Protein Production and Purification Partnership in Europe

Initiated in 2010 by Hüseyin Besir (EMBL Heidelberg)

1st ´kick-off/brain-storming´ meeting in Halle 2011


Crucial contribution, no authorship?
Why not publish interesting results?
Do chaperones really help?
New ideas, no capacities
Could we do better/faster?
Anyone tested new instrument?
Journal of Unpublished Observations?
Antigen prediction software?
Protein expressed before?
Protocol reliable, too complicated?
Save time, material, costs?
Antibody XY available?
Compare vector set XYZ with our ones?
Test product XY or not?
Better medium for cells?

Copenhagen 2011

Barcelona 2012

Heidelberg 2012

Porto 2013

Vienna 2014

Paris 2014

Dresden 2015

Munich 2015

Heidelberg 2016

Rehovot 2016

Prague 2017

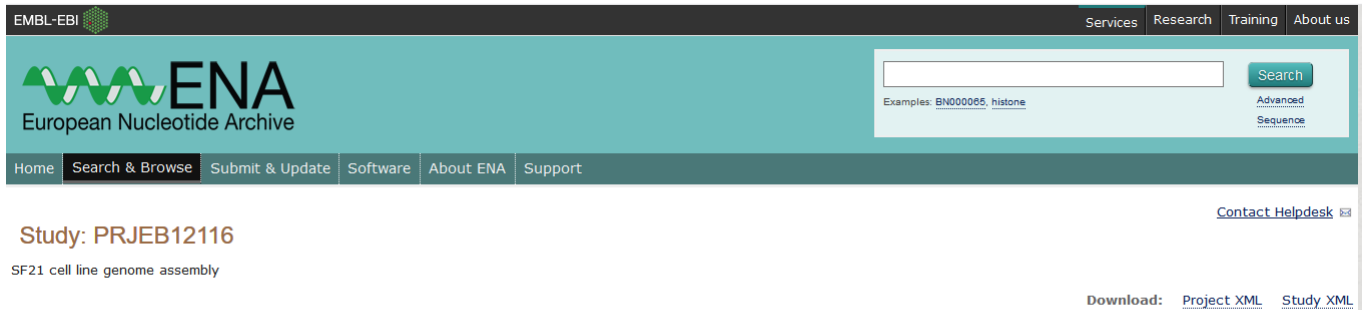
Gent 2018

London 2018

Protein Production and Purification Partnership in Europe

Projects and Benchmarks

Sf21 genome assembly P4EU crowd funded (GeneCore EMBL + VBCF)



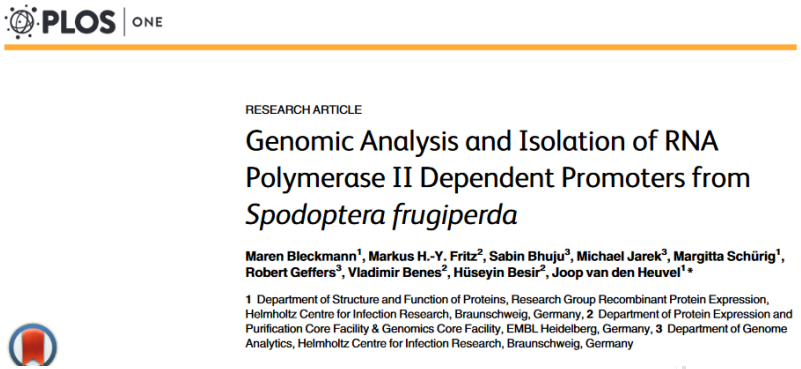
Genetic code expansion for multiprotein complex engineering

