FORM 2

THE PATENTS ACT, 1970

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AND

THE PATENT RULES, 2003

COMPLETE SPECIFICATION

(See section 10 and rule 13)

Title of Invention:

"ARTIFICIAL INTELLIGENCE BASED APPROACH FOR TARGETED AND THERAPEUTIC TREATMENT OF CANCER PATIENTS THROUGH NOVEL DRUG DELIVERY SYSTEMS"

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The following specification describes the invention and the manner in which it is to be performed.

FIELD OF INVENTION

The present invention relates to the field of designing & implementing a framework of Artificial Intelligence for targeted and therapeutic treatment of cancer patients. The proposed invention focuses on analyzing the impact of novel drug delivery techniques for treating cancer patients.

BACKGROUND OF INVENTION

[0001] Background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[0002] Targeted therapy is a type of cancer treatment. It uses drug to target specific genes and proteins that help cancer cells survive and grow. Targeted therapy can affect the tissue environment that cancer cells grow in, or it can target cells related to cancer growth, like blood vessel cells. It can also be used in combination with other cancer treatments, such as chemotherapy.

[0003] A number of different types of cancer disease analysis systems that are known in the prior art. For example, the following patents are provided for their supportive teachings and are all incorporated by reference.

[0004] Artificial intelligence in drug discovery and development:- The use of artificial intelligence (AI) has been increasing in various sectors of society, particularly the pharmaceutical industry. In this review, we highlight the use of

AI in diverse sectors of the pharmaceutical industry, including drug discovery and development, drug repurposing, improving pharmaceutical productivity, and clinical trials, among others; such use reduces the human workload as well as achieving targets in a short period of time. We also discuss crosstalk between the tools and techniques utilized in AI, ongoing challenges, and ways to overcome them, along with the future of AI in the pharmaceutical industry.

[0005] Artificial intelligence to deep learning: machine intelligence approach for drug discovery:- Drug designing and development is an important area of research for pharmaceutical companies and chemical scientists. However, low efficacy, off-target delivery, time consumption, and high cost impose a hurdle and challenges that impact drug design and discovery. Further, complex and big data from genomics, proteomics, microarray data, and clinical trials also impose an obstacle in the drug discovery pipeline. Artificial intelligence and machine learning technology play a crucial role in drug discovery and development. In other words, artificial neural networks and deep learning algorithms have modernized the area. Machine learning and deep learning algorithms have been implemented in several drug discovery processes such as peptide synthesis, structure-based virtual screening, ligand-based virtual screening, toxicity prediction, drug monitoring and release, pharmacophore modeling, quantitative structure–activity relationship, drug repositioning, polypharmacology, and physiochemical activity. Evidence from the past strengthens the implementation of artificial intelligence and deep learning in this field. Moreover, novel data

mining, curation, and management techniques provided critical support to recently developed modeling algorithms. In summary, artificial intelligence and deep learning advancements provide an excellent opportunity for rational drug design and discovery process, which will eventually impact mankind.

[0006] Some people with cancer will have only one treatment. Bust most people have a combination of treatment such as surgery with chemotherapy and or radiation therapy. The proposed invention focuses on analyzing and predicting the efficacy of targeted delivery of drug molecules.

[0007] Above information is presented as background information only to assist with an understanding of the present disclosure. No determination has been made, no assertion is made, and as to whether any of the above might be applicable as prior art with regard to the present invention.

[0008] In the view of the foregoing disadvantages inherent in the known types of cancer analysis systems now present in the prior art, the present invention provides an improved system. As such, the general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new and improved system for providing the therapeutic treatment to the cancer patients using algorithms of Artificial Intelligence that has all the advantages of the prior art and none of the disadvantages.

SUMMARY OF INVENTION

[0009] In the view of the foregoing disadvantages inherent in the known types of cancer analysis systems now present in the prior art, the present invention provides an improved one. As such, the general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new and improved system for analyzing the targetted and therapeutic treatment effect on cancer patients which has all the advantages of the prior art and none of the disadvantages.

[0010] The main objective of the proposed invention is to design & implement a framework of Artificial Intelligence for analyzing the impact of targeted treatment for cancer patients. The invention aims at predicting the best suitable therapeutic drug delivery system.

[0011] Yet another important aspect of the proposed invention is that a set of cancer patients are considered for the study. The targeted delivery of drugs through novel drug delivery systems are analyzed by the classification and prediction algorithms of Artificial Intelligence for predicting the most efficient drug delivery technique. The intention is to care the disease at faster rate and increase the life expectancy of cancer patients.

[0012] In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the various ways. Also, it is to be understood that the phraseology and terminology

employed herein are for the purpose of description and should not be regarded as limiting.

[0013] These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated preferred embodiments of the invention.

BREIF DESCRIPTION OF DRAWINGS

[0014] The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

Figure 1 illustrates the block diagram of Artificial Intelligence based approach for targeted and Therapeutic Treatment of Cancer Patients through novel Drug Delivery Systems, according to the embodiment herein.

DETAILED DESCRIPTION OF INVENTION

[0015] In the following detailed description, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that the

embodiments may be combined, or that other embodiments may be utilized and that structural and logical changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined by the appended claims and their equivalents.

