

Agel UMI

Agel's newest product, UMI, offers a vast array of health benefits that have only really been appreciated by coastal communities with abundant access to brown seaweed. The active ingredient in UMI is Fucoidan, which is a component of brown seaweed. For centuries, brown seaweed has been considered a natural source of healthy food and nutrition. But, it has only been recently that further research has identified Fucoidan, a sulfated polysaccharide, as the true source of the health and wellness benefits of this oceanic wonder. Fucoidan has piqued the interest of many scientists and researchers as one of the ocean's greatest treasures. However, as scientists have continued to explore this complex molecule, more and more of its health benefits have been identified.

Fucoidan is like a closely guarded secret kept by those coastal societies that have enjoyed the wonderful health benefits of the Fucoidan polysaccharide for centuries.

With Agel UMI, the secret is out. This new gelceutical that delivers Fucoidan in a good tasting gel brings the amazing health benefits of this potent polysaccharide to the rest of the world where seaweed is not a common part of the every day diet. It is encouraging that now everybody can enjoy healthier living as a result of Agel UMI.

Agel UMI Benefits

In many parts of the world, seaweed is not a regular part of the daily diet. In fact, there are many people who would not even consider eating seaweed. However, with Agel UMI, the exceptional health benefits of this oceanic treasure are now available to the masses. So, what is it about the brown seaweed that is so extraordinary? Through extensive research, scientists have identified a complex sulfated polysaccharide, called fucoidan as the active ingredient. Its primary makeup consists of an essential sugar called fucose along with other elements such as xylose, mannose, and galactose, and glucose. Studies consistently show that fucoidan possesses a wide range of properties beneficial to maintaining optimal health.

One of the primary ways in which Fucoidan provides a vast array of health benefits is its ability to interact with, and modulate the immune system. Several studies have identified many of the immune modulating effects of Fucoidan.^{1 2} The ability of a substance to modulate the immune system is an extremely useful property. Modulation is a term used to describe the process of reducing the extremes of cellular activity – either stimulation or inhibition. Immune modulating substances have the ability to increase immune function when it is depressed, such as in conditions like chronic fatigue, and then to reduce it when it is over-stimulated, such as in auto-immune diseases like lupus or rheumatoid arthritis.

Most immune modulating agents work by improving inter-cellular communication. One way cells interact and communicate is by presenting glycoproteins on their surface. Glycoproteins are complex information-rich macromolecules composed of a protein core to which is bound arrays of linked saccharides or sugars (polysaccharides). The structures of the saccharides vary and therefore relay different codes for different messages. For

example, one message might tell a cell to secrete a specific cellular product, and another message might tell a cell when to divide. Other cells have corresponding glycoprotein receptor molecules, which can then read these messages and respond accordingly. Thus, our bodies are involved in a very sophisticated and harmonious intercellular communication all the time.

The immune system depends heavily on this kind of communication to co-ordinate cellular defense, apoptosis, cell attack and repair processes. When any of the range of saccharides required to build competent glycoproteins (and thereby convey an accurate message) are missing, the quality of that communication is compromised. It has been shown that dietary supply of certain saccharides improves the integrity of glycoprotein production. Fucoidans provide an abundant supply of Fucose, one of the necessary saccharides, and smaller amounts of several other required sugars. This is likely to be one mechanism by which the fucoidans exert their immunomodulatory effect.

Now, with this understanding of glycoproteins, and intercellular communication, let's specifically identify the ways in which Fucoidan has been shown to be of significant benefit for health and wellness.

References

- 1: Antibacterial and immunomodulating activity of fucoidan, Zapozhets TS, Besednova NN, Loenko IuN. *Antibiot Khimioter.* 1995 Feb;40(2):9-13.
- 2: Immunostimulating and anticoagulating activity of fucoidan from brown algae *Fucus evanescens* of Okhotskoe sea. Kuznetsova TA, Zaporozhets TS, Besednova NN, et al. *Antibiot Khimioter.* 2003;48(4):11-3.