Christine Koehler[1], Paul F Sauter[2], Mirella Wawryszyn[2], Gemma Estrada Girona[1], Kapil Gupta[3], Jonathan J M Landry[1], Markus Hsi-Yang Fritz[1], Ksenija Radic[1], Jan-Erik Hoffmann[1], Zhuo A Chen[4], Juan Zou[4], Piau Siong Tan[1], Bence Galik[5], Sini Junttila[5], Peggy Stolt-Bergner[5], Giancarlo Pruneri[6], Attila Gyenesei[5], Carsten Schultz[1], Moritz Bosse Biskup[2], Hueseyin Besir[1], Vladimir Benes[1], Juri Rappsilber[4,7], Martin Jechlinger[1], Jan O Korbel[1], Imre Berger[3,8], Stefan Braese[2,9] & Edward A Lemke[1]

ones of the most widely used systems f
udy we present an approach using diffe
sembly contains 4,020 scaffolds of size,

Attributes

NATURE METHODS | VOL.13 NO.12 | DECEMBER 2016 | 997



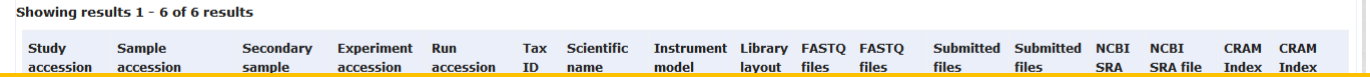
PLOS ONE

RESEARCH ARTICLE

Genomic Analysis and Isolation of RNA Polymerase II Dependent Promoters from *Spodoptera frugiperda*

Maren Bleckmann[1], Markus H.-Y. Fritz[2], Sabin Bhuju[3], Michael Jarek[3], Margitta Schürig[1], Robert Geffers[3], Vladimir Benes[2], Hüseyin Besir[2], Joop van den Heuvel[1]*

1 Department of Structure and Function of Proteins, Research Group Recombinant Protein Expression, Helmholtz Centre for Infection Research, Braunschweig, Germany, 2 Department of Protein Expression and Purification Core Facility & Genomics Core Facility, EMBL Heidelberg, Germany, 3 Department of Genome Analytics, Helmholtz Centre for Infection Research, Braunschweig, Germany



