
17 PARTNERSHIPS FOR THE GOALS


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POLICY FOR INSTITUTIONAL POLICY ON RESEARCH PUBLICATIONS AND DOCUMENTATION OF CONTRIBUTIONS

Policy Created On	07/01/2022	**Approved by**
Revision 1:	29/01/2024	
Responsible Units	RESEARCH AND DEVELOPMENT CELL	**REGISTRAR**
		Registrar

Chaitanya (Deemed to be University)
6-1[illegible], Himayathnagar Village, Moinabad (M)
[illegible] Reddy District, Hyderabad

Chaitanya (Deemed to be University) Himayathnagar(V) Moinabad (M) Rangareddy (D) Hyderabad

SDGs Directly Supported:

SDG17 – Partnerships for the Goals

SDGs Indirectly Supported:

SDG1 – No Poverty

SDG3 – Good Health and Well-being

SDG4 – Quality Education

SDG9 – Industry, Innovation, & Infrastructure

SDG10 – Reduced Inequalities

SDG11 – Sustainable Cities & Communities

INSTITUTIONAL POLICY ON RESEARCH PUBLICATIONS AND DOCUMENTATION OF CONTRIBUTIONS

1. INTRODUCTION

Chaitanya Deemed to be University recognizes research and scholarly publications as important instruments for knowledge creation, innovation and sustainable development. The University encourages faculty members, research scholars and students to undertake quality research and publish their findings in recognized journals, conference proceedings, books and other academic publications.

The University is committed to documenting and showcasing its research contributions towards the United Nations Sustainable Development Goals (SDGs). This policy establishes a common framework for identifying, collecting, verifying, classifying, and reporting all research publications of the University in relation to their respective SDGs.

2. OBJECTIVES

The objectives of this policy are:

1. To promote quality research and encourage scholarly publications among faculty members and research scholars.
2. To maintain a centralized institutional database of research publications.
3. To identify and map research publications to the relevant United Nations Sustainable Development Goals.
4. To encourage interdisciplinary and multidisciplinary research addressing societal and developmental challenges.
5. To recognize research contributions in areas such as education, health, environment, economic development, innovation and social inclusion.
6. To systematically collect and maintain evidence of published research articles.
7. To prepare and publish institutional SDG progress reports periodically.
8. To enhance the visibility and impact of university research at regional, national and international levels.

3. SCOPE OF THE POLICY

This policy applies to all faculty members, research scholars, and students of Chaitanya Deemed to be University.

The policy covers the following categories of academic publications:

- Research articles published in national and international journals.
- Peer-reviewed and refereed journal publications.
- Conference papers and proceedings.
- Research papers published in UGC-CARE-listed journals, where applicable to the publication period.
- Books and book chapters.
- Review articles and scholarly research papers.
- Interdisciplinary and collaborative research publications.
- Other recognized scholarly publications.

4. IDENTIFICATION AND MAPPING OF RESEARCH PUBLICATIONS TO SDGs

The University shall identify and classify research publications according to their subject matter, research objectives, findings, and contributions to the relevant Sustainable Development Goals.

The publications may be mapped to the following SDGs:

- **SDG 1:** No Poverty
- **SDG 2:** Zero Hunger
- **SDG 3:** Good Health and Well-being
- **SDG 4:** Quality Education
- **SDG 5:** Gender Equality
- **SDG 6:** Clean Water and Sanitation
- **SDG 7:** Affordable and Clean Energy
- **SDG 8:** Decent Work and Economic Growth
- **SDG 9:** Industry, Innovation and Infrastructure
- **SDG 10:** Reduced Inequalities
- **SDG 11:** Sustainable Cities and Communities
- **SDG 12:** Responsible Consumption and Production
- **SDG 13:** Climate Action
- **SDG 14:** Life Below Water

- **SDG 15:** Life on Land
- **SDG 16:** Peace, Justice and Strong Institutions
- **SDG 17:** Partnerships for the Goals

Each publication shall be mapped to the relevant SDG based on its actual research content and contribution.

5. DOCUMENTATION AND RECORD MAINTENANCE

The University shall maintain proper records of all research publications through a centralized publication database.

The following details shall be maintained:

1. Title of the research paper or publication.
2. Name of the author(s).
3. Department and institutional affiliation.
4. Name of the journal or publication.
5. Volume, issue and publication year.
6. ISSN/ISBN details.
7. DOI or publication link, wherever available.
8. Relevant Sustainable Development Goal.
9. Abstract and description of research contribution.
10. Copy of the published research paper as supporting evidence.

6. PUBLICATION OF SDG PROGRESS REPORTS

The University shall prepare and publish periodic reports highlighting its research contributions and institutional activities towards the Sustainable Development Goals.

The reports shall include:

- Details of research publications related to individual SDGs.
- Research contributions of faculty members and scholars.
- Description of research outcomes and their relevance to sustainable development.
- Supporting evidence in the form of published articles and journal details.
- Summary of institutional achievements and future research priorities.

The SDG progress reports shall be published through the official University website and other institutional communication platforms, wherever applicable.

