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Research Article

Unlocking the potential of Lion's Mane Mushroom (*Hericium erinaceus*)

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Abstract

The Lion's Mane mushroom, botanically known as *Hericium erinaceus*, stands out as a unique and esteemed member of the fungal kingdom. This extraordinary mushroom not only possesses an alluring appearance but also holds a significant historical presence in diverse cultures, especially within the context of ancient herbal medicine practices. This fungus holds promising prospects in several domains. Its potential as a natural remedy for cognitive health is gaining attention. This mushroom has neuroprotective properties and could play a role in supporting brain function, which is particularly relevant in the present aging population where neurodegenerative conditions like Alzheimer's disease are a growing concern. Furthermore, Lion's Mane has been explored for its potential in addressing mood disorders. It is a rich source of bioactive compounds, including β-glucans, that can positively affect the immune system. The fungus produces bioactive compounds that can be used to treat various chronic diseases like obesity, high blood pressure, hepatic disorders, and cancer ; it also has other benefits like wound healing and improving the immune system. This review endeavours to elucidate the multifaceted potential of Lion's Mane mushroom within the domains of nutrition, health, and wellness. Through a comprehensive examination of its properties and benefits, the review explored how Lion's Mane mushrooms can be harnessed to enhance human well-being. By unlocking the secrets hidden within this remarkable fungus, the study provides insights that can empower individuals to incorporate Lion's Mane into their daily lives, fostering a healthier and more balanced lifestyle.

Keywords: Bioactive compound, Edible fungi, Lion's Mane mushroom, Medicinal mushroom

INTRODUCTION

Medicinal plants and herbs hold significant importance in the context of traditional treatments. Approximately 140,000 to 150,000 mushroom species have been recognized for producing diverse medicinal compounds and about 700 medicinal compounds have been identified from these species (Bacha *et al*., 2018). Lion's Mane mushroom is among many medicinal mushrooms renowned for their potential health benefits and therapeutic properties. Referred to as fungi, these organisms encompass the visible fruiting body and the underlying mycelium, constituting a unique biological category. Humans have always fascinated by nature and their properties of mushrooms and gathered knowledge about their medicinal properties. Lion's Mane belongs to the category of higher fungi, also known as macro-fungi. Among the 14,000 identified species of higher fungi, 350 are recognized as edible and consumed by humans (Niego *et al*., 2021). It is intriguing name was derived from its unique appearance, which resembles the cascading tendrils of a lion's

mane. Its long, fringed, snow-white spines instantly make it recognizable in its natural habitat. It is prevalent in the United Kingdom, Japan, Europe, East Asia, and the temperate latitudes of the southern hemisphere (David and Williams, 2023).

The fungus commonly thrives on mature trees with broad canopies, such as old pollards or well-established specimens, but it can occasionally produce fruiting bodies on younger trees that have been injured or damaged (Sokol *et al*., 2015). In the natural environment, it reproduces via spores. These spores exhibit considerable resilience to diverse climatic conditions and can endure for a duration of up to seven years. It seems to thrive in warmth rather than intense heat, flourishing particularly in temperatures ranging from 25 to 30°C. While it can also develop in cooler conditions, such as 20°C, it does not thrive in freezing temperatures. Sporulation ceases when temperatures reach 31-33°C, elucidating its prevalence in Europe during late summer or autumn. It can prosper both in humid and acidic environments (Thongbai *et al*., 2015; He *et al.,* 2017). However, it does not thrive in tropical or subtropical regions, and it shows a preference for moderate rather than high humidity levels (David and Williams, 2023)

COMMERCIAL CULTIVATION

The Lion's Mane mushroom is an uncommon species, and the unauthorized harvesting of its wild fruiting bodies in the United Kingdom is rigorously forbidden. This fungus was artificially cultivated for the very first time in China, under controlled environments using synthetic logs that are enclosed within polypropylene bags and bottles (Imtiaj *et al*., 2008) This mushroom requires an optimal temperature range of 18-24 °C and 80-90 per cent relative humidity for the mycelial growth. Adequate fresh air circulation for about 5-8 hours is essential, and it flourishes best in light conditions ranging from 500 to 1000 lux (Bacha *et al*., 2018).

