Carbon nanotubes and carbon nano composites, Prevention that we should do in Methicillin Resistance Staphylococcus Aureus: A systematic review

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Cover Letter

Problem:
The use of Antibiotic Resistance Marker Genes (ARMGs) in Genetic Modified Organism (GMO) has changed the risk of Antibiotic Resistance incidence, from the known one, caused by using antibiotic with low indication. The last one has been socialized to physicians and health workers intensively for the last 2 decades, and we lose the war. Nowadays, Methicillin Resistance Staphylococcus Aureus (MRSA) morbidity is reported going to change the Comorbid mortality in this COVID-19 pandemic, ventilator-acquired pneumonia (VAP) in ICUs mostly 47,1% caused by MRSA Methicillin-resistant Staphylococcus aureus. Interference: Say No to ARMGs in superior seed in tropical rainforest area also losing the society 5.0 in industry 4.0. Comparison: cover by New antibiotics generation for MRSA and other antibiotic resistance. This study digs the industry 4.0 era to complete with society 5.0
Outcome: Tropical rainforest as a superior seed producer for dry and hot climate area, or dry and cold climate area on carbon nanotube and carbon nano composites Fiber-Ceramic Industry 4.0, which cultivation of fish and plant for collagen and cellulose on produce raw material.

Abstract

Introduction
Biopolymer and bioplastic using Carbon NanoTube (CNT) has been reported in these last decades, especially on the fiber mechanic, which is known as carbon nano Composite (CNC) or Carbon NanoFiber (CNF) in Industry 4.0. The body of the Brompton bicycle is one of the examples of 4.0 Industry, strong and light, non-metal. The need for collagen and cellulose from fauna and flora in the tropical rainforest area, is being cultivated by using GMOs, whereas Blue Economy are proposed in thereverse way to produce this raw material, not in tropical rainforest area. In reverse, it purposed that the making of superior seed in tropical rainforest area without ARMGs which is done to decrease the economy saving for the nutrition in a seedling period, e.g. 21 days for rice. The reverse of producer location should be the resolving way of MRSA incidence.
Method: Systematic Review on References in CNT, CNC, cellulose, collagen, ceramic. enamel which support industry 4.0. Using Science Direct search engine and other search engine, with PRISMA design flowchart to gain the References which support the aim of this study.
Result: 19 References was revealed, most are Material Trials. No systematic review nor meta-analysis was included.

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Discussion: Amorph, crystalline, nanofiber in hydroxyapatite resin in mechanic, electromagnetic field and cartilage/bone stem cell engineering, to thin solid layer batteries, is associated with industry 4.0. which should be managed to one earth blue economy.
Conclusion: Industry 4.0 should be parallel with society 5.0 in fighting higher MRSA prevalence.

Keywords: Carbon nanotubes (CNTs), fiber, cellulose, collagen, ARMGs, cultivation

Introduction

In the Industry 4.0 technology, biopolymer and bioplastic for brompton body mechanic and Protective Equipment (PPE) need collagen from fauna, and cellulose from fauna tropical rainforest area, which act as a large natural incubator, a large green glasshouse. On the other hand, the biology molecular technology is now easy to cut and paste the DNA for dry-hot or dry-cold condition seed, parallel with the blue economy. The Blue economy underlies by the Zen philosophy founded by Gunter Pauli say indirectly, that used plant media for the economic goal to reverse the raw material production should not depend on cultivation in tropical rainforest countries. Markov Antibiotic Resistance Genes,[1] RNAi jumping over the species and genus barrier,[2] and Antibiotic Resistance Marker Genes (ARMGs) which is use to economy restriction in the nutrition of the inferior seed in the seedling period.[3] This effort should not be neglected in our one earth blue economy. Gunter Pauli anticipates it with Zen philosophy which is now known as society 5.0. Cellulose from Banana Pseudo-stem has been chase by industry 4.0,[4] parallel with bacterial cellulose for nanocrystal.[5] Ceramic-cellulose then also ceramic-collagen has been revealed in RNAi-TNFa inhibits particles which induced inflammation and osteolysis.[6] Extraction collagen from waste leather to produce composites is also reported.[7] The making of ceramic from collagen,[8] has reported also before as collagen nanoFiber,[9] and has a role in cartilage engineering,[10] and bone engineering.[11] Understanding the Carbon nanotubes (CNTs) and carbon nano composites (CNCs) will easier to understand Macro Industry factory 4.0 and Society 5.0 in association with MRSA for the decision-maker and policy taker.