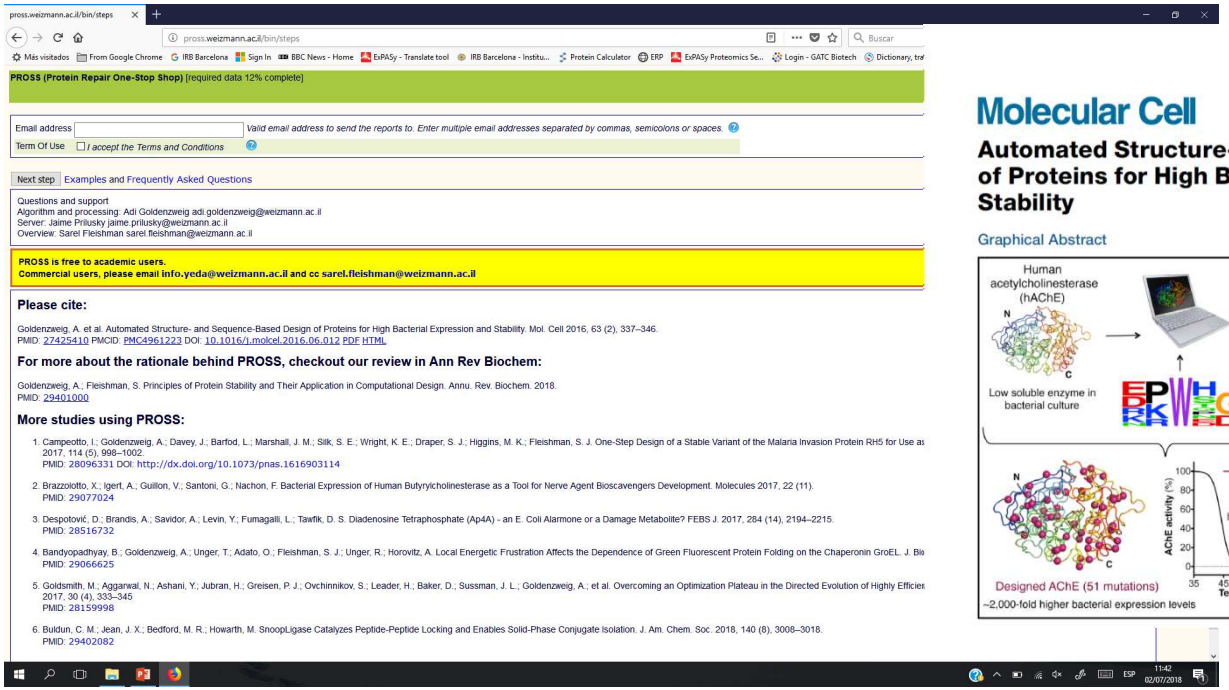
Showing results 1 - 6 of 6 results

Study accession	Sample accession	Secondary sample	Experiment accession	Run accession	Tax ID	Scientific name	Instrument model	Library layout	FASTQ files	FASTQ files	Submitted files	Submitted files	NCBI SRA	NCBI SRA file	CRAM Index	CRAM Index

Protein Production and Purification Partnership in Europe

Projects and Benchmarks

Benchmarking the PROSS algorithm-intelligent protein design for improved stability/activity.



Protein Production and Purification Partnership in Europe

Projects and Benchmarks

BEVS protein expression benchmarking: Tn7 based BEVs vs. FlashBac vs. ´custom´-based systems...

Journal of Structural Biology 203 (2018) 71–80

Contents lists available at ScienceDirect

Journal of Structural Biology

journal homepage: www.elsevier.com/locate/yjsbi

Baculovirus-driven protein expression in insect cells: A benchmarking study

Peggy Stolt-Bergner[a], Christian Benda[b], Tim Bergbrede[c], Hüseyin Besir[d], Patrick H.N. Celie[e], Cindy Chang[f], David Drechsel[g], Ariane Fischer[b], Arie Geerlof[h], Barbara Giabbai[i], Joop van den Heuvel[j], Georg Huber[h], Wolfgang Knecht[k], Anita Lehner[a], Regis Lemaitre[g], Kristina Nordén[k], Gwynn Pardee[l], Ines Racke[d], Kim Remans[d], Astrid Sander[m], Judith Scholz[n], Magda Stadnik[e], Paola Storici[i], Daniel Weinbruch[o], Isabel Zaror[l], Linda H.L. Lua[f,*], Sabine Suppmann[n,*]

Protein Production and Purification Partnership in Europe

ARBRE MOBIEU
BETWEEN ATOM AND CELL

Protein Quality Standard