Despite its nutritional value, it is highly regarded for its mild flavor and succulent texture. Even though wild fruiting bodies are rare, it is very easy to cultivate this fungus using agricultural byproducts abundant in cellulose (Table 1). Lion's mane mushroom consists of various components such as carbohydrates (60.95 %), protein (42.5 %), ash (8.9 %), low fats (7.9 %), crude fiber (7.81 %) and amino acids (Bacha *et al*., 2018).

Benefits of Lion's mane mushroom:

Lion's mane mushroom contains bioactive compounds such as hericerins, alkaloids, steroids, polysaccharides and erinacines (Table 2). Among these the terpenoid compounds like hericenones obtained from the fruiting body of the fungi and erinacines obtained from cultured media stimulate synthesis of Nerve growth factor (NGF).

Among these, the most significant results have been found in treating Parkinson's and Alzheimer disease. It also has antitumor, antidiebatic and anticancerous properties (Fig. 1).

Improve brain function

Li *et al*. (2020) conducted a study wherein for a period of 49 weeks Chinese nationals were given 350 mg capsules three times daily, each containing 5 mg/g of erinacine A, and the results showed improvements in various blood biomarkers, including calcium, hemoglobin, albumin, brain-derived neurotrophic factor, superoxide dismutase, and homocysteine. Moreover, participants who consumed capsules containing *Hericium erinaceus* mycelium also showed enhancements in alpha-ACT (α-ACT) and reductions in β-amyloid levels. These findings indicate improved cognitive abilities and greater levels of Neurocognitve benefits (social cognition, language, learning, memory, executive function and perceptual-motor skills). Martínez-Mármol *et al.* (2023) reported that Hericene-A functions by utilizing a unique signaling pathway that promotes overall neurotrophic effects, enhancing cognitive abilities. Kuo *et al.* (2016) reported that mycelium of *H. erinaceus* alleviate the damaging impact on neuronal cells within an animal model treated with 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (Kuo *et al*., 2016). *H. erinaceus* can

Table 1. Cultivation of Lion's Mane mushroom using Agricultural Waste

Developmental Stages	Organs	Agricultural Products
Vegetative	Mycelia	Rice bran, wheat bran, barley bran, egg shell Chinese cabbage, soybean powder, Potato dextrose agar medium, yeast malt medium, oak saw dust medium Sunflower seed hulls Tofu whey
Reproductive	Fruiting Body	Agro wastes (rice straw, soybean dregs, sugarcane bagasse) Textile industry wastes (hemp, rye straw, flax shive, alder sawdust,) Artemisia capillaries

Source : Bacha *et al*., (2018).

be used to treat various cognitive impairments (Mori *et al*., 2009), Alzheimer disease (Tzeng *et al*., 2016), Parkinson's disease (Kuo *et al*., 2016), Ischemic stroke (Lee *et al*., 2014), Presbycusis (Chan *et al*., 2019).

Support digestive health

Peptic ulcers, encompassing gastric and duodenal ulcers, have posed a significant health concern for the global population (Xie *et al*., 2022). The main factors contributing to peptic ulcer disease include persistent inflammation triggered by *Helicobacter pylori* infection and the consumption of nonsteroidal anti-inflammatory drug (NSAIDs) (Narayanan *et al*., 2018) The gastric mucus barrier serves a vital function in protecting the stomach (Allen and Flemstrom, 2005: Jia *et al*., 2023). When animals were pretreated with an aqueous extract of *H. erinaceus,* there was a notable enhancement in gastroprotection. This was evident as there was a significant increase in free mucus compared to animals with ulcers but without treatment. This mucus primarily consisted of mucin-type glycoprotein, identified using alcian blue dye. Alcian blue dye binds to substances with negative charges.

The mucus gel that adheres to the surface of the gastric mucosa acts as a shield, safeguarding the underlying epithelium from substances like acid pepsin and damaging agents such as ethanol and indomethacin (Devaraj *et al*., 2011). However, it is important to note that according to Allen and Flemstrom (2005), the mucus lining the gastric wall plays a more crucial role in protecting the gastric mucosa against chemical or mechanical threats than the soluble mucus found within the stomach's lumen. This gastric wall mucus coating may contribute to the healing of damaged gastric epithelium (Shih *et al*., 2005; Hagen 2021). Therefore, the increased capacity of alcian blue binding suggests that the aqueous extract of *H. erinaceus* can activate the defensive system of the gastric mucus barrier.

