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Comment: [e.g. explanation for delay]



Contents

Executive Summary.....	3
Introduction	3
Description of the web portal.....	3
Members area.....	8
Summary/Conclusions	10

Executive Summary

In this document, we report the development the public domain web-based UPGx information portal. In particular, we report the various functionalities of the web portal as well as the restricted access Members-only area and we focus on the most important developments for the first version of the portal.

Introduction

The web portal of the Ubiquitous Pharmacogenomics project is the public front of the project mainly to the research and biomedical community. The web portal is designed using the WordPress template and allows user-friendly navigation to the various activities of the project.

Description of the web portal

The **Home** page (**Figure 1**) of the web portal allows the use to scroll down to read the most important features of the UPGX project, such as the main focus points of the project, such as guidelines, implementation and evaluation, enabling technologies, education and dissemination (**Figure 2A**), a brief description of the project (**Figure 2B**) and the members of the Consortium and of the Scientific Advisory Board (**Figures 2C and 2D**, respectively).

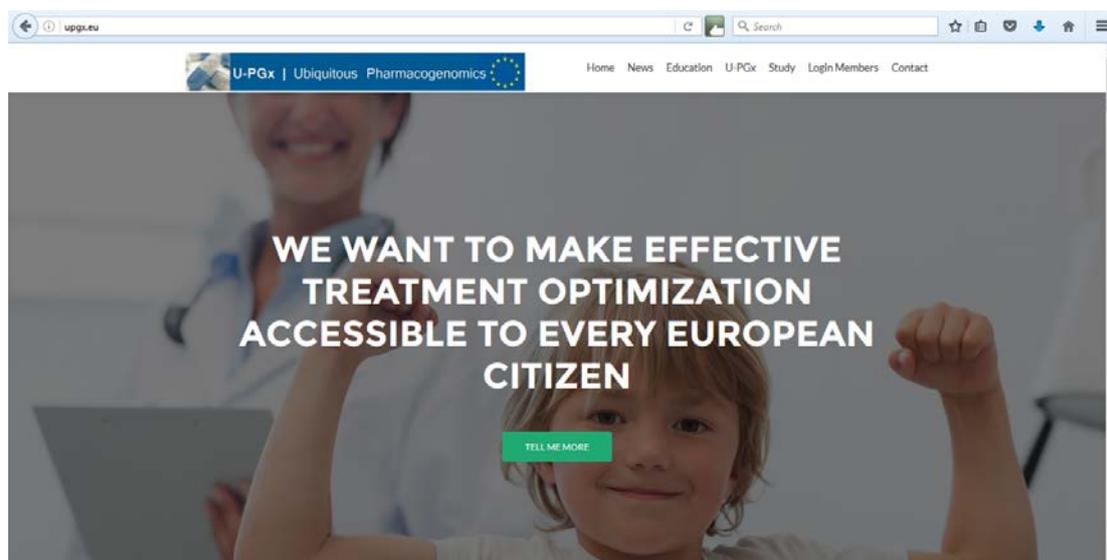


Figure 1. Overview of the Home page of the UPGx web information portal (www.upgx.eu).

A

OUR FOCUS

We want to improve the safety and efficacy of pharmacotherapy for every European patient by enabling clinical pharmacogenomics

 SHARED EUROPEAN GUIDELINES Maintenance and dissemination of pharmacogenomics guidelines in the European Union	 IMPLEMENTATION AND EVALUATION Clinical implementation and outcome evaluation of pre-emptive pharmacogenomics in a multitude of European countries	 ENABLING TECHNOLOGIES Development of powerful and barrier-free clinical decision support systems and novel pharmacogenomics methodologies	 COMMUNICATION AND EDUCATION Development of a program to reach out to patients, health care professionals, regulatory agencies, politics and health insurance organizations.
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B

THE PROJECT

Pharmacogenomics (PGx) is the study of genetic variability affecting an individual's response to a drug. Clinical application of pharmacogenomics knowledge will result in less "trial and error" prescribing and more efficacious, safer and cost-effective drug therapy. However, despite the major advances in PGx and several commercially available PGx tests, its application in routine patient care remains very limited.

