What does Hydrogen have to do with Parkinson?

Caspar L.P.M. Pompe MSCE, Watergas.NU Foundation, 240214 – edited 250225

Summary

The Watergas4Parkinson project is a 'citizen science project', supported by Watergas.NU Foundation.[1] A group of about 20 Parkinsonians has used hydrogen as therapy to alleviate their condition. Hydrogen is inhaled in the form of 'watergas' (aka HHO or Browns Gas[2, 3, 4]), combined with drinking hydrogen enhanced water ('power water').[5] During a period of about one and a half year (medio 2021-end 2022) participants are monitored with the 'Parkinson Monitor'(PM: Dutch version of UPDRS).[6] About 40% of the participants experienced an initial sharp decline in PM-values towards a lower base condition. In times of stress their condition aggravated temporarily. After stress is reduced, the condition returns to the base line. About 50 % of the participants experienced no improvement or aggravation. 10% of the participants experienced a slow increase of the PM values, albeit less than expected. One aspect not addressed by the PM is the increased level of energy (100%). This extra energy results in a more active social life – a better quality of life! Some members of the group have experimented as well with supporting therapies, like intake of different supplements, intermittent fasting, earthing[7] and infrared therapy. In particular infrared therapy is helpful as supporting therapy (Photo-Bio Modulation).[8, 9, 10] Yoritaka et al. confirm the findings of our project in a study with 19 participants.[11]

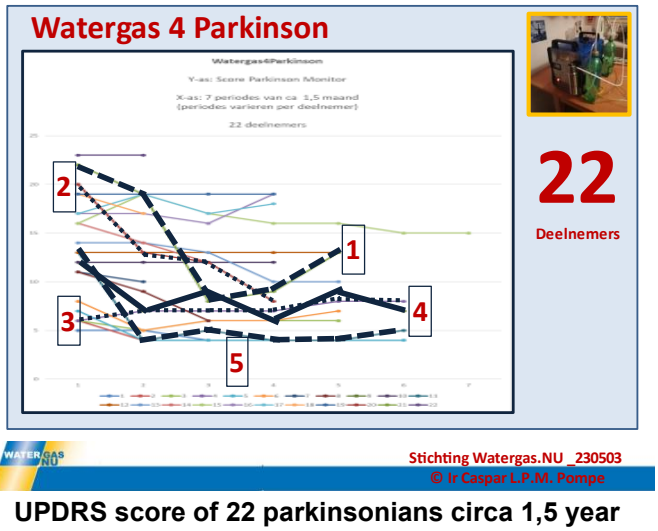
Why is hydrogen therapy such an effective therapy for Parkinsons?[12, 13, 14, 15] A reconnaissance survey learns that 'Watergas' is a rather unknown phase of water. Eckmann frames watergas as 'electrically expanded water'.[16] Both watergas and hydrogen act as a strong anti-oxidant. Watergas and hydrogen intake is applied in a broad spectrum of diseases.[17, 18, 19, 20] Suzuki et al write that parkinsonians lack specific intestinal bacteria producing hydrogen.[21] One of our participants adopted fecal transplantation. His condition improved impressively. Fu Y, et al conclude that molecular hydrogen is protective against 6-hydroxydopamine.[22] This toxic causes the Substantia Nigra to degenerate. Hydrogen neutralizes the OH-group into H_2O. This finding leads to the question about the interaction of neuromelanin and dopamin (difference only 4 hydrogen-ions?[23] Sircus states that dehydration leads to hydrogen deficiency, which is inherently linked to magnesium deficiency in cells and mitochondria.[24] Ryu Yamanaka et al note that an apparent exchange of sodium (Na – IN) and magnesium OUT of the mitochondrion is 'controversial', still a mystery.[25] We have looked at this phenomenon from the point of view of bio-transmutation.[26, 27] Goldfein/NASA confirms the findings of Kervran on bio-transmutation.[28] Goldfein suggests that in mitochondria stacked mATP-molecules function as a nano-cyclotron. We hypothese that hydrogen (H^1) and sodium (NA^{23}) are combined to magnesium (Mg^{24}). Wenwen et al. state that Magnesium deficiency results a.o. in incorrect folding of alpha-synuclein and eventually in the development of Lewy bodies, that hampers the transport of dopamin in neurons.[29]

Our reconnaissance study concludes with suggestions for further research. How do cells in our body react to additional hydrogen? Does hydrogen inhalation increase oxygen saturation? Can we find a nano-cyclotron that combines hydrogen with sodium to produce magnesium? Etcetera?