Relieve depression and anxiety

Depression is a prevalent and severe neuropsychiatric condition, ranking among the top contributors to the worldwide burden of disease. While there are numerous antidepressant medications on the market, their effectiveness is often limited, and a significant number of them come with undesirable side effects. There are various hypotheses involved in depression about how it works. One of the hypothesis is monoamine hypothesis, which state that the symptoms and expressions of depression are linked with impairment of monoamine systems, that encompass serotonin, norepinephrine and potentially dopamine (Coppen 1967; Schildkraut 2006; Chong *et al*., 2019). Reduced transmission of monoamine neurotransmitters can occur due to a range of factors, including deficits or malfunctions in monoamine precursor molecules, receptors, enzymes, and transporters, as well as issues related to monoamine synthesis (Fig. 2). Moreover, an increase in monoamine oxidase activity and reduced exocytosis can contribute to this deficiency.

Clinical observations conducted in vivo have supplied substantial evidence in favour of the monoamine hypothesis (Bunney and Davis 1965; Coppen 1967; Schildkraut 2006; Chong *et al.,* 2019). When animals displaying depressive-like symptoms were given H. erinaceus orally, it produced effects similar to those of conventional antidepressant medications. It is noted that H. erinaceus helps reinstate serotonin, norepineph-

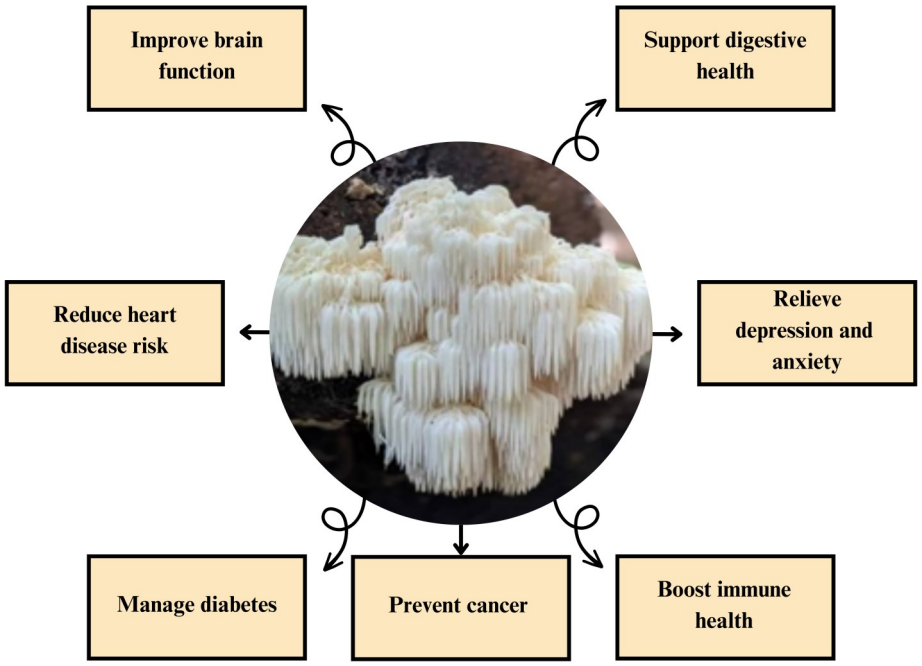

Fig. 1. *Benefits of Lion's mane mushrooms*

Table 2. Bioactive compounds of *Hericium erinaceum* and their therapeutic potential**.**