7. ROLES AND RESPONSIBILITIES

The following institutional units shall be responsible for implementing this policy:

Office of the Vice-Chancellor

- Provide institutional leadership and guidance for research and SDG initiatives.

Office of the Registrar

- Provide administrative support and institutional coordination.

Internal Quality Assurance Cell (IQAC)

- Monitor research documentation and coordinate institutional SDG reporting.

Research and Development Cell

- Coordinate research publication activities and maintain publication records.

SDG Coordination Committee

- Identify and map research publications to the relevant SDGs.
- Compile and prepare SDG-related progress reports.

Heads of Academic Departments

- Collect publication details from faculty members and research scholars.
- Verify departmental research publication records.

Faculty Members and Research Scholars

- Submit details and copies of their published research work for institutional documentation.

Website and IT Team

- Support the publication and dissemination of institutional SDG reports through the official University website.

8. MONITORING AND EVALUATION

The University shall periodically monitor the implementation of this policy through:

1. Number of research publications produced by faculty members and research scholars.
2. Number of publications mapped to different Sustainable Development Goals.

3. Number of interdisciplinary and collaborative research publications.
4. Research contributions addressing regional and societal challenges.
5. Availability of publication records and supporting evidence.
6. Periodic preparation and publication of SDG progress reports.

9. TRANSPARENCY AND ACCESSIBILITY

The University shall ensure that research publication records and SDG-related progress reports are properly documented and made accessible to stakeholders through appropriate institutional platforms. Only verified publications and authentic supporting documents shall be included in institutional SDG reporting.

10. POLICY REVIEW

This policy shall be reviewed periodically by the IQAC and SDG Coordination Committee to ensure its effective implementation and alignment with the United Nations Sustainable Development Goals.

11. CONCLUSION

Chaitanya Deemed to be University is committed to strengthening its research culture and contributing to sustainable development through quality academic publications, interdisciplinary research and knowledge dissemination. This policy provides a common institutional framework for documenting, classifying, and publishing research contributions towards the Sustainable Development Goals and promoting transparency, accountability, and continuous academic development.

29 – 01 – 2024

REGISTRAR

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Ranga Reddy District, Hyderabad

Chaitanya (Deemed to be University)
Himayathnagar(V)
Moinabad (M)
Rangareddy (D)
Hyderabad

SUPPORTED DOCUMENTS

Research Contribution

Title of the Research Paper: A Study on the Significance and Current Scenario of Higher Education in Telangana State – An Overview

Author: Dr. Pashikanti Omkar

Institution: Chaitanya Deemed to be University, Moinabad, Hyderabad, Telangana.

Journal: International Journal of Creative Research Thoughts (IJCRT)

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Description of the Research Contribution:

This research study examines the significance, current scenario, challenges and opportunities of higher education in Telangana State and its role in economic development. It highlights the importance of quality higher education, development of skilled human resources, research and development, adequate infrastructure, laboratories, libraries, equipment, and innovative teaching faculty.

The study also emphasizes inclusive access to public higher education institutions for Scheduled Castes (SC), Scheduled Tribes (ST), Backward Classes (BC), minority communities, and Economically Weaker Sections (EWS). It identifies major challenges such as inadequate financial resources, lack of quality research and development facilities, insufficient infrastructure, declining educational standards, and faculty recruitment gaps.

The research provides insights into strengthening higher education institutions, improving educational quality, promoting inclusive learning opportunities, and enhancing research and innovation for sustainable socio-economic development.

Outcome and Relevance:

The study contributes to understanding the importance of accessible, inclusive, and quality higher education in Telangana State. It highlights the need for improved educational infrastructure, research facilities, institutional development, and equal educational opportunities, supporting sustainable development through education and human resource development.

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An International Open Access, Peer-reviewed, Refereed Journal

A Study On The Significance And Current Scenario Of Higher Education In Telangana State - An Overview

Dr.PASHIKANTI OMKAR

M.A., B.Ed., APSET., PhD., PGDCA. Associate Professor of Economics Department of Commerce and Business Management, CHAITANYA DEEMED TO BE UNIVERSITY, Moinabad, Hyderabad, Telangana. India.PIN: 500075.

ABSTRACT

This study investigates the issues, challenges and opportunities in higher education and its significance in economic development of Telangana state. It includes colleges, universities, and all higher educational institutions teaching learning towards which students progress to attain higher educational qualification is where in depth skills knowledge and understanding is imparted to the students so as to advance to new frontiers of knowledge in different walks in life in every generation higher education provides quality human resources strong generation knowledge and empowered society they make high production or productivity in all aspects. The quality of primary education reflects higher education quality and standards also availability of facilities and infrastructure like teaching and non teaching, labs, equipment, research, library, books, senior innovative faculty members encourage the quality of higher education and present SC, ST, and other backward classes (BC) including minority communities, Economically Weaker Sections (EWS) are depends on public higher education institutions in Telangana state but the higher education faces many problems in my observation across higher education institutions and all universities in Telangana state. The main problems in the Telangana are lack of funding/finance in education sector and poor financial stage, lack of high quality research & development, basic needs, poor performance in quality of education and universities ranking, no recruitment in public universities past ten years and higher education, decline standards in field of higher education and infrastructure facilities and also present Government of Telangana creates uncertainty in the field of higher education institutions like Central university of Hyderabad 400 acres of land issue, and out of the all states and union territories in India Telangana is the last position or the overall performance of the state