Immediate knowledge of relevant PGx variation, with interpretation and recommendations, without any disruption of routine clinical care is a clear advantage of the U-PGx approach.

The U-PGx consortium will address major challenges and obstacles for implementation of PCR testing in patient care, taking into account the diversity of healthcare systems and citizens across Europe. Specifically, U-PGx will investigate if the emerging approach of pre-emptive genotyping of an entire panel of important PGx markers is cost-effective and results in a better outcome for patients. With the pre-emptive PCR testing approach data on multiple important pharmacogenes are collected prospectively and embedded into the patients' electronic record. Typically, it alerts prescribers and pharmacists through electronic clinical decision support systems when a drug is ordered or dispensed for a patient with an at-risk genotype. The new model of personalised medicine through pre-emptive PCR testing will be conducted at a large scale in seven existing European health care environments (The Netherlands, Spain, UK, Italy, Austria, Greece, Slovenia).

- POTENTIAL OPTIMIZATION**
50% of elderly patients will receive drug treatments that could be optimized via PGx within the next four years.
- PHYSICIAN INTEREST**
95% of physicians think that PGx could help to better predict drug response.
- LACK OF KNOWLEDGE**
Only 10% of physicians feel they currently have adequate knowledge and tools for PGx.

C

OUR TEAM

A strong and efficient team of expert researchers, clinicians, companies and stakeholders

 HENK JAN GUCHELAAR Scientific coordinator, U. Medical Centre Leiden, NL	 JESSE SWEN U. Medical Centre Leiden, NL	 SIR MUNIR PIRMOHAMED U. of Liverpool, UK	 JULIA STINGL Federal Institute for Drug and Medical Devices, GER
 MAGNUS INGELMAN-SUNDBERG Karolinska Institute, SWE	 CHRISTINA MITROPOULOU Golden Halls Foundation, UK	 KA-CHUN CHEUNG KNIP Holding BV, NL	 MATTHIAS SAMWALD Medical University of Vienna, AUT

D

ADVISORY BOARD

 MARK I. BATATIN U. of Chicago, USA	 RUSS ALTMAN Stanford University, Stanford, CA, USA	 DAN RODEN Vanderbilt University School of Medicine, Nashville, TN, USA	 MARY RELING St Jude Children's Research Hospital, Memphis, TN, USA
 MICHEL EICHELBAUM Dr. Margareta Fischer-Schuch-Institute of Clinical Pharmacology, Stuttgart, DE	 DAVID H. HAERRY European AIG Treatment Group EATG, Brussels, Belgium		

Figure 2. Overview of the main contents of the UPGx web information portal

The information available in the UPGx web portal is provided in 6 different tabs, available at the top of the web page (**Figure 3**).

Home News Education U-PGx Study Login Members Contact

Figure 3. The various tabs providing access to the public information of the UPGx project.

The **News** tab includes concise information about previous activities of the UPGx project, such as educational activities organized by the Consortium or other activities where UPGx members participate and general information related to the project (**Figure 4**).