Polyamide fill with CNT has also been described to make a mechanical gain.[12] Due to their outstanding properties, CNTs have been used in several technological fields. The range of Industry 4.0, range e.g. polyamide 6 fiber filled with CNT,[12] fabrication of small CNT,[13] CF been described reinforced carbon nano composites.[14] CNF reinforced electric field,[15] with SWCNT has been reported as stretchable polymer,[16] and CNT as polymer nano composite,[17] reported as gradation of diamond CNT.[18] CNT reinforced composite[19], strenghtness to a bullet,[20] resistance to fracture,[21] and high-performance lithium-sulfur batteries layer.[22] CNTs have remarkable mechanical,[12,24] thermal,[5,21,24] electronic,[16,17, 24, 25, 26] and biological,[11] properties due to their particular atomic structure made of graphene sheets that are rolled into cylindrical tubes.

Method

PRISMA design Systematic Review of CNT and CNC in fishery and cellulose cultivation using Science Direct search engines with keywords CNT and CNC and CNTNC fiber, and other search engines. Bayesian analysis and networking, take a heavy part in this study in association with biopolymer and bioplastic material technology, especially cellulose and collagen as raw materiel in ceramic and other Carbon Composite.
Systematic review and meta-analysis are preferable, also biomedical applications in using these materials. The recent author's name was used to dig their other manuscripts. The contemplation technique was also used to replace the second author in this study.

Result

Nine-teen of references which supports CnT (158,399) and CnT CnC (2,353) , 261 CnTnC fiber.
Fail to include some references in this Work from Home era, due to the COVID-19 pandemic, similar references are chosen. The function and technology of carbon nanotubes were included.