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SUSTAINABLE DEVELOPMENT GOALS

fruits and vegetables combined together 400 grams which includes 100 grams of green leafy vegetables, 200 grams of other vegetables and 100 grams of roots & tubers. In addition to this, fresh fruits must be taken 100 grams regularly. The requirement of iron and folic acid are higher for pregnant women. Indian council of Medical Research (ICMR) recommended that a consumer must take 325 grams of food which includes fruits and vegetables. However, in Telangana state, it was confined to 250 grams which is less than national average. A pregnant women have to take 100 grams of leafy vegetable daily but overweight candidates have to avoid high-calories vegetable and fruits. In 2024, the total production of horticulture was confined to 353.19 million tonnes which was 3.17 percent higher than the previous year. Increasing of horticulture production is an indication for nutritional and health security of India.

Keywords: Nutritional Security. IFPRI. GHI. ICMR. Malnutrition.

17.A study on Agricultural marketing its impact on Agrarian development in Telangana state Challenges and Possibilities

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Dept. of Economics Department of Commerce and Business Management
Chaitanya Deemed UniversityMoinabad,Hyderabad Telangana.

The present study is investigated agricultural marketing and its impact on agrarian development in Telangana state. It become a model for agricultural development in the country, and agriculture marketing ensuring food security improving farmers livelihoods and promoting sustainable agriculture development and increased growth rates, enhance the agricultural productivity in the state, as they proclaim to set up competitive alternative channels to create an eco system with freedom of choice for farmer and trader in sale and procurement of agricultural produce by facilitating remunerative prices as its preamble, would run contrary to its preamble with the law leaning more towards the interest of traders as against farmers, there is a need for more sustained intervention from state in agricultural marketing by acting as facilitators of regulated decentralized procurement of agrarian produce, still suffers from agriculture distress due to the agricultural marketing facilities and infrastructure price fluctuations now, more scarcity in the Telangana state that is fertilizer like urea bags $(NH_2)_2CO$.) the farmers suffers for it, agriculture marketing covers the services involved in moving in agricultural products from the farmers to consumers the unmoors interconnected activities are involved in doing this such as planning production, growing harvesting, grading, packing, transportation, storage and food processing

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The Impact of Environmental changes on Agricultural production in India- Opportunities and Challenges

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Abstract

This paper examine the environmental changes and agricultural production in India it is a big problem in various states and huge impact on all living factors growing factors especially agriculture crops production levels is under threat due to environmental change in food insecure regions, especially in India and Asian countries, various extremes, drought, heat waves, erratic and intense rainfall patterns, storms, floods, and emerging insect pests have adversely affected the livelihood of the farmers. Globally environment is changing day by day and now it has become a challenge to living forms due to the very ugly fact that every nation is trying to develop without taking into consideration the environmental impact of degradation and pollution of agricultural lands, people are using plastic bags, which are environmentally dangerous products, the environment and agricultural lands are thereby being polluted, has strictly reduced its environmental and agricultural land pollution, such as, waste water and solid waste discharges and energy use, consumers have increased environmental and agricultural land pollution, the negative environmental impacts and agricultural land pollution have raised the concern of the global community and the caring media around the world, the accumulation of greenhouse gases (GHGs) in the atmosphere carbon dioxide (CO_2), methane, nitrous oxide, and other gases contributes, it imposes costs on countries around the globe, it also increases the risk of several adverse effects, economic and otherwise, including slower growth of gross domestic product, property damage from flooding and higher sea levels, and damage to ecosystems that provide food, medicines, and clean air and water. CO_2 is the most common accounting for about 80 percent.GHG emissions, the remaining 20 percent are non CO_2 gases, and nearly half of those emissions are from the agriculture sector. The sector emits mainly nitrous oxide and methane in roughly equal amounts in CO_2 equivalent units (the amount of CO_2 that would trap the same amount of heat in the atmosphere). all the sector's nitrous oxide emissions are from excess fertilizer nitrogen that is not absorbed by plants. Agricultural activity and its associated GHG emissions are widely dispersed geographically, that dispersal has implications for how those emissions might be managed but otherwise has no implications for their effect on the climate because GHG emissions ultimately mix uniformly in the Earth's atmosphere, the factors underlying the relative stability of emissions in recent decades and provides projections of agricultural emissions, GHG emissions released from broad sectors, economy manufacturing, transportation, and electric power.

Keywords: *environmental conditions, changes, problems, impact on agriculture production, issues and challenges in India as well as all over the world.*

Introduction:

This paper focused on the relatishionship between the environment changes and the agriculture development in India. It is well known that about one third of the world's land surface is under agriculture, environment has a direct influence on existence and sustainability of agriculture as it depends upon the use of natural resources, undoubtedly, agriculture has a greater environmental impact on Earth than any other single human activity, conventional agricultural farming practices will not provide the food and fibre needed by burgeoning population in the future. India is primarily an agricultural nation, with over 58 percent of its rural households relying on farming for their income.