Watergas4Parkinson

Methodology
As a result of the article about watergas therapy in Parkinson Magazine by Mike Schellart (mei 2021), approximately 22 people have signed up to participate in the trial of this therapy: a citizen science project. [30] How does it work? Watergas is produced on site with a water gas generator. [31] The participants inhaled 'watergas' for twice a day for about an hour each day. The generator also produces ‘power water’ – hydrogen enhanced water.

The participants periodically kept track of how much they suffer from Parkinson's from mid-2021 to about end 2022 approximately every other month. They used the Parkinson Monitor, the Dutch version of the internationally used method to 'quantify' the symptoms of Parkinson's (Unified Parkinson's Disease Rating Scale (UPDRS)). The Parkinson Monitor scores on eight aspects that mainly occur in Parkinson's. The score ranges from 0 to 4. With a score of 0, one does not suffer from that aspect and 4 is 'a lot of trouble'.



UPDRS score of 22 parkinsonians circa 1,5 year

The graph above depicts the results of Watergas4Parkinson.

Approximately 50% of the participants showed a stable line from the start. Can this stable situation also be considered a gain?

About 40% of the participants experienced less symptoms, especially in the beginning. After that, they also started to flatten out. 10% of the participants experienced a slower than expected rise.

Participant 1 gained so much energy and self-confidence that he crawled out of a deep mental dip. Unfortunately, he then developed severe physical complaints and stopped after being admitted to the hospital. Participant 2 continues to descend sharply. Participant 3 had a Parkinsonism. His line is rising, but considerably less than expected. Participant 4 was no longer able to walk the dog every day. Now he can do that again. He also has much less trouble with his intestines. Another participant has lost his delusions. . It turns out that stress plays an important role (see lines of participants 4 and 5). After periods of stress (holidays, grandchildren over, water damage at home) the score recovers.

More energy!
Importantly, almost everyone has more energy. No longer falling asleep in the afternoon. A better quality of life! Unfortunately, this aspect that is not included in the Parkinson's Monitor.

On the website www.watergas.nu you can find four testimonials of particpants (in Dutch).

Evaluation
After a year and a half, a number of Watergas4Parkinson participants still use their water gas device on a daily basis. They usually also drink the power water.

All participants are asked how they are doing and if they are still active users. Here we limit ourselves to a brief overview.

Inhaling watergas is not a problem for many people. One starts with short periods of 5-10-15 minutes and slowly increases. Most participants inhale twice a day for half an hour to one hour. But you have to be able to find the peace and quiet for that.

Some particpants still have busy jobs. It turned out to be difficult for them to schedule 2 x 1/2 hours.

Another aspect is the operation of the device. If you do it yourself, you have to understand how the device works. Some participants are no longer able to do so. Then a caregiver must carry out the operation and maintenance. The suppliers of the watergas generators also provided support.

In one participant's case, it is not possible to coordinate the medication and the hydrogen. So he stopped.

An old couple has moved to a nursing home. They then end up in a regime where watergas doesn't really fit (unfortunately).

Another participant stopped because he achieved sufficient improvement with Vitamin B1 and fecal transplantation.

One of the participants lost his delusions. He always had a dog next to him. He said goodbye to the dog. It was an imaginary dog.

We heard from someone with MS that she can only use water gas for a maximum of half an hour. She does benefit from water gas. But she is very careful and 'listens' carefully to her body. I think this is a general recommendation: pay close attention to what water gas does to your body.

Note from the core group: Supervising this project requires quite a lot of personal attention. Especially in the beginning.