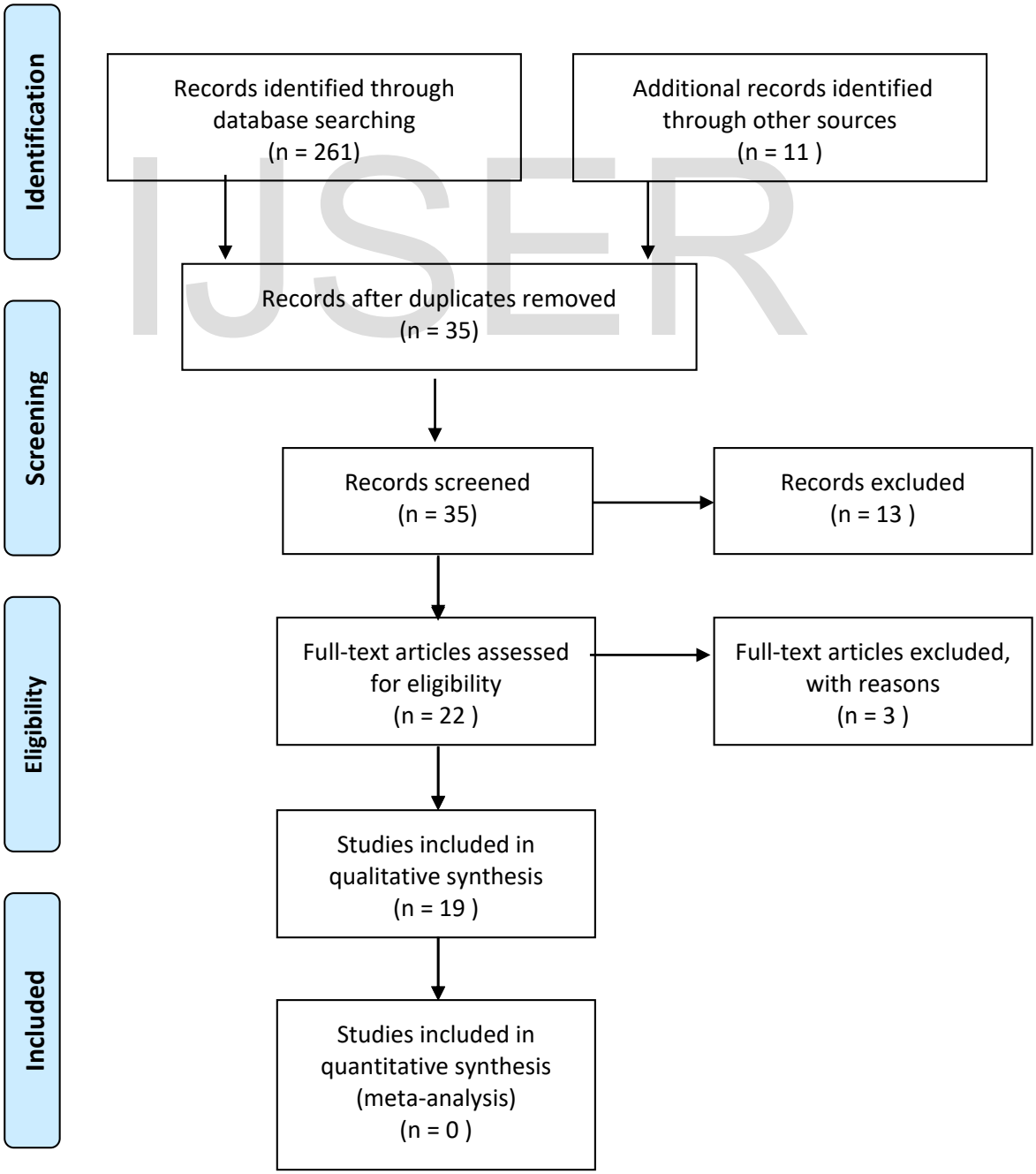

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Figure 1. Flowchart of 261 PRISMA design to 19 references CNTNC fiber

Table 1. Nine-teen references which support fiber in biopolymer filling with CNT

Study, year Journal	**Design**	**Population**	**CNTNC-Fiber**	**Function**
Chaudhry 2020 *Integrative Med Res*	Review	Polymers	pristine polyolefins	Low thermal conductivity
Liu, 2010 *CR Physique*	In situ assembly	High-quality CNTs	SWCNTs	Metal-catalyst free growth
Chuan 2018 *New Carbon Materials*	Device	Polyethylene imine Doping	SWCNT	High rectification ratio and LRSC
Cheng 2003 *CR Physique*	Review	Technological applications	CNT	Electron field emission
Yasukawa 1999 *Biophysical Journal*	MT	Single algal protoplast	p-benzoquinone	Photosynthetic Activity measurement
Vasconcelos 2017 *Revista Brasileira de Farmacognosia*	Observational	Leaves of Genipa americana	Ultra-structures, biominerals,etc	crystalline macro-pattern
Sa 2019 *Revista Brasileira de Farmacognosia*	Observational	Leaves of Averrhoa sp.	Oxalic acid	Diabetes treatment
Blot 2009 *NSC*	CT	Rat auditory brainstem neurons	Glutamin transport current	Neurotransmitters glutamate and GABA
Lee 2018 *Sci Rep*	MT	SWCNTs: ZnO	In various solvents and polymers	Nanospring –shaped
Saget 2020 *Sustainable Production and Consumption*	MT	The modern food system	Chickpea Protein-and fibre-rich legumes	Nutrition at a lower environmental cost
Short 2011 *Journal of Thoracic Oncology*	CT	Bronchial tree of 26 preneoplastic lesion	Auto fluorescence bronchoscopy	Drop Detection sensitivity of many false positive
Castro 2017 *Biochimie*	Docking	Pichia pastoris	Crystal structure of class I	Chitinase from cowpea hydrolyze
Pareira 2019 *Arabian Journal of Chemistry*	Docking	Tumor cell lines	Chalcone derivatives	Inhibitors of p53-MDM2 signaling apoptosis
Casali-Pereira 2015 *Chemosphere*	MT	Neotropical cladoceran survivalfertility	Toxicity of abamectin	Absorbance to organic material
Priscilla 2017 *Journal of Ethnopharmacology*	MT	Agqueous extract Cashew gum	antinociceptive	Inflammatory condition

