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**

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)
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)
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

Meeting the Global Thirst for Bioinformatics Training
The GOBLET Consortium: www.my goblet.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 initiatives that have taken place around the world. We share lessons learned in organizing and presenting these events, and discuss the impact they have had on further outreach efforts.

What is GOBLET?
Established in 2012, GOBLET is a subscription-based, umbrella organisation for a spectrum of societies, networks, institutions, groups and individuals. The Foundation, steered by an Executive Board and 5 Committees, aims to provide a global, sustainable support structure for bioinformatics capacity development.

Conference posters

Best practices in bioinformatics training for life scientists
Allegre Via, Thomas Bôcher, Erik Bengtsson-Rudolf, Michelle D. Bezzas, Cath Booksbank, Aidan Budd, Javier De Las Rivas, Jacqueline Dreyer, Pedro L. Fernandes, Celia van Gelders, Joachim Jacob, Rafael C. Janine, Jørn Lowland, Federico Morning, Nicola Mullar, Tammi Nyrönen, Kristian Rother, Marina Victorla Schneider* and Terese K. Attwood*

Submitted 5th February 2013. Revised (in revised form): 10th May 2013

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*These authors contributed equally to this work.

Allegre Via is an Associate Professor at Sapienza University of Rome, Italy. She works on structural bioinformatics and teaches both academic and short training courses. She is Secretary of the Global Organisation for Bioinformatics Learning, Education and Training (GOBLET).

Thomas Bôcher is an Associate Professor at the NNF Center for Protein Research, University of Copenhagen. He is involved in teaching graduate and undergraduate students as well as developing methods for one of web-based tools in teaching.

Erik Bengtsson-Rudolf is an Associate Professor at the Swedish University of Agricultural Sciences and Uppsala University, Sweden. He leads the Swedish COST Action and MinBio Coordination Action and is one of the founding members of the Global Organisation for Bioinformatics Learning, Education and Training (GOBLET).

Michelle D. Bezzas is the Manager of Knowledge and Research Exchange at the Ontario Institute for Cancer Research, where she coordinates the Canadian Bioinformatics Workshop series and other outreach education programs.

Cath Booksbank is the Head of Outreach and Training at SNMB-EMBL where she coordinates SNMB-EMBL’s public relations and outreach programs.

Aidan Budd is a Senior Computational Biologist at the EMBL. He organizes and teaches courses on various bioinformatics topics and is involved in organizing several professional bioinformatics networks, including the Heidelberg University in Bioinformatics.

Javier De Las Rivas is a scientific leader of the Bioinformatics and Functional Genomics Group at the Cancer Research Center in Salamanca, Spain. He is involved in bioinformatics teaching in international courses on functional genomics and network biology.

Jacqueline Dreyer is the Manager of External Scientific Courses at EMBL, Heidelberg, where she is responsible for the development and assessment of the scientific course programme.

Pedro L. Fernandes is the creator and coordinator of the Gulbenken Training Programme in Bioinformatics, hosted at the Instituto Gulbenkian de Ciencias, in Oeiras, Portugal, since 1999.

Celia van Gelders is education project leader at Nederlands Bioinformatics Centre (NBIC) and both coordinator and teacher at Radboud University Nijmegen Medical Centre, The Netherlands. She is a Treasurer of the Global Organisation for Bioinformatics Learning.
GOBLET & Standards: Collaborative publications

Conference posters

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Best practices in bioinformatics training for life scientists

BIOINFORMATICS APPLICATIONS NOTE
Vol. 31, no. 1, 2016, pages 140-142
doi:10.1038/bioinformatics.2015.261

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

Manuel Corpas1, Rafael C. Jimenez2, Erik Bongcam-Rudloff3, Aidan Budd4, Michelle D. Brazas5, Pedro L. Fernandes6, Bruno Gaeta7, Celia van Gelder8,9, Elia Korpela10,11, Fran Lewitter11, Annette McGrath12, Daniel MacLean13, Patricia M. Palagi14, Kristian Rother15, Jan Taylor16, Allegra Vía17, Mick Watson18, Maria Victoria Schneider1 and Teresa K. Atwood19