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ROYAL SOCIETY OF CHEMISTRY

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Synthesis and characterization of novel *N*-(2-(pyrazin-2-yl-oxy)ethyl)-4-(trifluoromethoxy) benzamide scaffolds, and biological evaluation and molecular docking studies†

Venkata Konda Prasad. B,[ab] G. Venkata Haritha,[c] Kavati Shireesha,[a] Kumara Swamy Jella,[*a] Dharavath Ravi[d] and Ajmeera Ramesh[e]

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A new series of biologically potent *N*-(2-(6-substituted-1*H*-pyrazin-2-yloxy)ethyl)-4-(trifluoromethoxy) benzamide scaffolds was synthesized, and their structures were confirmed by ^{1}H NMR, ^{13}C NMR, and mass spectrometry. All the synthesized molecules were tested against antibacterial activity against various pathogenic microorganisms and exhibited remarkable activity. Compounds **12a** and **13a** exhibited good antibacterial activity against pathogenic cell lines, *Staphylococcus aureus* and *Escherichia coli*. Additionally, synthesized molecules **12a** and **13a** were screened for anticancer activity against the A549 (lung cancer) cell line. These compounds displayed excellent anticancer activity with IC_{50} values of 19 + 0.50 μM, 17 ± 0.5 μM, A549 (lung cancer). Molecular docking studies results were well supported by strong intercalative interactions of the synthesized compounds with target proteins.

Introduction

Pyrazines are heterocyclic compounds characterized by a six-membered ring with two nitrogen atoms. These compounds serve as versatile scaffolds in medicinal chemistry due to their electronic properties and ability to participate in diverse chemical interactions. Structural modifications of the pyrazine ring allow for fine-tuning of biological activity and specificity. Nitrogen atoms in the ring system facilitate hydrogen bonding and metal coordination, broadening their biological applications.[1–5] Pyrazine derivatives have garnered attention in medicinal chemistry due to their diverse biological activities.[6–9] Recent studies highlight their potential as antimicrobial agents and their promising cytotoxicity against lung cancer cells.[10–12] In recent years, the quest for novel bioactive compounds has driven significant research into diverse chemical classes with potential therapeutic applications. Among these, pyrazine derivatives have emerged as a prominent area of interest due to their versatile biological activities.[13,14] The antimicrobial properties of pyrazine derivatives have garnered particular attention as the global rise in antimicrobial resistance challenges conventional treatment strategies.[15] These derivatives have demonstrated significant efficacy against various pathogenic microorganisms, including bacteria and fungi.[16] Their ability to inhibit microbial growth and potentially overcome resistance mechanisms makes them valuable candidates for developing new antimicrobial agents.[17] Over the years, numerous drugs and bioactive molecules have been developed based on the pyrazine core moiety; among them, some medicinally potent pyrazine drug derivatives are shown in Fig. 1.

In addition to their antimicrobial potential, pyrazine derivatives have also shown promise in oncology. Cancer remains a leading cause of morbidity and mortality worldwide, and the search for effective, targeted therapies is crucial. Pyrazine-based compounds have exhibited cytotoxic effects against various cancer cell lines, including those of lung cancer,[18–23] which is one of the most prevalent and aggressive types of cancer. The ability of these compounds to induce selective toxicity in cancer cells while sparing normal cells is of particular interest in designing more effective and less toxic cancer therapies.

In this manuscript, we explore the synthesis and evaluation of new *N*-(2-(6-substituted1-yl)pyrazin-2-yloxy)ethyl)-4-(trifluoromethoxy)benzamide derivatives, focusing on their antimicrobial activities and cytotoxic effects against human lung cancer cell lines. By investigating these dual properties,

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A new series of biologically potent *N*-(2-(6-substituted-1*H*-pyrazin-2-yloxy)ethyl)-4-(trifluoromethoxy) benzamide scaffolds was synthesized, and their structures were confirmed by ^{1}H NMR, ^{13}C NMR, and mass spectrometry. All the synthesized molecules were tested against antibacterial activity against various pathogenic microorganisms and exhibited remarkable activity. Compounds **12a** and **13a** exhibited good antibacterial activity against pathogenic cell lines, *Staphylococcus aureus* and *Escherichia coli*. Additionally, synthesized molecules **12a** and **13a** were screened for anticancer activity against the A549 (lung cancer) cell line. These compounds displayed excellent anticancer activity with IC_{50} values of 19 + 0.50 μM, 17 ± 0.5 μM, A549 (lung cancer). Molecular docking studies results were well supported by strong intercalative interactions of the synthesized compounds with target proteins.

