Karthikeyan Ramalingam

Karthikeyan Ramalingam , Dean, Student Affairs and Associate professor, BSA Crescent Institute of Science and Technology with over 20 years of laboratory knowledge, including academic, government, and industrial projects, handling experience with excellent supervisory skills and a strong record of scientific accomplishments and publications. In nanoemulsion sciences experienced from the University of Texas Health Science Center at San Antonio, Texas, USA, US Naval Medical Research Unit, San Antonio, Texas, USA, New York University, USA, Nottingham University, UK and received funds for nanoemulsions research from Department of Defense, Navy, USA ($105,900), DST-SERB (Rs. 23 lakhs) and ICMR (15 lakhs) and USA-NSF-SBIR ($475,766) as principle investigator.

Publications

Scope of Artificial Intelligence in Agriculture: A Review on Futuristic Applications of Artificial Intelligence in Farming (/chapter/scope-of-artificial-intelligence-in-agriculture/318851)

Divya R., Karthikeyan Ramalingam, Sneha Unnikrishnan. © 2023. 20 pages.

The world population will increase by two billion in the year 2050 as per the United Nations Food and Agriculture Organization. To meet the needs of people, more efficient...

Anti-Aging Activity of Natural Products: Applications and Future Perspectives (/chapter/anti-aging-activity-of-natural-products/327305)

Fariya Ahmed M., Sneha Unnikrishnan, Karthikeyan Ramalingam. © 2023. 27 pages.

Natural products are used to cure dermatologic disorders like anti-aging, acne, hives, etc. Natural products are sources of novel drugs and aid in drug development in the...

Medicinal Plant Treatments for Peptic Ulcers: Applications and Future Perspectives (/chapter/medicinal-plant-treatments-for-peptic-ulcers/327309)

G. Nivetha, Sneha Unnikrishnan, Karthikeyan Ramalingam. © 2023. 28 pages.

A peptic ulcer is a prevalent gastrointestinal disorder affecting a significant proportion of the global population. The use of steroidal and non-steroidal anti-inflammatory...

Handbook of Research on Nanoemulsion Applications in Agriculture, Food, Health, and Biomedical Sciences (/book/handbook-research-nanoemulsion-applications-agriculture/270397)

Karthikeyan Ramalingam. © 2022. 671 pages.

Nanoemulsions are produced by mixing an oil phase with an aqueous phase under shear pressure. This procedure yields uniform populations of oil droplets ranging in diameter from...

Phytochemicals: Their Therapeutic Potential Against Dental Caries (/chapter/phytochemicals/289480)

Karthikeyan Ramalingam, Bennett T. Amaechi. © 2022. 37 pages.

The chapter gives a picture of the current data on the available anticariogenic natural products and their mechanism of action. Different phytochemicals such as phenols...

The Essential Properties of Nanoemulsions: Basics of Nanoemulsion (/chapter/the-essential-properties-of-nanoemulsions/295456)

Mohamed Akif S., Jahangir Ahmed, Karthikeyan Ramalingam. © 2022. 23 pages.

Nanoemulsions are a submicron with colloidal particulate systems ranging from 10 to 1,000 nm in size. Nanoemulsions hold enormous scope in the field of cosmetics, diagnostics...

Composition and Efficacy of Essential Oil Nanoemulsions (/chapter/composition-and-efficacy-of-essential-oil-nanoemulsions/295459)

Sowbarnika Arul Senthil, Sneha Unnikrishnan, Karthikeyan Ramalingam. © 2022. 34 pages.

Essential oil, endorsed as a natural cum powerful ingredient, encompasses incredible properties, and various approaches have been proposed and spurred over the last decades. One...

Antimicrobial Mechanisms and Mode of Actions of Nanoemulsion Against Drug-Resistant ESKAPE Pathogens (/chapter/antimicrobial-mechanisms-and-mode-of-actions-of-nanoemulsion-against-drug-resistant-eskape-pathogens/295463)

Karthikeyan Ramalingam, Mohd Hashim Khan. © 2022. 27 pages.

An enhancement of antibiotic resistance in bacteria is associated with increased morbidity, mortality, and health infrastructure and hospital care charges. The Infectious...

Nanoemulsion-Based Antiviral Drug Therapy: Insight and Applications (/chapter/nanoemulsion-based-antiviral-drug-therapy/295465)

Halima M., Ihsana Banu Ishthiaq, Sneha Unnikrishnan, Karthikeyan Ramalingam. © 2022. 19 pages.

Nanoemulsions are an attractive approach for the delivery of antiviral drugs in the treatment of various viral infections. Nanoemulsions are easy to plan and develop, and their...

Microbes as Sustainable Biofertilizers: Current Scenario and Challenges (/chapter/microbes-as-sustainable-biofertilizers/299310)

Halima M., Sneha Unnikrishnan, Karthikeyan Ramalingam. © 2022. 21 pages.

Across the globe, in both developed and developing countries, wheat provides the fundamental support for all other important foods. However, due to climate change, environmental...

In Vitro and in Vivo Models for Pathogenic Neisseria gonorrhoeae Infections (/chapter/in-vitro-and-in-vivo-models-for-pathogenic-neisseria-gonorrhoeae-infections/305260)

Karthikeyan Ramalingam, Sucharithra Ganesh. © 2022. 31 pages.

The prevalence of gonorrhea has not discontinued in several countries and still remains as one of the top sexually transmitted diseases (STD) and it's caused by Neisseria...

In Vitro and in Vivo Models for Pathogenic Neisseria gonorrhoeae Infections (/chapter/in-vitro-and-in-vivo-models-for-pathogenic-neisseria-gonorrhoeae-infections/271560)

Karthikeyan Ramalingam, Sucharithra Ganesh. © 2021. 33 pages.

The prevalence of gonorrhea has not discontinued in several countries and still remains as one of the top sexually transmitted diseases (STD) and it's caused by Neisseria...