Regenerate Cells and Increase Life Span

Much of the research that has been done on fucoidan has been focused on its ability to regenerate cells. Studies have shown that fucoidan helps support mobilization of stem cells that enable the body to replace dead cells thereby enabling tissue and organ regeneration.³ In addition, fucoidan helps slow symptoms of the aging process. In study after study, fucoidan has shown itself to be beneficial in the fight for a longer, healthier life.

References

- 3: Sulfated Glycans Induce Rapid Hematopoietic Progenitor Cells Mobilization: Evidence for Selectin-dependent and Independent Mechanisms. Frenette PS, Weiss L. *Blood*, 2000 Oct 1 96(7):2460-8

Support the Circulatory System & Health Functions

Fucoidan has also been shown to help maintain healthy blood flow and cardiac functions—thereby supporting the circulatory system.^{4 5 6 7} Increased blood flow helps all of our organs work more efficiently and helps us to feel better and healthier.⁸ Efficient functioning of our vital organs can help us prolong the effects of “wear and tear” of the normal aging process. Additionally, one study suggested that fucoidan helps to slow the absorption rate of glucose, or sugar, into the blood stream. A slower absorption rate leads to a more regulated blood sugar level.

References

- 4: Fucoidan is a non-anticoagulant inhibitor of intimal hyperplasia. McCaffrey TA, Falcone DJ, Borth W, Brayton CF, Weksler BB. *Biochem Biophys Res Commun.* 1992 Apr 30;184(2):773-81.
- 5: Fibrinolytic and anticoagulant activities of highly sulfated Fucoidan. Soeda S, Sakaguchi S, Shimeno H, Nagamatsu A. *Biochem Pharmacol.* 1992 Apr 15;43(8):1853-8.
- 6: Potential Antioxidant Capacity of Sulfated Polysaccharides From the Edible Brown Seaweed *Fucus Vesiculosus*. Ruperez P, Ahrazern O, Leal JA *Agrie Food Chem.* 2002 Feb 13;50(4):840-5
- 7: Anticoagulant properties of a Fucoidan fraction. Collic S, Fischer AM, Tapon-Bretau diere J, Boisson C, Durrand P, Jozefonvicz J. *Thromb Res.* 1991 Oct 15;64(2):143-54.
- 8: Intravascular granulocyte aggregates caused by the selectin-binding carbohydrate fucoidan in pig kidneys. Dittrich S, Lippek F, Gratopp A, Grosse-Siestrup C, Lange PE, Buhner C. *Clin Exp Pharmacol Physiol.* 2002 Oct; 29 (10): 909-14

Maintain Healthy Cholesterol Levels

The process of cholesterol formation is in the liver. Our bodies produce a “good” cholesterol (HDL) and a “bad” cholesterol (LDL). Optimum health is achieved when we can maintain lower levels of the LDL, and sufficient levels of the HDL. There is some evidence to suggest that fucoidan can help us to maintain healthy levels of cholesterol by influencing the metabolic activity in the liver where fatty acids are processed.⁹ In addition, because fucoidan is a dietary fiber, it absorbs cholesterol contained in foods allowing them to be discharged from the body. This suppresses cholesterol elevations related to dietary intake of foods high in cholesterol.

References

- 9: Hepatic fatty acid oxidation enzyme activities are stimulated in rats fed the brown seaweed. Murata, M. et al. *Journal of Nutrition,* 1999 Jan;29(1):146-51.

Help Support Healthy Joint Functions

For many of us in the United States and throughout the world, healthy joints and cartilage are daily concerns. Arthritis and joint pain can be a bothersome and sometimes debilitating. Among its many properties, fucoidan has been hailed as a natural answer to joint health. Fucoidan supports proper joint functions and cartilage health by modulating some of our body's inflammatory and immune processes.^{10 11 12}

References

10: Effects of the anti-inflammatory compounds castanospermine, mannose-6-phosphate and fucoidan on allograft rejection and elicited peritoneal exudates. Bartlett MR, Warren HS, Cowden WB Parish CR *Immunol Cell Biol.* 1994 Oct; 72(5):367-74

11: Immunomodulating activity of arabinogalactan and Fucoidan in vitro. Choi EM, Kim AJ, Kim YO, Hwang JK. *J Med Food.* 2005 Winter;8(4):446-53.