List of compounds	Action	Medical use	References
Polysaccharides β-D-glucans	Anti-carcinogenic	Stomach and intestinal cancers (gastric, liver, colorectal), Leukemia	Sokol *et al*., (2015); David and William (2023)
	Immune response modulation	For treating cancers	
	Gastrointestinal shielding	Chronic gastritis, ulcers	
	Bactericidal effect	Ailments caused by Helicobacter pylori	
	Reduction of Cholesterol and triglyceride levels	Hyperlipidaemia	
	Anti-hyperglycemic	Diabetes	
	Liver function support	Liver tissue injury	
Polyphenols	Oxidative stress protection	Skin rejuvenation	Sokol *et al*., (2015); David and William (2023)
Hericenones A–B	Anti-thrombotic	Thrombosis, vascular diseases, stroke	Sokol *et al*., (2015); David and William (2023)
	Cytolytic	Cancers	Sokol *et al.,* (2015); David and William (2023)
Hericirine	Diminishing inflammatory signaling molecules and immune system messengers(cytokines)	Inflammatory ailments	Sokol *et al.,* (2015); David and William (2023)
Hericenones C–H, erinacines A–I	Neuro-restorative, Nerve cell preservation	Dementia, Alzheimer's and Parkinson's diseases, depression	Sokol *et al.,* (2015); David and William (2023)
Erinacine A	Heightened synthesis of neurotrophins, leading to elevated levels of nerve growth factor messenger RNA (NGF mRNA).	Neuroregenerative treatments for neurological disorders or injuries	Rupcic *et al*., (2018)
Erinacine B	Augmented generation of neurotrophins, specifically an elevation in the production of nerve growth factor messenger RNA (mRNA).	Treatment of neurodegenerative disorders, nerve injuries, and conditions where enhanced neural regeneration is desired	Rupcic *et al.,* (2018)
Erinacine C	Mitigating neuroinflammation by decreasing the levels of nitric oxide (NO), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF-α), and hindering the activation of NF-κB and the phosphorylation of IκBα.	Treatment of various neurological disorders	Wang *et al.,*(2019)
Erinacine P	Substantial promotion of the extension of neuronal projections (neurites).	Treatment of conditions involving nerve injuries, neurodegenerative diseases, or other disorders where the promotion of neural growth and connectivity is desirable	Zhang *et al.,* (2018)
Erinacine S	The promotion of neurite outgrowth in primary neurons from both the central nervous system (CNS) and peripheral nervous system (PNS) is significantly increased.	Promotes nerve regeneration and functional recovery in cases of injuries to both the CNS and PNS	Lin *et al.,* (2023)
Erinacine W,X,Y	Induced growth of neuronal projections	Repair and recovery of damaged nerves, which is particularly relevant in conditions involving nerve injuries or neurodegenerative diseases	Ma *et al.,* (2021)
Hericenone F	Diminished nitric oxide (NO) production resulting in an anti-inflammatory effect	Treatment of inflammatory conditions	Lee *et al.,* (2016)
Isohericerinol A, Corallocin A	Elevated the production of brain-derived neurotrophic factor (BDNF) protein.	Treatment of neurodegenerative disorders, mood disorders, and other conditions where neuronal health and plasticity are critical	Ryu *et al.,* (2021)

rine, and dopamine levels in these animals (Chiu *et al*., 2018; Chong *et al*., 2021). This fungus's fruiting bodies and mycelia consist of various bioactive compounds that can stimulate the production of several neurotrophic factors (Kawagishi *et al*.,1992; Kawagishi *et al*.,1994; Kawagishi *et al*.,1996; Kushairi *et al*., 2019).

The majority of identified bioactive compounds responsible for producing antidepressant-like effects are primarily linked to their ability to stimulate NGF (Nerve Growth Factor) production (Mori *et al*., 2008; Li *et al*., 2018) and also nerve cells (Wong *et al*., 2007; David and Williams 2023). In the context of *H. erinaceus*, the bioactive compounds responsible for affecting NGF release are mainly hericenones and erinacines. Due to their small molecular size they can easily penetrate the blood-brain barrier (Huang *et al*., 2021). Nagano *et al.* (2010) conducted an experiment to study the effects of *H. erinaceus* on depression, menopause, sleep quality and indefinite complaints, wherein 30 females were randomly given *H. erinaceus* (HE) cookies or placebo cookies for 4 weeks. It was found that each of the Center for Epidemiologic Studies Depression Scale and the Indefinite Complaints Index scores after the HE intake was significantly lower than before. Hence, it was proved that HE intake can reduce anxiety and depression but the mode of action in this case differed from the NGF-enhancing action of *H. erinaceus*. Ryu *et al*. (2018) carried out a study to evaluate the antidepressant and anxiolytic potential of ethanolic extract derived from *H. erinaceus* in adult mice and found that mice fed with extract of *H. erinaceus* showed significant changes in antidepressant effects.