Microbes as Sustainable Biofertilizers: Current Scenario and Challenges (/chapter/microbes-as-sustainable-biofertilizers/276658)

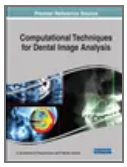
Halima M., Sneha Unnikrishnan, Karthikeyan Ramalingam. © 2021. 20 pages.

Across the globe, in both developed and developing countries, wheat provides the fundamental support for all other important foods. However, due to climate change, environmental...

Bioremediation: A Logical Approach for the Efficient Management of Textile Dye Effluents (/chapter/bioremediation/242020)

Sneha Unnikrishnan, Nagamani Bora, Karthikeyan Ramalingam. © 2020. 24 pages.

Synthetic dyes are extensively used in several industries and the dyes are great concern for the ecosystem. During the dyeing process, a certain percentage of the used dye is...



Phytochemicals: Their Therapeutic Potential Against Dental Caries (/chapter/phytochemicals/216052)

Karthikeyan Ramalingam, Bennett T. Amaechi. © 2019. 38 pages.

The chapter gives a picture of the current data on the available anticariogenic natural products and their mechanism of action. Different phytochemicals such as phenols...

Technologies, Artificial Intelligence and the Future of Learning Post-COVID-19 pp 237–253

Willingness to Communicate in Face-To-Face and Online Language Classroom and the Future of Learning

G. Bhuvaneswari, Rashmi Rekha Borah & Moon Moon Hussain

Chapter | First Online: 17 February 2022

Part of the Studies in Computational Intelligence book series (SCI,volume 1019)

Abstract

Meaningful communication inside and outside language classrooms is emphasized in second/foreign language (L2) learning theories. Language learners must use the target language in this regard. They do, however, have significant differences in terms of how much they talk. This dis-parity has been partially explained by the willingness to communicate in foreign/second languages. In recent years, its relationship with various social, personal, and affective factors has been studied in various settings. However, much research has been done into the use of L2 in classrooms, particularly in India. Furthermore, even though language classrooms are the primary platforms for most students, this has gone unnoticed in conjunction with classroom environmental factors so far. As a result, the purpose of this research was to look into the motivation levels of students and willingness to communicate in the online and face-to-face classroom and the relationship between the two variables. This study investigates the relationship between student's perceptions of the classroom environment, online and offline, and their willingness to communicate in the classroom. The samples were 326 students (undergraduate, post-graduate and PhD scholars), and questionnaires were used to collect data. The majority of the students believed their face-to-face classroom had comfort and willingness to communicate, according to the results. Furthermore, students' affiliation and role orientation in the classroom were positively and substantially correlated with their willingness to interact in individual and group communication with classmates and teachers accordingly. To put it another way, the more favourably students feel comfortable, the more eager they are to interact.

Keywords

Online classrooms **Face-to-Face** **Virtual learning**

Willing to communicate

References

1. Tomas, C. L., & Carlson, C. L. (2015). How do Facebook users believe they come across in their profiles?: A meta-perception approach to investigating Facebook self-presentation. *Communication Research Reports, 32*(1), 93–101.

2. Ellis, R. (1991) Grammar teaching—practice or consciousness-raising?" In R. Ellis (Ed.), Second language acquisition and second language pedagogy, 232–241. Clevedon, Avon: *Multilingual Matters*.

3. Pajares, F., & Valiante, G. (1999). Grade level and gender differences in the writing self-beliefs of middle school students. *Contemporary Educational Psychology, 24*, 3907405.

4. MacIntyre, P. D., & Charos, C. (1996) Personality, attitudes, and affect as predictors of second language communication. *Journal of Language and Social Psychology, 15*, 3–26. https://doi.org/10.1177/0261927X960151001

5. MacIntyre, P. D., Clément, R., Dörnyei, Z., & Noels, K. A. (1998). Conceptualizing willingness to communicate in a L2: A situational model of L2 confidence and affiliation. *The Modern Language Journal, 82*(4), 545–562. (1998).

6. Hashimoto, Y. (2002). Motivation and willingness to communicate as predictor Predictors of reported L2 use: The Japanese context. *Second Language Studies, 20*(2), 29–70.

7. Cao, Y., & Philp, J. (2006). Interactional context and willingness to communicate: A comparison of behavior in whole class, group and dyadic interaction. *System, 34*(4), 480–493.

8. Oz, H., & Demirezen, M., & Pourfeiz, J. (2015) Emotional intelligence and attitudes towards foreign language learning: Pursuit of relevance and implications. *Procedia—Social and Behavioral Sciences, 186*, 416–423. https://doi.org/10.1016/j.sbspro.2015.04.118.

9. Alemi, M., Parisa, D., & Pashmforoosh, R. (2011) The impact of language anxiety and language proficiency on WTC in EFL context. *Cross-Cultural Communication, 7*, 150–166. https://doi.org/10.3968/j.ccc.1923670020110703.152.

10. Donovan, L. A., & MacIntyre, P. D. (2004). Age and sex differences in willingness to communicate, communication apprehension, and self-perceived competence. *Communication Research Reports, 21*(4), 420–427. https://doi.org/10.1080/08824090409360006.

11. Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*(2), 111–127. https://doi.org/10.1207/s15326985ep4102_4.

12. Walther, J. B. (1996). Computer-mediated communication impersonal, interpersonal, and hyperpersonal interaction. *Communication Research, 23*(1), 3–43.

13. Peng, J.-E., & Woodrow, L. (2010) Willingness to communicate in English: A model in the Chinese EFL classroom context. *Language Learning, 60*, 834–876. https://doi.org/10.1111/j.1467-9922.2010.00576.x.

14. Bhuvaneswari, G., & Vijayakumar, S. (2021). Emotional intelligence and values in digital world through emoticons among indian students and faculty. *International Journal of Asian Education, 2*(2), 267–276. https://doi.org/10.46966/ijae.v2i2.142.

15. Chan, B., & McCroskey, J. C. (1987). The WTC scale as a predictor of classroom participation. *Communication Research Reports, 4*(2), 47–50.

16. MacIntyre, P. D., Babin, P. A., & Clément, R. (1999). Willingness to communicate: Antecedents & consequences. *Communication Quarterly, 47*(2), 215–229.