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Introduction

Pyrazines are heterocyclic compounds characterized by a six-membered ring with two nitrogen atoms. These compounds serve as versatile scaffolds in medicinal chemistry due to their electronic properties and ability to participate in diverse chemical interactions. Structural modifications of the pyrazine ring allow for fine-tuning of biological activity and specificity. Nitrogen atoms in the ring system facilitate hydrogen bonding and metal coordination, broadening their biological applications.[1–5] Pyrazine derivatives have garnered attention in medicinal chemistry due to their diverse biological activities.[6–9] Recent studies highlight their potential as antimicrobial agents and their promising cytotoxicity against lung cancer cells.[10–12] In recent years, the quest for novel bioactive compounds has driven significant research into diverse chemical classes with potential therapeutic applications. Among these, pyrazine derivatives have emerged as a prominent area of interest due to their versatile biological activities.[13,14] The antimicrobial properties of pyrazine derivatives have garnered particular attention as the global rise in antimicrobial resistance challenges conventional treatment strategies.[15] These derivatives have demonstrated significant efficacy against various pathogenic microorganisms, including bacteria and fungi.[16] Their ability to inhibit microbial growth and potentially overcome resistance mechanisms makes them valuable candidates for developing new antimicrobial agents.[17] Over the years, numerous drugs and bioactive molecules have been developed based on the pyrazine core moiety; among them, some medicinally potent pyrazine drug derivatives are shown in Fig. 1.

In addition to their antimicrobial potential, pyrazine derivatives have also shown promise in oncology. Cancer remains a leading cause of morbidity and mortality worldwide, and the search for effective, targeted therapies is crucial. Pyrazine-based compounds have exhibited cytotoxic effects against various cancer cell lines, including those of lung cancer,[18–23] which is one of the most prevalent and aggressive types of cancer. The ability of these compounds to induce selective toxicity in cancer cells while sparing normal cells is of particular interest in designing more effective and less toxic cancer therapies.

In this manuscript, we explore the synthesis and evaluation of new *N*-(2-(6-substituted1-yl)pyrazin-2-yloxy)ethyl)-4-(trifluoromethoxy)benzamide derivatives, focusing on their antimicrobial activities and cytotoxic effects against human lung cancer cell lines. By investigating these dual properties,

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Synthesis and Characterization of Biologically Active N-phenyl-1,8-Naphthyridine-Thiazole Derivatives as Potential Anticancer and Antimicrobial Agents

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Keywords:
N-phenyl-1,8-naphthyridin-2-amine
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Structure-Activity Relationship (SAR) studies

ABSTRACT

A new series of N-phenyl-3-(4-phenylthiazol-2-yl)-1,8-naphthyridin-2-amine scaffolds (**7a–h)** were synthesized and confirmed by the ^{1}HNMR, ^{13}CNMR, and mass spectrometry data. The synthesized derivatives were evaluated for the biological evaluation of anticancer activity against three human cancer cell lines, MCF-7 (human breast cancer), Colo-205 (human colon cancer), and A549 (human lung cancer), by using the MTT assay method. All the tested compounds showed significant anticancer activity, predominantly, two compounds**, 7d** and **7g,** demonstrated the highest anticancer activity with IC_{50} values of 10.38±0.35 μM, 13.38+0.21 μM (MCF-7), IC_{50}=25.57 ±0.16 μM, 27.05±0.41 μM (Colo-205), and IC_{50}=28.41±0.39 μM, 29.35±0.03 μM (A549). All the tested compounds exhibited promising antimicrobial activity, among all compounds **7d** showing the strongest MIC values against *Staphylococcus aureus* (21.5 μg/mL), *Escherichia coli* (26 μg/mL), *Candida albicans* (28.5 μg/mL), and *Aspergillus terreus* (34 μg/mL), compared with the clinical drugs. SAR studies showed that electron-donating groups enhanced, electron-withdrawing groups reduced, and halogens had moderate anticancer activity.

1. Introduction

The selective and asymmetric synthesis of valuable organic molecules has gained significant attention due to their beneficial pharmaceutical applications. These molecules play a key role in the development of new drugs for treating severe diseases such as cancer, hypertension, and HIV, which are often challenging diseases to cure. Cancer encompasses a diverse and intricate group of diseases marked by the uncontrolled proliferation of cells, which can invade surrounding tissues and spread to distant organs through metastasis. Despite significant research advancements, a definitive cure remains intangible. As of 2022, an estimated 20 million new cancer cases were reported globally, with 9.7 million deaths, making it one of the leading causes of mortality. The five-year prevalence reached approximately 53.5 million, reflecting the significant burden of the disease. Cancer remains a major global health challenge, with the increasing incidence of cancer and the considerable loss of lives recognized, and it has emerged as a critical area of concern for healthcare systems and research communities. The complexity of cancer makes it one of the most urgent medical problems today. A significant hurdle in this pursuit is the identification and design of novel drugs that can act as reliable, selective, and potent anticancer agents. Current cancer treatments often face some limitations, such as resistance, toxicity, and lack of specificity. This highlights the urgent necessity to explore new strategies and approaches to cancer conflict [1–4]. Some medicinally active 1,8-naphthyridine derivatives are shown in Fig. 1.