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Boros 1984 *British Journal of Anaesthesia*	In vitro	Pethidine	Rat phrenic nerve-hemidiaphragma	Droperidol inhibitory
Fatima 2019 *Water Resources and Industry*	MT	f-Cadmium tungstated 37nm nanoparticles	Through green synthesis	Photocatalytic properties water treatment
Fittipaldi 2017 *Carbohydrate Polymers*	MT	Bacterial cellulose nanofibers	Amorphous and crystaline	New functionality to the material, higher crystallinity index
Ribeiro 2018 *Heliyon*	Rat model	39 rats with A gel of bacterial cellulose gel/BCG	Neovascularized, Colonized by fibroblast	Revert the loss of anal resting pressure after injury

Note: CNT: Carbon nanotube; CNC: Carbon nano Composite; CNf: Carbon nanofiber; SWCNTs: Single walled CNTs; LRSC: Low Reverse Saturation Current; MT: Material Trial; BCG: Bacterial cellulose gel

Yasukawa[27] 1999, Vasconcelos[28] 2017, Sa[29] 2019, Blot[30] 2009, Saget[31] 2020, Short[32] 2011, Castro[33] 2017, Pereira[34] 2019, Casali-Pereira[35] 2015, Priscilla[36] 2018, Boros[37] 1984, Fatima[38] 2019, Ribeiro[39] 2018 complete the references on table 1.

Discussion

1. Collagen and cellulose cultivation using ARMGs

Using Antibiotic Resistance Marker Genes (ARMGs) in the making of superior genes,[3] is parallel with the increasing incidence of MRSA whereas ventilator-acquired pneumonia (VAP) in ICUs only 26,4 % sensitive to methicillin (MSSA/ not MRSA),[40] and it is simillar reported that just 33% meropenem sensitive in certain ICU,[41] and meropenem still has become on of sensitive antibiotics in other room,[41] This MRSA will be more about in the Industry 4.0. Emergency Department clinicians reveal to improve their probability of causative organism of sepsis therapy,[42] and community-acquired MRSA has been reported.[43] Many ICU intubated patients with fever, leukocytes and pulmonary infiltrates have MRSA (30-40% reported as MRSA-VAP).[44] Plant and fish become the source of 4.0 Industry such as Brompton, Ceramic, banana pseudostem fiber that used Carbon Composite which also gains in resistance to bullet, strong composite, resistance to thermal, and fracture and other mechanical property. Semiconductor and optical aspect is also being conducted. The raw material came from cellulose and collagen and GMOs using ARMGs should be neglected and could be replaced by using sustainable 'Hara' (free nutrient) to produce superior seeds that are good in a dry and hot, or a dry and cold climate. In these non-wet climates, RNAi does not jump over species. The use of ARMGs is aiming broadly to push down the NPK in the seedling period for economic gain.[3]

2. CNT filling in fiber

Carbon nanotubes p-n junction diodes is the building block of New Generation integrated circuits,[25] known as chiplets, could be 1 nm diameter. In the other hand, CnT filling polyamide 6 fiber was reported, for mechanical properties,[12] green system water treatment,[38] CNT/CF reinforcement CNC,[14] supercapacitor MWCNT,[45]

3. All aspect

There are many technical intervention in making a better material, not only mechanic, but CNTs also have remarkable thermal,[23] electronic,[45] biological,[11] properties, almost all materials in the industry 4.0 era. Reinforcement of Composite by CnT, and CnF has been

reported.[14,19,20] There are also SWCNT,[17,46] DWCNT,[24] and MWCNT[45,47] and Carbon nanoBall as structure.
Inkjet-printed carbon nanotube forest arrays capable of detecting picomolar concentrations of immunoglobulin G (IgG) using electrochemiluminescence (ECL) are described. Patterned SWCNT forests were printed on indium tin oxide (ITO) electrodes.[20]