12: Fucoidan a sulfated polysaccharide from brown algae is a potent modulator of connective tissue proteolysis. Senni K, Gueniche F, Foucault-Bertaud A, Igondjo-Tchen S, Fioretti F, Collic-Jouault S, Durand P, Guezennec J, Godeau G, Letourneur D. *Arch Biochem Biophys.* 2006 Jan 1;445(1):56-64.

Assist in Inducing the Elimination of Harmful Cells

Fucoidan may also prove helpful in eliminating harmful cells, including those that are related to some cancers. This is accomplished through a process called apoptosis. Apoptosis is technical term for the process of a cell "bursting" and therefore dying. Sulphated polysaccharides like fucoidan have been shown to assist in inducing apoptosis, which is a natural process where living organisms eliminate harmful cells and render the genetic blueprint (DNA) of harmful cells useless.^{13 14 15 16} Additionally, some research suggests that fucoidan may have an effect on cancer growth by suppressing the generation of new blood vessels around cancer cells, cutting off their nutrient supply.

References

13: Antitumor activity and immune response of Mekabu fucoidan extracted from Sporophyll of *Undaria pinnatifida*. Maruyama H, Tamauchi H, Hashimoto M, Nakano T. *In Vivo.* 2003 May-Jun;17(3):245-9

14: Antitumor activity and immunological properties of marine algal polysaccharides, especially fucoidan, prepared from *Sargassum thunbergii* of Phaeophyceae. Itoh H, Noda H, Amano H, Zhuang C, Mizuno T, Ito H *Anticancer Res.* 1993 Nov-Dec;13(6A):2045-52

15: Fucoidan extracted from *Cladosiphon okamuranus* Tokida induces apoptosis of human T-cell leukemia virus type 1-infected T-cell lines and primary adult T-cell

leukemia cells. Haneji K, Matsuda T, Tomita M, Kawakami H, Ohshiro K, Uchihara JN, Masuda M, Takasu N, Tanaka Y, Ohta T, Mori N. *Nutr Cancer*. 2005;52(2):189-201.

16: Antitumor and antiproliferative effects of fucan extracted from *ascophyllum nodosum* against a non-small-cell bronchopulmonary carcinoma line. Riou D, Colliec-Jouault S, Pnczon du Sel D, Bosch S, Siavoshian S, Le Bert V, Tomasoni C, Sinquin C, Durand P, Roussakis C. *Anticancer Res*. 1996 May-Jun;16(3A):1213-8.

Help Maintain a Strong Immune System

Fucoidan supports the immune system in a number of different ways. Some research suggests that it may cause an increase in the number of circulating mature white blood cells in the body, which are an integral part of the body's natural immune system.¹⁷ The findings from other studies suggest that fucoidan supports the immune system by improving phagocytosis and activating other important immune responses. These processes act together to destroy bacteria, viruses and other foreign particles by multiple blood "scavenger" cells.^{18 19 20 21}

References

17: Antitumor activity and immunological properties of marine algal polysaccharides, especially fucoidan, prepared from *Sargassum thunbergii* of Phaeophyceae. Itoh H, Noda H, Amano H, Zhuang C, Mizuno T, Ito H *Anticancer Res*. 1993 Nov-Dec;13(6A):2045-52

18: Antitumor active fucoidan from the brown seaweed, *umitoranoo* (*Sargassum thunbergii*). Zhuang C. et al. *Biosci Biotechnol Biochem*, 1995 Apr;59(4):563-7.

19: Antibacterial and immunomodulating activity of Fucoidan. Zapopozhets TS, Besednova NN, Loenko IuN. *Anitbiot Khimoioter*. 1995 Feb;40(2):9-13.

20: Pentosan polysulfate, a sulfated oligosaccharide, is a potent and selective anti-HIV agent in vitro. Baba M, Nakajima M, Schols D, Pauwels R, Balzarini J, De Clercq E. *Antiviral Res*. 1988 Sep;9(6):335-43.