Concerns about protein quality from academic sources and the need for protein quality standards in academia raised by members as long ago as 2009:

PepTalk 2009 *„Systems biology needs minimal standards for evaluating Recombinant Protein Functionality“ A de Marco.*

Standards in Genomic Sciences (2011) **5**:195-197 DOI:10.4056/sigs.1834511

Recombinant protein quality evaluation: proposal for a minimal information standard

Ashley M. Buckle[1,15], Mark A. Bate[1], Steve Androulakis[2], Mario Cinquanta[3], Jerome Basquin[4], Fabien Bonneau[4], Deb K. Chatterjee[5], Davide Cittaro[3], Susanne Gräslund[6], Alicja Gruszka[7], Rebecca Page[8], Sabine Suppmann[9], Jun X. Wheeler[10], Deborah Agostini[3], Mike Taussig[11], Chris F. Taylor[12], Stephen P. Bottomley[1], Antonio Villaverde[13], Ario de Marco[14,*]

Shortcuts

- Public Forum
- Wiki
- Contact

Protein Quality Standard PQS

There is increasing awareness in the scientific community about the lack of reproducibility and reliability of results published with purified proteins. While protein production is highly regulated and controlled in the pharmaceutical industry by the authorities, there are up to date no guidelines or standards in place in the academic research to guarantee the quality of proteins included in scientific experiments. There is an urgent need to define guidelines for the scientists but also for editors and reviewers of scientific journals and funding agencies for their review processes:

Lebendiker M., Danieli T. and de Marco A. (2014)
Raynal B., Lenormand P., Baron B., Hoos S. and England P.(2014)