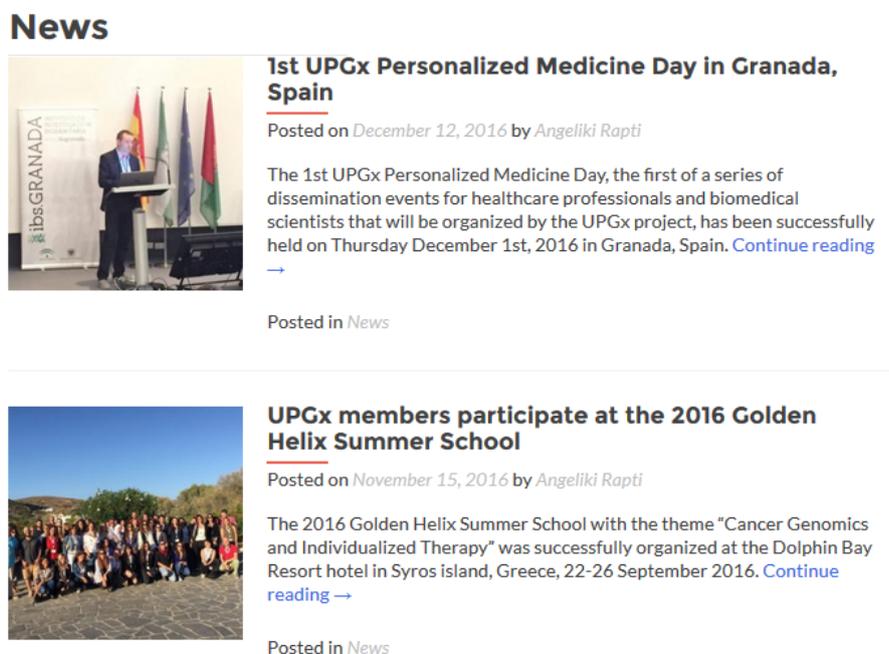
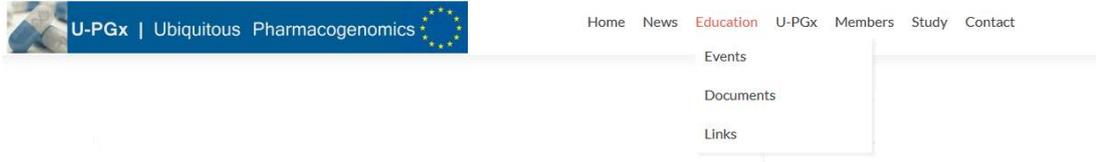


Figure 4. News items available at the UPGx web portal.

An important feature of the UPGx web portal, both for its members as well as visitors, is the events calendar available in the **Education** tab (**Figure 5A**). The various meetings that are related to the various disciplines of the UPGx project, focused in particular on Pharmacogenomics, Personalized Medicine, genome informatics and translational tools and public health genomics are extracted from the web and made available for querying. The user can query for a specific meeting by discipline and by date using the querying tool at the top of the calendar, while by hovering the cursor over a specific event, concise information related to this event is displayed (**Figure 5B**).

By clicking on the conference, more detailed information appears in a specific window (Figure 5C).

A



U-PGx | Ubiquitous Pharmacogenomics

Home News **Education** U-PGx Members Study Contact

- Events
- Documents
- Links

B



EVENTS IN: Date SEARCH: Search FIND EVENTS VIEW AS: Month

Events for December 2016

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
12th International Congress on Clinical and Molecular Genetics	13th International Conference on Clinical and Molecular Genetics	14th International Conference on Clinical and Molecular Genetics	1st U-PGx Day International Conference on Glycomics	International Conference on Glycomics International Conference on Histocompatibility and Immunogenetics		Target Validation Using Genomics and Informatics
15th International Conference on Precision, Preventive and Personalized Medicine & Molecular Diagnostics	16th International Conference on Precision, Preventive and Personalized Medicine & Molecular Diagnostics	International Conference on Precision Medicine December 5 - December 7 Precision Medicine				
17th Target Validation Using Genomics and Informatics	18th Target Validation Using Genomics and Informatics	19th International Conference on Precision Medicine	20th International Conference on Computer Engineering and Bioinformatics	21st International Conference on Computer Engineering and Bioinformatics	22nd International Conference on Computer Engineering and Bioinformatics	23rd International Conference on Computer Engineering and Bioinformatics

C

International Conference on Precision Medicine
December 5 - December 7

Precision Medicine

+ GOOGLE CALENDAR + ICALEXPORT

Details

Start: December 5

End: December 7

Event Category: Pharmacogenomics and Genomic Medicine

Website: <http://precisionmedicine.conferenceseries.com/>

Venue

San Antonio United States

San Antonio, United States

+ Google Map



← Target Validation Using Genomics and Informatics 5th International Conference on Computer Engineering and Bioinformatics →

Figure 5. Event calendar available at the UPGx web portal.

The **Education** tab also features Documents, where related, to the UPGx information documents, such as the UPGx video, are available (**Figure 6**), while related links are available from the respective sub-tab.