How does the device work? How often maintained? What kind of water do you use? How does the Parkinson Monitor work (some participants found it difficult to use - so the score was recorded by telephone). Periodically updating the data is also an issue for the core group - it would be better if someone kept track in a professional way. If you have a larger group of participants, you can zoom in on sub-aspects and sub-groups.

We have formed App groups so that participants can maintain contact with each other. That worked at first, but later the enthusiasm waned. Some participants met twice regionally. That was experienced as very useful. Sometimes there are details that make the difference. And the personal exchange is worth a lot!

Confirmation

We have found another study similar to Watergas4Parkinson. In that study of Yoritaka et al 19 participants drink ‘Power Water’ (hydrogen enriched water).[32] The development of Parkinson's symptoms is significantly reduced. In other words, this scientific research confirms our lay research.

Some participants are very active in finding additional therapies. The core group of Watergas4Parkinson has investigated a number of these supporting therapies – on paper, but also in practice.

Hydrogen and co

Hydrogen as medicine

Hydrogen provides relief for a broad spectrum of diseases.[33] If you google “Therapeutic opportunities of hydrogen in a variety of disease models” you will get a number of very interesting publications.

The book 'Hydrogen Medicine' by Dr Sircus describes how hydrogen serves as a medicine.[34] Watergas brings extra electrons and hydrogen into your body. 'Hydrogen Medicine' gives a hint as to why Hydrogen or Watergas helps against cancer: Watergas affects acidity positively.

Acidity allows a web of fine blood vessels to grow around tumors and their metastases; the capillaries. They supply energy to the tumors. The growth of those blood vessels is sensitive to the acidity. If acidity is too high or too low, the growth of blood vessels (angiogenesis) stops.

Thus it also stops the supply of nutrition to the tumors. First the metastases shrink and then the tumor. That's what watergas does! We have found publications on watergas/hydrogen and cancer. [35, 36, 37, 38, 39]

The course of many life processes depends on the acidity (pH). If you exercise a lot, your muscles become acidic. Then you are vulnerable to injuries. It appears that (top) athletes recover faster from acidified muscles and can provide more energy (expressed in Wattage) by inhaling watergas or hydrogen.[40]

Power Water

In a 2021 publication of the Dutch Moerman Association MMV, Professor Muskiet talks about Hydrogen gas water: revolutionary antioxidant therapy.[41]

"Dissolve a little hydrogen gas (H2) in your drinking water, take about 1.5 liters per day and consume an amount of antioxidants equivalent to 38 carrots, 516 apples or 756 bananas. Have antioxidant researchers been working hard for decades for nothing? Or is this too good to be true?"

If you bubble watergas through a bottle of drinking water, some of the watergas will 'stick' to the water. We call this 'power water'.

Participants of Watergas4Parkinson always drink it after inhaling the watergas for approximately twice an hour per day. Our power water has a potential of about -minus 300 mVolt immediately after production. This means extra electrons are available in the water. We think these extra electrons give the power water its anti-oxidative effect.

We know two ways of producing power water. The cheapest is with hydrogen beakers at a price of approximately € 100. The second way is to bubble watergas through water.

Most Watergas4Parkinson participants have used the watergas generators costing approximately €650.

Similar units are marketed by the Dutch companies Condit Medicare and HydroBooster.[42]

Most effective supporting therapies

Watergas itself does act as supporting therapy. In China and Japan, watergas is used together with chemotherapy. Chemical waste is then removed faster out of the system of the patients.

Several supporting therapies have been tried by members of the core group. Most important of these therapies are infrared therapy and grounding.

Infrared light therapy

Infrared light therapy is the most important supporting therapy we have tried.[43] Light is very important for life. Light is transmitted by photons. Photons are sub-atomic particles that are simultaneously a particle with a certain mass and an electromagnetic energy wave.

With our optic nerves we can perceive wavelengths between 400 and 700 nanometers. We can't see wavelengths from 700 to about 2000 nanometers. We feel that light as heat radiation – infrared radiation. Some animals can see those wavelengths.