Boost immune health

Lion's Mane mushroom is recognized for its abundance of beta-glucans, especially beta 1-3, 1-6 glucan, among the various mushroom varieties rich in this compound (Kawagishi *et al*., 1992), it also contains erinacines (Kawagishi *et al*., 1992; Kawagishi *et al*., 1994; Nagai *et al*., 2006), Hericenones (Mori *et al*., 2009), dilinoleoyl -phosphatidylethanolamine, DLPE (Kawagishi 2006), terpene compounds (Kenmoku *et al*., 2001), protein vitamins (Wu *et al*., 2012) amino acids (Li *et al*., 2014). Mushroom-derived β-glucans are well-known for their potent immunomodulatory properties, surpassing other types in terms of their ability to affect immune and inflammatory responses (Han *et al*., 2020; Ikewaki *et al*., 2021). Immunomodulation involves the capacity to correct aberrant immune functions, which can entail bolstering weakened or suppressed aspects or normalizing hyperactive or excessive functions (Jesenak *et al*., 2014)

Because of their versatile mechanism of action, β-glucans are recognized as biological response modifiers. They alter the epigenetic profile of innate immune cells, leading to an enhanced immune response. Additionally, they serve as pathogen-associated molecular patterns, binding to specific receptors for pathogen

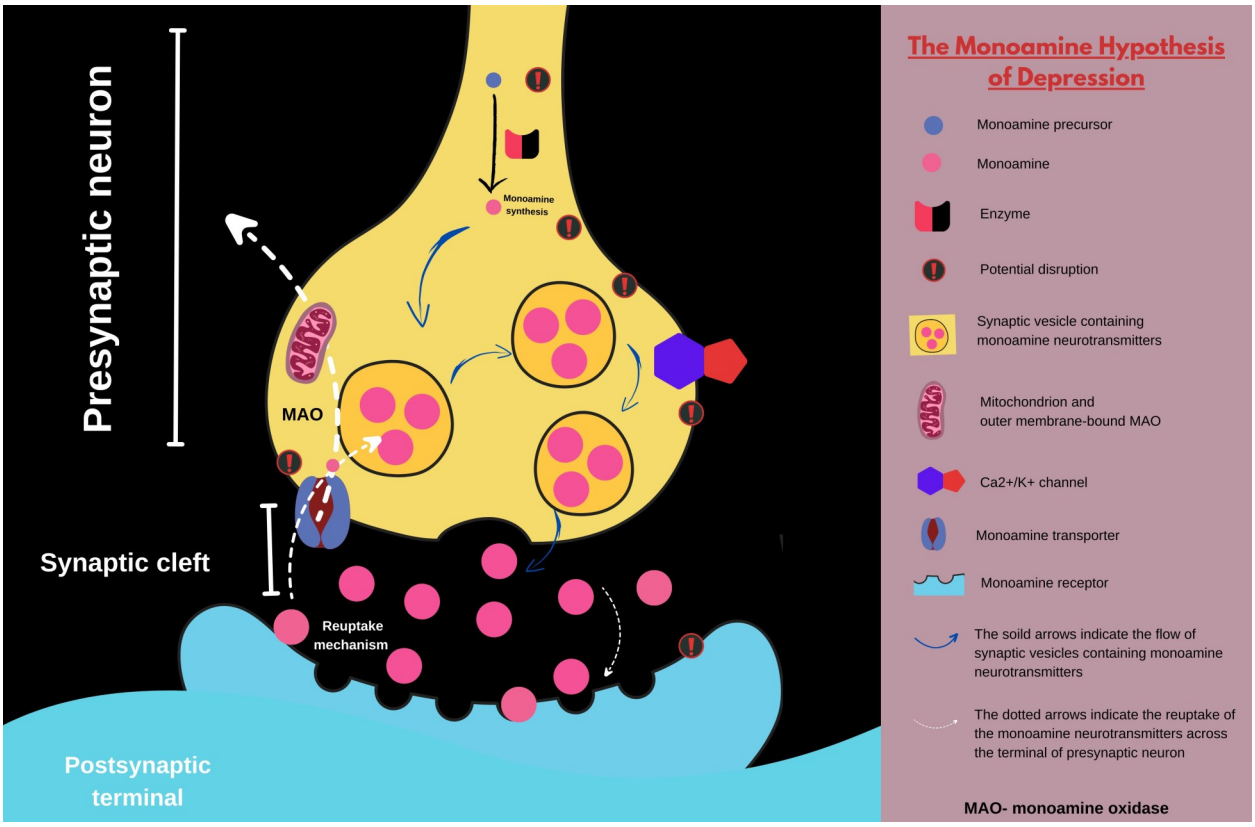

Fig. 2. *Monoamine hypothesis of depression*

recognition, thereby triggering innate and adaptive immune reactions (Han *et al*., 2020; Ikewaki *et al*., 2021). These β-glucans can additionally boost the performance of macrophages and neutrophils, bolster the capabilities of natural killer (NK) cells, affect the generation of cytokines and chemokines, and oversee the control of antibody production, among a myriad of other roles. Therefore, it can be concluded that Hericenone can increase the immune health. *H. erinaceus* fruiting body contains various compounds that show hemagglutination (Gong *et al*., 2004). This fungus also shows anti microbial properties (Yim *et al*., 2007; Chong *et al*., 2019), immunomodulatory (Kim *et al*., 2012; Zhao *et al*., 2020), anti-aging (Zhang *et al*., 2012; Tripodi *et al*., 2022), anti-oxidant properties (Malinowska *et al*., 2009; Hsu *et al*., 2023).

Prevent cancer