17. Zakahi, W. R., & McCroskey, J. C. (1989). Willingness to communicate: A potential confounding variable in communication research. *Communication Reports, 2*(2), 96–104.

18. MacIntyre, P. D., Baker, S. C., Clément, R., & Conrod, S. (2001). Willingness to communicate, social support, and language-learning orientations of immersion students. *Studies in Second Language Acquisition, 23*(03), 369–388.

19. Skehan, P. (1991). Individual differences in second language learning. *Studies in Second Language Acquisition, 13*, 275–298. https://doi.org/10.1017/S0272263100009979.

20. Kang, S. J. (2005). Dynamic emergence of situational willingness to communicate in a second language. *System, 33*(2), 277–292.

21. McCroskey, J. C., & Elaine, B. J. (1985). Willingness to communicate: The construct and its measurement.

22. Fåhræus, E. R., Bridgeman, N., Rugelj, J., Chamberlain, B., & Fuller, U. (1999). Teaching with electronic collaborative learning groups: Report of the ITiCSE'99 Working Group on Creative Teaching of Electronic Collaborative Learning Groups. In *Annual Joint Conference Integrating Technology into Computer Science Education*. (Cracow, Poland). ACM, NY, USA, 121–128. (1999)

23. Bhuvaneswari, G. (2016). 'Teacher Cognition' *International Journal of Economic Research, 13*(3), 693–695.

24. Bhuvaneswari, G., Swami, M., Jayakumar, P. (2020). Online classroom pedagogy: Perspectives of undergraduate students towards digital learning. *International Journal of Advanced Science and Technology, 29*(04),

6680–6687. Retrieved from http://sersc.org/journals/index.php/IJAST/article/view/28069.

25. Cooley, R. E., Roach, D. A. (1984). "A Conceptual Framework," In R. N. Bostrom (Ed.) *Competence in Communication: A Multidisciplinary Approach*, (Beverly Hills, CA: Sage) 25.

Author information

Authors and Affiliations

School of Social Sciences and Languages, Vellore Institute of Technology, Chennai, India

G. Bhuvaneswari & Rashmi Rekha Borah

B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India

Moon Moon Hussain

Editor information

Editors and Affiliations

College of Business and Finance, Ahlia University, Manama, Bahrain

Prof. Allam Hamdan

College of Computers and Artificial Intelligence, Cairo University, Giza, Egypt

Dr. Aboul Ella Hassanien

AACSB International, Tampa, FL, USA

Prof. Timothy Mescon

Majan University College, Muscat, Oman

Assist. Prof. Bahaaeddin Alareeni

Ethics declarations

No conflict of interest exists.

Appendix

Questionnaire

Directions: We would like to get your inputs for the below questions to understand, analyze and evaluate how willingly people communicated concerning online and face-to-face communication. People respond differently when the environment changes from online to a face-to-face environment. Therefore, a questionnaire for online communication and face-to-face communication has been given.

Online Communication

Select any one of the values from “Never”,” Sometimes”, “Frequently”, and “Always” for each of the questions. There will be a corresponding question in the face to face communication section for analysis.

1. I feel comfortable talking to a group of strangers without looking at their face in the classroom.
2. I can initiate talking to a group of strangers online in the classroom.
3. I can participate in online Group Discussions in the classroom.
4. In an online classroom, I can talk to my classmates, who I don’t know before.
5. I can present any speech online comfortably.
6. I feel comfortable talking without looking at people.
7. Communications are easy online.
8. I have felt miscommunication in online classes.
9. I feel comfortable talking to the teacher online without the need to look at the teacher.
10. I feel comfortable listening to teachers online.

Offline Communication—Face to Face communication.

Select any one of the values from “Never”,” Sometimes”, “Frequently”, and “Always” for each of the questions.

11. I am shy about talking to a group of strangers.
12. I like to initiate group discussion.
13. I enjoy talking to new people.
14. I can present a talk to a group of strangers.
15. I can talk in a large meeting of acquaintances.
16. I can initiate asking for doubts/questions in the classroom.
17. Communications are easy in face-to-face communication.
18. I can listen comfortably face-to-face.
19. Eye contact is important in communicating with the teacher.

20. I feel miscommunication in the classroom.

Rights and permissions

Reprints and Permissions

Copyright information

About this chapter

Cite this chapter

Bhuvaneswari, G., Borah, R.R., Hussain, M.M. (2022). Willingness to Communicate in Face-To-Face and Online Language Classroom and the Future of Learning. In: Hamdan, A., Hassanien, A.E., Mescon, T., Alareeni, B. (eds) Technologies, Artificial Intelligence and the Future of Learning Post-COVID-19. Studies in Computational Intelligence, vol 1019. Springer, Cham. https://doi.org/10.1007/978-3-030-93921-2_14

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-030-93921-2_14	17 February 2022	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-030-93920-5	978-3-030-93921-2	Intelligent Technologies and Robotics Intelligent Technologies and Robotics (R0)

Ashok Kumar Pandurangan

Ashok Kumar Pandurangan is an associate professor in School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Vandalur, Chennai, India. He pursued his PhD in the prestigious University of Madras, Guindy campus, Chennai, India in the area of natural products as a therapeutic agent for colorectal cancer. Later, he was postdoctoral researcher in Center for Cancer research, Children's Hospital Oakland Research Institute, Oakland, California, USA. Further he completed two postdoctoral research programs in Department of Nutrition and Dietetics, Universiti of Putra Malaysia and Department of Pharmacology, University of Malaya, Malaysia. He is currently interested to work in the area of colitis associated cancer (CAC) in murine model. Colitis associated cancer is very common nowadays in developing countries. Ulcerative Colitis (UC) is a type of Inflammatory Bowel Disease (IBD), if untreated can be a risk of developing as colitis associated cancer. Numerous studies are underway to identify drugs that control both inflammation and cell proliferation. So, he is interested in identify some novel drugs from natural source and elucidate the molecular mechanisms involved in the process of curing colitis associated cancer. He published several articles on the effects of natural agents in these areas of interest.

