Congress Abstracts

Natural Health Products Research Society of Canada

Natural Health Products and Cancer Mini-Symposium 2025

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Natural Health Products and Cancer Mini-Symposium 2025

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Summary

Many natural health products (NHPs), including extracts from turmeric, long pepper, dandelion, lemon grass, mushroom, tea leaves, rosemary, avocado, and holy basil, have shown very potent anticancer and/or apoptotic-inducing activity in multiple cancer cell lines in pre-clinical studies. Some of these extracts have been used clinically as well. One of the major concerns with the use of anticancer NHPs are their unknown interactions with standard anticancer drugs, along with any potentially related adverse effects. Various research labs have focussed on these topics and observed interesting results, including the enhancement of anticancer effects in conjugation with chemotherapy (positive interactions). Many of the NHPs have potential to prevent cancer, as well as for the management of post-therapy quality of life. Some of these materials have also been shown to decrease the adverse reactions caused by chemotherapeutics. The current symposium includes presentations from many of the aforementioned topics as well as important invited talks on the preventative potential of NHPs, clinical research with mushroom extracts, the nutraceutical compounds from natural products that induce anticancer activity, plant-based nanomicellar formulation with anticancer natural compounds, and meta-analysis of anticancer effect of NHPs in patients. It is extremely interesting to see the interactive conversations regarding pre-clinical and clinical studies discussed collaboratively between researchers, NHP industry partners, health practitioners, and health regulators.

Antioxidative and Adhesive Properties of Probiotics Reinforce Gut Barrier Integrity to Mitigate Cancer Risk

by Jacqueline L. Boyajian and Satya Prakash | Biomedical Technology and Cell Therapy Research Laboratory, Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, Quebec, H3A 2B4, Canada

Abstract ID: 151 Event: 2025 Cancer Symposium Topic: Cancer Research
Presenter Name: Jacqueline L. Boyajian Keywords: Adhesion, Antioxidants, Gut Barrier, Microbiome, Probiotics, Reactive Oxygen Species

Summary /Résumé

The gut microbiome is essential for maintaining epithelial integrity and regulating host oxidative balance. Disruptions to this environment can impair barrier function, increase susceptibility to oxidative damage, and promote chronic inflammation - key drivers of gastrointestinal cancer. Probiotic therapeutics offer a promising strategy to restore microbial homeostasis and counteract these effects. We investigated the antioxidative and adhesive properties of three lactic acid bacterial strains: *Lactobacillus gasseri* A237 (LgA237), *Lactobacillus plantarum* WCFS1 (LpWCFS1), and *Lactobacillus fermentum* NCIMB 5221 (Lf5221). All strains showed strong antioxidant activity via DPPH radical scavenging assay, with LgA237 and LpWCFS1 outperforming quercetin, a known antioxidant control with anti-cancer effects. Adhesion to HT-29 human intestinal epithelial monolayers was also evaluated, with LpWCFS1 binding the greatest (68.3%), followed by LgA237 (35.5%) and Lf5221 (25.9%). These findings suggest the strains' potential to colonize the gut and exert localized protective effects. By reducing oxidative stress and promoting epithelial interaction, these strains may help suppress early microenvironmental changes associated with tumor development. Overall, these results support the potential of select probiotic strains in mitigating inflammation-associated carcinogenesis. Further investigation *in vivo* are warranted to evaluate their relevance as cancer therapeutics.

Lessons Learned from Superficially Simple Mushroom Extractions.

by Jhanielle James | Mohaddeseh Mansouri | Dr. Mary Egbuta | Dr Kasra Razmkhah | Dr. John F. Trant | University of Windsor | Uiversity of Windsor | University of Windsor | University of Windsor | University of Windsor

Abstract ID: 149 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Jhanielle James
Keywords: B-glucans, extraction, mushroom

Summary /Résumé

Reishi, Lion's Mane, and Cordyceps are protein-rich medicinal mushrooms containing bioactives like polysaccharides, terpenes, sterols, and vitamins. This study presents an improved, scalable Soxhlet and maceration extraction technique. An 8-hour extraction balanced yield and degradation. Tinctures were prepared by conducting macerations with water and ethanol as the solvents. β-glucan was the primary marker for efficiency, with key variables optimized: time, temperature, ultrasound, and solvent order, with ethanol-first extraction recovering more bioactives. Calorimetric analysis showed β-glucan declined over time, and ergosterol converted to vitamin D2 during storage. Standard 1:5 tinctures were produced; consecutive extractions yielded more β-glucan than concentrating to 1:1, though concentration slightly increased protein in Reishi and Lion's Mane.