21: Antiviral properties of Fucoidan fractions from *Leathesia difformis*. Feldman SC, Reynaldi S, Stortz CA, Cerezo AS, Damont EB. *Phytomedicine*. 1999 Nov;6(5):335-40.

Promotes Optimal Gastrointestinal Health

The number of people suffering from gastric diseases is rapidly increasing around the world as more and more people are consuming foods with more fat content and less dietary fiber. Once in the stomach, fucoidan attaches to the stomach lining where it has a protective effect. In addition, it stimulates the stomach lining to regulate the inflammatory process and also to "self-repair" damaged tissue. Fucoidan, because of its immune promoting and inflammation modulating activity, is a tremendous aid in maintaining proper gastrointestinal function and health.²²

References

22: Fucoïdan derived from *Cladosiphon okamuranus* Tokida ameliorates murine chronic colitis through the down-regulation of interleukin-6 production on colonic epithelial cells, Matsumoto S., Nagaoka M, Hara T. Kimura-Takagi I, Mitsuïvama K. *Clinical and Experimental Immunology*. June 2004, vol. 136, no.3 pp. 432-439(8)

Increase Energy & Support Respiratory Functions

Fucoïdan supports immunological abilities by assisting the body in the production of interferon- γ and interleukin-12 while supporting normal respiratory functions.²³

References

23: The Polysaccharide Fucoïdan Inhibits the Antibiotic-induced Inflammatory Cascade in Experimental Pneumococcal Meningitis, Granert C. Raud J, Lindquist L, *Clinical and Diagnostic Laboratory Immunology*, May 1998, 5(3): 322-4

Detoxify the Body and Help Rid The Body of Free Radicals

The deleterious effect of free radicals on our bodies is well documented. The beneficial effect of antioxidants in helping to neutralize the oxidative stresses placed upon our organs and metabolic processes is also very clear. Fucoïdan has a long list of health and wellness properties, not the least of which is that it also is a rich supply of antioxidants.²⁴

References

24: Potential Antioxidant Capacity of Sulphated Polysaccharides From the Edible Brown Seaweed *Fucus Vesiculosus*. Ruperez P, Ahrazem O, Leal JA. *Agric Food Chem*. 2002 Feb 13; 50(4):840-5

Promotes Kidney Health

The kidneys serve as the “waste disposal system” for our bodies. Therefore, the proper function of our kidneys is vital to our overall health and wellbeing. There are numerous studies in the literature to suggest that fucoïdan may play a significant roll in maintaining optimal kidney function.^{25 26 27 28}

References

25: Intravascular granulocyte aggregates caused by the selectin-binding carbohydrate fucoïdan in pig kidneys. Dittrich S, Lippek F, Gratopp A. Grosse-Siestrup C, Lange PE. Buhner C, *Clin Exp Pharmacol Physiol*. 2002 Oct 29(10):909-14

Agel UMI

26: Protective effects of inhibiting both blood and vascular selectins after stroke and reperfusion. Ruehl ML, Orozco JA, Stoker MB, McDonagh PF, Coull BM, Ritter LS. *Neurol Res.* 2002 Apr;24(3):226-32.

27: Effects of Fucoidan on chronic renal failure in rats. Zhang Q, Li Z, Xu Z, Niu X, Zhang H. *Planta Med.* 2003 Jun;69(6):537-41.

28: Fucoidan inhibits the development of proteinuria in active Heymann nephritis. Zhang Q, Li N, Zhao T, Qi H, Xu Z, Li Z. *Phytother Res.* 2005 Jan;19(1):50-3

Supports Vibrant Health & Vitality

Fucoidan supports the body against “complement activation” believed to play an adverse role in chronic degenerative symptoms like atherosclerosis, myocardial infarction, alzheimer’s disease and other conditions associated with aging.²⁹

The literature is plentiful supporting the fact that fucoidan is a valuable resource for maintaining optimal health. The brown algae harvested from the earth’s ocean are truly one of the most valuable gifts of the great deep. And Agel has harnessed this power into a single gelceutical—UMI.

