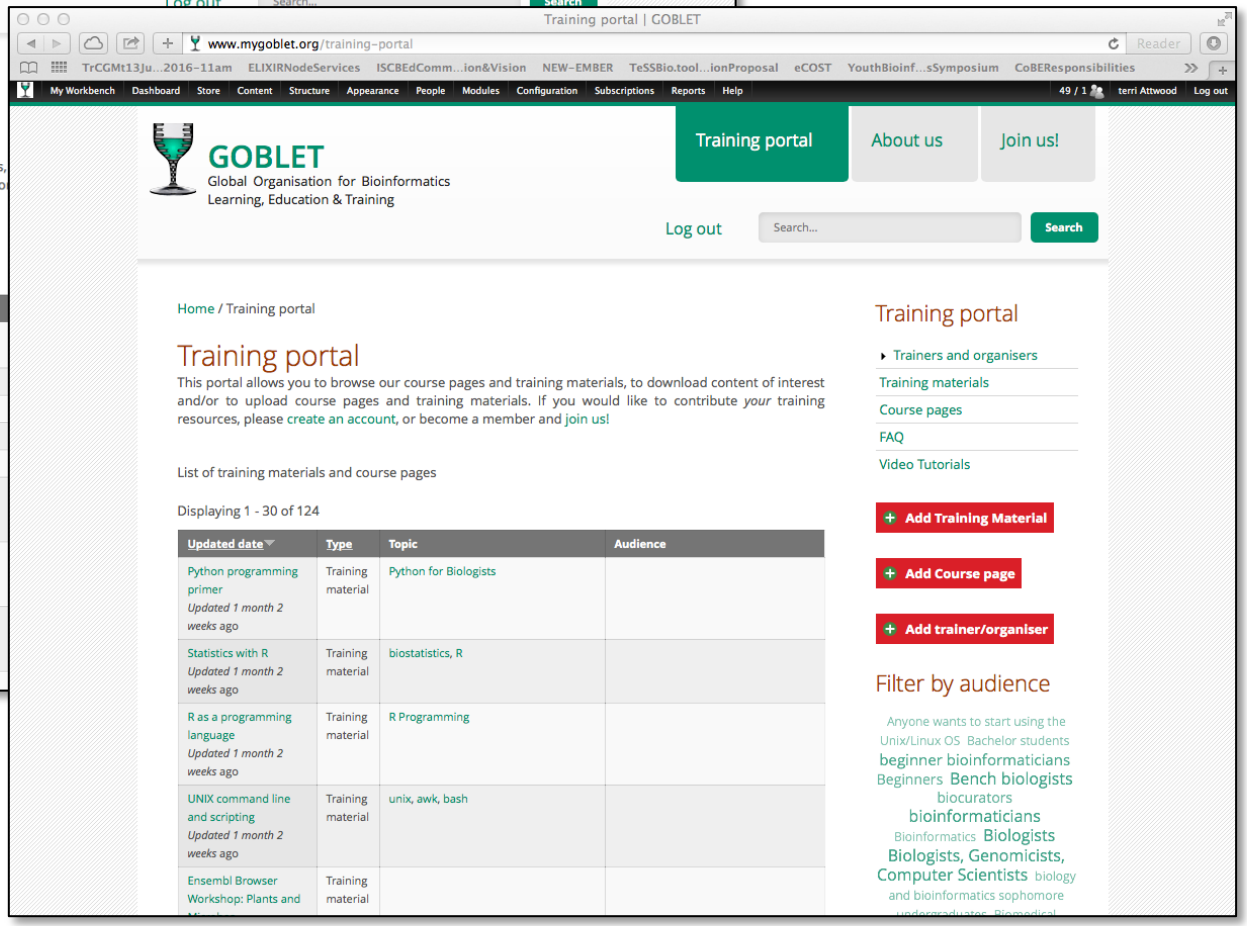
# GOBLET & Standards: Defining minimal descriptors

