

## **Paul STAMETS**

### **Mycology**

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[https://en.wikipedia.org/wiki/Paul\\_Stamets](https://en.wikipedia.org/wiki/Paul_Stamets)

#### **Paul Stamets**

Paul Edward Stamets (born July 17, 1955) is an American mycologist and entrepreneur who sells various mushroom products through his company. He is an author and advocate of medicinal fungi and mycoremediation.

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<https://paulstamets.com/>

<https://www.youtube.com/user/paulstamets>

#### **Paul Stamets' YouTube Channel**

<https://fungi.com>

#### **Fungi Perfecti**

<http://cordycepsreishiextracts.com/>

#### **Cordyceps Reishi Extracts, LLC**

Fungi Perfecti Mushrooms, Better for You : Ling Zhi ... Ganoderma lucidum ... Ganoderma Extract ... Cordyceps Extract

Expert cultivation and extraction - triad of extraction methods - hot water extraction, alcohol extraction and fermentation - guarantees highest concentration and availability of full range of active compounds

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[https://www.youtube.com/watch?time\\_continue=4&v=XI5frPV58tY&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=4&v=XI5frPV58tY&feature=emb_logo)

#### **6 ways mushrooms can save the world**

Mycologist Paul Stamets studies the mycelium -- and lists 6 ways that this astonishing fungus can help save the world.

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[https://www.ted.com/speakers/paul\\_stamets](https://www.ted.com/speakers/paul_stamets)

#### **Paul Stamets Mycologist**

Paul Stamets believes that mushrooms can save our lives, restore our ecosystems and transform other worlds.

Entrepreneurial mycologist Paul Stamets seeks to rescue the study of mushrooms from forest gourmets and psychedelic warlords. The focus of Stamets' research is the Northwest's native fungal genome, mycelium, but along the way he has filed 22 patents for mushroom-related technologies, including pesticidal fungi that trick insects into eating them, and mushrooms that can break down the neurotoxins used in nerve gas.

There are cosmic implications as well. Stamets believes we could terraform other worlds in our galaxy by sowing a mix of fungal spores and other seeds to create an ecological footprint on a new planet.

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*Fantastic Fungi: How Mushrooms Can Heal, Shift Consciousness & Save the Planet* (2019, ISBN 1683837045, 978-1683837046)

*Mycelium Running: How Mushrooms Can Help Save the World* (2005, ISBN 1-58008-579-2)

*Psilocybin Mushrooms of the World* (1996, ISBN 0-89815-839-7)

*Growing Gourmet and Medicinal Mushrooms* (1996, ISBN 1-58008-175-4)

*Psilocybe Mushrooms & Their Allies* (1978), Homestead Book Company, ISBN 0-930180-03-8

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<https://bmccomplementmedtherapies.biomedcentral.com/articles/10.1186/s12906-019-2681-7>

BMC Complementary and Alternative Medicine volume 19, Article number: 342 (2019)

2 December 2019

**The mycelium of the *Trametes versicolor* (Turkey tail) mushroom and its fermented substrate each show potent and complementary immune activating properties in vitro**

**Kathleen F. Benson, et al.**

#### **Abstract**

The medicinal mushroom *Trametes versicolor* (Tv, Turkey Tail) is often prepared for consumption as a powder from the fungal mycelium and the fermented substrate on which it grew. The goal for this study was to evaluate the immune-modulating properties of the mycelium versus the fermented substrate, to document whether an important part of the immune-activating effects resides in the metabolically fermented substrate.

#### **Conclusion**

The results demonstrated that the immune-activating bioactivity of a mycelial-based medicinal mushroom preparation is a combination of the mycelium itself (including insoluble beta-glucans, and also water-soluble components), and the highly bioactive, metabolically fermented substrate, not present in the initial substrate.