The main goal of cancer treatment is to find new drugs that can specifically target tumor cells. A continuous goal of cancer therapy is identifying novel agents that can specifically target tumor cells, which remains a crucial aspect of cancer treatment. In parallel, chemists are focused on developing environmentally friendly and sustainable methods for synthesizing bioactive substituted heterocyclic compounds, often using green chemistry techniques [5–9]. Microwave-assisted green synthesis has gained significant attention in organic synthesis, materials science, and nanotechnology. This technique uses microwave irradiation to enhance energy transfer to reactants, resulting in rapid internal temperature increases. Compared to traditional heating methods, it offers advantages such as faster reactions, higher yields, improved selectivity, greater purity, reduced waste, and energy efficiency, with uniform and selective heating [10–11].

Heterocyclic compounds containing nitrogen, oxygen, or sulfur in their rings exhibit diverse biological activities due to their interactions

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Synthesis and characterization of novel *N*-(2-(pyrazin-2-yl-oxy)ethyl)-4-(trifluoromethoxy) benzamide scaffolds, and biological evaluation and molecular docking studies†

Venkata Konda Prasad. B,[ab] G. Venkata Haritha,[c] Kavati Shireesha,[a] Kumara Swamy Jella,[*a] Dharavath Ravi[d] and Ajmeera Ramesh[e]

A new series of biologically potent *N*-(2-(6-substituted-1*H*-pyrazin-2-yloxy)ethyl)-4-(trifluoromethoxy) benzamide scaffolds was synthesized, and their structures were confirmed by ^{1}H NMR, ^{13}C NMR, and mass spectrometry. All the synthesized molecules were tested against antibacterial activity against various pathogenic microorganisms and exhibited remarkable activity. Compounds **12a** and **13a** exhibited good antibacterial activity against pathogenic cell lines, *Staphylococcus aureus* and *Escherichia coli*. Additionally, synthesized molecules **12a** and **13a** were screened for anticancer activity against the A549 (lung cancer) cell line. These compounds displayed excellent anticancer activity with IC_{50} values of 19 + 0.50 μM, 17 ± 0.5 μM, A549 (lung cancer). Molecular docking studies results were well supported by strong intercalative interactions of the synthesized compounds with target proteins.

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Introduction

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In this manuscript, we explore the synthesis and evaluation of new *N*-(2-(6-substituted1-yl)pyrazin-2-yloxy)ethyl)-4-(trifluoromethoxy)benzamide derivatives, focusing on their antimicrobial activities and cytotoxic effects against human lung cancer cell lines. By investigating these dual properties,

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RESEARCH ARTICLE

Design, Synthesis, and Biological Evaluation of Aryl-Pyrazin-2-yl-*N*, *N*-Dimethyl Piperidine Amine and Sulfonyl-Pyridine-3-yl-Pyrazinamine Derivatives, and Their Anticancer and Antibacterial Activity

Venkata Konda Prasad B[1,2] | G. Venkata Haritha[3] | Kavati Shireesha[1] | Kumara Swamy Jella[1]

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Keywords: antibacterial activity | anticancer activity | pyrazine scaffolds | SARS studies

ABSTRACT

A novel series of biologically active aryl-pyrazin-2-yl-*N*, *N*-dimethyl piperidine amines and sulfonyl-pyridine-3-yl-pyrazinamine derivatives (**3/5a-e**) was synthesized and confirmed through ^{1}H NMR, ^{13}C NMR, and mass spectrometry. All synthesized compounds were evaluated for their antibacterial activity against pathogenic microorganisms. Among them, compound **3b** demonstrated the most potent antibacterial activity, particularly against *Staphylococcus aureus* and *Escherichia coli*. Furthermore, compound **3b** was screened for anticancer activity against the A549 lung cancer cell line, showing promising cytotoxicity with an IC_{50} value of 40 μg/mL. Structure–activity relationship (SAR) studies indicated that electron-donating groups significantly enhanced antibacterial activity, while electron-withdrawing groups led to a reduction in activity, and halogen substituents showed moderate antibacterial activity.

1 | Introduction

Cancer remains one of the most formidable and devastating challenges in modern medicine, claiming millions of lives each year and inflicting profound emotional and physical suffering on patients and their families. As the second leading cause of death worldwide, it underscores the urgent need for safer, more effective therapeutic strategies. While significant progress has been made in cancer treatment, current approaches often suffer from critical limitations, severe side effects, a lack of precision, and eventual loss of efficacy due to the emergence of drug resistance.

