Intellectual Property Office

BL O/507/21

05 July 2021

PATENTS ACT 1977

APPLICANT	Innoplexus AG
ISSUE	Whether patent application GB1804870.2 is excluded under section 1(2)
HEARING OFFICER	J Pullen

DECISION

Background

1 Patent application GB1804870.2, entitled “System and method for identifying potential targets for pharmaceutical compound”, was filed on 27 March 2018 and was subsequently published as GB 2572538 A.

2 The application has not been searched. The examiner issued a report under section 17(5)(b) along with an abbreviated examination report, dated 2 October 2018, in which the examiner set out their objection that the invention is excluded from patentability as a program for a computer as such. The applicant disagreed and following several rounds of correspondence the applicant requested a decision on the papers with their letter of 24 March 2021.

3 In reaching my decision I confirm that I have considered all the correspondence on file, including letters from the applicant’s agent dated 26 March 2020 and 6 November 2020. Following a telephone conversation between the applicant’s agent and my assistant, Dr Stephen Richardson, held on 16 May 2021, the agent confirmed that their letter of 6 November 2020 amended the claims such that the set of claims included with the “Auxiliary Request” (filed with their letter of 26 March 2020) is the presently pending set of claims. Accordingly, I have based my decision upon amended claims 1-9 included with the “Auxiliary Request”.

The invention

4 The application relates generally to data mining and processing. Specifically, the invention concerns identifying potential targets for pharmaceutical compounds by extracting them from a database of data sources and information related to pharmaceutical compounds.

5 There are three independent claims directed to a system (claim 1), method (claim 5) and computer readable medium (claim 9). In my view, claims 1, 5 and 9 do not differ in substance, so will stand, or fall, together. Claim 1 defines the invention as follows:

1. A system that identifies potential targets for a pharmaceutical compound, wherein the system includes a computer system, characterized in that the system comprises:

- a database arrangement operable to store existing data sources and information related to the pharmaceutical compound; and

- a processing module communicably coupled to the database arrangement, the processing module operable to:

- receive information related to the pharmaceutical compound, wherein the information comprises at least one known target associated with the pharmaceutical compound;

- extract plurality of targets from existing data sources, wherein the existing data sources comprise plurality of data records and wherein each of the plurality of targets is associated with the pharmaceutical compound in at least one data record;

- analyse druggability of each of the plurality of targets to determine a preliminary set of targets;

- determine a net score for each of the targets in the preliminary set of targets; and

- designate targets with a net score above a predefined threshold, as the potential targets,

wherein the processing module is operable to determine the net score for a target based on:

- a genetic association score, wherein the genetic association score comprises likelihood of mutation in the target;

- a gene expression score, wherein the gene expression score is based on number of available gene expression studies related to the target;

- a somatic association score, wherein the somatic association score comprises likelihood of somatic mutations in the target;

- a pathway score, wherein the pathway score is based on a number of pathways related to the target; and

- a gene ontology score, wherein the gene ontology score is based on number of available gene ontologies related to the target.

The law

6 Section 1(2)(c) of the act sets out that certain things cannot be protected by a patent:

It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of -

(a)… ;

(b)… ;

(c) ***a scheme, rule or method for … doing business, or a program for a computer****;*

(d)… ;

but the foregoing provision shall prevent anything from being treated as an invention for the purposes of this Act only to the extent that a patent or application for a patent relates to that thing as such.

7 Well-established case-law provides guidance on determining whether an invention falls within this exclusion. In *Aerotel Ltd v Telco Holdings Ltd & Ors*[1] the Court of Appeal set out the following four-step approach for determining whether an invention is excluded under section 1(2):

1) properly construe the claims;

2) identify the actual or alleged contribution;

3) ask whether it falls solely within the excluded subject matter;

4) check whether the actual or alleged contribution is actually technical in nature.

8 In *Symbian Ltd's Application*[2], the Court made it clear that when determining whether a proposed invention is excluded, it does not matter whether the question of "whether the contribution is technical" is asked at step 3) or 4).