In an hour-long presentation, Dr J. Anders discusses 'Photobiomodulation'.[44] Very interesting! Infrared light with a short wavelength appears to strengthen biochemical processes in the mitochondria. That's why the PBM community focuses on those short wavelengths.

One of our participants uses a small infrared lamp (consisting of a 'tablet' with a series of IR LED lights). He especially benefits from the proper functioning of his intestines. These lamps emit light with two wavelengths – 480 and approximately 600 nanometers.

Other members of the working group have experimented with a kind of helmet with IR LED lights. That would stimulate the brain and that infrared also relieves joint pain.

At least two participants use infrared heating panels. These panels radiate with a wavelength of approximately 2000 nanometers. According to Pollack this is a favorable wavelength for building gel water in cells and mitochondria. [45] [46] While energy is absorbed in the gel, hydrogen becomes available for processes in the cell and the mitochondria.

We found a video of Dr Lin Hung-Yu from Taiwan. He himself has Parkinson's and wheelchair bound. Watergas alone did not work well enough for him. But in combination with infrared therapy he did have a good result. Lin participated in the study of Hong et al..[47] He got out of his wheelchair and can now dance ballroom again!

So infrared light enhances both the processes of the mitochondria and the storage of energy in gel water in the mitochondria – depending on the wavelength(s) of the IR light.

Earthing

One of the core group members uses 'grounding' as a supporting therapy. Good grounding ensures the induction of electrons into our body. These 'free' electrons are indispensable as antioxidants and for the proper functioning of biochemical processes in our body. In his book 'Earthing' Dr. Clinton Ober describes a 'double-blind' test with which he demonstrates the effect of grounding. [48] Grounded people need fewer white blood cells to keep their immune system in order.

So…..Shoes off! By wearing shoes with rubber soles we insulate ourselves from the electrons in the ground.

People, animals and plants are water-electric creatures! 'Electroculture' in horticulture demonstrates the importance of electrons for plants. Ir Yannick van Doorne from France shows us in practice how plants grow better by strengthening the supply of electrons.[49]

Grounding is a simple and important therapy.

Several participants now work at home with earthing mats near their computers and some sleep with earthing sheets.

Elements and supplements

Important complementary therapies concern our lifestyle. What are we eating? Do we exercise enough? Should we take supplements? We consume complex substances through our diet.

In the intestines, food is broken down into digestible chunks for many chemical and physical processes in cells and mitochondria.

In addition to glucose, vegetables contain many elements, such as sodium, potassium, iron and magnesium. Wild edible plants often contain more useful elements than regular vegetables. Nettles contain much more iron and magnesium than cultivated spinach.

Intermittent fasting → burning ketones

One of the participants has good experience with intermittent fasting. The body then switches to burning brown fat (ketones). You hardly eat carbohydrates.

Intermittent fasting allows you to lower your insulin levels and lose weight. The ketones help produce antioxidants. Ketones are a much more efficient fuel for your brain.

The New Food organization states that Parkinson's patients benefit from a ketogenic approach. [50, 51] On their website we find: “There has been one small-scale study with a promising result. Symptoms such as trembling, balance problems, fluctuating mood and energy levels, 'freezing' ' of the legs and walking in general improved. Each participant also lost several kilos of weight.”

Vitamin B1

Another participant used a high dose of Vitamin B1. He had a Parkinsonism. Before he started this B1 therapy, he walked quite stiffly. But when I visited him later he was moving relatively smoothly. D. Bryant published a Dutch booklet on vitamin B1 suppletion. [52]

Sodiumbicarbonate

Dr Sircus advises to use baking soda or sodium carbonate (NaHCO3) as supplement.[53] This compound helps to balance the level of acidity in your system.

From book description of webshop Bol.Com:

"Sodium Bicarbonate begins with a basic overview of the everyday item known as baking soda, chronicling its long history of use as an effective home remedy. It then explains the role sodium bicarbonate plays in achieving optimal pH balance, which is revealed as an important factor in maintaining good health. The book goes on to detail how sodium bicarbonate and its effect on pH may benefit sufferers of a number of conditions, including kidney disease, fungal infection, influenza, hypertension, and even cancer."