References

29: Effects of C-reactive protein and pentosan polysulphate on human complement activation. Klegeris A. Singh EA. McGerr PL *Immunology* 2002 Jul;106(3):381-8

UMI References

1: Antibacterial and immunomodulating activity of fucoidan, Zapozhets TS, Besednova NN, Loenko IuN. *Antibiot Khimioter.* 1995 Feb;40(2):9-13.

2: Immunostimulating and anticoagulating activity of fucoidan from brown algae *Fucus evanescens* of Okhotskoe sea. Kuznetsova TA, Zaporozhets TS, Besednova NN, et al. *Antibiot Khimioter.* 2003;48(4):11-3.

3: Sulfated Glycans Induce Rapid Hematopoietic Progenitor Cells Mobilization: Evidence for Selectin-dependent and Independent Mechanisms. Frenette PS, Weiss L. *Blood*, 2000 Oct 1 96(7):2460-8

4: Fucoidan is a non-anticoagulant inhibitor of intimal hyperplasia. McCaffrey TA, Falcone DJ, Borth W, Brayton CF, Weksler BB. *Biochem Biophys Res Commun.* 1992 Apr 30;184(2):773-81.

5: Fibrinolytic and anticoagulant activities of highly sulfated Fucoidan. Soeda S, Sakaguchi S, Shimeno H, Nagamatsu A. *Biochem Pharmacol.* 1992 Apr 15;43(8):1853-8.

- 6: Potential Antioxidant Capacity of Sulfated Polysaccharides From the Edible Brown Seaweed *Fucus Vesiculosus*. Ruperez P, Ahrazern O, Leal JA *Agrie Food Chem*. 2002 Feb 13;50(4):840-5
- 7: Anticoagulant properties of a Fucoidan fraction. Collic S, Fischer AM, Tapon-Breaudiere J, Boisson C, Durrand P, Jozefonvicz J. *Thromb Res*. 1991 Oct 15;64(2):143-54.
- 8: Intravascular granulocyte aggregates caused by the selectin-binding carbohydrate fucoidan in pig kidneys. Dittrich S, Lippek F, Gratopp A, Grosse-Siestrup C, Lange PE, Buhner C. *Clin Exp Pharmacol Physiol*. 2002 Oct; 29 (10): 909-14
- 9: Hepatic fatty acid oxidation enzyme activities are stimulated in rats fed the brown seaweed. Murata, M. et al. *Journal of Nutrition*, 1999 Jan;29(1):146-51.
- 10: Effects of the anti-inflammatory compounds castanospermine, mannose-6-phosphate and fucoidan on allograft rejection and elicited peritoneal exudates. Bartlett MR, Warren HS, Cowden WB Parish CR *Immunol Cell Biol*. 1994 Oct; 72(5):367-74
- 11: Immunomodulating activity of arabinogalactan and Fucoidan in vitro. Choi EM, Kim AJ, Kim YO, Hwang JK. *J Med Food*. 2005 Winter;8(4):446-53.
- 12: Fucoidan a sulfated polysaccharide from brown algae is a potent modulator of connective tissue proteolysis. Senni K, Gueniche F, Foucault-Bertaud A, Igondjo-Tchen S, Fioretti F, Collic-Jouault S, Durand P, Guezennec J, Godeau G, Letourneur D. *Arch Biochem Biophys*. 2006 Jan 1;445(1):56-64.
- 13: Antitumor activity and immune response of Mekabu fucoidan extracted from Sporophyll of *Undaria pinnatifida*. Maruyama H, Tamauchi H, Hashimoto M, Nakano T. *In Vivo*. 2003 May-Jun;17(3):245-9
- 14: Antitumor activity and immunological properties of marine algal polysaccharides, especially fucoidan, prepared from *Sargassum thunbergii* of Phaeophyceae. Itoh H, Noda H, Amano H, Zhuang C, Mizuno T, Ito H *Anticancer Res*. 1993 Nov-Dec;13(6A):2045-52
- 15: Fucoidan extracted from *Cladosiphon okamuranus* Tokida induces apoptosis of human T-cell leukemia virus type 1-infected T-cell lines and primary adult T-cell leukemia cells. Haneji K, Matsuda T, Tomita M, Kawakami H, Ohshiro K, Uchihara JN, Masuda M, Takasu N, Tanaka Y, Ohta T, Mori N. *Nutr Cancer*. 2005;52(2):189-201.
- 16: Antitumor and antiproliferative effects of fucan extracted from *ascophyllum nodosum* against a non-small-cell bronchopulmonary carcinoma line. Riou D, Collic-Jouault S, Pnczon du Sel D, Bosch S, Siavoshian S, Le Bert V, Tomasoni C, Sinquin C, Durand P, Roussakis C. *Anticancer Res*. 1996 May-Jun;16(3A):1213-8.