A team of experts in the field of Biophysics (Association of Resources for Biophysical Research in Europe (ARBRE-MOBIEU) and Recombinant Protein Production (Production and Purification Partnership in Europe (**P4EU**) have developed the following Minimal Protein Quality Standard:

Members of the Protein Quality Initiative:

Bertrand Raynal – Pasteur institute, Paris, France (ARBRE)
Stefan Knauer – Bayreuth University, Germany (ARBRE)
Stephan Uebel – Max-Plank Institute for Biochemistry, Munich (ARBRE)
Rob Meijers – EMBL Hamburg, Germany (ARBRE)
Nick Berrow – Institute for Research in Biomedicine, Barcelona, Spain (P4EU)
Kim Remans – EMBL Heidelberg, Germany (P4EU)
Ario de Marco – University of Nova Gorica, Slovenia (P4EU)
Mario Lebendiker (coordinator) – Hebrew University of Jerusalem, Israel (P4EU)

- Minimal information to provide in publications
- Minimal quality control parameters that should be tested on protein sample
- Extended quality control parameters

The full guidelines are also available as a single pdf document here (downloads document).
The proposed guidelines are intended to lay the groundwork for the standardization and reproducibility of data. The goals of this document are to disseminate operative guidelines in our laboratories through the existing networks, to raise awareness amongst colleagues and collaborators and to encourage the whole scientific community to implement these guidelines in publications, e.g. as part of the supplementary information. The implementation of protein production and QC data will allow greater transparency to readers and enable efficient reproducibility in other

Projects and Benchmarks

- PROSS Benchmarking
- Insect and HEK benchmarking
- Sf21 genome assembly

Courses

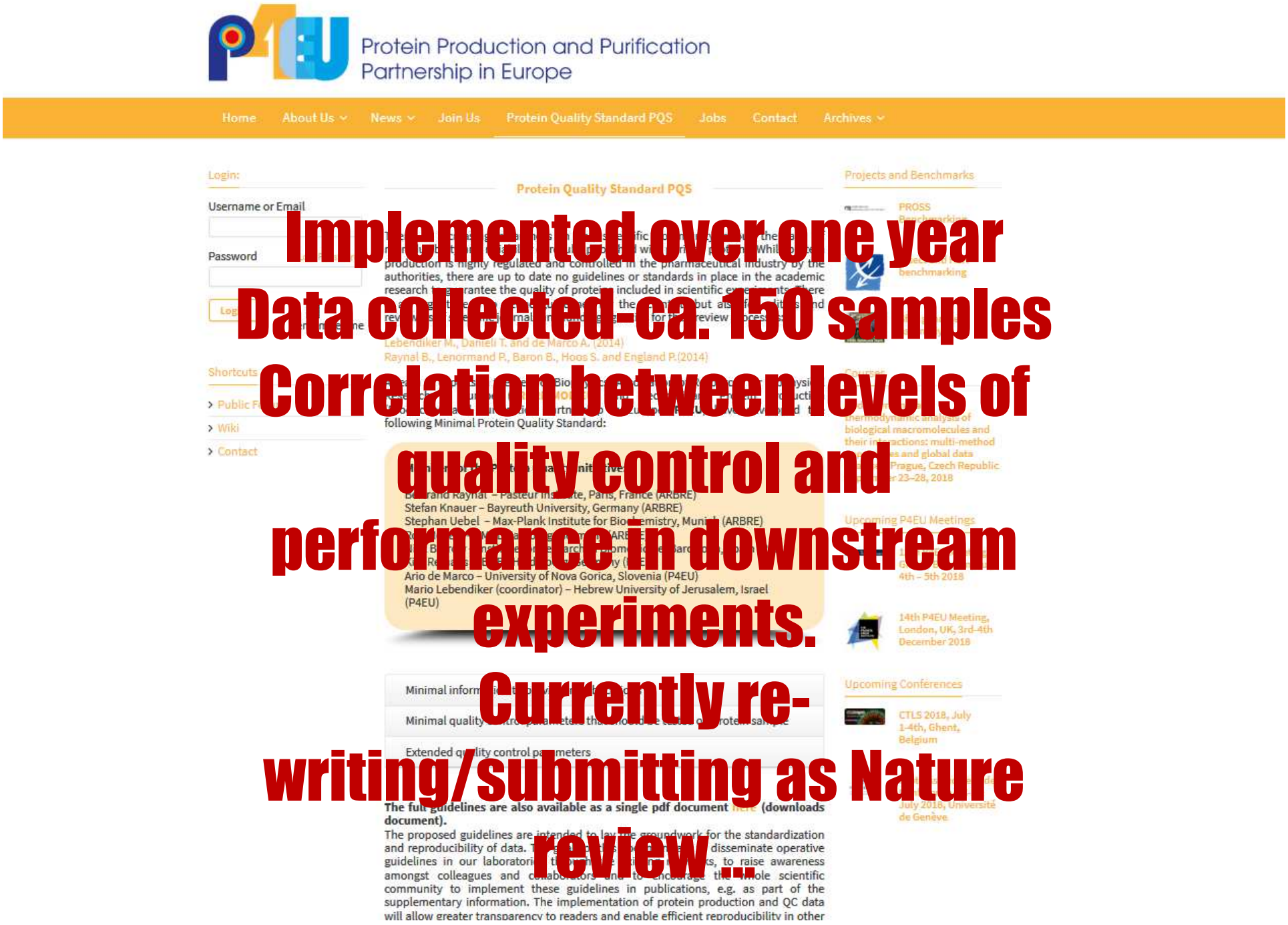
Hydrodynamic and thermodynamic analysis of biological macromolecules and their interactions: multi-method approaches and global data analyses, Prague, Czech Republic September 23–28, 2018