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<https://www.nature.com/articles/s41598-018-32194-8>

Scientific Reports volume 8, Article number: 13936 (2018)

4 October 2018

**Extracts of Polypore Mushroom Mycelia Reduce Viruses in Honey Bees**

**Paul E. Stamets, et al.**

#### **Abstract**

Waves of highly infectious viruses sweeping through global honey bee populations have contributed to recent declines in honey bee health. Bees have been observed foraging on mushroom mycelium, suggesting that they may be deriving medicinal or nutritional value from fungi. Fungi are known to produce a wide array of chemicals with antimicrobial activity, including compounds active against bacteria, other fungi, or viruses. We tested extracts from the mycelium of multiple polypore fungal species known to have antiviral properties. Extracts from amadou (*Fomes*) and reishi (*Ganoderma*) fungi reduced the levels of honey bee deformed wing virus (DWV) and Lake Sinai virus (LSV) in a dose-dependent manner. In field trials, colonies fed *Ganoderma resinaceum* extract exhibited a 79-fold reduction in DWV and a 45,000-fold reduction in LSV compared to control colonies. These findings indicate honey bees may gain health benefits from fungi and their antimicrobial compounds.

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<https://www.sciencedirect.com/science/article/abs/pii/S0925857414002250>

<https://doi.org/10.1016/j.ecoleng.2014.05.016>

**Removal of *Escherichia coli* from synthetic stormwater using mycofiltration**

**Alex Taylor, et al.**

## Abstract

Pathogens from nonpoint sources are the leading cause of water quality impairments in US surface waters. This study assessed the capacity of basidiomycetous fungal mycelium on cellulosic substrates to remove *Escherichia coli* from synthetic stormwater under unsaturated vertical-flow conditions. The mycelium of *Stropharia rugoso-annulata* was tested in mycofiltration columns consisting of 18.6 L containers with mycelium grown on either wood chips or a mixture of wood chips and straw. *S. rugoso-annulata* mycofiltration columns were loaded with water spiked with 600–900 cfu/100 mL of *E. coli* at low (0.5 L/min; 0.57 m/d) and high (2.2 L/min; 2.5 m/d) hydraulic loading. Influent and effluent were monitored for thermotolerant coliform and *E. coli* using the Coliscan membrane filter chromogenic method. Alder wood chips infused with *S. rugoso-annulata* mycelium yielded a removal rate of around 20% relative to control filters. Wood chip and straw media appeared less effective with substantial net export of bacteria from both mycelium-infused and un-inoculated control media. The un-inoculated control media used in this study commonly exported high concentrations of thermotolerant coliform bacteria. On wood chip-based media, the presence of actively growing mycelium reduced the thermotolerant coliform exports by >90% relative to the control media. The study highlights the limitations of using thermotolerant coliform to assess pathogen removal in cellulose rich ecotechnologies like mycofiltration.

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[https://www.researchgate.net/publication/314826775\\_Biological\\_and\\_chemical\\_evaluation\\_of\\_anti-TB\\_coumarins\\_from\\_the\\_polypore\\_mushroom\\_Fomitopsis\\_officinalis](https://www.researchgate.net/publication/314826775_Biological_and_chemical_evaluation_of_anti-TB_coumarins_from_the_polypore_mushroom_Fomitopsis_officinalis)

Planta Medica 78(11) July 2012

**Biological and chemical evaluation of anti-TB coumarins from the polypore mushroom,  
*Fomitopsis officinalis*  
Changhwa Hwang, et al.**

## Abstract

Two naturally occurring chlorinated coumarins, 6-chloro-4-phenyl-2H-chromen-2-one (1) and ethyl 6-chloro-2-oxo-4-phenyl-2H-chromen-3-carboxylate (2), were isolated from the EtOH extract of the polypore mushroom, *Fomitopsis officinalis*. The structures of 1 and 2 were deduced spectroscopically and confirmed by chemical synthesis. In addition, analogues of the coumarins were synthesized as 7-chloro-4-phenyl-2H-chromen-2-one (3) and ethyl 7-chloro-2-oxo-4-phenyl-2H-chromen-3-carboxylate (4), and 1-4 were physicochemically characterized. An extensive assessment of their antimicrobial activities indicated that 2 - 4 display specific activity against both replicating and non-replicating *Mycobacterium tuberculosis* as well as *M. tuberculosis* isolates with mono-resistance to rifampin, isoniazid, streptomycin, kanamycin, or cycloserine, with MICs from 22 to 50 µg/ml.