Plant-Derived Nanomedicine: A Nanoplatform Encapsulating Quercetin as a Natural Adjuvant with Anti-miRNA 21 in Colorectal Cancer Therapy

by AHMED ABOSALHA | Biomedical Technology and Cell Therapy Research Laboratory, Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, Quebec, H3A 2B4, Canada.

Abstract ID: 152 Event: 2025 Cancer Symposium Topic: Cancer Research
Presenter Name: AHMED ABOSALHA Keywords: Colorectal cancer; quercetin; anti-miRNA 21; cytotoxicity; targeted drug delivery

Summary

Cancer continues to be the leading cause of mortality worldwide, revealing the critical need for the advancement of targeted therapeutic interventions. Quercetin, a naturally derived flavonoid from the flavonol subclass, is commonly found in plant-based foods such as onions, grapes, berries, cherries, broccoli, and citrus fruits. It possesses strong antioxidant properties and has been widely reported to induce apoptosis in numerous cancer cell lines. The miRNA 21 is significantly upregulated in colorectal cancer, where its expression level is positively correlated with disease progression and severity. In this study, we investigated the co-delivery of quercetin and anti-miRNA 21 to augment therapeutic effectiveness and reduce cytotoxic side effects. This combination therapy was encapsulated within polymeric nanoplatform, designed for colon-targeted oral delivery of both anti-miRNA 21 and quercetin. The engineered nanoparticulate system exhibited favorable physicochemical characteristics. Moreover, the designed nanoplatform demonstrated substantial cytotoxicity and enhanced apoptosis in colorectal cancer cell line, indicating strong potential for its application as a novel oral nanoformulation for targeted colon cancer treatment.

Targeting PKM2 with Nutraceuticals as a Therapeutic Strategy in Leukemia

by Nikolina Vrdoljak | Katya Parfenova | Paul A. Spagnuolo | Mark D. Minden | University of Guelph | University of Guelph | University of Guelph | Ontario Cancer Institute

Abstract ID: 153 Event: 2025 Cancer Symposium Topic: Cancer Research
Presenter Name: Nikolina Vrdoljak Keywords: cancer, leukemia, naphthoquinone, nutraceutical, targeted therapy, translational research

Summary /Résumé

Acute myeloid leukemia (AML) is a malignancy of the blood and bone marrow in dire need of novel, selective therapies. Pyruvate kinase catalyzes the final step of glycolysis and is encoded by the PKM gene, comprising of two isoforms: tetrameric, high activity PKM1 and dimeric, low activity PKM2. Only PKM2 expression is elevated in malignant cell lines, leading to a reduction in pyruvate kinase activity that provide proliferative advantages and leads to increased dimeric PKM2 accumulation within the nucleus. There, PKM2 acts as a protein kinase to stimulate oncogenic signaling pathways. As such, modulation of PKM2 has demonstrated efficacy as an anti-cancer strategy.

Despite its therapeutic potential, no pharmacological modulators have progressed to clinical applications, highlighting the continued need for novel therapies. Screening of a nutraceutical library identified a naphthoquinone compound as a selective activator of PKM2. Activity assays confirmed a selective increase in PKM2 activity vs. PKM1, and revealed selective increases in pyruvate kinase activity in cells derived from AML patients compared to those of healthy donors. Activation of PKM2 with this naphthoquinone leads to reductions in nuclear accumulation and protein kinase function, ultimately disrupting c-Myc expression and leading to cell death. Viability assays and a NOD/SCID in vivo model confirmed selective eradication of AML cells with minimal impact on healthy donor cells both in vitro and in vivo. Given that a majority of current PKM2 activators are synthetically derived, identification of a natural compound that imparts this selective activity presents a promising alterative, as well as builds on PKM2-targeting strategies in cancer.