Upcoming P4EU Meetings

- 13th P4EU Meeting, Ghent, Belgium, July 4th – 5th 2018
- 14th P4EU Meeting, London, UK, 3rd-4th December 2018

Upcoming Conferences

- CTLS 2018, July 1-4th, Ghent, Belgium
- Proteins and Peptides Conference, 23-26 July 2018, Université de Genève



Implemented over one year

Data collected-ca. 150 samples

Correlation between levels of quality control and performance in downstream experiments.

Currently re-writing/submitting as Nature review...

Protein Production and Purification Partnership in Europe

Courses

December 2013 Practical Course on Mammalian Protein expression, Helmholtz Center, Braunschweig

November 2017 Advanced Methods in Protein Purification, MPIB Martinsried

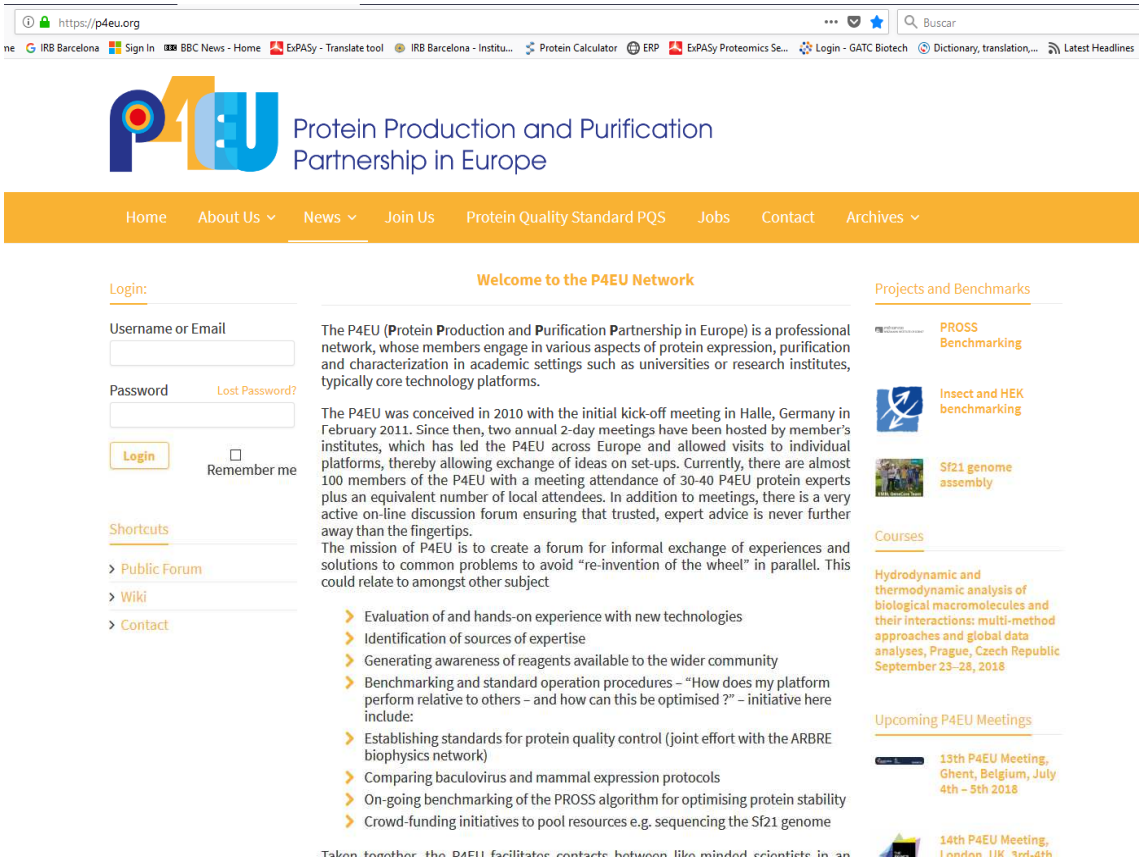
May/June 2018 Expert training in MultiBac expression,, Harwell Research Complex, Oxford

Small numbers of students, intensive hands-on practical experience

Protein Production and Purification Partnership in Europe

https://p4eu.org/

- New homepage launched August2017
- >125 members from ca.90 labs CFs/PIs/Pharmas/Biotech)
- Tens of thousands of views
- Job advertisement, members publications
- Public and confidential communication forum



Protein Production and Purification Partnership in Europe

Wiki

Welcome to the P4EU Wiki. This is an interactive protocol database with a “comment” function to add corrections, suggestions, improvements etc. You find three different types of entries:

