A guard of Liver, *Hovenia dulcis*

Liver disease hard to be self-aware, precaution is the best!
Neumed suggests *Hovenia dulcis* for alcohol poisoned liver.
NEUMED is an R&D company specialized in functional raw materials based on natural product. It was founded in 2003 by a group of researchers from College of traditional Korean Medicine, Kyung Hee University. Our company produces raw materials for high value-added new medicine and health functional foods from natural products.

Liver health HP426 approved for functional ingredient by MFDS protects liver damage via improvement of γ-GTP, increasing by alcohol over consumption.
2017’S
05 Won the Korea Small-Medium Business Awards, Technology & Innovation Division
04 Won the president of Korea Health Industry Development Institute award
02 Selected as Hi-Seoul Brand, Seoul Metropolitan Government

2016’S
12 Won the Administrator of Small and Medium Business Administration Republic of Korea award
09 Korea Ho Gan Sung (liver health) export to China

2015’S
12 Achievement of annual sales W12 billion

2014’S
08 Approved by MFDS the HT042 height growth functional food ingredient
01 Approved by MFDS the HP426 liver health functional food ingredient

2013’S
04 Approved by MFDS the HT008 joint health functional food ingredient

2012’S
05 Approved by MFDS the HT008 joint health functional food ingredient
04 Licensed out composition for stimulating bone growth

2011’S
09 Approved by MFDS the HT008 joint health functional food ingredient

2010’S
11 Attraction of investment from major company and agreement on collaboration

2009’S
11 Approved by MFDS the HT008-1 memory improvement functional food ingredient
08 Attraction of investment of pharmaceutical company and agreement on collaboration
05 Attraction of investment of bio technology
03 ISO9001:2008 certification

2008’S
04 Selected as Ministry of Education, Science and Technology frontier qualified business achievement

2007’S
12 Licensed out botanical drug candidate, HP012, for vascular dementia treatment

2006’S
06 INNO-BIZ certification

2005’S
12 Achievement of annual sales W2.9 billion and export $ 700,000

2004’S
04 Industrial R&D Center certification
03 Venture business certification

2003’S
10 Establishment of factory, Manufacture permission acquired
04 Foundation of NEUMED Inc.
In many countries around the world, the alcohol consumption per person is consistently increasing.

Alcohol has been adored by many people that it dates back to the history of mankind. Nevertheless, constantly abusing alcohol causes mental, physical illness and lead to health and social problems. According to World Health Organization (WHO) statistics, in 2010 the world average annual alcohol consumption per person over the age of 15 was 6.2 liters. However, Korea was twice the world average consumption, around 12.3 liters.
Over 40% of people in their 20s to 40s are binge drinking.

Over 40% of socially active people in 20s to 40s have been reported of binge drinking the past month. Furthermore, 83.5% of workers drank more than once a week. Due to binge drinking a lot of people suffer from hangover the next day.

An appropriate amount of alcohol will break down in the liver and soon recover. However, consistent over-consumption may gradually damage the liver and cause abnormal symptoms.

*Korean Health Association, Drinking-Related Statistic System*
Is your liver healthy?

Basic of health! Center of detoxification!
Liver is the most important organ and affected the most easily for alcohol.

Frequent drinking, overwork, stress, obesity, drug abuse, viruses and so on can cause liver damage. Especially increasing alcohol intake raises the risk of alcohol–related mortality and liver disease. Alcohol induces liver damage through oxidative damage, adiposity, inflammation and liver toxicity.

Liver, the silent organ with no self–aware symptoms!
Our researches focus on liver’s fundamental health by protecting alcohol poisoning and regenerating liver tissue.

Progress and recovery of alcoholic liver damage

To recover to normal liver
- Increase alcoholysis enzyme activity
- Accelerate alcoholysis
- Increase antioxidant enzyme activity
- Anti–inflammation
- Triglyceride Reduction
Alcohol is detoxified in the liver.

