Open PHACTS

Deliverable 6.22

Report on results of case studies and scientific publications achieved with the Open PHACTS Discovery Platform

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Approved by UNIVIE, GSK, Janssen, PSMAR, AstraZeneca

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Definitions

Partners of the Open PHACTS Consortium are referred to herein according to the following codes:

1 - GSK – GlaxoSmithKline – **Coordinator**
2 - UNIVIE – Universität Wien – **Managing Entity of IMI JU funding**
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4 - UHAM – University of Hamburg, Center for Bioinformatics
5 - BIT – BioSolveIT GmbH
6 - PSMAR – Consorci Mar Parc de Salut de Barcelona
601 - FIMIM – Fundacio Institut Mar d'Investigacions Mediques
602 - UPF – Universitat Pompeu Fabra
7 - LUMC – Leiden University Medical Centre
8 - RSC – Royal Society of Chemistry
801 - RSCWV – RSC World Wide Ltd
9 - VUA – Stichting VU-VUMC
10 - CNIO – Centro Nacional de Investigaciones Oncológicas
11 - UNIMAN – University of Manchester
12 - UM – Universiteit Maastricht
13 - ACK – ACKnowledge
14 - USC – Universidade de Santiago de Compostela
15 - UBO – Rheinische Friedrich-Wilhelms-Universität Bonn
16 - AZ – AstraZeneca AB
17 - Pfizer – Pfizer Limited
18 - Esteve – Laboratorios del Dr. Esteve, S.A.
19 - Novartis – Novartis Pharma AG
20 - ME – Merck
21 - HLU – H. Lundbeck A/S
22 - Lilly – Eli Lilly and Company Limited
23 - NBIC – Stichting Netherlands Bioinformatics Centre
24 - SIB – Swiss Institute of Bioinformatics
25 - CD – ConnectedDiscovery
26 - EMBL-EBI – European Molecular Biology Laboratory
27 - Janssen – Janssen Pharmaceutica NV
28 - OGL – OpenLink Group Ltd
29 - OPF – The Open PHACTS Foundation
30 - ALM – Laboratorios Almirall S.A.
31 - SciBite – SciBite Limited
1 Introduction

This deliverable follows up on D 6.18 (Interim report on results of case studies), providing an update on publications on use-cases solved with the Open PHACTS Discovery Platform by members of the consortium. This provides an overview on published work created with the help of the platform, but does not claim to be an exhaustive list. A full list of publications from within the consortium is available from http://www.openphacts.org/news-and-events/publications.

2 The scientific competency questions

D 6.1 introduced 20 research questions published by Azzaoui et al. [1], which were driving the development of the Open PHACTS Discovery Platform. Recently, KNIME workflows which are able to answer 16 of these 20 questions by using Open PHACTS API calls were published. [2] All workflows were made available on myexperiment.org (see http://www.myexperiment.org/workflows?filter=TAG_ID%28%224416%22%29), to allow users outside of the consortium access to an easy possibility to answer those questions. The still missing questions depend on datasets which are not yet included, but planned for the near future, such as patent and adverse events data.

3 Results of Ongoing Case Studies mentioned in D 6.18

TRPV1

A study on the usability of open data for the creation of classification models was performed with inhibitors of TRPV1. [3] Since the interim report, another study using this dataset was published, showing results of a pharmacophore screening using the data retrieved from open datasources, leading to the identification of compounds with a different type of scaffold (Figure 1). [4]

A perspective on the use of open data, including Open PHACTS, was given in [5]. This paper discusses the usability of open data for pharmacoinformatics, and states requirements needed for data quality.
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STF Use-Cases

The results from the use-cases selected by the scientific task force (STF) at the first Researchathon in London were published in the open access journal Plos ONE [6]. These use cases cover 1) the comprehensive identification of chemical matter for a dopamine receptor drug discovery program 2) the identification of compounds active against all targets in the Epidermal growth factor receptor (ErbB) signaling pathway that have a relevance to disease and 3) the evaluation of established targets in the Vitamin D metabolism pathway to aid novel Vitamin D analogue design.

Use case 1 shows the integration of Open PHACTS data with in-house data in a pharmaceutical company using Pipeline Pilot, while use cases 2 and 3 focus on academic research questions which are solved using KNIME workflows.

The following picture shows an overview of the use case 2 workflow:

Figure 1: Pharmacophore models for TRPV1 antagonists derived from public sources
In addition, there are ongoing studies on inhibitors of ABC-transporter, such as MDR1, BSEP, BCRP, and MRP2.

Finally, it should be mentioned that these are only studies conducted by members of the consortium and where the results justified publication. There are numerous hits via the Open...
PHACTS Explorer and selected Example Applications such as the ChemBioNavigator, which are used in the daily work, but finally are not explicitly mentioned in publications.

4 References