Investigation of the Anti-Cancer Effects of Black Maitake Odaira Extract (BMOE) on Human Pancreatic Cancer Cell Line Bx-PC3 and the Interaction of BMOE with Chemotherapeutic Drugs

by Miguel Lazo | Dr. Siyaram Pandey | Primary Author | Advisor

Abstract ID: 157 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Miguel Lazo
Keywords: Black Maitake Odaira Extract (BMOE), Bx-PC3, Cancer Research, Natural Health Products, Pancreatic Cancer

Summary

Pancreatic cancer is often fatal and has a poor prognosis. Currently, researchers are searching for alternative treatments. Natural Health Products, which are medicinal components derived from plants, may be the answer as they have been found to have anti- cancer effects. The natural health product Black Maitake Odaira Extract (BMOE: a trade name of the Black Maitake Mushroom Extract manufactured and marketed by Shogun Maitake Canada, London, ON), has shown promise as a cancer treatment. During this study, pancreatic cancer cell line Bx-PC3 was subjected to BMOE in both 2D and 3D cell models to identify both the anti-cancer effects of BMOE and the mechanisms of action of BMOE. Moreover, BMOE was administered along with the chemotherapy drug Taxol to identify the drug-natural health product interaction. Annexin V Propidium Iodide testing confirmed that BMOE induces apoptosis in pancreatic cancer cells and that BMOE interacts positively with Taxol. Tetramethyl Rhodamine Methyl Ester testing suggested that the mechanism of action of BMOE involves selectively targeting the mitochondrial membrane potential of pancreatic cancer cells. The experiments undertaken in this study suggest that BMOE could be developed into a safe treatment that could be used simultaneously with chemotherapy to improve patient prognosis.

Optimizing the Extraction of Bioactive Compounds from Medicinal Mushrooms

by Mohaddeseh Mansouri | Kasra Razmkhah | Mary Egbuta | Arezoo Khodaei | Mahasin Al Shabi | John Trant | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada

Abstract ID: 148 Event: 2025 Cancer Symposium Topic: Cancer Research
Presenter Name: Mohaddeseh Mansouri Keywords: Bioactive compounds, Cordyceps, Ganoderma lucidum, Hericium erinaceus, Maceration, Medicinal mushrooms, Nutraceutical extraction, Tincture optimization, Ultrasound-assisted extraction, β-glucans

Medicinal mushrooms such as *Ganoderma lucidum, Hericium erinaceus*, and *Cordyceps* species are renowned for their health benefits and have long been used in traditional medicine. They are protein-rich, low in fat, and packed with a diverse array of bioactive compounds.

This study focused on optimizing nutraceutical extraction from medicinal mushrooms by comparing maceration and ultrasound-assisted methods, aiming to refine conventional techniques to achieve higher concentrations of bioactive molecules, particularly β-glucans, compared to commercial tinctures, while improving time and energy efficiency. Tinctures were first prepared from mushroom samples by maceration using ethanol and water as solvents. The extraction efficiency of the maceration method was primarily assessed based on β-glucan content of the resultant tinctures, with the process further optimized by considering extraction duration, temperature, ultrasound application, and solvent order. The bioactive composition of resultant tinctures was determined using chromatography and spectroscopy methods.

A significant finding was that prolonged extraction times decreased β-glucan content, emphasizing the importance of precise parameter optimization. The developed method enabled the preparation of standardized tinctures with a 1:1 mushroom-to-solvent ratio, yielding superior bioactive concentrations compared to commercial products. This work demonstrates a scalable and efficient approach to producing high-quality tincture, advancing research and commercial applications.

Strain-Specific Probiotics Target Inflammatory Pathways Implicated in Gastrointestinal Cancer

by Jacqueline L. Boyajian and Satya Prakash | Biomedical Technology and Cell Therapy Research Laboratory, Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, Quebec, H3A 2B4, Canada

Abstract ID: 150 Event: 2025 Cancer Symposium Topic: Cancer Research
Presenter Name: Jacqueline L. Boyajian Keywords: Gut Therapeutics, IL-8, Inflammation, MCAF, Microbiome, Probiotics

Summary /Résumé

The gut microbiome plays a pivotal role in maintaining host immune balance and epithelial function. An imbalance to the gut microbiome, or dysbiosis, can drive chronic, low-grade inflammation that promotes gastrointestinal cancer by disrupting barrier integrity and supporting tumor growth. Functional probiotics offer a promising strategy to mitigate inflammation at its source. Here, we investigated three lactic acid bacterial strains - *Lactobacillus gasseri* A237 (LgA237), *Lactobacillus plantarum* WCFS1 (LpWCFS1), and *Lactobacillus fermentum* NCIMB 5221 (Lf5221) - for their immunomodulatory effects in human intestinal epithelial cells. Following lipopolysaccharide-induced inflammation, LgA237