Entering into the body, Ethanol, the main component of alcohol, is broken down by alcohol dehydrogenase as acetaldehyde. This acetaldehyde causes hangover symptoms such as headaches, diarrhea, and heartburn nausea. Aldehyde dehydrogenase causes secondary decomposition to form acetic acid, which is known to be almost non-toxic. Through this chain of processes, it will break down ethanol and wake you up from alcohol.

After drinking the body doesn’t feel the usual, check $\gamma$-GTP.

Alcohol elevates $\gamma$-GTP level in hepatocytes. $\gamma$-GTP levels and alcohol intake have a correlation. When measuring alcohol $\gamma$-GTP is more sensitive than AST or ALT known as liver somatic index. In addition, persistent elevation of $\gamma$-GTP is one of the causes of type 2 diabetes.

Check the $\gamma$-GTP levels from medical examination. $\gamma$-GTP levels may indicate a risk for alcoholic liver damage.
What is *Hovenia dulcis* berry?

Traditionally *Hovenia dulcis* was used to treat gastroenteritis. It protects the liver from alcoholic damage.

“To stop nausea and get rid of the poison.”

止嘔逆，解酒毒 本草綱目, 李時珍 1596 (Compendium of Materia Medica, Li Shizhen 1956)

A thirty year old man is in a state of severe fever due to drinking ... Essentially, the poison should be solved with *Hovenia dulcis*. Add this to his medicine and it will cure.

一男子年三十餘, 因飲酒發熱 ……必須鷄距子解其毒, 遂煎藥中加而服之, 乃愈, 本草衍義補遺, 朱震亨 1358
(Supplement and Expansion of Materia Medica, Chu Chen-heng 1358)

“*Hovenia dulcis* are known to remove the alcohol taste, If you use this tree as a pillar Then all the liquor in the house becomes lighter”

能敗酒, 若以為屋柱, 則一屋之酒皆薄。圖經本草, 蘇頌 1061
(Illustrated Pharmacopoeia Su Song 1061)

“A long time ago, a southerner was fixing their house composed of this tree, he accidentally dropped a piece into the liquor jug, then the liquor in the jug changed into water.”

昔有南人修舍用此, 誤有一片落在酒瓮中, 其酒化為水味 食療本草, 孟誥 713
(Food Therapy Materia Medica Meng Shen 713)
**Hovenia dulcis** has been scientifically proven to alleviate alcohol poison.

A animal experiment and human panel test confirmed its safety and functionality. This result was published in a paper and gain academic recognition.

- Name of Ingredient: *Hovenia dulcis* Extract Powder
- Number of individually approved functional ingredient  2014–01
- Health claim: Help to protect the liver from alcohol damage
- Dose: 2,460mg/day
- Contents: *Hovenia dulcis*

Concerned about γ-GTP levels, try *Hovenia dulcis* for improvement

In our 12-week, randomized, double-blind, placebo-controlled study in 57 adults with 60 U/L of γ-GTP or higher due to alcohol consumption, the γ-GTP levels of H. dulcis group were significantly improved.

NEUMED’s *Hovenia dulcis* is twice better than other brands on the liver function improvement.
(Neumed: Approximately 28 U/L of γ-GTP levels decreased, ‘A’ Brand: Approximately 11 U/L of γ-GTP levels decreased)

![Graph showing liver function improvement](image-url)

Source Kor. J. Herbology 28(6), 2013
Drinking often and heavy, the solution is *Hovenia dulcis*

**Daily alcohol consumption**

*Hovenia dulcis* berry extract powder protects liver from chronic hepatocyte damage by lowering the increased γ-GTP, AST, and ALT levels from daily alcohol consumption.

**Binge drinking alcohol consumption**

*Hovenia dulcis* berry extract powder protects the liver from acute hepatocyte damage caused by excessive alcohol consumption.
The solution for toxin-induced liver injury is also *Hovenia dulcis*.