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<https://bmccomplementmedtherapies.biomedcentral.com/articles/10.1186/1472-6882-11-60>

BMC Complementary and Alternative Medicine volume 11, Article number: 60 (2011)

**Antihyperlipidemic effects of *Pleurotus ostreatus* (oyster mushrooms) in HIV-infected  
individuals taking antiretroviral therapy**

**Donald I Abrams, et al.**

## Abstract

Antiretroviral treatment (ART) regimens in HIV patients commonly cause significant lipid elevations, including increases in both triglycerides and cholesterol. Standard treatments for hypercholesterolemia include the HMG CoA reductase inhibitors, or "statins." Because many ART agents and statins share a common metabolic pathway that uses the cytochrome P450 enzyme system, coadministration of ART with statins could increase statin plasma levels significantly. The oyster mushroom, *Pleurotus ostreatus*, has been shown in animal models to decrease lipid levels - a finding that has been supported by preliminary data in a small human trial.

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<http://www.dl.begellhouse.com/journals/708ae68d64b17c52,0d0f121956dd501b,0a3878105512f782.html>

International Journal of Medicinal Mushrooms, pages 495-506

**Antipox Properties of *Fomitopsis officinalis* (Vill.: Fr.) Bond. et Singer (Agarikon) from the Pacific Northwest of North America**  
**Paul E. Stamets**

**ABSTRACT**

Polypore mushrooms have been used medicinally for thousands of years. The Greek physician Dioscorides first described the use of *Fomitopsis officinalis*, a wood conk (or agarikon), as a treatment against consumption in 65 AD. Its use as a topical anti-inflammatory agent also spans millennia. Other wood conks such as *Ganoderma lucidum* (Ling Chi or Reishi) have had a similarly long history of use in Asia. In the past 20 years, wood conks continue to be carefully explored for their immunomodulating and anticancer properties. More recently, mushrooms, including polypores, have been and are being explored for their antimicrobial properties. Of more than 200,000 pharmaceutical and natural products analyzed, and subsequent to the authors' submitting more than 100 in vitro cultures of mushrooms to the US National Institute of Allergy and Infectious Diseases (NIAID) in coordination with the US National Institute of Health (NIH) and the US Defense Department (DOD)'s Bioshield BioDefense program, several tests show that the author's extracts of cultures originating from rare "old growth" polypore mushrooms demonstrated strong antiviral activity. Within verdant natural landscapes, trees hundreds of years old host ancestral strains of these elusive mushroom species. Species that are now rare, or in some cases thought to be extinct, still reside in the pristine old growth forests of the Pacific Northwest of North America. When clones from these mushrooms were grown in vitro and submitted for antiviral screening, several mycelial cultures produced antimicrobial agents effective against pox and other viruses. Notably, strains vary in their antiviral properties. Our mushroom genomes hold within them great potentials for staving off disease and barely have been explored. The fungal diversity within these genomes may prove critical for isolating the most active strains, similar to the lessons learned from the isolation of *Penicillium chrysogenum* strains that lead to the commercialization of penicillin, subsequently saving millions of lives. With deforestation, pollution, and industrialization, societies should reevaluate the importance of their natural forests in the context that they hold within them novel medicines of enormous socioeconomic and national defense importance.