and LpWCFS1 cell-free supernatants significantly reduced expression of interleukin-8 (IL-8), a key chemokine involved in tumor-associated inflammation, by 34.2% and 29.4%, respectively. Lf5221 also reduced IL-8, modestly (13.8%). Moreover, in a cytokine-induced colitis model, the same strains downregulated monocyte chemotactic and activating factor (MCAF) expression by over 60%, suggesting inhibition of macrophage recruitment and tissue remodeling - two processes critical to tumorigenesis. These findings support the role of strain-specific probiotics in suppressing inflammation-associated cancer risk by targeting cytokine pathways central to tumor microenvironment formation. Further preclinical studies are warranted to evaluate the probiotics' potential in inflammation-driven cancer prevention and/or treatment.

Black Maitake Mushroom (Grifola frondosa) Extract Exerts Anti-Cancer Effects and Enhances the Efficacy of Chemotherapeutic Drugs in 2-D & 3-D Models of Triple-Negative Breast Cancer

by Silvia DeMarco | Abby Raad | Hannah Drew | Sofia Milicia | Saveenah Chawla | Siyaram Pandey | University of Windsor

Abstract ID: 147 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Silvia DeMarco
Keywords: 2-D models, 3-D models, BMOE, Black Maitake Odaira Extract, Breast cancer, Grifola frondosa, MDA-MB-231 cells, NHPs, Shogun Maitake Canada, TNBC, Taxol, Traditional Chinese Medicine, adjuvant, anti-cancer supplements, apoptosis, black maitake mushroom, cancer treatment, cell division, cell migration, chemotherapeutic drugs, cisplatin, complementary therapy, dose-dependent, in vitro, lack of selectivity, medicinal compounds, mitochondrial membrane depolarization, mitochondrial vulnerabilities, natural health products, non-toxic, pro-apoptotic effects, side effects, time-dependent, triple-negative breast cancer, women, wound healing assay

Breast cancer is the most common cancer among women worldwide. Chemotherapeutic drugs are commonly used for treatment and have led to major advancements, but their lack of selectivity causes harsh side effects, limiting long-term use. This has led to growing interest in natural health products (NHPs) as complementary anti-cancer supplements, as they have traditionally been used as medicinal compounds in many cultures and may offer a safer and less toxic approach to cancer treatment. Black maitake mushroom (Grifola frondosa), used in Traditional Chinese Medicine, contains compounds with anti-cancer properties. However, further research is needed on the whole extract's efficacy, mechanisms, and interactions with standard therapies. This study examines the effects of Black Maitake Odaira Extract - Prothera (BMOE), manufactured by Shogun Maitake Canada (London, ON), on triple-negative breast cancer (TNBC) MDA-MB-231 cells, both alone and in combination with cisplatin and Taxol. BMOE induced apoptosis in 2-D and 3-D *in vitro* TNBC models in a dose- and time-dependent manner, targeting mitochondrial vulnerabilities by triggering mitochondrial membrane depolarization. It also inhibited cell migration and division in wound healing assays. BMOE enhanced the pro-apoptotic effects of cisplatin and Taxol. These findings highlight BMOE's potential as a non-toxic, complementary adjuvant to conventional cancer therapies.

Investigating the Effects of Black Maitake Mushroom Extract on the A549 Lung Cancer Cell Line and its Interaction with Standard Chemotherapies

by Divyanshi Mitra | Eesha Atikukke | Dr. Siyaram Pandey | University of Windsor | University of Windsor | University of Windsor

Abstract ID: 155 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Divyanshi Mitra
Keywords: A549 cells, Black maitake extract, lung cancer, natural health products

Summary /Résumé

Lung cancer leads the cancer-related deaths in the world. Lung adenocarcinoma is a type of non-small lung cancer. Natural health products (NHPs) have long been used for medicinal purposes and have shown anti-cancer properties in past studies, providing a potential alternative to chemotherapy treatments. The Black maitake mushroom has traditionally been used in Japan and has shown anti-cancer effects in breast-cancer studies. This study investigated the effectiveness of Black Maitake Odaira Extract-Prothera (*Grifola frondosa*), a trademark product of Black maitake extract (BME), on inducing apoptosis in the A549 lung adenocarcinoma cell line *in-vitro*, alone and in combination with Taxol and cisplatin. Dose- dependent kinetics, 2-D and 3-D cell culture models, and wound-healing assays were utilized. BME increased cell death in a dose-dependent manner. BME in combination with Taxol significantly reduced mean cell viability relative to the DMSO control. This combination also slowed cell migration at 48- and 72-hours, while cisplatin and BME did so at 72-hours only. It is likely that BME does not target mitochondria to induce apoptosis in A549 cells.