Unbalanced acidity (pH) is considered the origin of many diseases. Therefore sufficient supply of sodium- or magnesium carbonate production is needed. For example to neutralize gastric acid when digested food enters the small intestine:

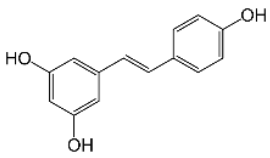
$$HCL + NaHCO_3 \rightarrow NaCL + H_2O + CO_2$$

Sodium carbonate is a.o. produced in stomach, pancreas and kidneys.

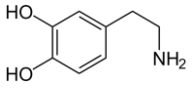
Another important aspect of sodium carbonate is that it 'cleans up' pesticides and heavy metals. In particular in the field of PD this is interesting, because intake of pesticides is considered a main cause of developing Parkinsons.[54]

Resveratrol

Resveratrol helps against a broad spectrum of conditions as well.[55] Resveratrol activates the protein sirtuin, which in turn activates NAD+ that plays an important role in many biochemical processes. Resveratrol helps to clean up cells (autophagy). Resveratrol supports NAD+ against cancer, Parkinson's and Alzheimer's, cardiovascular disease and aging. NAD+ is an enzyme and one of the most abundant substances in your body.



Resveratrol



Dopamin

Resveratrol is one of the top five supplements, advised by nutritionists. Resveratrol also works against Parkinson's (according to www.infonu.nl).

In China and Japan, resveratrol has been investigated and applied as a remedy against COVID. In vitro, resveratrol kills 95% of the SARS virus. Researchers Feng Zhang et al. have published a paper on Resveratrol and Parkinson.[56]

Dr Sinclair issued an interesting video on NAD+ and resveratrol levels in respect to the process of aging.[57]

Magnesium

Magnesium is a very important element for life. Currently you see a lot of advertisements for magnesium. Magnesium is said to be good for the proper functioning of your brain. On the website of Dr Sircus you'll find interesting information on magnesium as a supplement, including some warnings.[58] Magnesium plays an important role in Parkinson as well, as noted by Feng Ru Xue et al..[59]

Magnesium deficiency influences the functioning of the mitochondria. And more seriously for Parkinsonians: magnesium deficiency induces loss of dopamine production!

"Epidemiological studies revealed that the high incidence of PD is attributed to nutritional deficiencies of Mg2+ [194,195,196]. Continuous low Mg intake over generations damages mitochondria, ER, ribosomes, and nuclear DNA, as well as induces the loss of the dopaminergic neurons in the substantia nigra [8]."

We will return to magnesium later in this paper. Now, let's look for a reason why hydrogen helps to alleviate Parkinsons.

Reconnaissance research

What is the ratio behind hydrogen?
Hydrogen therapy is (not yet) taken seriously in mainstream healthcare in the Netherlands and Europe. An important scientist in PD said that he doesn't know about hydrogen therapies – "I don't know the ratio of hydrogen therapy".

This remark is the trigger for us to delve deeper into possible explanations of why hydrogen is so effective a therapy. Why is hydrogen therapy so useful in a broad spectrum of diseases?

Our desk research is a lay reconnaiscance survey. The real scientific research should be taken up by eager PHD candidates. That is our goal: to trigger Science in the Netherlands and Europe to embrace hydrogen and related supporting therapies. Hydrogen turned out too helpful to Parkinsonians to be ignored by science.

We found that a lot of research has already been done in this area, especially in Asia. On the website of producer Aqua2Heal you can find a mountain of publications about the healing power of hydrogen (and water gas).[60]

An invaluable source of information can be found on the website of the Molecular Hydrogen Institute. This website contains the latest research and scientific publications on hydrogen therapy including cell, animal, and human studies.[61]

We live in a time in which science (physics, chemistry, biology) is gaining new insights with artificial intelligence, automated research methods and computers with enormous computing power for 'data mining'. Please use these new tools to develop more experience with hydrogen – and supporting therapies in medical practice. In the closing paragraphs we articulate some interesting questions related with hydrogen as medicine.