- Textbook protocols
- “Expert User” Protocols
- “Author” Protocols

Review Process

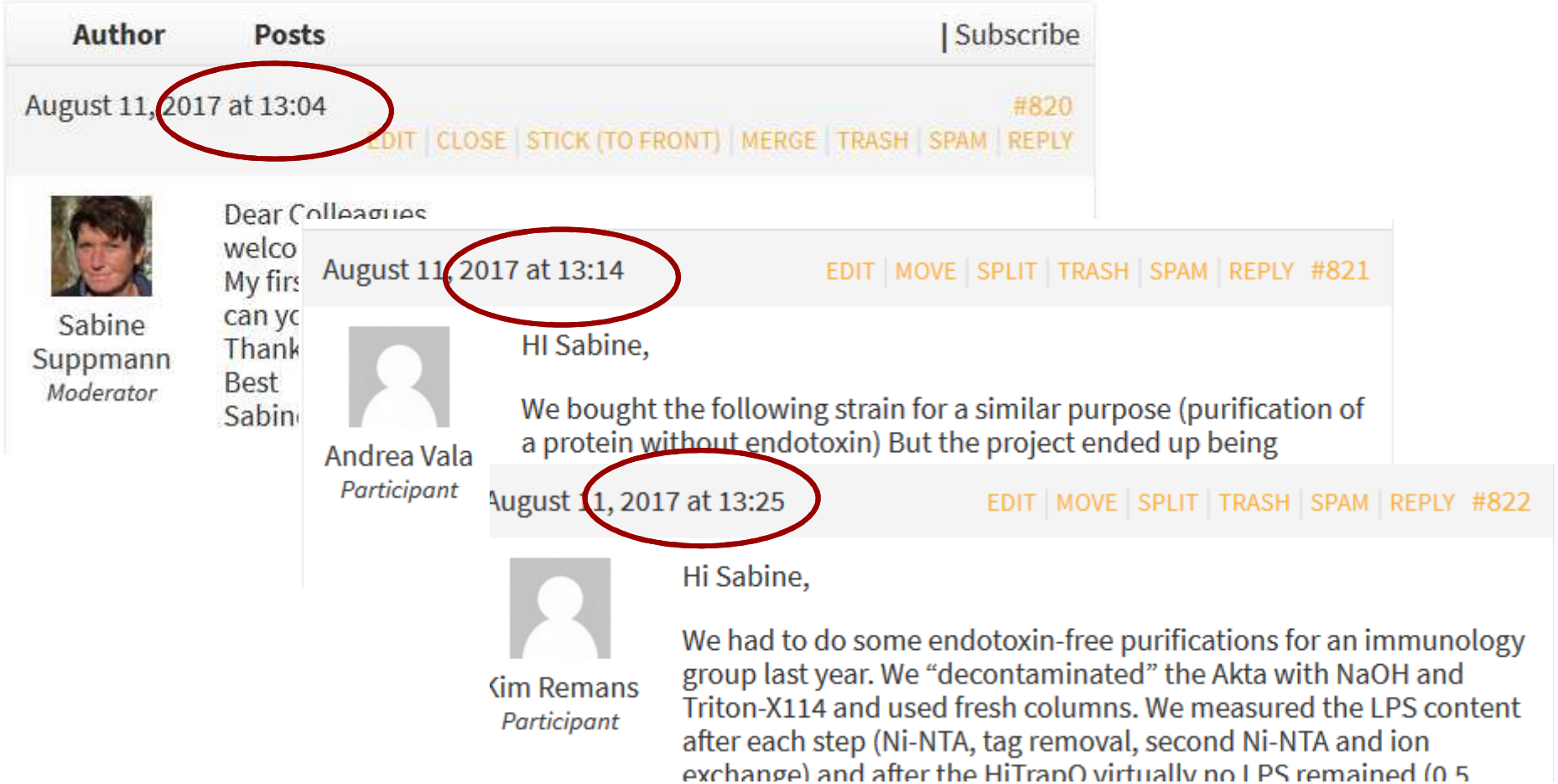
The submitted protocols will undergo a review process. Members of the editorial board will distribute the protocols to the respective experts within the P4EU network for review. Members of the editorial board:

- Patrick Celie, NKI Protein Facility, Netherlands Cancer Institute (NKI)
- Mario Lebendiker, Protein Purification Facility, Wolfson Centre for Applied Structural Biology, Jerusalem
- Frederico Silva, Protein Production and Purification Unit, IBMC Porto

P4EU Wiki

- Molecular Biology
- Protein Purification
- Protein Quality control
- Protein – Protein Interaction
- Expression Hosts

Protein Production and Purification Partnership in Europe



…all in the time you have got as far as 'choose option 3 for…' on official tech support lines!!

Protein Production and Purification Partnership in Europe

Minimal criteria for P4EU membership are:

In your function as head or staff member of a Core Facility / Research group you provide expertise, services, training, or access to equipment for recombinant protein production for your local scientific community AND/OR have a strong interest in methodological research in the subject of recombinant protein production.
Active participation in network activities, including attendance of, and presentations at P4EU meetings, contributions to expert protocols on the P4EU Wiki page, participation in projects or joint grant applications as well as workshops and/or staff exchanges.

Please complete the following form as thoroughly as possible, **ensuring that your e-mail address is entered correctly**. After submission your application will be approved and you will shortly receive your P4EU login details, and temporary password, by mail. Also remember to check your Spam/Junk box for this mail.
Please note: information about instrumentation and methodology will be password protected. This information is fundamental to search for specific expertise and advice within the network.

save

Personal information | Institution | Equipment

Your first and last name*

Your e-mail address*

I accept the terms and conditions*