PUBBLICAZIONE, ai sensi dell'art. 19 del D.lgs n. 33 del 14 marzo 2013, modificato dall'art. 18 del D.lgs n. 97 del 25 maggio 2016 come integrato dall'art.1 c. 145 della Legge 27 dicembre 2019 n. 160, delle domande della prova colloquio tenutosi in data 25 novembre 2024 come stabilite dalla commissione esaminatrice della selezione di seguito indicata:

Bando n. 400.6 IRIB PNC

Selezione per titoli e colloquio ai sensi dell'art. 8 del "Disciplinare concernente le assunzioni di personale con contratto di lavoro a tempo determinato", per l'assunzione, ai sensi dell'art. 141 del CCNL del Comparto "Istruzione e Ricerca" 2019-2021, sottoscritto in data 18 gennaio 2024, di una unità di personale con profilo professionale di Ricercatore III livello, presso l'Istituto per la Ricerca e l'Innovazione Biomedica del Consiglio Nazionale delle Ricerche – sede di Palermo – progetto "Digital Driven Diagnostics, prognostics and therapeutics for sustainable Health care (D34Health)" - (PNC-PNC0000001) - (CUP B53C22006100001) -

In relazione al bando in oggetto si dispone la pubblicazione sulla pagina del sito Internet del CNR agli indirizzi https://www.urp.cnr.it/ e https://selezionionline.cnr.it/ delle domande della prova colloquio allegate alla presente.

Il Responsabile del Procedimento
Sig.ra Daniela Riccobono

Daniela Riccobono
25.11.2024 19:43:10
GMT+02:00

DOMANDE BUSTE SELEZIONATE

DOMANDE – Busta n. 2

1. Il candidato descriva il suo percorso scientifico;
2.
   2a. Il candidato spieghi le tecniche di modellizzazione applicata a macro-processi biologici di rilevanza clinica;
   2b. Il candidato spieghi i processi di estrazione di cellule immuni da tessuto e sangue periferico;
3. Il candidato descriva le sue conoscenze nell'ambito delle applicazioni dell'intelligenza artificiale nel miglioramento della terapia ai pazienti;
4. Conoscenza della lingua inglese: lettura e compressione testo in allegato tratto da:

Nilmini WICKRAMASINGHE, Nalika ULAPANE, Elliot B SLOANE and Vijay GEHLOT

Digital Twins for More Precise and Personalized Treatment

Abstract. The use of Digital Twins (DTs) or the digital replicas of physical entities has provided benefits to several industry sectors, most notably manufacturing. To date, the application of DTs in the healthcare sector has been minimal, however. But, as pressure increases for more precise and personalized treatments, it behooves us to investigate the potential for DTs in the healthcare context. As a proof-of-concept demonstration prior to working with real patients, we attempt in this paper, to explore the potential for creating and using DTs. We do this in a synthetic environment at this stage, making use of data that is all computer-generated. DTs of synthetic present patients are created making use of data of synthetic past patients. In the real world, the clinical objective for creating such DTs of real patients would be to enable enhanced real-time clinical decision support to enable more precise and personalized care. The objective of the numerical experiment reported in this paper, is to envisage the possibilities and challenges of such an approach. We attempt to better understand the strengths and weaknesses of applying DTs in the healthcare context to support more precise and personalized treatments…..

DOMANDE – Busta n. 3

1. Il candidato descriva il suo percorso scientifico;
2.
   2a. Il candidato spieghi i metodi di Machine learning comunemente utilizzati per la creazione di modelli in silico di utilità clinica;
   2b. Il candidato spieghi le tecniche utilizzate per l'analisi dei meccanismi citotossici delle cellule del sistema immune nelle neoplasie solide;
3. Il candidato descriva le sue conoscenze nell'ambito delle applicazioni dei Digital Twins nelle immunoterapie;
4. Conoscenza della lingua inglese: lettura e compressione testo in allegato tratto da :

Tong Li, Yupeng Li, Xiaoyi Zhu, Yao He, Yanling Wu, Tianlei Ying, Zhi Xie

Artificial intelligence in cancer immunotherapy: Applications in neoantigen recognition, antibody design and immunotherapy response prediction

Abstract Cancer immunotherapy is a method of controlling and eliminating tumors by reactivating the body's cancer- immunity cycle and restoring its antitumor immune response. The increased availability of data, combined with advancements in high-performance computing and innovative artificial intelligence (AI) technology, has
resulted in a rise in the use of AI in oncology research. State-of-the-art AI models for functional classification and prediction in immunotherapy research are increasingly used to support laboratory-based experiments. This re- view offers a glimpse of the current AI applications in immunotherapy, including neoantigen recognition, antibody design, and prediction of immunotherapy response. Advancing in this direction will result in more robust predictive models for developing better targets, drugs, and treatments, and these advancements will eventually make their way into the clinical setting, pushing AI forward in the field of precision oncology…..