But let's first try to find an explanation why hydrogen therapy is so effective in Parkinsons.

Relation between hydrogen and dopamin
The first insights we gained is that some strains of bacteria produce hydrogen. And we learned that dopamine is not only produced in the brain, but also in our intestines.

The bad news is that Parkinsonians lack bacteria that produce hydrogen!

We looked at how the conversion of Glucose to Dopamine takes place. In that process, on balance, hydrogen (H), hydroxyl (OH), nitrogen (N) and carbon (C) are added to the glucose. We also see that in case of stress, Dopamine is made into Adrenaline. That explains why stress is so bad for Parkinsonians. Stress requires adrenaline. Then you have less dopamine left for regular work. This phenomenon is reflected in the graphs of Watergas4Parkinson.

Our reconnaiscance follows a path of seven steps.

Step 1: The not so obvious

Hydrogen in biochemical processes
"Where you have water, there is hydrogen". Water – H2O – always splits a little – depending on the circumstances – into hydrogen ions H+ and hydroxy ions OH-. But does that phenomenon provide enough hydrogen? Apparently not for Parkinsonians.

Hydrogen H is present in bound form in many body substances. Consider the 'simple' Glucose: $H_6C_{12}O_6$ - with 6 H ions - or ATP: $C_{10}H_{16}N_5O_{13}P_3$ - with 16 H ions.

The production of all kinds of compounds in our system takes place in small steps. Enzymes, are proteins acting as workbenches for these biochemical processes. In these processes H+ and OH- ions are released or attached to compounds 'fixed' on the enzymes to make new substances.

That requires energy! Electrons and photons provide that energy. So the influx of electrons and photons is equally important to sustain our bodies.

You could say H+ and OH- are the nuts and bolts of the workshop. If you do not have sufficient stock in stock, the production process will come to a standstill. That will lead to irritation in the workplace. Hampering production – due to lack of nuts and bolts – will also affect these enzymes.

But… water is so banal that we often overlook it. After all, it is always there! And what about dehydration?

The availability of water and hydrogen is not so obvious as we think it is! Why does a lack of hydrogen production in the gut of Parkinsonians cause so many problems?

Poop
Can we enhance or restore the natural production of hydrogen in our body? Parkinsonians have fewer or no hydrogen-producing bacteria in their intestines (the bacterial strains Blautia coccoides and Clostridum Leptum produce the most hydrogen).[62]

The Dutch Professor Bloem of Radboud University Nijmegen tells in a popular video about a Parkinson Pandemy.[63] Pesticide intake plays an important role in the development of Parkinson's. Does the pesticide actually kill those hydrogen-producing bacterial strains in our intestines?

Can we re-introduce those bacteria back into our intestines? As is already done in veterinary practice (vet's info).

Dr Bekker-Chernova is leading a trial with poop transplantation at Leiden University (LUMC). [64] Poop is essentially a mass of obsolete bacteria. One of our participants in Watergas4Parkinson takes part in this trial (which in science is of course called fecal transplantation).

So his intestines produce hydrogen again. The effect was that he initially suffered more from tremor. He then reduced the L-Dopa medication and his tremor disappeared.

The consequence of the Leiden research may be that fecal transplantation may be preferable to watergas therapy. Inhaling hydrogen and watergas is actually a kind of symptom relief, because we import hydrogen that we do not produce ourselves.

Does feces transplantation sufficiently restore 'endogenous' hydrogen production?

Is external hydrogen intake still necessary after feces transplantation?

Confirmation
The publication by Ostojic et al. "Inadequate Production of H2 by Gut Microbiota and Parkinson Disease".[65] This publication states that Parkinsonians produce less hydrogen in their intestines. This publication confirms the link between hydrogen production and dopamine production. How does it work?