Publications

Pharmacological Benefits of Natural Agents (/book/pharmacological-benefits-natural-agents/303948)

Narayanaswamy Radhakrishnan, Srinivasan Vasantha, Ashok Kumar Pandurangan. © 2023. 440 pages.

Many natural products are known to have health-promoting pharmaceutical activities. For example, capsaicin, curcumin, epigallocatechin, resveratrol, and quercetin have been...

Protective Effects of Cannabis in Neuroinflammation-Mediated Alzheimer's Disease (/chapter/protective-effects-of-cannabis-in-neuroinflammation-mediated-alzheimers-disease/320042)

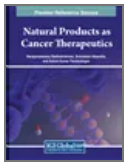
Mohd Kashif, Mohammad Waseem, Poornima D. Vijendra, Ashok Kumar Pandurangan. © 2023. 28 pages.

In recent years, Alzheimer's disease (AD) has been recognized as an age-related neurological disorder wherein neurons degenerate and exhibit abnormal structure and function....

Role of Cannabinoids in the Regulation of Amyotrophic Lateral Sclerosis (ALS) (/chapter/role-of-cannabinoids-in-the-regulation-of-amyotrophic-lateral-sclerosis-als/320047)

Akila Muthuramalingam, Ashok Kumar Pandurangan, Subhamoy Banerjee. © 2023. 17 pages.

Amyotrophic lateral sclerosis (ALS) is a degenerative disease that manifests in older adults as a result of death of motor neurons. Incidence is 60-80% sporadic and 10-20%...



Natural Products as Cancer Therapeutics (/book/natural-products-cancer-therapeutics/324094)

Narayanaswamy Radhakrishnan, Srinivasan Vasantha, Ashok Kumar Pandurangan. © 2023. 388 pages.

The field of cancer therapeutics faces challenges like limited treatment options, adverse side effects, and drug resistance, leaving a critical gap in addressing this disease....

Handbook of Research on Natural Products and Their Bioactive Compounds as Cancer Therapeutics (/book/handbook-research-natural-products-their/276934)

Ashok Kumar Pandurangan, Suresh Kumar Anandasadagopan, Fahad A. Alhumaydhi. © 2022. 643 pages.

Many chemotherapeutic agents are available in today's market that are highly effective against a variety of cancer types; however, the major drawbacks of these chemotherapeutic...

An Update on the Effect of Natural Products on Oncogenic Transcription Factors in Triple Negative Breast Cancer (/chapter/an-update-on-the-effect-of-natural-products-on-oncogenic-transcription-factors-in-triple-negative-breast-cancer/299794)

Ashwathi Vijayalekha, Prathibha Sivaprakasam, Suresh Kumar Anandasadagopan, Ashok Kumar Kumar Pandurangan, Tamilselvi Alagumuthu. © 2022. 26 pages.

Breast cancer is the most aggressive and rapidly growing cancer worldwide. It is classified into several subtypes among which triple negative breast cancer (TNBC) is the most...

The Molecular Mechanisms Involved in Suppressing Triple Negative Breast Cancer Using Natural Agents (/chapter/the-molecular-mechanisms-involved-in-suppressing-triple-negative-breast-cancer-using-natural-agents/299796)

Saabira Banu Sahubar Sadik, Prathibha Sivaprakasam, Nishanthi Ramasami, Ashok Kumar Pandurangan. © 2022. 27 pages.

Breast cancer is an aggressive and primary cause of death among women globally. Triple negative breast cancer (TNBC) is one of the sub types of breast cancer. TNBC lacks the...

Effects of Nigella sativa and Its Active Ingredient Thymoquinone on Breast Cancer (/chapter/effects-of-nigella-sativa-and-its-active-ingredient-thymoquinone-on-breast-cancer/299805)

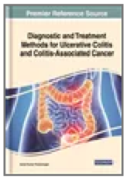
Syed Faisal Jahir Hussain, Mohammed Adil A., Durga Munireddy, Ashok Kumar Kumar Pandurangan. © 2022. 15 pages.

Breast cancer (BC) is the most prevalent malignancy in women. The main treatment for BC is surgery and chemotherapy. Generally, the chemotherapeutic drugs used for treatment...

Current Update on Natural Agents Against Triple Negative Breast Cancer (/chapter/current-update-on-natural-agents-against-triple-negative-breast-cancer/305269)

Prathibha Sivaprakasam, Sureshkumar Anandasadagopan, Tamilselvi Alagumuthu, Ashok Kumar Pandurangan. © 2022. 18 pages.

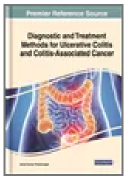
Breast cancer (BC) is sub-categorized into several well-recognized subtypes including estrogen receptor (ER), progesterone receptor (PR), and HER2 triple-negative breast cancer...



Diagnostic and Treatment Methods for Ulcerative Colitis and Colitis-Associated Cancer (/book/diagnostic-treatment-methods-ulcerative-colitis/243482)

Ashok Kumar Pandurangan. © 2021. 309 pages.

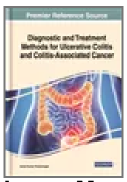
In recent years, epidemiological studies have shown a significant increase of incidences regarding ulcerative colitis (UC) in most regions of the world. At present, a common...



Protagonist of Immuno-Profiling, Immuno-Scoring, and Immunotherapy Towards Colitis-Associated Cancer: Systematic Review (/chapter/protagonist-of-immuno-profiling-immuno-scoring-and-immunotherapy-towards-colitis-associated-cancer/274078)

Mohamed Adil, Anandraj K. Vaithy.k, Ashok Kumar Pandurangan, Mohammad Waseem, Neesar Ahmed. © 2021. 14 pages.

Chronic inflammation in the large intestinal epithelial to rectum is a major risk for malignancies. The pathogenesis of colitis associated cancer is distinct with perilous...