| Descriptor | What should this include | Mandatory/ Recommended/ Optional |
|---|---|---|
| GOBLET ID | Unique versioned identifier | M |
| Author | Main author of the training materials | M |
| Contact point | Contact point for the training materials | M |
| Title | | M |
| File name | The file name | M |
| File format | The file format | M |
| Material type | Different options for material types: 1. Lecture 2. Practical 3. Dataset 4. Reading material (including research papers) 5. Tools, Resources, Scripts 6. Other | M |
| Short description (less than 50 words?) | Short description of the content covered in the training material and overall aims | M |
| Supporting materials | If appropriate, list of other | |
| Learning objectives | Provide the trainees with a upon completion of the se | |
| Learning outcome | | |
| Target audience | For GOBLET this Introducto NGS repo this is part of tar | |
| Prerequisites | Any prior knowledge that r | |
| Licence | Conditions under this mate | |
| Stability/date last modified | When was the material last updated? | |
| Date created | | M |
| Date uploaded | Note: that this can be considered version of the material | M |
| Topic | Scientific topic covered by the materials | M |
| Keywords | Concepts that add context to the material topic - in addition to title and topics | R |
| Additional contributors or co-authors | Additional authors | M |
| DOI | If available | O |
| Duration | Time required to complete the training | O |
| Description (unlimited) | In Bioschemas this could include learning objectives | O |
| URL | URL to the original material & datasets | O |

Work in progress;
to be aligned with BioSchemas;
to be implemented in GOBLET Portal

# GOBLET & Standards: website & training portal

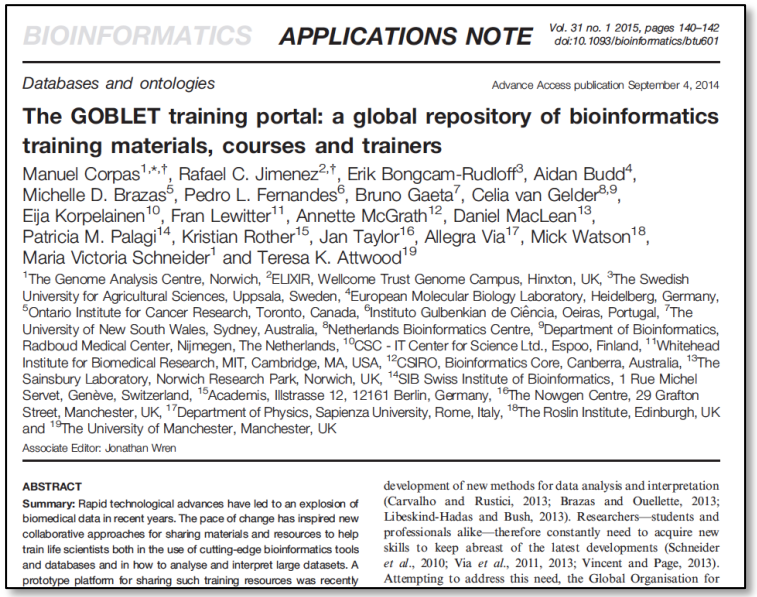


# GOBLET & Standards: website & training portal

Website:

- Information about GOBLET and its activities
- Event calendar (with iAnn)



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doi:10.1093/bioinformatics/btu601

*Databases and ontologies*

Advance Access publication September 4, 2014

**The GOBLET training portal: a global repository of bioinformatics training materials, courses and trainers**

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Associate Editor: Jonathan Wren

**ABSTRACT**

**Summary:** Rapid technological advances have led to an explosion of biomedical data in recent years. The pace of change has inspired new collaborative approaches for sharing materials and resources to help train life scientists both in the use of cutting-edge bioinformatics tools and databases and in how to analyse and interpret large datasets. A prototype platform for sharing such training resources was recently

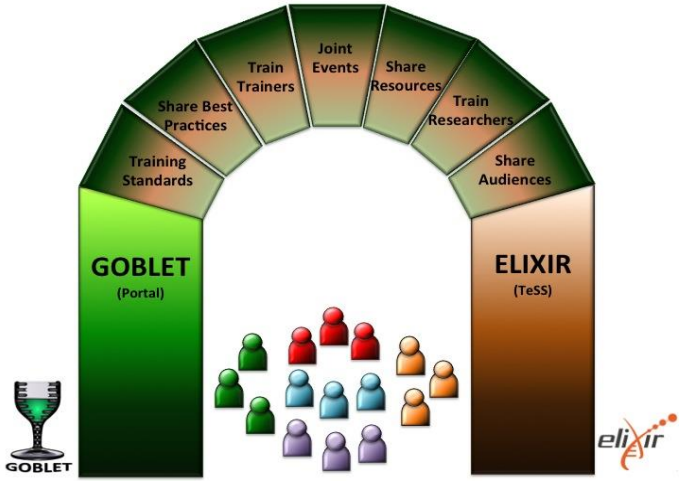
development of new methods for data analysis and interpretation (Carvalho and Rustici, 2013; Brazas and Ouellette, 2013; Libeskind-Hadas and Bush, 2013). Researchers—students and professionals alike—therefore constantly need to acquire new skills to keep abreast of the latest developments (Schneider *et al.*, 2010; Via *et al.*, 2011, 2013; Vincent and Page, 2013). Attempting to address this need, the Global Organisation for