17: Antitumor activity and immunological properties of marine algal polysaccharides, especially fucoidan, prepared from *Sargassum thunbergii* of Phaeophyceae. Itoh H, Noda H, Amano H, Zhuang C, Mizuno T, Ito H. *Anticancer Res.* 1993 Nov-Dec;13(6A):2045-52

18: Antitumor active fucoidan from the brown seaweed, *Umitoranoo* (*Sargassum thunbergii*). Zhuang C. et al. *Biosci Biotechnol Biochem.* 1995 Apr;59(4):563-7.

19: Antibacterial and immunomodulating activity of Fucoidan. Zapopozhets TS, Besednova NN, Loenko IuN. *Anitbiot Khimoioter.* 1995 Feb;40(2):9-13.

20: Pentosan polysulfate, a sulfated oligosaccharide, is a potent and selective anti-HIV agent in vitro. Baba M, Nakajima M, Schols D, Pauwels R, Balzarini J, De Clercq E. *Antiviral Res.* 1988 Sep;9(6):335-43.

21: Antiviral properties of Fucoidan fractions from *Leathesia difformis*. Feldman SC, Reynaldi S, Stortz CA, Cerezo AS, Damont EB. *Phytomedicine.* 1999 Nov;6(5):335-40.

22: Fucoidan derived from *Cladosiphon okamuranus* Tokida ameliorates murine chronic colitis through the down-regulation of interleukin-6 production on colonic epithelial cells, Matsumoto S., Nagaoka M, Hara T, Kimura-Takagi I, Mitsuhashi K. *Clinical and Experimental Immunology.* June 2004, vol. 136, no.3 pp. 432-439(8)

23: The Polysaccharide Fucoidan Inhibits the Antibiotic-induced Inflammatory Cascade in Experimental Pneumococcal Meningitis, Granert C, Raud J, Lindquist L, *Clinical and Diagnostic Laboratory Immunology,* May 1998, 5(3): 322-4

24: Potential Antioxidant Capacity of Sulphated Polysaccharides From the Edible Brown Seaweed *Fucus Vesiculosus*. Ruperez P, Ahrazem O, Leal JA. *Agric Food Chem.* 2002 Feb 13; 50(4):840-5

25: Intravascular granulocyte aggregates caused by the selectin-binding carbohydrate fucoidan in pig kidneys. Dittrich S, Lippek F, Gratopp A, Grosse-Siestrup C, Lange PE, Buhner C, *Clin Exp Pharmacol Physiol.* 2002 Oct 29(10):909-14

26: Protective effects of inhibiting both blood and vascular selectins after stroke and reperfusion. Ruehl ML, Orozco JA, Stoker MB, McDonagh PF, Coull BM, Ritter LS. *Neurol Res.* 2002 Apr;24(3):226-32.

27: Effects of Fucoidan on chronic renal failure in rats. Zhang Q, Li Z, Xu Z, Niu X, Zhang H. *Planta Med.* 2003 Jun;69(6):537-41.

28: Fucoidan inhibits the development of proteinuria in active Heymann nephritis. Zhang Q, Li N, Zhao T, Qi H, Xu Z, Li Z. *Phytother Res.* 2005 Jan;19(1):50-3

29: Effects of C-reactive protein and pentosan polysulphate on human complement activation. Klegeris A, Singh EA, McGerr PL. *Immunology* 2002 Jul;106(3):381-8