Diagnostic and Treatment Methods for Ulcerative Colitis and Colitis-Associated Cancer: Natural Agents Therapy for Ulcerative Colitis – Elucidating the Mechanism of Action (/chapter/diagnostic-and-treatment-methods-for-ulcerative-colitis-and-colitis-associated-cancer/274080)

Syed Nasar Rahaman, Prathiba Sivaprakasam, Ashok Kumar Pandurangan, Suresh Kumar Anandasadagopan. © 2021. 29 pages.

Ulcerative colitis (UC) is a serious health problem around the world. Inflammatory bowel disease (IBD) is comprised of both Crohn's disease (CD) and UC. IBD is a clinical...

The Multifaceted Role of Natural Agents in Colitis-Associated Cancer Prevention and Therapy (/chapter/the-multifaceted-role-of-natural-agents-in-colitis-associated-cancer-prevention-and-therapy/274086)

Ashok Kumar Kumar Pandurangan, Suresh Kumar Anandasadagopan, Neesar Ahmed. © 2021. 20 pages.

Inflammatory bowel disease (IBD) is comprised of ulcerative colitis (UC) and Crohn's disease (CD) that was recognized by the inflammation in the colon. There are no proper...

Current Update on Natural Agents Against Triple Negative Breast Cancer (/chapter/current-update-on-natural-agents-against-triple-negative-breast-cancer/252937)

[illegible]prakasam, Sureshkumar Anandasadagopan, Tamilselvi Alagumuthu, Ashok Kumar Pandurangan. © [illegible].

Breast cancer (BC) is sub-categorized into several well-recognized subtypes including estrogen receptor (ER), progesterone receptor (PR), and HER2 triple-negative breast cancer...

ScienceDirect

Copper Nanostructures: Next-Generation of Agrochemicals for Sustainable Agroecosystems

Nanobiotechnology for Plant Protection

2022, Pages 367-391

Chapter 15 - Nanostructured materials based on copper/carbon as a plant growth stimulant

Shagufta Afreen [a], Rishabh Anand Omar [b], Neetu Talreja [c], Divya Chauhan [d], R.V. Mangalaraja [c], Mohammad Ashfaq [c e]

[a] CAS Key Laboratory of Bio-Based Materials, Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences, Qingdao, PR China
[b] Center for Environmental Science and Engineering, Indian Institute of Technology Kanpur, Kanpur, India
[c] Advanced Ceramics and Nanotechnology Laboratory, Department of Materials Engineering, Faculty of Engineering, University of Concepción, Concepción, Chile
[d] Department of Chemical and Biomedical Engineering, University of South Florida, Tampa, FL, United States
[e] School of Life Science, BS Abdur Rahman Institute of Science and Technology, Chennai, India

Available online 21 January 2022, Version of Record 21 January 2022.

Abstract

Continuously increasing global population growth requires an adequate amount of food to fulfill the requirements of all living creatures. The demand for food might be fulfilled by increasing the yield of crops. In this regard, nanostructured materials have become more accepted in various areas of research, including agriculture. Nanostructured materials have improved the development of plants and the efficiency of the crops, as well as protecting them against diseases. Such nanostructured materials translocate within the plants, increasing the adsorption of water, and subsequently enhancing seed germination as well as crop yield. Numerous materials such as carbon-based nanostructured fullerene (C_{60}), carbon nanotubes (CNTs), carbon nanofibers (CNFs), graphite, etc. as well as metal- and metal oxide-based nanomaterials such as CuO, TiO_2, CeO_2, Fe_3O_4, and ZnO have been used as plant growth stimulants. Among all of the Cu- and carbon-based nanostructured materials extensively used in the growth of plants, the Cu-based nanostructured materials best augment the growth of crops as well as protect against various diseases due to their antibacterial and antifungal characteristics. The carbon-based nanostructured materials like CNTs, CNFs, and graphene easily penetrate within the seed coat, which enhances water uptake capacity, thereby improving the growth of plants. The translocation, deposition, and interaction of nanostructured materials are essential for the development of plants. In this chapter, we focus on the role of Cu/carbon-based nanostructured materials in the production of plants. The interaction of Cu- and carbon-based nanostructured materials is also discussed. Finally, we also address the translocation mechanism of Cu/carbon-based nanostructured materials and the prospects of such materials in agriculture.

Previous Next

Keywords

Growth stimulator; Nanomaterials; Carbon-based material; Metal; Nanoparticle

Recommended articles

Cited by (4)

Influence of biologics on the productivity of winter wheat varieties under irrigation conditions ↗
2023, Notulae Scientia Biologicae

Effects of copper oxide nanoparticles on soil diazotrophic communities in maize rhizosphere ↗
2023, Journal of Soils and Sediments

Assessment of the Effect of Biological Growth-Regulating Preparations on the Yield of Agricultural Crops under the Conditions of Steppe Zone ↗
2023, Journal of Ecological Engineering

2D-Nanosheets Based Hybrid Nanomaterials Interaction with Plants ↗
2023, Nanomaterial Interactions with Plant Cellular Mechanisms and Macromolecules and Agricultural Implications

View full text

ScienceDirect

Copper
Agrochen

Chapter 15 - Nanostructu
plant growth stimulant

Shagufta Afreen [a], Rishabh Anand Omar [b], Neetu Talreja

[a] CAS Key Laboratory of Bio-Based Materials, Qing
China
[b] Center for Environmental Science and Engineerin
[c] Advanced Ceramics and Nanotechnology Labora
Concepción, Chile
[d] Department of Chemical and Biomedical Enginee
[e] School of Life Science, BS Abdur Rahman Institute