Erinacine-A potentially triggers a series of programmed cell death events in TSGH 9201 cells (Mori *et al*., 2009) through the activation of the FAK/AKT/p70S6K/PAK1 pathway and the increased expression of proteins 1433S and MTUS2. This offers a novel explanation for how this compound exerts its anti-cancer effects on human gastric cancer cells (Li *et al*., 2014). This potent anti-tumor effect of Erinacin-A has been further validated by a study, which not only replicated these findings *in vitro* using two human colon cancer cell lines (DLD-1 and HCT-116) but also confirmed its efficacy in an *in vivo* mouse model. This subsequent research provided additional insights into the mechanisms underlying its strong anti-tumor properties and also increased NK cells (Figure-3) (Lee *et al*., 2019).

Utilizing the body's innate immune system to target cancerous cells, NK cell-based immunotherapy represents an innovative frontier in cancer treatment (Cheent and Khakoo 2009; Shin *et al.,* 2020) This innovative therapy capitalizes on the unique abilities of NK cells, which are a type of white blood cell with a natural propensity to target and destroy cancerous cell (Cheng *et al.,* 2013; Liu *et al.,* 2021). NK cell-based immunotherapy holds great promise for various cancers, including leukemia, lymphoma, and solid tumors. It offers a targeted and less toxic alternative to traditional cancer treatments like chemotherapy and radiation therapy. However, challenges remain, such as optimizing NK cell expansion, persistence and overcoming the immunosuppressive tumor microenvironment. Ongoing research and clinical trials aim to refine this approach further and improve its efficacy to fight against malignant cells.

The polysaccharides present in *H. erinaceus* have the capacity to modulate pro-inflammatory cytokines, trigger immune responses mediated by macrophages, and stimulate the maturation of dendritic cells (Sheu *et al*., 2013). Reducing cancer risk is possible through a well-rounded diet and making appropriate lifestyle decisions. Laboratory studies indicate that Lion's Mane contains polysaccharides and aromatic compounds with anti-cancer properties. Researchers have identified multiple mechanisms through which Lion's Mane extract can inhibit the proliferation of diverse cancer cells, including those associated with lung and breast cancer.