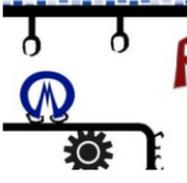
Documents



U-PGx | Ubiquitous Pharmacogenomics Video
 Posted on October 4, 2016 by Wendy van Hemmen

This U-PGx video (6 minutes) visualises and promotes the idea of personalised medicine and pre-emptive PGx testing. The video can be used to inform the public via the webpage, for educational purpose and for communication with stakeholders and at (inter)national workshops.
[Continue reading →](#)

Posted in [Documents](#)



How Genetic testing can be used to personalized drug prescriptions and dosages
 Posted on June 23, 2016 by Manolis Viennas

The following 90-sec video nicely shows how genetic variation can affect people's response to drug treatment in terms of both efficacy and toxicity. Determining the genetic profile in certain drugs can help improve drug response and also to minimize adverse drug reactions.

[Click here](#) to watch the video.

Posted in [Documents](#)

Figure 6. Documents related to the UPGx project available from the web portal.

At the **UPGx** tab, information about the various partners participating at the UPGx project, such as the Organization and Institution hyperlinked to the corresponding website is provided along with the name of the principal investigator (**Figure 7**).

Participants		
	Participant organisation name	Country
	1. Leiden University Medical Center - LUMC (coordinator) Dept. Clinical Pharmacy & Toxicology and Dept. of Clinical Genetics H.J. Guchelaar, J.J. Swen, M. Kriek	Netherlands
	2. University of Liverpool - UOL and Royal Liverpool University Hospital (RLBUTH) Dept. of Molecular & Clinical Pharmacology M. Pirmohamed, R. Turner	UK
	3. The Federal Institute for Drugs and Medical Devices, Bonn - BfArM J. Stingl	Germany
	4. Karolinska Institute, Stockholm - KI Dept. of Physiology & Pharmacology M. Ingelman-Sundberg	Sweden
	5. The Golden Helix Foundation, London - GHXF C. Mitropoulou	UK

Figure 7. Partners of the UPGx project available from the UPGx tab of the web portal.



Also, information related to the various work packages is available from the corresponding tab. Lastly, detailed contact information regarding the project coordinator, executive board, management team and website administrator is provided from the **Contact** tab of the web portal.

Members area

The **Members** tab includes all password-protected information related to the UPGx project. By clicking on the Members tab, the user is prompted to enter his/her username and password to access the password-protected information of the web portal. All UPGx partners have received their passwords to access the Members-only area of the UPGx website. A user can also request his/her password to be regenerated, if forgotten.

The Members area includes additional news items, restricted to UPGx members, related to UPGx activities, or other activities where UPGx members have participated (Figure 8).

members



First ethical approval PREPARE study protocol

Posted on *December 7, 2016* by *Wendy van Hemmen*

Again exciting news. Cristina Fajardo (Granada, Spain) has just announced that the ethical committee of Andalucia has approved the protocol! The team in Granada is now working on the final preparations and is then ready to start. [Continue reading →](#)

Posted in *members*



PREPARE protocol submitted by all 7 sites

Posted on *November 29, 2016* by *Wendy van Hemmen*

After the submission of the PREPARE study protocol in Spain, Italy and Austria, the other four countries, i.e. Greece, Slovenia, UK and the Netherlands, have now also submitted the protocol to their respective IRBs. Hopefully we will soon receive the first approvals so we can start recruiting patients.

Posted in *members*

Figure 8. News items available in the UPGx web portal for the UPGx partners only.

The most useful item in the members area is the Repository (**Figure 9A**), where useful documents related to the project are stored and can be easily retrieved. These include all agreements, documents, meeting minutes related to all 4 components of the work program, Consortium meetings, dissemination and outreaching activities, management and reporting. Indicative examples are shown in **Figures 9B** and **9C**, where UPGx publications and Deliverables are securely stored.