Available online 21 January 2022, Version of Record 21 Ja

Show less

Outline | Share | Cite

https://doi.org/10.1016/B978-0-12-823833-2.00004-0
Get rights and content

Abstract

Continuously increasing global population growth r
the requirements of all living creatures. The
demand for food might be fulfilled by increasing th
l materials have become more accepted in
various areas of research, including agriculture. Nar
elopment of plants and the efficiency of the
crops, as well as protecting them against diseases. S
hin the plants, increasing the adsorption of
water, and subsequently enhancing seed germinatic
such as carbon-based nanostructured
fullerene (C_{60}), carbon nanotubes (CNTs), carbon nanofibers (CNFs), graphite, etc. as well as metal- and metal oxide-based nanomaterials such as CuO, TiO_2, CeO_2, Fe_3O_4, and ZnO have been used as plant growth stimulants. Among all of the Cu- and carbon-based nanostructured materials extensively used in the growth of plants, the Cu-based nanostructured materials best augment the growth of crops as well as protect against various diseases due to their antibacterial and antifungal characteristics. The carbon-based nanostructured materials like CNTs, CNFs, and graphene easily penetrate within the seed coat, which enhances water uptake capacity, thereby improving the growth of plants. The translocation, deposition, and interaction of nanostructured materials are essential for the development of plants. In this chapter, we focus on the role of Cu/carbon-based nanostructured materials in the production of plants. The interaction of Cu- and carbon-based nanostructured materials is also discussed. Finally, we also address the translocation mechanism of Cu/carbon-based nanostructured materials and the prospects of such materials in agriculture.

Previous Next

Keywords

Growth stimulator; Nanomaterials; Carbon-based material; Metal; Nanoparticle

Recommended articles

Cited by (4)

Influence of biologics on the productivity of w
2023, Notulae Scientia Biologicae

Effects of copper oxide nanoparticles on soil d
2023, Journal of Soils and Sediments

Assessment of the Effect of Biological Growth
of Steppe Zone
2023, Journal of Ecological Engineering

2D-Nanosheets Based Hybrid Nanomaterials I
2023, Nanomaterial Interactions with Plant Cellular Mec

View full text

Author

Mohammad Ashfaq
View in Scopus

Advanced Ceramics and Nanotechnology Laboratory, Department of Materials Engineering, Faculty of Engineering, University of Concepción, Concepción, Chile

School of Life Science, BS Abdur Rahman Institute of Science and Technology, Chennai, India

nditions

sphere

Agricultural Crops under the Conditions

nplications

More documents by Mohammad Ashfaq

Provided by Scopus

PVP encapsulated MXene coated on PET surface (PMP)-based…
Environmental Research, Volume 233, 15 Septe…
Talreja, N., …, Viswanathan, M.R.

Dielectric properties of nanolayers for next-generation supercapacitor…
Dielectric Materials for Energy Storage and En…
Talreja, N., …, Ashfaq, M.

Two-Dimensional Nanomaterial (2D-NMs)-Based Polymeric Composite f…
Sustainability (Switzerland), Volume 15, Issue 1…
Omar, R.A., …, Chauhan, D.

Quantum and Blockchain for Modern Computing Systems: Vision and Advancements pp 341–364

Secure Blockchain-Based Mental Healthcare Framework:—A Paradigm Shift from Traditional to Advanced Analytics

Tawseef Ahmad Naqishbandi, E. Syed Mohammed ✉, S. Venkatesan, A. Sonya, Korhan Cengiz & Yusra Banday

Chapter | First Online: 22 July 2022

Part of the Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT,volume 133)

Abstract

Modern state-of-the-art technologies, ranging from advanced statistical approaches to deep learning technologies, have fundamentally transformed the digital data world, notably in the healthcare industry. Artificial intelligence (AI), machine learning (ML), blockchain, and deep learning (DL) technologies have all evolved in the recent decade and have piqued the interest of a variety of sectors ranging from industries to environment, wellness to health, commerce to service sectors The latest technological breakthroughs are allowing for new approaches to exploit untapped opportunities in mental healthcare. Inside this mental health care sector, the value proposition for blockchain technology is to securely transmit sensitive patient data among health care institutions while also empowering patients. The healthcare sector and related organizations have begun to adopt state-of-the-art technologies for value-based healthcare diagnosis, but there is still a long way to go because the challenges these organizations face are multidimensional and necessitate the use of appropriate techniques that cannot be trumped. The purpose of this article is to learn about the technology's fundamentals, the crucial impact it can play in the mental healthcare field, and draw attention towards the conceptual framework for secure mental health analytics to be practically worked upon soon. It is crucial to note that determining the entire benefits of blockchain at this time is difficult. We won't be able to arrive at a realistic conclusion on the technology's usefulness until and until it is widely adopted and employed.

Keywords

Mental healthcare **Blockchain** **Predictive analytics**

Valuebased healthcare **Privacy** **Security**

Notes

1. Market research future. https://www.marketresearchfuture.com/reports/clinical-data-analyticsmarket-2520. Accessed 30 January 2022.

2. https://estech.shinyapps.io/prisma_flowdiagram/.

3. Mckinsey [https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/the-era-of-exponential-improvement-in-healthcare. [Acessed on 23–01-2022].

References

1. Wang Y, Hajli N (2017) Exploring the path to big data analytics success in healthcare. J Bus Res 70:287–299. https://doi.org/10.1016/j.jbusres.2016.08.002

2. Naqishbandi TA, Ayyanathan N (2020) Clinical big data predictive analytics transforming healthcare:-an integrated framework for promise towards value

based healthcare, pp 545–561

3. Santos MY, et al (2017) A big data system supporting Bosch Braga industry 4.0 strategy. Int J Inf Manag xxxx:0–1. https://doi.org/10.1016/j.ijinfomgt.2017.07.012

4. Naqishbandi T, Sheriff IC, Qazi S, Big data, CEP and IoT: redefining holistic healthcare information systems and analytics. www.ijert.org

5. Haddaway NR, Pritchard CC, McGuinness LA (2021) PRISMA2020: R package and ShinyApp for producing PRISMA 2020 compliant flow diagrams (Version 0.0.2). Zenodo. https://doi.org/10.5281/zenodo.5082518

6. "1979_2_A certified digital Signature.pdf." 1979

7. Hölbl M, Kompara M, Kamišalić A, Zlatolas LN (2018) A systematic review of the use of blockchain in healthcare. Symmetry (Basel) 10(10). https://doi.org/10.3390/sym10100470