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**International Journal of Medicinal Mushrooms, Volume 2, 2000 Issue 2**  
**DOI: 10.1615/IntJMedMushr.v2.i2**

**Techniques for the Cultivation of the Medicinal Mushroom Royal Sun Agaricus-*Agaricus blazei* Murr. (Agaricomycetidae)**  
**Paul E. Stamets**

**ABSTRACT**

The cultivation of the Royal Sun Agaricus or *Agaricus blazei* Murr. is discussed in detail. The particular temperature, humidity and environmental requirements are delineated, accompanied by recommended strategies for crop management. Fruitbodies grown from the same culture on sterilized sawdust have light pilei whereas fruitbodies grown from fermented manure-based compost have dark brown pilei, suggesting that substrate composition affects pigmentation during the expression of the fruitbody. Since cap pigmentation has been used as a taxonomic feature of some importance in the genus *Agaricus*, this study raises concerns about its taxonomic significance. The medicinal properties of this mushroom and its potential application in recycling are discussed.

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**Integr Med (Encinitas). 2014 Feb; 13(1): 46–47.**  
**PMCID: PMC4684114**  
**PMID: 26770081**

**Medicinal Mushrooms: Ancient Remedies Meet Modern Science**  
**Paul Stamets, DSc and Heather Zwickey, PhD**

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## Patents

**US2012070414 [ [PDF](#) ] // US2013287829**

### **Controlling disease vectors from insects and arthropods using preconidial mycelium and extracts of preconidial mycelium from entomopathogenic fungi**

#### **Abstract**

The present invention utilizes extracts of the pre-sporulation (preconidial) mycelial stage of entomopathogenic fungi as insect and arthropod attractants and/or pathogens and can be employed to limit the zoonotic and plant diseases they transmit. The fungus can be cultivated on grain, wood, agricultural wastes or other cellulosic material and extracts can be made thereof. More than one fungus and substrate can be used in combination with one or more antimicrobial, antiprotozoal, antiviral, or genetically modified agents that result in reduced spread of contagions and lessens the damage they inflict on animals and plants.

**US2009047236 [ [PDF](#) ] // AU2001296679**

### **Mycoattractants and mycopesticides**

#### **Abstract**

The present invention utilizes extracts of the pre-sporulation (preconidial) mycelial stage of entomopathogenic fungi as insect attractants and/or pathogens. The fungus can be cultivated on grain, wood, agricultural wastes or other cellulosic material. More than one fungus and substrate can be used in combination.

**US2005276815 [ [PDF](#) ]**

### **Antiviral activity from medicinal mushrooms**

#### **Abstract**

Compounds having unique antiviral properties are prepared from medicinal mushroom mycelium, extracts and derivatives. The compositions are derived from Fomitopsis, Piptoporus, Ganoderma resinaceum and blends of medicinal mushroom species and are useful in preventing and treating viruses including Pox and HIV viruses.

**US2012039976 [ [PDF](#) ]**

### **Controlling zoonotic disease vectors from insects and arthropods using preconidial mycelium and extracts of preconidial mycelium from entomopathogenic fungi**

#### **Abstract**

The present invention utilizes extracts of the pre-sporulation (preconidial) mycelial stage of entomopathogenic fungi as insect and arthropod attractants and/or pathogens and can be employed to limit the zoonotic diseases they transmit. The fungus can be cultivated on grain, wood, agricultural wastes or other cellulosic material and extracts can be made thereof. More than one fungus and substrate can be used in combination with one or more antimicrobial, antiprotozoal, antiviral, and genetically modified agents that result in reduced spread of contagions and lessens the damage they inflict on animals, and plants.

**US2005238655 [ [PDF](#) ]**

### **Antiviral activity from medicinal mushrooms**

#### **Abstract**

Compounds having unique antiviral properties are prepared from medicinal mushroom mycelium, extracts and derivatives. The compositions are derived from Fomitopsis, Piptoporus, Ganoderma resinaceum and blends of medicinal mushroom species and are useful in preventing and treating viruses including Pox and HIV viruses.

**US2014105928 [ [PDF](#) ]**

### **Antiviral and antibacterial activity from medicinal mushrooms**

#### **Abstract**

Compounds having unique antiviral and antibacterial properties are prepared from medicinal mushroom mycelium, extracts and derivatives. The compositions are derived from Fomitopsis, Piptoporus, Ganoderma, Inonotus, Trametes, Pleurotus, and blends of medicinal mushroom species and are useful in preventing and treating viruses including Poxviridae and Orthopox viruses, flu

viruses including bird flu (H5N1), SARS and Hepatitis C(HCV), as well as infections from Mycobacterium tuberculosis, Staphylococcus aureus and Escherichia coli.