The development of novel anticancer agents is therefore imperative. A deeper understanding of cancer biology, combined with advances in targeted drug design, holds the promise of creating therapies that selectively eliminate malignant cells while sparing healthy tissues. Such precision treatments aim not only to inhibit tumor growth but also to induce cancer cell death without causing collateral damage to the body. Chemotherapy, despite being a cornerstone in the management of diverse malignancies, faces a persistent challenge: tumor cells frequently acquire resistance to chemotherapeutic agents over time. This resistance diminishes therapeutic effectiveness, often forcing clinicians to increase drug dosages, a step that intensifies systemic toxicity

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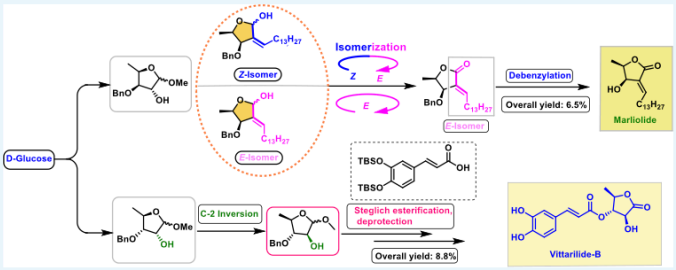
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[illegible]ynthesis of Marliolide-(4*R*,5*R*,3*E*)-4-hydroxy-5-methyl-3-tetradecylidenedihydrofuran-2(3*H*)-one and Vittarilide-B: A Unified Strategy Utilizing a Chiral Pool Approach

Janardana Reddi Desireddi,* Mora Mallikarjuna Rao, Kiran Kumar Murahari, Shivanagababu Challa, Bhimcharan Maiti, and Ravinder Manchal*

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ABSTRACT: The first stereoselective total synthesis of the natural products Marliolide-(4*R*,5*R*,3*E*)-4-hydroxy-5-methyl-3-tetradecylidenedihydrofuran-2(3*H*)-one (**1**) and Vittarilide-B (**1b**) has been accomplished using a carbohydrate-based approach starting from D-glucose. The synthesis of Marliolide-(4*R*,5*R*,3*E*)-4-hydroxy-5-methyl-3-tetradecylidenedihydrofuran-2(3*H*)-one (**1**) was achieved in 13 steps with an overall yield of 6.5%, featuring key transformations such as reduction, Wittig olefination, TEMPO-mediated oxidation, isomerization, and debenzylation. Vittarilide-B (**1b**) was synthesized in 18 steps with an overall yield of 8.8%, involving crucial steps like inversion, radical-mediated lactonization, Steglich esterification, and deprotection. The synthesis of Marliolide (**1**) led to the discovery of a notable isomerization phenomenon, where the **Z**-isomer was converted to the ***E***-isomer during the oxidation step using BAIB and TEMPO. Various reaction conditions were investigated for this isomerization process, with the TEMPO-mediated reaction consistently providing the best results. The synthesis of Vittarilide-B (**1b**) required the inversion of stereochemistry at the C-2 position of the common intermediate **6b**, followed by a sequence of steps to obtain the final product. The analytical data for both synthetic Marliolide-(4*R*,5*R*,3*E*)-4-hydroxy-5-methyl-3-tetradecylidenedihydrofuran-2(3*H*)-one (**1**) and Vittarilide-B (**1b**) were consistent with the data reported for the natural compounds. This work demonstrates the efficiency of using readily available chiral pool materials like D-glucose in the stereoselective synthesis of complex natural products and provides a foundation for further exploration of their biological activities and potential therapeutic applications.

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γ-Lactones, organic compounds found in various natural products, exhibit a wide range of biological activities, including antimicrobial, anticancer, anti-inflammatory, and antioxidant properties. These activities are crucial for drug discovery and development.[1−4] In this study, we focus on synthesizing compounds that include γ-lactones, given their frequent occurrence in nature. Various γ-butyrolactones have been discovered in *Litsea japonica*, each displaying unique biological activities, following the identification of Litsenolides.[5−7] Additionally, Chin *et al.* found that extracts from the bark of *Cinnamomum cambodianum* possess potent anti-inflammatory

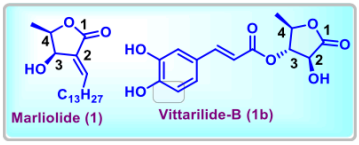


Figure 1. Structures of Marliolide (**1**) and Vittarilide-B (**1b**).

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Synthesis, Biological Evaluation, and Molecular Docking Studies of [1, 8]-Naphthyridine Derivatives as Potential Anticancer and Antimicrobial Agents

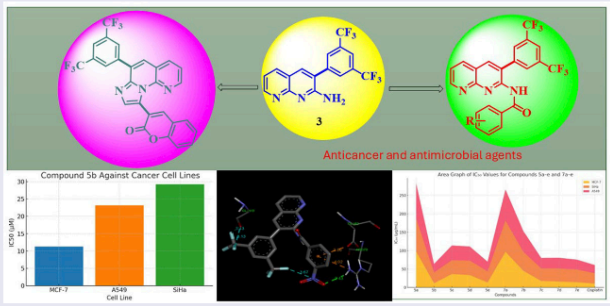
Sontireddy Surender Reddy, Kavati Shireesha and Kumara Swamy Jella

Heterocyclic & Medicinal Chemistry Laboratory, Department of Chemistry, Chaitanya (Deemed to be University), Hyderabad, India