Selective Targeting of Neural Cancers with Long Pepper and Green Tea Extracts

by Darcy Wear | Karolina Konior | Michael Okoko | Caleb Vegh | Ibrahim Alsalkhadi | Victoria Iannetta | Siyaram Pandey | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada | Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, Canada

Abstract ID: 142 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Darcy Wear
Keywords: Apoptosis, Cancer, Glioblastoma, Green Tea, Long Pepper, Mitochondria, Neuroblastoma, Oxidative Stress

Summary: Glioblastomas are highly aggressive brain tumours with 5-year survival rates of just 7%, while neuroblastoma remains the most prevalent infancy tumour accounting for 15% of childhood cancer deaths. Standard treatments for these cancers, including radiotherapy and chemotherapy, lack specificity and negatively impact quality of life. Conversely, research has shown anti-cancer activity in extracts of *Piper longum* and *Camellia sinensis*, used in traditional medicines and safe for long-term consumption. Alongside standard chemotherapeutics, these extracts may enhance cancer cell death allowing for reduced dosages and associated adverse events. As a result, this study aimed to selectively target both glioblastoma and neuroblastoma using long pepper extract (LPE) and Synthite tea extract (STE) concurrently with the chemotherapies cisplatin and temozolomide. We found selective apoptotic induction through oxidative stress and mitochondrial destabilization with LPE and STE respectively, with no impact on normal healthy cells. Most importantly, chemotherapy-induced cell death was not reduced by our extracts demonstrating their safety alongside current treatments. Reduced numbers of tumourigenic CD44-positive stem-like cells further highlights their potential to reduce cancer relapse. Therefore, clinical studies with LPE and STE alongside chemotherapy in glioblastoma and neuroblastoma are warranted as a potential therapeutic strategy.

Clinical Guidelines for Natural Products in Oncology

by Ellen Conte | Patterson Institute for Integrative Oncology Research

Abstract ID: 144 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Ellen Conte
Keywords: Natural Health Products, clinical practice guidelines, integrative oncology, naturopathic medicine

Background

The growing research base for natural health products (NHPs) in cancer care presents a challenge for clinicians to remain current and integrate emerging findings. Evidence-informed resources aim to reduce clinician workload, improve informed decision-making, and enhance patient outcomes. While some guidelines have been created for integrative oncology, gaps remain. This project aims to (1) develop rigorous, transparent, and feasible methodology for the creation of clinical practice guidelines (CPGs) for NHP use in cancer care and (2) create a series of CPGs to help manage cancer-related symptoms.

Methods

Systematic literature searches will be conducted, followed by data extraction, risk of bias assessment, and assignment of levels of evidence. A multidisciplinary panel of experts will formulate recommendations. Rating systems have been adapted from the European Society for Medical Oncology and GRADE evidence-to-decision framework such that the methods are rigorous, feasible, and reflective of unique considerations for NHPs. Recommendations will be formulated based on the level of evidence, balance of benefits and risks, magnitude of effect, and pragmatic considerations including clinician experience, traditional knowledge, and patient values. Feedback from target users will be sought prior to developing a series of CPGs, which will be maintained and updated in a multi-year project.

Results

A standard operating procedure has been created to facilitate the creation of CPGs for NHPs in oncology.

Conclusion

The development of these methods is novel in the naturopathic and integrative medical fields. The dissemination of CPGs may reduce knowledge gaps, foster improved application of evidence in patient care, and lead to enhanced patient outcomes.

Advancing Naturopathic Cancer Care: A Survey of Naturopathic Doctors to Identify Practice Patterns and Knowledge Gaps

by Erica Rizzolo | Patterson Institute for Integrative Oncology Research

Abstract ID: 145 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Mark Legacy
Keywords: Naturopathic medicine, integrative oncology, survey

Background: Clinical guidance and advanced training for naturopathic doctors (NDs) in supportive cancer care is limited. Identifying oncology-related knowledge gaps is essential for developing clinical resources to enhance patient care. Objectives: We distributed a survey to describe naturopathic practice, characterize oncology-related knowledge gaps, and determine NDs preferred clinical resources.