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

ABSTRACT
The purpose of this paper is to introduce the GOBLET training portal, a global repository of bioinformatics training materials, courses and trainers. The portal provides a platform for life scientists and educators to share their expertise, experiences and best practices in bioinformatics training. It aims to facilitate the dissemination of knowledge and promote the development of new methods for data analysis and interpretation. The portal offers a wide range of training materials, from introductory courses to advanced seminars, to accommodate the diverse needs of life scientists at all levels. It also encourages the sharing of practical experiences and innovative approaches, as well as the development of new tools and resources to enhance the learning experience. In conclusion, the GOBLET training portal is an important resource for the bioinformatics community, providing a valuable platform for collaboration and knowledge exchange.
GOBLET & Standards: Collaborative publications

Conference posters

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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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Who can participate?
• 30+ organisations have joined GOBLET.
• Published a joint training strategy with EURLIR.
• Launched an open survey of training needs.
• Held workshops in Boston, Manchester, Toronto.
• Worked with IC3 to launch the Computational Biology Education Community of Special Interest.

Lessons Learned & Impacts
Community: Participation in 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.
Wide Ranges 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.
Collective Effort: Aligning training efforts with like-minded organisations, such as EURLIR, increases our collective output and reduces redundancy.

Best practices in bioinformatics training for life scientists

BIOINFORMATICS APPLICATIONS NOTE
Vol. 31 no. 1 2015, pages 140-142
doi:10.1038/biotech.2015.61

Databases and ontologies

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

Manuel Carajo, Eija Korpe, Patricia Miller, Maria Victor, Eija Korpe

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

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

Teresa K Akwo, Eija Korpe, Patricia Miller, Maria Victor, Francisco Gaudê, Frank Lewalter, Nicole Muller, Patrice M Plage, Maria Victoria Schneider, Carla K D van Delft, GOBLET Consortium

Published: April 9, 2015

ABSTRACT
Summary: Rapid biostatistical data and train life scientists and databases and provide a global platform for bioinformatics training.

GOBLET Enterprises in 2014-2015
• Published 3 papers
• Published a joint training strategy with EURLIR.
• Published an open survey of training needs.
• Held workshops in Boston, Manchester, Toronto.
• Worked with IC3 to launch the Computational Biology Education Community of Special Interest.

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Journal 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.

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

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<tr>
<th>Descriptor</th>
<th>What should this include</th>
<th>Mandatory/Recommended/Optional</th>
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<td>GOBLET ID</td>
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<tr>
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<tr>
<td>File format</td>
<td>The file format</td>
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<tr>
<td>Short description (less than 50 words?)</td>
<td>Short description of the content covered in the training material and overall aims</td>
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</tr>
<tr>
<td>Supporting materials</td>
<td>If appropriate, list of other related materials</td>
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<tr>
<td>Learning objectives</td>
<td>Provide the trainees with a clear indication of what they should know/be able to do upon completion of the selected training material</td>
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<tr>
<td>Learning outcome</td>
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<tr>
<td>Target audience</td>
<td>For GOBLET this Introduction level; for BioSchemas this level of difficulty; for NGS repo this part of target audience</td>
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<tr>
<td>Prerequisites</td>
<td>Any prior knowledge that might help the participants to achieve the Learning Objectives</td>
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<td>Licence</td>
<td>Conditions under which this material is used</td>
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<td>Concepts that add context to the material topic - in addition to title and topics</td>
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</tr>
<tr>
<td>Additional contributors or co-authors</td>
<td>Additional authors</td>
<td>M</td>
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<tr>
<td>DOI</td>
<td>If available</td>
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<td>Duration</td>
<td>Time required to complete the training</td>
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<tr>
<td>Description (unlimited)</td>
<td>In BioSchemas this could include learning objectives</td>
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</tr>
<tr>
<td>URL</td>
<td>URL to the original material &amp; datasets</td>
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</tbody>
</table>

**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)

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

** 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