

Gravitate  Health  
**Hackathon #1**  
17-19 January 2024



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## Gravitate-Health Hackathon CERTH/ITI team participation

Team members

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# Description – Challenge 1

- The CERTH/ITI team participated in the Gravitare-Health Hackathon in both challenges.
- In challenge 1, we built **ePI-tome**, a system that can extract semantic information from the Electronic Product Information (ePI) data. ePI-tome automatically preprocesses ePI data and semantically annotates entities based on standard terminologies (i.e., ICPC2, ICD10, ATC) using natural language processing tools and large language models (LLMs), such as QuickUMLs, Named Entity recognition models (e.g. Med7) and Mistral LLM. This results in annotations including diseases, mental or behavioural disfunction, side effects, signs or symptoms, drugs, pharmacological substances and chemical compounds, dosages, frequency, etc.

Figure 1: Example semantic annotation of ePI data as performed by ePI-tome

Select EPI ▾

Select Process ▾

Process epi

Categories Found

- drug
- finding
- sign-or-symptom
- pathological-function
- disease
- mental-or-behavioral-dysfunction

```
<li>muscle or joint aches.</li>
<li>See a doctor straight away. Your doctor may decide to carry out tests to check your liver, kidneys or blood, and may tell you to stop taking Dovato.</li></ul>
<p><strong>Very common side effects</strong>
</p><p>These may affect more than 1 in 10 people:</p>
<ul>
<li>headache</li>
<li>diarrhoea</li>
<li>feeling sick (nausea).</li>
</ul><p>
<strong>Common side
```

stop unless your doctor tells you to. **stopping** Dovato can affect your health and how future treatment works.

If you have any further questions on the use of this medicine, ask your doctor or pharmacist.

Like all **medicines**, this **medicine** can cause **side effects**, although not everybody gets them, so it is **very important** to **talk** to your doctor about any changes in your health.

**Allergic reactions**

**Dovato** contains **dolutegravir**. **Dolutegravir** can cause a serious allergic reaction known as a hypersensitivity reaction. This is an uncommon reaction (may affect up to 1 in 100 people) in people taking dolutegravir. If you get any of the following symptoms:

- skin rash
- a **high temperature** (**fever**)
- lack of **energy** (fatigue)
- swelling, sometimes of the face or mouth (**angioedema**), causing **difficulty** in **breathing**
- muscle or joint **aches**.
- See a doctor straight away. Your doctor may decide to **carry** out tests to check your liver, kidneys or blood, and may tell you to stop taking Dovato.

# Description – Challenge 2

- In challenge 2, we built on top of the semantic annotations extracted by ePI-tome, to develop *MyG-lensAssistant*, an integrated system and dashboard for personalized presentation of medical information. *MyG-lensAssistant* presents the International Patient Summary (IPS) of the patient in a structured manner, showing general information, medications, conditions, etc. The ePI annotations extracted by ePI-tome are combined with the IPS to personalize the presentation of the ePI document, highlighting/color-coding information especially relevant to the patient and hiding non-relevant information. The presented information is enhanced with visual aids such as images of administered drugs. Potential interactions between the medications taken by the patient are presented in a graph view, showing links between drugs and substances, based on external databases, and highlighting conflicts. Last but not least, *MyG-lensAssistant* includes an AI-powered chatbot with which the patient can converse in natural language to get information about medication, dosages, etc. that is personalized according to their IPS, leading to a more intuitive interface.

Figure 2:  
*The MyG-lensAssistant*  
dashboard.

## Health Summary

My Health Record



Alicia

Age: 28 Gender: ♀

## Description:

Age: 28 years. I live with my boyfriend. PhD Student Interests: I love reading and walking outdoors with my dog. I also love art and photography. Health Conditions: HIV (diagnosed with 25 years) Trigeminal neuralgia Depression Overweight

## Medications:

6



## Medications

Name	Form	Total Ingredients	Leaflet
Flucevax	suspension for injection in pre-filled syringe	1	
HIPÉRICO ARKOPHARMA cápsulas duras	Tablet	1	
CALCIO/VITAMINA D3 ROVI 1000 mg/880 UI COMPRIMIDOS EFERVESCENTES	Effervescent tablet	2	
Biktarvy 30 mg/120 mg/15 mg film-coated tablets	Coated tablet	3	
Tegretol (Carbamazepine) 200 mg tablets	Tablet	1	
Xenical (Orlistat) 60 mg capsule	Capsule, hard	1	

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## Medication interactions


 Show all substances

**CAUTION:** Some of the medicines you take interact:

- You take **Biktarvy 30 mg/120 mg/15 mg film-coated tablets** which contains substance **bictegravir** which interacts with other medicines that you take: **CALCIO/VITAMINA D3 ROVI 1000 mg/880 UI COMPRIMIDOS EFERVESCENTES** and **Xenical (Orlistat) 60 mg capsule**.



## Conditions

Condition	Diagnosed	Doctor
Depressive disorder (disorder)	-	-
Human immunodeficiency virus infection	2018	Dr. Walter Waltz
Trigeminal neuralgia (disorder)	2018	Dr. Walter Waltz
Overweight (finding)	2018	Dr. Walter Waltz



Figure 3: Enhancing ePI presentation using semantic annotation.

Highlighted Text Legend

-  Disease
-  Drug
-  Sign or Symptom
-  Mental or Behavioral Dysfunction
-  Pathological Function
-  Finding

Dovato is a medicine that contains two active ingredients used to treat human immunodeficiency virus (HIV) infection: dolutegravir and lamivudine. Dolutegravir belongs to a group of anti-retroviral medicines called integrase inhibitors (INIs), and lamivudine belongs to a group of anti-retroviral medicines called nucleoside analogue reverse transcriptase inhibitors (NRTIs).