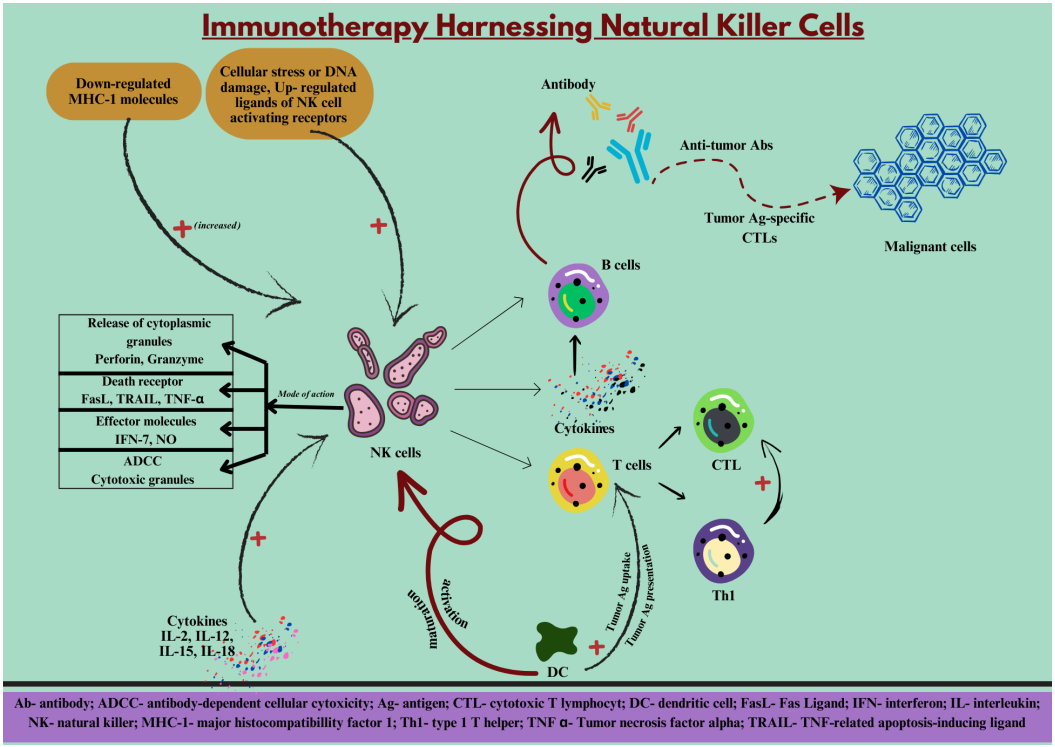

Fig. 3. *Natural killer cell based therapy for malignant cells*

Investigations are ongoing to understand its potential role as a supplementary treatment in cancer care. (Atay *et al*., 2021). The presence of polysaccharides, hericirine, polyphenols, and various other compounds in Lion's Mane contributes to the inhibition of inflammation, provides antioxidant benefits, and regulates immune responses. Consequently, consistent consumption may contribute to the reinforcement of the immune system (Meena *et al*., 2020).

Manage diabetes

In the year 2000, diabetes was determined to have a worldwide prevalence of 2.8 per cent among people of all age groups, and it is anticipated to increase to 4.4 per cent by the year 2030 (Wild *et al*., 2004; Kaveeshwar *et al*., 2014). In diabetes mellitus, persistent high levels of blood sugar lead to a range of biochemical irregularities (Giugliano *et al.,* 1996; Rajasekaran *et al*., 2005), Oxidative stress plays a significant role in the development of diabetes (Nishikawa *et al*., 2000; Forbes *et al*., 2008; Giacco and Brownlee, 2010). Clinical investigations have shown that strict management of hyperglycemia can lower the risk or slow down the progression of diabetes. Nevertheless, with the existing medications for lowering blood sugar levels, achieving and sustaining precise glycemic control in diabetic individuals can be challenging (Nathan *et al*.,1993; Ohkubo *et al*., 1995; Dronavalli *et al*., 2008). The substantial antioxidant capabilities and presence of bioactive compounds in *Hericium erinaceus* make it a valuable resource for addressing metabolic disorders, particularly in the context of diabetes treatment (Chaiyasut *et al.,* 2017). Exo-biopolymer derived from *H. erinaceus* mycelial culture has beneficial impact on lowering lipid levels in rats with diet-induced hyperlipidemia (Han *et al*., 2013) as well as lowering the glycemic index in animals (Wang *et al*., 2005). All these studies concludes that lion's mane can reduce the lipid accumulation in the body and also reduces the glycemic index.