DOMANDE BUSTE NON SELEZIONATE

DOMANDE – Busta n. 1

1. Il candidato descriva il suo percorso scientifico;
2. 2a. Il candidato spieghi le tecniche di modellizzazione di sistemi biologici che ha utilizzato di recente;

   2b. Il candidato spieghi i saggi immunologici che ha usato di recente;
3. Il candidato descriva le sue conoscenze nell'ambito del Digital Twins e le possibili applicazioni in ambito immunologico;
4. Conoscenze della lingua inglese: lettura e compressione testo in allegato tratto da:

Maria Bordukova, Nik I Rodriguez-Esteban, Fabian Schmich & MichaeI P. Menden

Generative artificial intelligence empowers digital twins in drug discovery and clinical trials

Abstract Introduction: The concept of Digital Twins (DTs) translated to drug development and clinical trials describes virtual representations of systems of various complexities, ranging from individual cells to entire humans, and enables in silico simulations and experiments. DTs increase the efficiency of drug discovery and development by digitalizing processes associated with high economic, ethical, or social burden. The impact is multifaceted: DT models sharpen disease understanding, support biomarker discovery and accelerate drug development, thus advancing precision medicine. One way to realize DTs is by generative artificial intelligence (AI), a cutting-edge technology that enables the creation of novel, realistic and complex data with desired properties.
Areas covered: The authors provide a brief introduction to generative AI and describe how it facilitates the modeling of DTs. In addition, they compare existing implementations of generative AI for DTs in drug discovery and clinical trials. Finally, they discuss technical and regulatory challenges that should be addressed before DTs can transform drug discovery and clinical trials.
Expert opinion: The current state of DTs in drug discovery and clinical trials does not exploit the entire power of generative AI yet and is limited to simulation of a small number of characteristics. Nonetheless, generative AI has the potential to transform the field by leveraging recent developments in deep learning and customizing models for the needs of scientists, physicians and patients…..

DOMANDE – Busta n. 4

1. Il candidato descriva il suo percorso scientifico;
2. 2a. Il candidato spieghi l'utilità dei modelli ad agenti per spiegare dinamiche di interesse biologico;

   2b. Il candidato spieghi le procedure di proliferazione, differenziamento e mantenimento in vitro di cellule primarie del sistema immune;
3. Il candidato descriva come i modelli in silico siano utili per la predizione, diagnosi e prognosi in ambito clinico;
4. Conoscenza della lingua inglese: lettura e compressione testo in allegato tratto da:

Philippe Moingeon, Marylore Chenel, Cécile Rousseau, Emmanuelle Voisin, Mickael Guedj

Computational models are being explored to simulate in silico the efficacy and safety of drug candidates and medical devices. Disease models that are based on patients' profiling data are being produced to represent interactomes of genes or proteins and to infer causality in the pathophysiology, which makes it possible to mimic the impact of drugs on relevant targets. Virtual patients designed from medical records as well as digital twins are generated to simulate specific organs and to predict treatment efficacy at the individual patient level. As the acceptance of digital evidence by regulators grows, predictive artificial intelligence (AI)-based models will support the design of confirmatory trials in humans and will accelerate the development of efficient drugs and medical devices.

Introduction Randomized clinical trials remain the gold standard for evaluat- ing the efficacy and safety of new drugs. These complex and costly trials may, however, expose large populations of patients to unproven therapies for several years. Difficulties in patient selection, recruitment, monitoring and retention in conven- tional clinical studies all contribute to significant failure rates. In addition, while codified controlled trials are designed to eval- uate mass-market drugs, they are less adapted to test new treat- ments for complex heterogeneous chronic diseases or rare disease indications.

For those reasons, in silico simulations are attracting strong interest as an approach that complements classical clinical trials in the evaluation of investigational drugs or medical devices. .....