ABSTRACT

A highly efficient and environmentally friendly synthetic strategy has been developed for the construction of novel bis(trifluoromethyl)phenyl-quinoline-benzamide-[1, 8]-naphthyridine and imidazo[1,2-a][1, 8]-naphthyridine derivatives. The structures of the synthesized compounds were confirmed by ^{1}HNMR,^{13}CNMR, and Mass data. The synthesized compounds (**5/7a-e)** were evaluated for their anticancer activity against three human cancer cell lines: MCF-7, A549, and SiHa. Among them, derivatives **5b** and **5e** displayed the most potent activity with IC_{50} values 11.25 ± 0.09 μM, 23.19 ± 0.45 μM, 29.22 ± 0.35 μM and 13.45 ± 0.09 μM, 26.24 ± 0.41 μM, 30.18 ± 0.39 μM. The synthesized derivatives were evaluated for their antimicrobial activity against pathogenic bacterial and fungal strains. All synthesized compounds demonstrated notable biological activity. Molecular docking studies were performed to evaluate the interactions of compounds 5/7a–e with selected target proteins. The results revealed strong binding affinities and favorable molecular interactions, supporting their potential as therapeutic agents. These derivatives exhibited significant antimicrobial and anticancer properties. Structure–activity relationship (SAR) analysis indicated that the presence of electron-withdrawing groups and hydrogen bond donors substantially enhanced cytotoxic effects.

GRAPHICAL ABSTRACT



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KEYWORDS
1; 8-naphthyridines; cytotoxic studies; antimicrobial activity; in silico studies

1. Introduction

The pursuit of designing and synthesizing novel molecules with strong anticancer potential remains a central and enduring objective in medicinal chemistry, driven by the urgent need for more effective, selective, and safer therapeutic agents. Today's cancer remains one of the most formidable global health challenges, claiming millions of lives each year and devastating families. As the second leading cause of

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Design and synthesis of new quinazoline hybrid molecules as EGFR targeting anti-breast cancer agents and computational studies

Gade Narmada [a], Siddhartha Marupati [b], B. Srinivas [a], Mohammad Azam [c], Saud I. Al-Resayes [c], Kim Min [d], Narasimha Swamy Thirukovela [a]

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Highlights

- Synthesis of new quinazoline derivatives (5a-n) with possible features of EGFR inhibitors.
- Compounds 5k and 5n showed higher inhibition against MCF-7 cell line than the DOX.
- Compound 5 g showed comparable inhibition against MCF-7 cell line with the DOX.
- Compounds 5 g, 5k and 5n also act as potent *in vitro* EGFR inhibitors as compared to Erlotinib.
- Computational studies were conducted in order to support the *in vitro* anti-EGFR IC50 data.

Article preview
Abstract
Introduction
Section snippets
References (52)

Abstract

A new series of quinazoline-isoxazole derivatives (**5a**-**o**) were synthesized based on molecular hybridization approach and features of marketed EGFR inhibitors. The *in vitro* anti-breast cancer activity of compounds (**5a**-**o**) against MDA-MB-231 and MCF-

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Microwave assisted one-pot synthesis of novel 1,3,4-oxadiazole-imidazo[1′,5′:1,2]pyrrolo[3,4-d][1,2,3]triazoles as potent EGFR targeting anticancer agents

Shaik Johnpasha [a], Mohammad Azam [b], Ravikumar Kapavarapu [c], Murali Krishna Thupurani [d], Saud I. Al-Resayes [b], Uma Rani Janapatla [e], Kim Min [f], Sirassu Narsimha [a] Show more

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Highlights

- This study aims to design and synthesize fused 1,3,4-oxadiazole-imidazo[1′,5′:1,2]pyrrolo[3,4-d][1,2,3]triazoles using PEG-400 mediated one-pot reaction under microwave irradiation.
- Fused 1,2,3-triazoles exhibited anti-lung cancer activity, caspases, and EGFR was carried out for potent compounds.
- *In silico* molecular docking and ADMET studies were also held potent compounds for the future anticancer drug discovery initiatives.
- The compounds 6j and 6k showed greater potency than the standard drug Erlotinib.

Article preview
Abstract
Introduction
Section snippets
References (61)

Abstract

EGFR inhibitors represent a category of targeted therapies employed in the treatment of specific types of tumors, including non-small cell lung cancer and breast cancer. In this investigation, we meticulously designed and synthesized a series of 1,3,4-oxadiazole-imidazo[1′,5′:1,2]pyrrolo[3,4-d][1,2,3]triazoles using a single [3 + 2]cycloaddition reaction of 2-(4-fluorophenyl)-5-(1-(3-iodoprop-2-yn-1-yl)-1H-imidazol-2-yl)-1,3,4-oxadiazole (**5**) followed by C–C bond coupling with various aryl azides under microwave irradiation using PEG-400 as solvent. The newly synthesized compounds underwent evaluation for their in vitro anti-lung cancer activity against the A-549 and NCI-H4607 cell lines. In comparison to the reference molecule, erlotinib, several of the compounds exhibited commendable efficacy. Compounds **6j** and **6k** exhibited significant anticancer activity against both tested cancer cell lines, with IC_{50} values of 3.46 ± 0.62 to 5.43 ± 0.46 μM, respectively. Additionally, they

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15	Mr. R. Sridevi, Mechanical Engineering	Member	

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