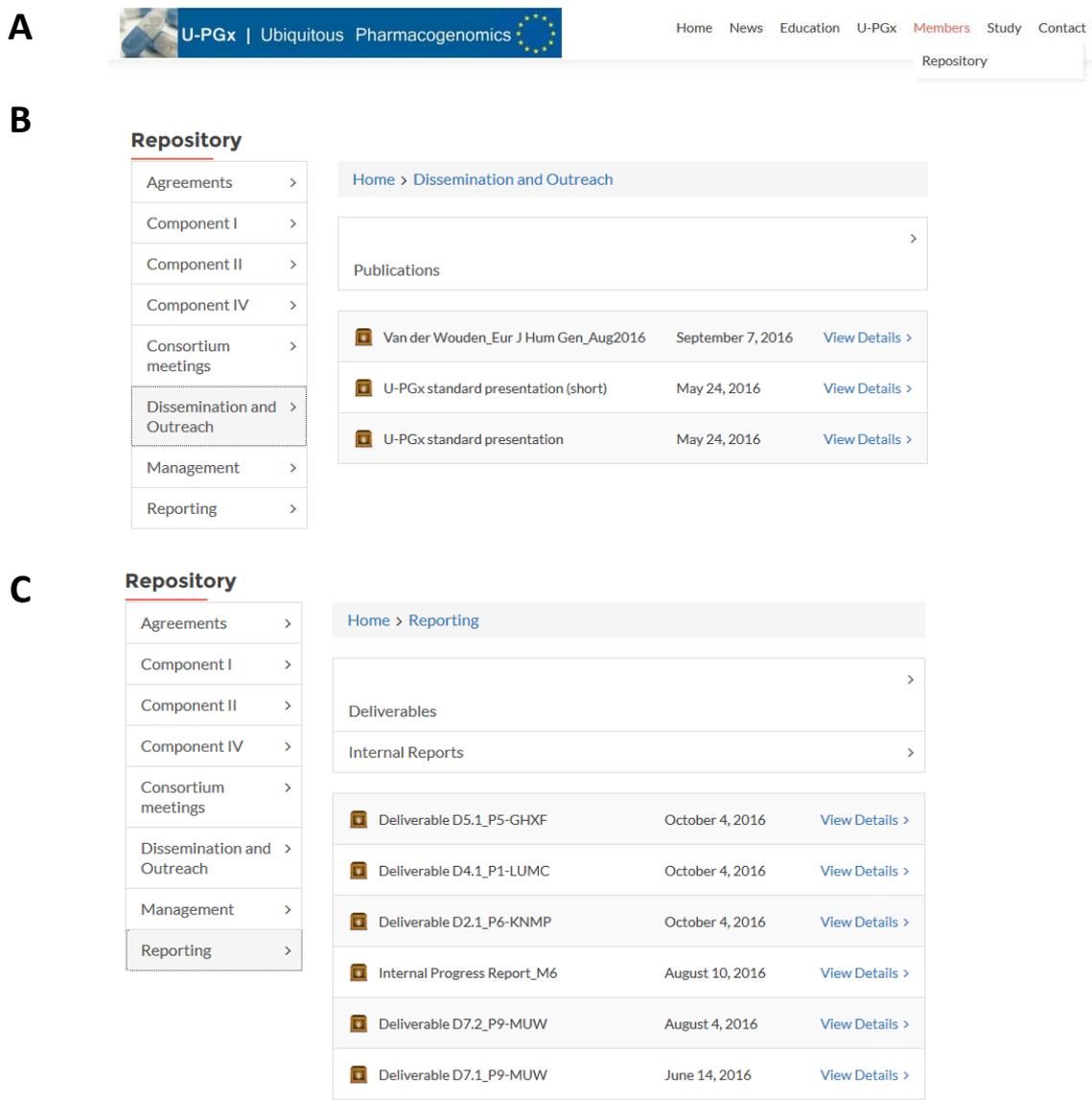


Figure 9. Publications and Deliverables available to UPGx members from the Repository.



Summary/Conclusions

Overall, the first version of the UPGx web portal is developed and is regularly being enriched with material from all UPGx members. The web portal administrator is frequently updating the content of the web portal, including news items, conferences, and so on.

We expect that the web portal will continue to be updated with new material, while we anticipate that, as soon as the recruitment of the patients will start in early 2017, many more visitors will access the web portal, particularly clinicians involved in the project and other personnel as well as patients recruited during the study. The updates for the subsequent versions of the UPGx web portal will be the subject of future deliverables.