4. Cartilage and bone tissue engineering applications
In biomechanical engineering and stem cell therapy, this material science is also done on nano-micro scaffold through electrospinning,[47] nano crystal under different hydrolysis,[Fittipaldi 2016] till certain softness like in anal sphincter injury.[39] The using of CNT in bone tissue regeneration and engineering, give superiority advancements.[11]
The nano-micro composite provide increase hydrophilicity, tensile strength and bioactivity by MWCNT.[47]

5. Hydrogen generation
With the electrical automobile which change the fuel energy, batteries will colonize lithium, silicon, nickel material and not electricity, but hydrogen generation technology is also came to the peak. Graphene nanosheets-coated textile fibers, increase capacitance, and be the base of a supercapacitor.[45] Thin Solid Film (TSF) exhibited high stability with metallic Lithium. Solid electrolytes for rechargeable TF lithium batteries. TFLi electrolytes for all-solid-state micro-batteries. TSF for a capacitor. Rapid fade typical of typical composite cathodes. 'Thin-film capacitors a very interesting option to electrolytic capacitor, because they are simple, compact in structure and effective for the fabrication of high-frequency devices. Thin-film coating capacitors also improved processing characteristics and better dielectric strength. To determine the frequency-dependent complex-valued isotropic dielectric function for WO_3, a technical WO_3 thin films were developed.[49] A scalable nano-engineering method to make 3D-graphene-CNT hybrid fibers for Superconductor produced.[50]

6. Velocity Bullet impact
Intermediate velocity bullet impact has been reported, the response of laminated glass fiber reinforced hybrid (HEP) resin CNC.[20] Cooked chickpea pasta contains 3.2 times more fiber than cooked durum wheat pasta per kcal energy content. Protein-and fiber-rich leguminous crop substituting cereal contributing to non-communicable diseases related to malnutrition.[31] Leaves have a role in diabetes treatment,[29] and also in crystalline macro-pattern.[28] Crystal structure of class I made not only from leave cellulose,[49] but also from bacterial cellulose.[5]

7. The early technology on biomaterial science
CNT have recently emerged as a class of electron field emitters.[13] The emphasis is on the emission characteristics of macroscopic CNT cathodes and the relations with the underlying materials properties. A low threshold electric field for emission and a high emission current density make them attractive for technological uses.[13] The work on the controlled synthesis of SWCNT and DWCNT via floating catalyst chemical vapor deposition and arc-discharge methods are reported.[24] The findings on metal-catalyst-free growth of SWCNTs have been introduced, including in film, rope, and books.[24] The unique structure of distorted hexagonal Nano spring Shaped-CNTs (NS-CNTs) encircled around ZnO nanoparticles which was formed by the bending SWCNTs etc. increase the relative dielectric constant (K) of polymer nano composite, with only a small dielectric loss tangent(D).[17]

<u>Limitation</u>

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Because of the shorter follow-up experience with the study of MRSA patients, the other side of low sensitivity is reported and no one dares report the percentage number of the resistance. Soft Diction with the aim of hindrances has now been covered by the Emergency Department of clinicians, ICU anesthetists, PICU/NICU health workers' comments. Meta-analysis as the icon of quantitative references prefers by PRISMA Systematic Review design could not be found with the keywords, but material technology trials with mathematical, mechanical, electrical, and biological measurements dominate this study. Reporting of CNT, CNC, CNF with variable size and shape, also ball shape. The application of CNT and CNC in Industry 4.0 could easily be found in the online shop engine. Graphene and other composites, which are almost used in all industry 4.0. The technology, which using cellulose and collagen in industry 4.0 should be parallel with thinking the effect in society 5.0, and that is medical society MRSA. Changing the tropical rainforest (a wet and warm climate) as a superior seed producer without ARMGs[1,3] cause of the free nutrition during the seedling period, to plant in dry warm or cold climate area, will be conquered the jumping over RNAi[2] as methylation technology used in silencing inferior seed DNA.[3]

Conclusion

CNT and CNC describe the macro fiber in the 4.0 industry, describe an excess to MRSA and others environments that should be anticipated.

Conflict of Interest

None

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