The hypoglycemic and antihyperlipidemic effects of the aqueous extract from *H. erinaceus* have been documented in experimental rat models. The addition of *H. erinaceus* extract (at doses of 100–200 mg/kg body weight) resulted in enhanced serum insulin levels and decreased glucose levels in diabetic rats induced by streptozotocin. The study also indicated that supplementation with *H. erinaceus* aqueous extract demonstrated antihyperlipidemic properties and enhanced the activity of free radical scavenging enzymes (Liang *et al*., 2013). Wu and Xu (2015) documented the *in vitro* antidiabetic properties of *H. erinaceus*, highlighting that the suppression of a-glycosidase and aldose reductase activity occurred in a dose-dependent manner. Zhang *et al*. (2015) observed that the ethanolic extract derived from *H. erinaceus* demonstrated anti-neuropathic pain effects in a diabetic neuropathic Wistar rat model induced by alloxan. Supplementation with approximately 40 mg of the ethanolic extract per kilogram of body weight led to a reduction in neuropathic pain, increased inhibition of lipid peroxidation, and enhanced activities of antioxidant enzymes such as lactate dehydrogenase, glutathione peroxidase, glutathione reductase, catalase, Na+ K+ ATPase, and glutathione S transferase in the experimental rats. The findings suggested that the improvement in the host's antioxidant system by *H. erinaceus* extract could be accountable for the alleviated diabetic neuropathy.

Reduce heart disease risk

Atherosclerosis, which is a multifaceted pathological progression, accounts for over 50 per cent of fatalities in industrialized nations (Murray *et al*., 1997). The primary factor implicated in the initiation of atherosclerosis is commonly identified as the oxidative modification of low-density lipoprotein (LDL). Atherosclerosis is the major reason that ultimately result in cardiovascular diseases (CVD) and strokes (Murray *et al.,*1997; Libby, 2002; Roger *et al*., 2012). The factors governing the oxidation of LDL lay the groundwork for the harmful progression of atherosclerosis (Li and Mehta, 2005; Yoshida and Kisugi 2010; Rahman *et al*., 2014). Oxidized LDL is readily taken up by macrophages. Mushrooms have naturally low fat content and do not contribute to elevated cholesterol levels. Moreover, specific mushrooms, such as Lion's Mane, contain compounds that inhibit lipid oxidation and demonstrate an antihyperlipidemic effect. Consequently, Lion's Mane is recognized as beneficial for cardiovascular health (Jang *et al*., 2017). *Hericium erinaceus* extracts posses inhibitory effect on HMG CO-A reductase activity and *in vitro* LDL oxidation (Rahman *et al.* 2014). Mushrooms have been recognized for their capacity to inhibit both cholesterol production (Rahman *et al*., 2014) and absorption (Bobek *et al.,*1994; Berger *et al*., 2004) as well as promote the excretion of cholesterol through feces (Yang *et al*., 2013). Additionally, the dietary fibers found in mushrooms contribute to their effectiveness as agents for reducing lipid levels (Cheng *et al*., 2002; Ganesan and Xu 2018).

Limited evidence from experimental research suggests that incorporating mushrooms into the diet has a positive impact on serum/plasma triglycerides and High-sensitivity C-reactive protein (hs-CRP) levels. Increased mushroom consumption is associated with reduced levels of blood triglycerides and hs-CRP, which are indicators of cardiometabolic health. (Uffelman *et al*., 2023). L-ergothioneine is an amino acid obtained from the diet, known for its antioxidant and anti-inflammatory characteristics, which are linked to the onset of various degenerative and chronic conditions, including several cardiometabolic diseases (CMD) (Nguyen *et al*., 2013). Notably, animals and

higher plants do not produce L-ergothioneine; instead, it is biosynthesized by mushrooms, cyanobacteria, and certain soil bacteria. While L-ergothioneine is present in low levels in various foods, mushrooms stand out as the most significant dietary sources (Kalaras *et al*., 2020).

Conclusion

Lion's Mane products, such as supplements and functional foods, are expected to become more popular. Moreover, Lion's Mane's unique culinary qualities, resembling the taste and texture of seafood, make it a sought-after ingredient for plant-based and vegetarian diets. Its adaptability in various recipes and dishes adds to its appeal in the culinary world. In the context of agriculture and sustainability, Lion's Mane cultivation is relatively eco-friendly, requiring minimal resources and space. As the demand for sustainable and locally sourced food grows, the cultivation of this mushroom could play a role in meeting these preferences. In conclusion, Lion's Mane mushroom is poised for a bright future, driven by its potential in brain health, mental well-being, nutrition, culinary applications, and sustainability. Continued research and innovation in harnessing its benefits may lead to even more exciting developments in the future.

Conflict of interest

The authors declare that there is no competing interest.

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