8. Li W, Wu J, Cao J, Chen N, Zhang Q, Buyya R (2021) Blockchain-based trust management in cloud computing systems: a taxonomy, review and future directions. J Cloud Comput 10(1)

9. Merkle RC (1988) A digital signature based on a conventional encryption function. In: Lecture notes in computer science (including subseries lecture notes in artificial intelligence and lecture notes in bioinformatics), vol 293 LNCS, pp 369–378. https://doi.org/10.1007/3-540-48184-2_32

10. Loscalzo J (2007) Association studies in an era of too much information: clinical analysis of new biomarker and genetic data. Circulation 116(17):1866–1870. https://doi.org/10.1161/CIRCULATIONAHA.107.741611

11. Xia Q, Sifah EB, Smahi A, Amofa S, Zhang X (2017) BBDS: blockchain-based data sharing for electronic medical records in cloud environments. https://doi.org/10.3390/info8020044

12. Kim SK, Kim UM, Huh JH (2019) A study on improvement of blockchain application to overcome vulnerability of IoT multiplatform security. Energies 12(3). https://doi.org/10.3390/en12030402

13. Reyna A, Martín C, Chen J, Soler E, Díaz M (2018) On blockchain and its integration with IoT. Challenges and opportunities. Futur Gener Comput Syst 88(2018):173–190. https://doi.org/10.1016/j.future.2018.05.046

14. Shen B, Guo J, Yang Y (2019) MedChain: Efficient healthcare data sharing via blockchain. Appl Sci 9(6). https://doi.org/10.3390/app9061207

15. Mettler M, Hsg MA (2016) 2016 IEEE 18th international conference on e-Health networking, applications and services, Healthcom 2016, pp 16–18

16. Roehrs A, da Costa CA, da Rosa Righi R (2017) OmniPHR: a distributed architecture model to integrate personal health records. J Biomed Inform 71:70–81. https://doi.org/10.1016/j.jbi.2017.05.012

17. Azaria A, Ekblaw A, Vieira T, Lippman A (2016) MedRec: using blockchain for medical data access and permission management. In: 2nd international conference on open and big data (OBD) 2016, pp 25–30. https://doi.org/10.1109/OBD.2016.11

18. Xia Q, Sifah EB, Asamoah KO, Du X, Guizani M (2017) MeDShare: trust-less medical data sharing among. IEEE Access 5:1–10

19. Serdar D (2019) No 主観的健康感を中心とした在宅高齢者における 健康関連指標に関する共分散構造分析 title. Sustainable 11(1):1–14. http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0A, https://doi.org/10.1016/j.regsciurbeco.2008.06.005%0A, https://www.researchgate.net/publication/305320484_SISTEM_PEMBETUNGAN_TERPUSAT_STRATEGI_MELESTARI

20. Tandon A, Dhir A, Islam N, Mäntymäki M (2020) Blockchain in healthcare: a systematic literature review, synthesizing framework and future research agenda. Comput Ind 122. https://doi.org/10.1016/j.compind.2020.103290

21. Amofa S, et al (2018) A blockchain-based architecture framework for secure sharing of personal health data. In: 2018 IEEE 20th international conference on e-Health networking, applications and services (Healthcom), pp 1–6. https://doi.org/10.1109/HealthCom.2018.8531160

22. Auffray C et al (2016) Making sense of big data in health research: towards an EU action plan. Genome Med 8(1):1–13. https://doi.org/10.1186/s13073-016-0323-y

23. Cosic R, Shanks G, Maynard S (2012) Towards a business analytics capability maturity model. ACIS 2012 proceedings of the 23rd Australasian conference on information systems, no. June 2012

24. Loscalzo J, Kohane I, Barabasi AL (2007) Human disease classification in the postgenomic era: a complex systems approach to human pathobiology. Mol Syst Biol 3(124). https://doi.org/10.1038/msb4100163

25. Davis DA, Chawla NV (2011) Exploring and exploiting disease interactions from Multi-Relational gene and phenotype networks. PLoS One 6(7). https://doi.org/10.1371/journal.pone.0022670

26. Davis DA, Chawla NV, Blumm N, Barabási AL, Christakis N (2008) Predicting individual disease risk based on medical history. Int Conf Inf Knowl Manag Proc 769–778. https://doi.org/10.1145/1458082.1458185

27. Baro E, Degoul S, Beuscart R, Chazard E (2015) Toward a literature-driven definition of big data in healthcare. Biomed Res Int 2015. https://doi.org/10.1155/2015/639021

28. Ben Fekih R, Lahami M (2020) Application of Blockchain technology in healthcare: a comprehensive study, vol 12157 LNCS. Springer International Publishing

29. Chen HS, Jarrell JT, Carpenter KA, Cohen DS, Huang X (2019) Blockchain in healthcare: a patient-centered model. Biomed J Sci Tech Res 10(3):1–10

30. Nakamoto S, Bitcoin: a peer-to-peer electronic cash system, pp 1–9

31. Ethereum E, Welcome to Ethereum, pp 1–15

32. Gemos I, The world has changed, pp 1–13

33. Multichain D, Enterprise blockchain. Subscribe for MultiChain updates MultiChain helps organizations to build and deploy blockchain applications

with speed. Rapid deployment, pp 1–6

34. Panwar A, Bhatnagar V (2020) Distributed ledger technology (DLT): the beginning of a technological revolution for blockchain. In: 2nd international conference on data, engineering and applications (IDEA 2020). https://doi.org/10.1109/IDEA49133.2020.9170699

35. Roschin P, Efanov D, Efanov D (2018) ScienceDirect all-pervasiveness of the inspired blockchain 8th annual the the of the blockchain technology 1 the blockchain the of the of the blockchain technology the all-pervasiveness of the blockchain technology the of blockchain 1 technology. Procedia Comput Sci 123:116–121

36. Buterin V (2014) A next-generation smart contract and decentralized application platform. Etherum no January, pp 1–36