*Hovenia dulcis* berry protects the liver by lowering AST and ALT levels, which are triggered by alcohol and other substances that cause liver toxicity.

The facts of the above figures show significant decreasing effects and it means *Hovenia dulcis* helps recovering liver’s health.

- γ-GTP level is elevated in 90% of alcoholics and is more sensitive than AST and ALT. AST and ALT levels may be normal even for alcoholic liver disease patients. Therefore, it’s important to check these levels.
- AST and ALT is most commonly examined to check for liver disease. AST and ALT are enzymes in the hepatocytes. When hepatocytes are died by damage, the AST and ALT inside them break out of hepatocytes and flow into the bloodstream. Then by taking a blood test, it shows that AST and ALT levels have increased. In other words, AST and ALT levels reflect the damage of hepatocytes.
- Silymarin is one of the treatments for liver disease.
- Hepatotoxicity is caused by carbon tetrachloride.
Research results on *Hovenia dulcis*

**Individually approved functional ingredient**

Approved by MFDS the liver health functional food ingredient in 2014

Achieved 3rd place in manufacturing scale of individually approved ingredients in 2014, and 4th place in 2015

"Help to protect the liver from alcohol damage"

Number of individually approved functional ingredient: 2014-01

**Succeed on human test**

Conducted at Semyung university oriental medicine hospital in Jecheon

Protect liver via reducing γ-GTP, liver damage index induced by alcohol

The only *Hovenia dulcis* that is published liver protective effect in RCT.

"Confirmed significant impact in human test"

Human test report, 2013
Kor. J. Herbology, 2013

**Animal Experiment Paper**

Confirmed improvement on acute and chronic liver injuries induced by alcohol.

Confirmed improvement on toxin-induced liver injury.

"Hepatoprotective effect on liver toxicity and acute and chronic disease by alcohol."
Kor. J. Herbology, 2013
Accreditation status

Recognized for excellence in research and development.

Venture Company
Korea Technology Finance Corporation

Innovation Business Small and and Medium Business Administration (INNO-BIZ)
Small and Medium Business Administration

ISO 9001:2008
Health Functional Food Research, Development and Production

Excellent Corporate Brand in Seoul
Seoul

Member of Korea Women Inventors Association
Korea Women Inventors Association

Works together with verified partners

GMP certification
MSC Raw Material Manufacturer

GMP certification
Novarex Product Manufacturer

GMP certification
CNS Pharm Korea Product Manufacturer

GMP certification
Kolmar BNH Product Manufacturer
Quality control for the best products

*Hovenia dulcis* selected at the origin
Neumed’s strict process starts by selecting the safety products to excellent quality products raw materials and products. Whenever *Hovenia dulcis* is imported, it is checked by researchers in College of traditional Korean medicine, Kyung Hee University.

Thorough Material Inspection
Ingredients are thoroughly inspected for not only items such as coliforms, heavy metals, residual pesticides according to regulations, but also other factors that may affect the products safety, such as foreign matter, moisture, fungus toxin, preservative, tar color, melamine and sulfur dioxide.

Reliable and fast delivery chain
We can produce more than 60 tons of raw material per year, and we have a stable inventory, so we deliver within 2 weeks after ordering.

Goods with *Hovenia dulcis*
- Main ingredient of Kuffers, Korea Yakult’s representative product
- Since its launch in 2009, prolonged steady
- Main ingredient of Ganpyunhage Hukkae, Chong Kun Dang healthcare’s representative product
- Developed Kakao Store’s Self-planned products

You can meet our various products at the tax-free shops. Formulation: tablet, powder, gel, chewable and so on.
Hovenia dulcis keeps your liver healthy.

You should meet our Hovenia dulcis berry extract powder,

If you drink often and heavy,
If you are an office worker suffering from work and stress,
If you always feel fatigue,
If you have bad feelings on your overweight,
If you enjoy irregular meals or disposable food,
If you do not have enough time to invest for health,

Our Hovenia dulcis is ‘A guard of liver’s health’.