Methods: This was a cross-sectional study. A 40-item survey, created using SurveyMonkey, was distributed to NDs through naturopathic associations, social media platforms and informal networking. Questions were tailored according to whether respondents indicated they provide cancer care ('cancer stream') or not ('general stream'). The survey ran from September 2023 to March 2024. Data was analyzed using frequency distributions and descriptive statistics.

Results: 170 responses were collected, of which 149 were eligible for analysis. 92 respondents (62%) practiced in Canada, 54 (36%) in the US, and 3 (2%) outside North America. Respondents in the cancer stream (N = 99, 66%) primarily work in community settings, provide in-person and virtual consults, and do not exclusively work with cancer populations. The largest knowledge gaps were reported for intravenous green tea extract and curcumin, photodynamic therapy and ozone therapy, and managing tinnitus. Interactions between naturopathic interventions and photodynamic therapy and stem cell transplants also had high gaps. The smallest knowledge gaps were reported for exercise counseling, the Mediterranean diet, intravenous vitamin C, vitamin/mineral infusions, and in managing constipation, anxiety, diarrhea, fatigue, hot flashes, and depression. The most cited reason for knowledge gaps was a lack of time to find new and existing information. In the general stream, 29 (58%) indicated that additional training and resources would increase their likelihood of offering cancer care.

Conclusion: This survey identified oncology-related knowledge gaps, which were generally highest for less commonly used and studied therapies, and strong clinician support for resource development. Varied resource formats may accommodate different learning styles and improve dissemination.

Black Maitake Induces Apoptosis and Enhances the Efficacy of Standard Chemotherapy in 2D and 3D U-87 MG Glioblastoma Cell Models

by Sona Regonda | Paula-Stephanie Popescu | Siyaram Pandey | University of Windsor

Abstract ID: 154 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Sona Regonda
Keywords: 3D spheroids, black maitake mushroom, glioblastoma, apoptosis, cancer therapy, cell migration, mitochondrial depolarization, natural health products

Abstract

Glioblastoma is an aggressive brain tumour marked by rapid growth, invasiveness, and poor prognosis, with over 90% of patients experiencing tumour recurrence. Current therapies, including surgery, radiation, and chemotherapy, are non-selective and toxic, creating urgency for safer strategies. Natural health products (NHPs), long used medicinally, have gained global attention for their anti-inflammatory and antioxidative properties, suggesting potential as non-toxic adjuncts in cancer therapy. Black maitake mushroom (*Grifola frondosa*), a well-tolerated NHP, has shown anticancer effects in breast cancer but remains largely unexplored in glioblastoma. This study investigates the apoptotic effects of Black Maitake Odaira Extract - Prothera (BMOE: a trade name of the extract manufactured by Shogun Maitake Canada, London ON) in U-87 MG human glioblastoma cells, alone and with temozolomide (TMZ), a standard chemotherapeutic. Apoptosis was assessed using Hoechst 33342, annexin V/propidium iodide staining, and 3D spheroid morphological analyses. Mitochondrial depolarization and migration were evaluated using TMRM staining and wound-healing assays. BMOE induced significant, dose-dependent apoptosis, mitochondrial destabilization, impaired migration, and structural disintegration while enhancing TMZ efficacy. These findings support BMOE as a promising adjunct in glioblastoma therapy to greatly improve patient outcomes.

Enhancement of Pancreatic Cancer Treatment: Synthite Tea Extract Promotes Cell Death and Boosts Chemotherapy Effectiveness

by Mohammad Nour El Hindawi | Siyaram Pandey | Saveena Chawla | The University of Windsor | The University of Windsor | The University of Windsor

Abstract ID: 143 Event: 2025 Cancer Symposium Topic: Cancer Research
Presenter Name: Mohammad Nour El Hindawi Keywords: apoptosis., chemotherapeutics, natural health products, pancreatic adenocarcinoma

The aggressive nature of pancreatic adenocarcinoma and the scarcity of available therapeutics make it challenging for oncologists to treat cancer patients effectively. In this article, we examine the anti-cancer properties of a new green tea extract, specifically Synthite tea extract (STE), against pancreatic adenocarcinoma cells while also observing the synergy effect between STE and gemcitabine (GEM). Our results have shown that STE causes apoptosis in a dose- and time-dependent manner, significantly reducing the viability of BxPC-3 cells. Also, our experiments demonstrate that combining STE with GEM produces a stronger apoptotic response. We confirmed this effect through brightfield and fluorescence microscopy. Furthermore, studies based on the wound healing assay have shown that STE can significantly hinder the metastasis of cancer cells. Additionally, research has pointed out a possible unique way that STE works: by targeting weaknesses in mitochondria, even when used in combination with GEM to disrupt the mitochondrial membrane potential. The STE + GEM treatment significantly reduced 3D spheroid surface area. Those findings point to STE's potential as a therapeutic agent for pancreatic cancer.