Step 2: Hydrogen helps

Degeneration of Substantia Nigra
We have found an interesting publication by Suzuki et al. "Quantification of hydrogen production by intestinal bacteria that are specifically dysregulated in Parkinson's disease". [66] This publication states that drinking 'power water' suppresses the progression of Parkinson's in both animal experiments and humans. The degeneration of the black mass in the center of our brains – the substantia nigra – is prevented. It is in this black organ that dopamine is produced (in the brains).

> **"We reported that hydrogen water prevents the development and progression of PD in a rat model** [19]. Similarly, hydrogen in drinking water reduces dopaminergic neuronal loss in the 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)-induced mouse model of PD [20]."

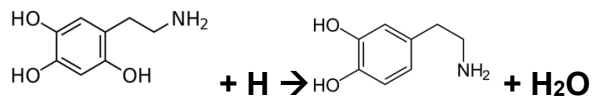
So, next question is how hydrogen helps to prevent progression of Parkinsons.

Step 3: Toxic 6-OHDopamine

6-OH Dopamine causes Parkinsons
We have found an answer in the study of M.P. Smith and W.A. Cass. "Oxidative stress and dopamine depletion in an intrastriatal 6-OH-dopamine model of Parkinson's disease".[67] The toxic 6-OH Dopamine causes cell death in the substantia nigra in the brain. This toxic sister of dopamin is used in animal experiments to induce Parkinson's. 6OH-Dopmanine causes oxidative stress and kills cells. As a result, the substantia nigra degenerates (and therefore produces less dopamine).

Hydrogen neutralises 6-OH Dopamine
Luckely hydrogen neutralises 6-OH Dopamin, as we read in the publication by Yuan Fu et al. "Molecular hydrogen is protective against 6-hydroxydopamine-induced nigrostriatal degeneration in a rat model of Parkinson's disease".[68]

The toxic 6-OH-Dopamin is dopamin molecule with an additional hydroxy (OH) particle. If you add hydrogen, you get dopamin + water (H_2O), because hydrogen plus hydroxyl forms water. So if the body itself no longer produces any or an insufficient amount of hydrogen, then the toxic substance (free radical) hydroxyl can do its detrimental work.



6-OHDopa + Hydrogen → Dopamin + Water

The hydrogen to reduce the toxic 6OH-dopamin is probably made by melanin.

Step 4: Melanin → Hydrogen

Melanin is sister of Chlorophyll
Hydrogen is not only produced by bacteria.

Hydrogen can also be produced by splitting water. The process of splitting water requires (exogenous) energy in the first place. Then, hydrogen and oxygen deliver energy.

Two molecules are known to split water: chlorophyll and melanin. Melanin is made from glucose in a long chain of biochemical transformations.

Herrera et al. argue that water is an important source of energy, made available by Melanin.[69] Melanin uses photons to split water into hydrogen ions, oxygen ions and electrons.

From the Abstract:

Our finding, in the human eye initially, of the intrinsic property of melanin molecule to split and re-form the water molecule breaks the ground. Our body has the astonishing property to uses water as source of electrons, as in plants happen.

Water is the source of energy by excellence and meals are merely the source of biomass. With meals our body makes skin, nails, hair, muscle, blood, neuron cells, bone; etc. Glucose is out of discussion, the perfect building block, thereby our organism is able to makes even nucleic acids arising from $C_6H_{12}O_6$. ***However, energy, defined as any thing that is able to produce some kind of change, is taken from water through the dissociation and re-formation of the molecule.***

Melanin is the equivalent to the human chlorophyll. ***Both molecules possess the intrinsic capacity to transform photonic energy into free chemical energy****, susceptible to be used by eukaryotic cell.*

Chlorophyll produces Glucose – the essential ring molecule $C_6H_{12}O_6$. Glucose is made by catching photons and splitting hydrogen and oxygen from a water molecule to combine it with CO_2 from the air. The half product is CH_2O. The Oxygen (O_2) is discarded into the air. This process is repeated six times to get the ring molecule $C_6H_{12}O_6$ (popular version). I call these ring molecules 'magic rings' because they are inherently linked with the magic of life.