9 The examiner has based their analysis on *Aerotel* and *Symbian*. The examiner has also made use of the set of 'signposts' of *AT&T/CVON*[3] and *HTC v Apple*[4]. There is no disagreement between the examiner and the applicant as to the relevant law.

Argument and analysis

10 Beginning with step 1) of *Aerotel*, I consider that the claims are clear and are straightforward to construe. However, the agent's arguments appear to raise two issues of claim construction.

11 Firstly, in their letter of 26 March 2020, the agent argues that the analysis performed by the claimed invention goes beyond pure data processing because it is dealing with technical entities (i.e. the pharmaceutical compounds and the targets) and their interaction. However, I agree with the examiner that the invention does not define the features of physical pharmaceutical compounds or targets *per se*. I agree with the examiner that the claimed invention relates to a computer system characterised by a database of data records (i.e. information relating to pharmaceutical compounds, which may be in the form of articles, research papers, publications, dissertations and the like – see page 13, lines 9-14) and a processor that mines or extracts information relating to potential targets by assessing the druggability of targets and by scoring targets according to the steps defined in claim 1.

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[1] [2007] RPC 7
[2] [2009] RPC 1
[3] [2009] EWHC 343 (Pat)
[4] [2013] EWCA Civ 451

12 Secondly, in their letter of 6 November 2020, the agent argues that the system of claim 1, "ought to be seen as a system directing a laboratory in how to select and conduct experiments, not as mere processing within a computer." Consequently, the agent goes on to say that, "the present system processes representations of technical entities and provides suggestions that allow the lab technician to more speedily find and produce suitable drugs." While I agree that the end result of the claimed invention, i.e. the suggestions for potential targets, would undoubtedly be useful information for a lab technician, I cannot agree that the claimed invention has anything to do with conducting or directing laboratory experiments. As it is defined in the claims, the invention does not physically control or otherwise perform any experiment. The invention of claim 1 is confined to a system for mining information about potential targets for a given pharmaceutical compound from a database of information, as defined therein.

13 Moving on to step 2) of *Aerotel*, in their official letter dated 24 May 2021, the examiner identifies the contribution made by the invention of claim 1, in broad fashion, as being, "an automatic analysis of data in the database and of scoring possible targets according to a threshold". The agent disputes this. In their letter of 26 March 2020, the agent argues that the effect (i.e. the contribution) of the invention is "not merely that data entities are provided, but that candidate targets that will be tested in laboratories are provided, which thereby reduces the need for extensive laboratory testing." Like the examiner, I am not persuaded by this argument because it is not consistent with what is claimed. Claim 1 does not involve any form of laboratory testing, so any alleged effect on laboratory testing must fall entirely outside the claimed invention. In my view, the contribution made by the claimed invention does not lie in, nor have any effect upon, laboratory testing.

14 The agent submits that the examiner has erred by failing to consider the claim *as a whole* in their assessment of the invention. I agree the law requires that it is the claim as a whole that must be considered when assessing the contribution, e.g. as made clear in paragraph 64 of the judgment in *Lantana*[5]. However, I am unable to agree with the agent that the examiner's analysis is in error. I am satisfied that the examiner has correctly considered the claim as a whole in identifying the contribution made by the invention. I agree with the examiner that the contribution relates to the automatic analysis of data in the database and the scoring of possible targets according to a threshold.

15 The examiner and agent have also been unable to agree whether the invention reveals a relevant technical contribution, at steps 3) and 4) of *Aerotel*. The examiner is of the view that the contribution is not technical in nature. The agent disputes this, and in their letter of 26 March 2020 the agent relies on signposts i and v to argue the contribution is technical.