Dovato is used to treat HIV in adults and adolescents over 12 years old who weigh at least 40 kg.

Dovato does not cure HIV infection; it keeps the amount of virus in your body at a low level. This helps maintain the number of CD4 cells in your blood. CD4 cells are a type of white blood cells that are important in helping your body to fight infection.

Not everyone responds to treatment with Dovato in the same way. Your doctor will monitor the effectiveness of your treatment.

## 2. What you need to know before you take Dovato 50 mg/300 mg film-coated tablets

Do not take Dovato

- if you are allergic (hypersensitive) to dolutegravir or lamivudine or any of the other ingredients of this medicine (listed in section 6).
- If you are taking a medicine called fampridine (also known as dalfampridine; used in multiple sclerosis).

• **If you think any of these apply to you, tell your doctor. Warnings and precautions** Some people taking Dovato or other combination treatments for HIV are more at risk of serious side effects than others. You need to be aware of the extra risks:

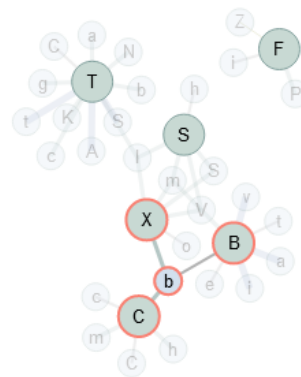
- if you have moderate or severe liver disease if you have ever had liver disease, including hepatitis B or C (if you have hepatitis B infection, don't stop Dovato without your doctor's advice, as your hepatitis may come back) • if you have a kidney problem. → Talk to your doctor before using Dovato if any of these apply to you. You may need extra checkups, including blood tests, while you're taking your medicine. See section 4 for more information. Allergic reactions Dovato contains dolutegravir. Dolutegravir can cause a serious allergic reaction known as a hypersensitivity reaction. You need to know about important signs and symptoms to look out for while you're taking Dovato. → Read the information 'Allergic reactions' in section 4 of this leaflet. Look out for important symptoms Some people taking medicines for HIV infection develop other conditions, which can be serious. These include: • symptoms of infections and inflammation • joint pain, stiffness and bone problems. You need to know about important signs and symptoms to look out for while you're taking Dovato. → Read the information 'Other possible side effects' in section 4 of this leaflet.

Figure 4: Enhancing ePI information using visual aids.



Figure 5: Highlighting drug interactions using a graph view.

Medication interactions



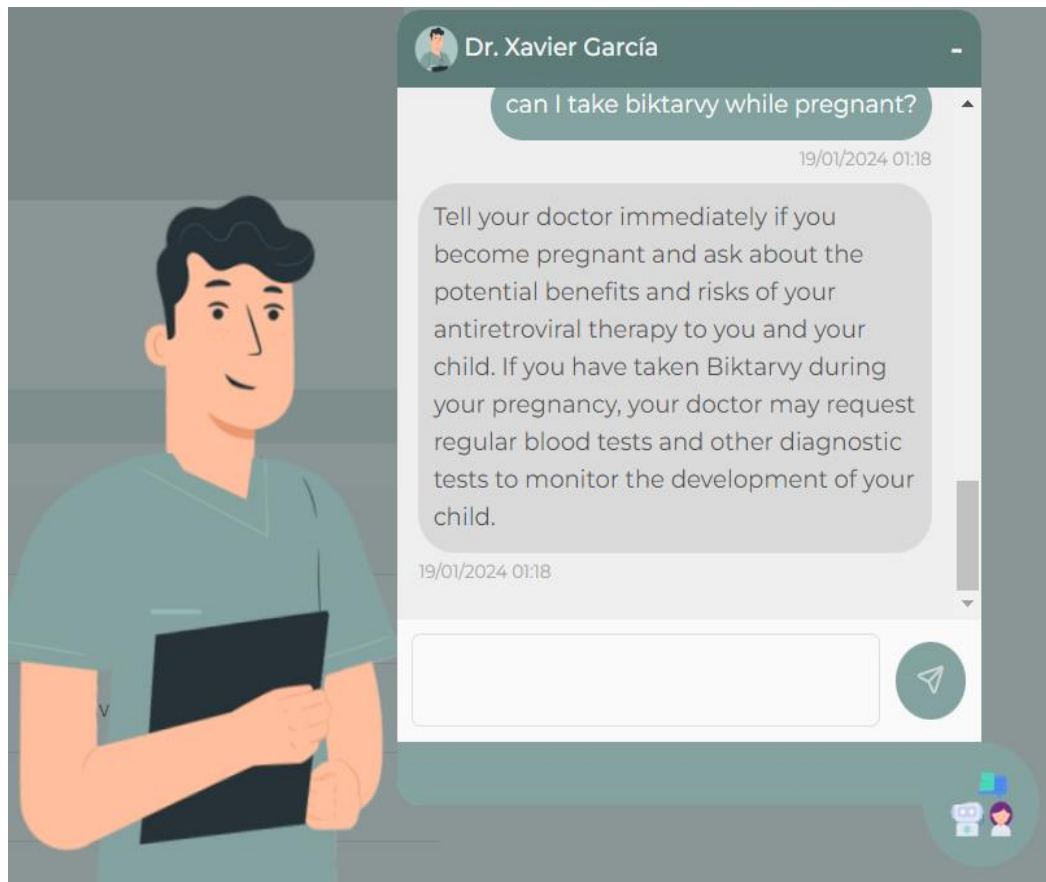
Show all substances

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Drawing 1:  
The *MyG-lensAssistant*  
AI-powered chatbot.





# ATHENS + DIGITAL HEALTH WEEK

CO-ORGANIZERS



National eHealth Authority  
Republic of Cyprus

HOSTED BY



15-19th January 2024  
Royal Olympic Hotel

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