**US2016000754 [ [PDF](#) ] // WO2016161138**

**Antiviral Activity from Medicinal Mushrooms and their Active Constituents**

**Abstract**

Compounds having unique antiviral properties found in mushroom mycelium and their analogs are extracted, concentrated, isolated or manufactured to create compositions useful in preventing the spread and proliferation of various viruses afflicting animals, particularly viruses harming humans, pigs, birds, bats and bees. Such compounds and compositions can be used individually or in combination with known medicines or natural products to improve health.

**US2011008384 [ [PDF](#) ]**

**Antiviral activity from medicinal mushrooms**

**Abstract**

Compounds having unique antiviral properties are prepared from medicinal mushroom mycelium, extracts and derivatives. The compositions are derived from Fomitopsis and blends of medicinal mushroom species and are useful in preventing and treating viruses including Poxviridae and Orthopox viruses.

**US2008005046 [ [PDF](#) ] // US2008046277**

**Living systems from cardboard packaging materials**

**Abstract**

Compositions, methods and business applications of using new and recycled cardboard infused with a plurality of saprophytic (including endophytic) and mycorrhizal fungi matched with seeds of plants (including trees, vegetables, herbs and grasses) whereby the cardboard can be sprouted by end-users to start ecosystems. Such containers may have carbon-credit value for companies and consumers when planted and grown as a carbon sink or carbon offset for the photosynthetic and mycelial sequestration of carbon dioxide. The relative weight of the Life Box's added seeds and spores does not significantly affect the total weight of the infused cardboard, thus not increasing transportation costs.

**US2018021326 [ [PDF](#) ]**

**Compositions and methods for enhancing neuroregeneration...**

**Abstract**

Methods and compositions are disclosed for enhancing neurogenesis, resolving neuropathy and improving neurological health and functioning using fungal extracts and their active ingredients, including species of mushrooms and mycelia containing psilocybin and psilocin, combined with erinacines and hericenones or fungal extracts containing those active ingredients, with the addition of nicotinic acid. The compositions may optionally be combined with nervine plants.

**US2009130138 [ [PDF](#) ]**

**Antiviral and antibacterial activity from medicinal mushrooms**

**Abstract**

Compounds having unique antiviral and antibacterial properties are prepared from medicinal mushroom mycelium, extracts and derivatives. The compositions are derived from Fomitopsis, Piptoporus, Ganoderma, Inonotus, Trametes, Pleurotus, and blends of medicinal mushroom species and are useful in preventing and treating viruses including Poxviridae and Orthopox viruses, flu viruses including bird flu (H5N1), SARS and Hepatitis C(HCV), as well as infections from Mycobacterium tuberculosis, Staphylococcus aureus and Escherichia coli.

**US2008286298 [ [PDF](#) ]**

**Compositions Comprising Hypsizygus Ulmarius Extract**

**Abstract**

Disclosed are topical compositions comprising extracts of Hypsizygus ulmarius in amounts that are effective to influence LTB4-mediated chemotaxis and/or IL-1beta mediated adhesion of polymorphonuclear leukocytes. The hypsizygus ulmarius extract may be used alone or in combination with secondary anti-inflammatory and skin active agents, such as other mushroom and/or natural extracts. The secondary anti-inflammatory agents may or may not function by antagonizing LTB4-

mediated chemotaxis and IL-1beta mediated adhesion. The extract may be incorporated into a cosmetically acceptable vehicle. The present invention includes methods of treating skin inflammation by applying to inflamed skin, anti-inflammatory effective amounts of Hypsizygus ulmarius extract in a defined treatment regimen.

**AU2002244133**

**Delivery systems for mycotechnologies, mycofiltration and mycoremediation**

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