37. Kumar T, Ramani V, Ahmad I, Braeken A, Harjula E, Ylianttila M (2018) Blockchain utilization in healthcare: key requirements and challenges. In: 2018 IEEE 20th international conference on e-Health networking, applications and services (Healthcom), no. August 2018. https://doi.org/10.1109/HealthCom.2018.8531136

38. McGhin T, Choo KKR, Liu CZ, He D (2019) Blockchain in healthcare applications: research challenges and opportunities. J Netw Comput Appl 135(February):62–75. https://doi.org/10.1016/j.jnca.2019.02.027

39. Ahsan MAM, et al (2018) CLASS : cloud log assuring soundness and secrecy scheme for cloud forensics. https://doi.org/10.1109/TSUSC.2018.2833502

40. Hulsen T, et al (2019) From big data to precision medicine. Front Med 6(MAR):1–14. https://doi.org/10.3389/fmed.2019.00034

41. Mehta N, Pandit A (2018) Concurrence of big data analytics and healthcare: a systematic review. Int J Med Inform 114(March):57–65. https://doi.org/10.1016/j.ijmedinf.2018.03.013

42. Mohammed EA, Far BH, Naugler C (2014) Applications of the MapReduce programming framework to clinical big data analysis: current landscape and future trends. BioData Min 7(1). https://doi.org/10.1186/1756-0381-7-22

43. Sheriff CI, Naqishbandi T, Geetha A (2015) Healthcare informatics and analytics framework. https://doi.org/10.1109/ICCCI.2015.7218108

44. Weng C, Kahn MG (2016) Clinical research informatics for big data and precision medicine. Yearb Med Inform 1:211–218. https://doi.org/10.15265/iy-2016-019

45. Kotter E, Marti-Bonmati L, Brady AP, Desouza NM (2021) ESR white paper: blockchain and medical imaging. Insights Imaging 12(1). https://doi.org/10.1186/s13244-021-01029-y

46. Jones JB, Snyder CF, Wu AW (2007) Issues in the design of Internet-based systems for collecting patient-reported outcomes. Qual Life Res 16(8):1407–1417. https://doi.org/10.1007/s11136-007-9235-z

47. Rumsfeld JS, Joynt KE, Maddox TM (2016) Big data analytics to improve cardiovascular care: promise and challenges. Nat Rev Cardiol 13(6):350–359. https://doi.org/10.1038/nrcardio.2016.42

48. Shahnaz A, Qamar U, Khalid A (2019) Using blockchain for electronic health records. IEEE Access 7:147782–147795. https://doi.org/10.1109/ACCESS.2019.2946373

49. Liu X, Yang H, Li G, Dong H, Wang Z (2021) A blockchain-based auto insurance data sharing scheme. Wirel Commun Mob Comput 2021. https://doi.org/10.1155/2021/3707906

50. Chen CL, Deng YY, Tsaur WJ, Li CT, Lee CC, Wu CM (2021) A traceable online insurance claims system based on blockchain and smart contract technology. Sustain 13(16):1–37. https://doi.org/10.3390/su13169386

51. Jenkins J, Kopf J, Tran BQ, Frenchi C, Szu H (2015) Bio-mining for biomarkers with a multi-resolution block chain. Indep Compon Anal Compressive Sampl, Large Data Anal (LDA), Neural Netw, Biosyst Nanoeng XIII 9496:94960N. https://doi.org/10.1117/12.2180648

52. Lindell Y (2021) Secure multiparty computation. Commun ACM 64(1):86–98. https://doi.org/10.1145/3387108

53. Parlakkılıç A (2021) Blockchain use cases in healthcare, pp 85–104. https://doi.org/10.4018/978-1-7998-8493-4.ch004

54. Ahmed H (2020) Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. In: The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information, no. January 2020

55. Agricultural C, Bulletin S, Chun Y, Bo W (2009) "叶 春 1, 王 博 1,2(1)" vol 25, no 17, pp 260–264

56. National G, Pillars H, "No 主観的健康感を中心とした在宅高齢者における 健康関連指標に関する共分散構造分析 title"

57. Dagher GG, Mohler J, Milojkovic M, Marella PB (2018) Ancile: Privacy-preserving framework for access control and interoperability of electronic health records using blockchain technology. Sustain Cities Soc 39(August 2017):283–297. https://doi.org/10.1016/j.scs.2018.02.014

Author information

Authors and Affiliations

Department of Computer Science and Engineering, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, 600048, India
Tawseef Ahmad Naqishbandi, E. Syed Mohammed & S. Venkatesan

Department of Information Technology, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, 600048, India
A. Sonya

College of Information Technology, University of Fujairah, Fujairah, UAE
Korhan Cengiz

Electrical Engineering Department, Indian Institute of Technology, Jammu & Kashmir, 181221, India
Yusra Banday

Corresponding author

Correspondence to E. Syed Mohammed .

Editor information

Editors and Affiliations

Department of Systemics, University of Petroleum and Energy Studies, Dehradun, Uttarakhand, India

Dr. Adarsh Kumar

School of Electronic Engineering and Computer Science, Queen Mary University of London, London, UK

Assist. Prof. Sukhpal Singh Gill

Scientific Network for Innovation and Researsch Excellence, Machine Intelligence Research Labs (MIR Labs), Auburn, WA, USA

Prof. Dr. Ajith Abraham

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Ahmad Naqishbandi, T., Syed Mohammed, E., Venkatesan, S., Sonya, A., Cengiz, K., Banday, Y. (2022). Secure Blockchain-Based Mental Healthcare Framework:—A Paradigm Shift from Traditional to Advanced Analytics. In: Kumar, A., Gill, S.S., Abraham, A. (eds) Quantum and Blockchain for Modern Computing Systems: Vision and Advancements. Lecture Notes on Data Engineering and Communications Technologies, vol 133. Springer, Cham. https://doi.org/10.1007/978-3-031-04613-1_12

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-031-04613-1_12	22 July 2022	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-031-04612-4	978-3-031-04613-1	Intelligent Technologies and Robotics Intelligent Technologies and Robotics (R0)