16 Signpost i asks, "whether the claimed technical effect has a technical effect on a process which is carried on outside the computer". The agent advances two lines of argument under this signpost. Firstly, the agent says the invention has a technical effect on a process performed outside a computer, namely the laboratory tests for the compound. The alleged effect on testing is that the group of potential targets to be tested is reduced based on the automatic analysis of the targets' ability to bind to

[5] *Lantana v Comptroller General of Patents* [2014] EWCA Civ 1463

the compound. I am unable to agree this is an effect of the invention because, as I have already said, the contribution does not involve laboratory testing.

17 Secondly, the agent argues that since the affinity of a target to bind with a compound is technical, its analysis must also be technical. Even if pharmaceutical compounds and targets can be regarded as having technical character 'outside' a computer, I do not agree it necessarily follows that the automatic analysis of information sources relating to compounds and targets performed by the present invention is technical. Everything the invention does goes on *inside* the computer. The invention has no technical effect on the pharmaceutical compounds or the targets themselves. Signpost i does not assist the applicant.

18 Signpost v asks, "whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented". The agent says that the invention provides a solution to the existing problem of ineffective and speculative potential targets provided by conventional methods of drug repositioning, which expedites the drug development process. Even if this problem is solved by the invention, I do not believe the solution provided by the invention is technical over and above its implementation as a computer program. Any effect provided by the present invention relates to the mere automation of the processing of information relating to pharmaceutical compounds and targets by a computer program. In my view, this effect falls entirely within the 'program for a computer' exclusion of section 1(2)(c).

19 In their letter of 06 November 2021, the agent identifies another problem that is said to be solved. The agent says, "the problem of having to run expensive laboratory tests is not simply side-stepped, as laboratory tests are still needed to confirm the findings. Only that the number of tests needed is greatly reduced, thereby reducing the problem and not circumventing it." However, I cannot agree that this is a problem that is solved by the claimed invention because, as I have already noted, the claims are not limited to performing or controlling any form of laboratory experiment.

20 In their letter of 26 March 2021, the agent argues that the reasoning of the decision in *Gene Onyx* BL O/435/14 indicates there is more to the applicant's present invention than simple or pure data processing, especially when analysing and scoring compounds and their interaction with living organisms (i.e. targets) is performed (even if performed by a computer). Like the examiner, I am not persuaded that a helpful analogy with *Gene Onyx* can be made. As the examiner points out, in *Gene Onyx* the invention in suit involved a step of testing a sample of genetic material from an individual to assess the suitability of active ingredients in skincare, cosmetic, cosmeceutical or nutricosmetic products for use by that individual. Unlike, *Gene Onyx*, the present invention does not involve any form of laboratory testing. I agree with the examiner that *Gene Onyx* does not help the applicant.

21 In their letter of 6 November 2020, the agent argues that, "The analysis to identify potential targets for a pharmaceutical compound is not a mere data processing, but a scientific and technical investigation into properties of components." While I accept that the data mining performed by the invention may well be a scientific investigation, based on my analysis above it is not one that is technical in nature, as required by steps 3) and 4) of the *Aerotel* approach.

22 In the same letter, the agent suggests that the analysis of the invention is performed by artificial intelligence, but as I understand it the application fails to disclose any application of “artificial intelligence”. The agent also argues that the invention’s analysis fulfils the same function as simulations and is thus equal to laboratory tests in importance. I do not agree. There is no doubt in my mind that the claimed invention does not involve any simulation of a physical process, nor any simulation of a technical process such as a laboratory test. Rather, the claimed invention is wholly directed to a process of extracting information relating to potential targets for a given pharmaceutical compound from a database of information (e.g. comprising academic papers and the like) and, in my view, this is not technical in nature.

Decision

23 For all the reasons given above, I conclude that claim 1 fails to reveal a relevant technical contribution and is, therefore, excluded under section 1(2)(c) as a program for a computer as such. Claims 2-9 are also so excluded. I refuse the application under section 18(3).

Appeal

24 Any appeal must be lodged within 28 days after the date of this decision.

J PULLEN

Deputy Director, acting for the Comptroller