Evaluating the Anticancer Activity of Black Maitake Odaira Extract-Prothera (Grifola frondosa) and its Interactions with Common Chemotherapeutics in In-Vitro and In-Vivo Models of Human Colorectal Cancer.

by Hannah Drew | Vanessa Chimienti | Sona Regonda | Mohammad El Hindawi | Divyanshi Mitra | Eesha Atikukke | Angelina Hermes | Dr. Siyaram Pandey | Department of Chemistry and Biochemistry UWindsor | Department of Chemistry and Biochemistry UWindsor | Department of Integrative Biology UWindsor | Department of Biomedical Sciences UWindsor | Department of Integrative Biology UWindsor | Department of Integrative Biology UWindsor | Department of Biomedical Sciences UWindsor | Department of Chemistry and Biochemistry UWindsor*

Abstract ID: 156 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Hannah Drew
Keywords: Black Maitake Odaira Extract-Prothera; anti-cancer; colorectal cancer; natural health products; antioxidant; anti-inflammatory

Many common chemotherapeutics yield several negative side effects due to their lack of treatment specificity in cell targeting, preventing them from being used long-term. Natural health products are well tolerated and safe for consumption, and some have demonstrated anticancer effects due to their anti-inflammatory and antioxidant properties. Black Maitake Odaira Extract-Prothera (*Grifola frondosa*) (BME) has shown promising results in clinical studies; however, its efficacy, mechanism of action, and interaction with common chemotherapeutics have not been tested in colorectal cancer models. If positive drug-drug interactions are observed, BME has the potential to be used in conjunction with chemotherapeutics to reduce the risk of drug toxicity while enhancing treatment efficacy. We have demonstrated that BME has anticancer properties and enhanced apoptotic induction when combined with the common chemotherapeutic, FOLFOX, compared to individual chemotherapy treatment. Further, a reduced rate of tumour growth was observed in colorectal cancer xenograft models when administered orally ad libitum, while also being well-tolerated, demonstrated by progressive weight gain. Our findings suggest that the use of BME in adjuvant therapies could be an efficacious and well-tolerated treatment for colorectal cancer patients.

Evaluating the Anticancer Activity of Black Maitake Odaira Extract-Prothera (Grifola frondosa) and its Interactions with Common Chemotherapeutics in In-Vitro Models of Human Prostate Cancer.

by Hannah Drew | Vanessa Chimienti | Dr. Siyaram Pandey | Department of Chemistry and Biochemistry UWindsor | Department of Chemistry and Biochemistry UWindsor | Department of Chemistry and Biochemistry UWindsor*

Abstract ID: 146 Event: 2025 Cancer Symposium Topic: Cancer Research Presenter Name: Hannah Drew
Keywords: Black Maitake Odaira Extract-Prothera; anti-cancer; prostate cancer; cancer cells; apoptosis; oxidative stress

Summary /Résumé

Prostate cancer is one of the most commonly diagnosed cancers among men in Canada. Without early diagnosis, prostate cancer can be fatal, with an average survival rate of 28% once metastasized. Although chemotherapeutics are a common treatment method for metastatic prostate cancer, their lack of specificity in cellular targeting results in severe negative side effects, making them unsuitable for long-term use. Black Maitake Odaira Extract-Prothera (*Grifola frondosa*) (BME) has shown potential to selectively target cancer cells, while providing safe, long-term consumption. The anti-cancer efficacy of BME, studied in 2D and 3D cell culture models, was evaluated by induction of apoptosis, indicated by fluorescent markers, cell migration, and morphology. Fluorogenic dyes were also utilized to study mitochondrial activity and oxidative stress for mechanistic studies. Our results demonstrate that BME causes an apoptotic effect in multiple prostate cancer cell models. BME showed positive combinatory interactions with common chemotherapeutics, suggesting that BME can be an effective and long-term treatment option.