[0016] While the present invention is described herein by way of example using several embodiments and illustrative drawings, those skilled in the art will recognize that the invention is neither intended to be limited to the embodiments of drawing or drawings described, nor intended to represent the scale of the various components. Further, some components that may form a part of the invention may not be illustrated in certain figures, for ease of illustration, and such omissions do not limit the embodiments outlined in any way. It should be understood that the drawings and detailed description thereto are not intended to limit the invention to the particular form disclosed, but on the contrary, the invention covers all modification/s, equivalents and alternatives falling within the spirit and scope of the present invention as defined by the appended claims. The headings are used for organizational purposes only and are not meant to limit the scope of the description or the claims. As used throughout this description, the word "may" be used in a permissive sense (i.e., meaning having the potential to), rather than the mandatory sense (i.e., meaning must). Further, the words "a" or "a" mean "at least one" and the word "plurality" means one or more, unless otherwise mentioned. Furthermore, the terminology and

phraseology used herein is solely used for descriptive purposes and should not be construed as limiting in scope. Language such as "including," "comprising," "having," "containing," or "involving," and variations thereof, is intended to be broad and encompass the subject matter listed thereafter, equivalents, and any additional subject matter not recited, and is not intended to exclude any other additives, components, integers or steps. Likewise, the term "comprising" is considered synonymous with the terms "including" or "containing" for applicable legal purposes. Any discussion of documents, acts, materials, devices, articles and the like are included in the specification solely for the purpose of providing a context for the present invention.

[0017] In this disclosure, whenever an element or a group of elements is preceded with the transitional phrase "comprising", it is understood that we also contemplate the same element or group of elements with transitional phrases "consisting essentially of, "consisting", "selected from the group consisting of", "including", or "is" preceding the recitation of the element or group of elements and vice versa.

[0018] Targeted therapy is a type of cancer treatment that targets proteins that control how cancer cells grow, divide, and spread. It's the foundation of precision medicine. As researchers learn more about the DNA changes and proteins that drive cancer, they are better able to design treatments that target these proteins.

[0019] Therapeutic treatment is treatment that is directed to a specific organ or

limited area of the body, such as the breast or an abnormal growth on the skin. Examples of local therapy used in cancer are surgery, radiation therapy, cryotherapy, laser therapy and topical therapy (medicine in a lotion or cream that is applied to the skin). The proposed invention focuses on designing a framework of Artificial Intelligence for analyzing the efficacy of drug delivery and targeted delivery of drugs for treating cancer.

[0020] Reference will now be made in detail to the exemplary embodiment of the present disclosure. Before describing the detailed embodiments that are in accordance with the present disclosure, it should be observed that the embodiment resides primarily in combinations arrangement of the system according to an embodiment herein and as exemplified in FIG. 1

[0021] Figure 1 illustrates the block diagram of Artificial Intelligence based approach for targeted and Therapeutic Treatment of Cancer Patients through novel Drug Delivery Systems 100. The proposed system 100 includes a Database of cancer patients 101 which is considered for the study. The targeted delivery 102 is combined with novel drug delivery techniques 103 which is used to treat the cancer patients 101. The Artificial Intelligence unit 104 will analyze the impact of targeted delivery 102 and novel drug delivery techniques 103 in treating cancer patients. The classification unit 105 will classify the drug delivery techniques according to their efficacy. The predictive unit 106 will predict the best drug delivery technique 103 and results of prediction are displayed on display unit 102.

[0022] In the following description, for the purpose of explanation, numerous specific details are set forth in order to provide a thorough understanding of the arrangement of the system according to an embodiment herein. It will be apparent, however, to one skilled in the art that the present embodiment can be practiced without these specific details. In other instances, structures are shown in block diagram form only in order to avoid obscuring the present invention.

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WE CLAIM

1. Artificial Intelligence based approach for targeted and Therapeutic Treatment of Cancer Patients through novel Drug Delivery Systems comprises of

   Artificial intelligence unit;

   Classification unit;

   Predictive unit and

   Drug delivery technique.

2. Artificial Intelligence based approach for targeted and Therapeutic Treatment of Cancer Patients through novel Drug Delivery Systems, according to claim 1, includes an artificial intelligence unit, wherein the artificial intelligence unit will analyse the various drug delivery techniques that are used for treating cancer patients.

3. Artificial Intelligence based approach for targeted and Therapeutic Treatment of Cancer Patients through novel Drug Delivery Systems, according to claim 1, includes a classification unit, wherein the classification unit will classify the cancer patients according to the treatment that is efficient on them.

4. Artificial Intelligence based approach for targeted and Therapeutic Treatment of Cancer Patients through novel Drug Delivery Systems, according to claim 1, includes a predictive unit, wherein the predictive unit will predict the efficiency of various drug delivery techniques.

5. Artificial Intelligence based approach for targeted and Therapeutic Treatment of Cancer Patients through novel Drug Delivery Systems, according to claim 1,

includes a drug discovery technique, wherein the drug discovery techniques will be analysed for their efficacy.

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ABSTRACT

ARTIFICIAL INTELLIGENCE BASED APPROACH FOR TARGETED AND THERAPEUTIC TREATMENT OF CANCER PATIENTS THROUGH NOVEL DRUG DELIVERY SYSTEMS

Artificial Intelligence based approach for targeted and Therapeutic Treatment of Cancer Patients through novel Drug Delivery Systems is the proposed invention. The proposed invention focuses on analyzing the various targeted and therapeutic treatments that are available for cancer patients through the algorithms of Artificial Intelligence. The

invention aims at identifying the best novel drug delivery technique for effective treatment of cancer patients.

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