Training portal:

- two main entrance routes:
  - Training materials
  - Trainers & Organizers
- Materials described with EDAM
- Downloadable under CC BY-SA 2.5 licence
- Planned: materials described / tagged with minimal descriptors defined by Standard Committee (aligned with Bioschemas)

# ELIXIR-GOBLET Collaboration Strategy

- Published April 2015
- Collaboration between ELIXIR's and GOBLET's training portals
- Collaboration on train-the-trainer and train-the-researcher activities
  - Train the Trainer
  - Metagenomics materials hackaton
  - Elearning
- Joint exploration of training 'accreditation' mechanisms
- Sharing of best practices and developing standards and expertise on professionalising bioinformatics training

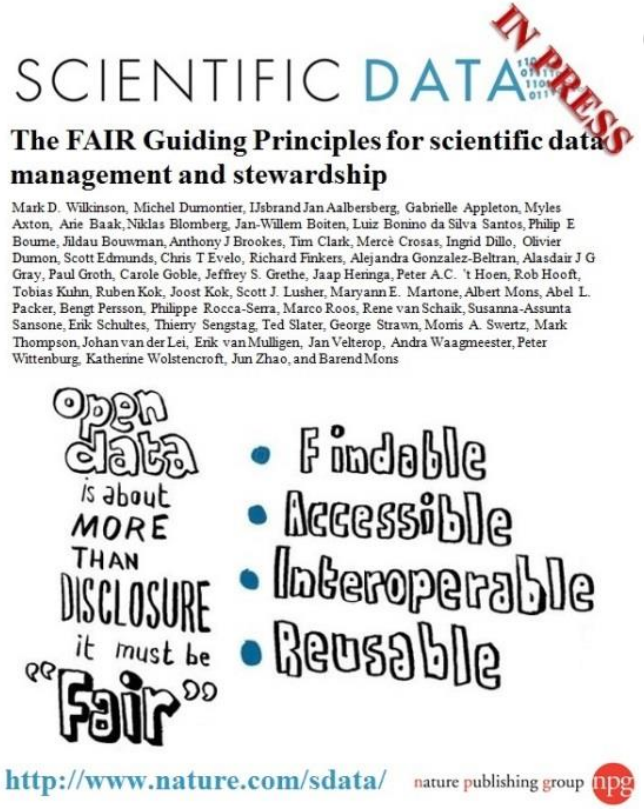


# The FAIR principles

**SCIENTIFIC DATA MUST BE FAIR:**

**Findable**
**Accessible****
**Interoperable**
**Re-usable**

**… for man and machine**




- **Global movement**
- **Key element in European Open Science policy**
- **Paper March 2016: FAIR Principles, Nature *Scientific Data* , doi:10.1038/sdata.2016.18**

***** *A = accessible under a well-defined license***

# Towards FAIR bioinformatics training!

- **Findable**
  - Well described course materials & courses
  - metatags, EDAM, BioSchemas
- **Accessible**
  - Available in course portals (e.g. GOBLET, TeSS, BD2K )
  - Proper licensed (e.g. CC-BYE)
- **Interoperable (technical)**
  - Exchange formats (e.g. SCORM for elearning modules)
- **Reusable**
  - Modular
  - Learning Objectives & Outcomes
  - Also e.g. datasets and description of technical setup needed

# Acknowledgements


- GOBLET Officers
  - GOBLET Executive Board: Terri Attwood (chair), Michelle Brazas (Secretary), Fran Lewitter (Treasurer), Vicky Schneider
  - Nicky Mulder, Celia van Gelder (Education co-Chairs)
  - Manuel Corpas (Tech Chair)
  - Pascale Gaudet (Standards Chair)
  - Patricia Palagi (Fund-raising Chair)
  - Erik Bongcam-Rudloff (Outreach & PR Chair)

- The GOBLET Consortium
  - organisational & individual members