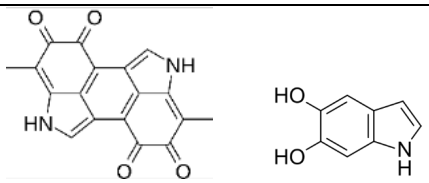
Glucose is 'essential' because animals and humans can't make it. Glucose is the origin of many compounds, such as dopamine, serotonin and adrenalin.

Melanin delivers hydrogen

Melanin is found in our skin as a pigment. The name melanin comes from the Greek *melas* – dark. There are five types of melanin: eumelanin, pheomelanin, allomelanin, pyomelanin and neuromelanin.[70] Melanin is found in different places in our body. Each with its own specialization.

Melanin is the brother of chlorophyll. Both molecules consist of 6- and 5- side rings (but in different configurations). Melanin catches photon energy from a wider spectrum of light than chlorophyll does.

Melanin also absorbs infrared light radiated by heat sources. The core function of melanin is to split water into oxygen and hydrogen (proton + electron). Water power!



Melanin **Neuro-Melanin**

Neuromelanin is important to us in relation to Parkinsons. Dr Sircus states that one third of the energy our body uses comes from melanin – from splitting water into hydrogen and oxygen. He says "THE most important source of energy for our body is water. Not food".

What happens in the substantia nigra and how does hydrogen production influence dopamin production?"

Melanin and Pesticides

Melanin also attracts foreign substances – such as pesticides.

Sodium carbonate also catches pesticides – in the intestines. Could intake of $NaCHO_3$ as supplement be used to prevent pesticide damage to the brain?

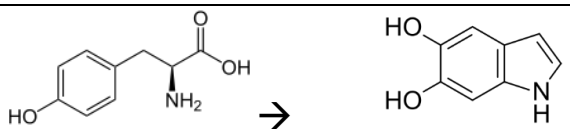
Steven Brenner states "Parkinson's disease may be due to failure of melanin in the Substantia Nigra to produce molecular hydrogen from dissociation of water, to protect the brain from oxidative stress".[71]

Abstract

Melanin, a hybrid electronic/ionic conductor may have the potential to split the water molecule into molecular hydrogen and molecular oxygen.
Molecular hydrogen is an antioxidant and may be instrumental in preventing the excessive oxidation leading to Parkinson's disease.
Melanin, located in the Substantia Nigra, deteriorates in Parkinson's disease so may be related to the development and progression of the disease, since molecular hydrogen would no longer be generated as it deteriorates.
***Environmental toxins, thought to be related to development of Parkinson's disease, may cause deterioration of intrinsic melanin,** since it is a chelator which would collect such environmental contaminants, but its function of splitting the water molecule into molecular hydrogen and oxygen could be effected as a consequence.*
Restoring melanin function or providing supplemental molecular hydrogen might be potential treatments for Parkinson's disease.

This publication links damage to melanin production to the absorption of pesticides. Melanin produces hydrogen (hydrolysis) in the Substantia Nigra (Black Mass). This hydrogen protects the brain against oxidative stress. When melanin no longer produces hydrogen - to neutralize 6OH-Dopamine - Parkinson's will develop (in animal models, 6OHD is injected to induce PD).

On Wikipedia we find:



Tyrosin **Neuro-Melanin**

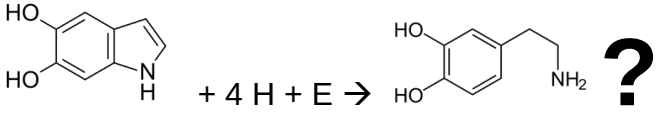
***"Neuromelanin is biosynthesized from L-DOPA**, precursor to dopamine, by tyrosine hydroxylase (TH) and aromatic acid decarboxylase (AADC).*

*Alternatively, synaptic vesicles and endosomes accumulate cytosolic dopamine (via vesicular monoamine transporter 2 (VMAT2) and transport it to mitochondria where it is metabolized by monoamine oxidase. **Excess dopamine and DOPA molecules** are oxidized by iron catalysis into dopaquinones and semiquinones which are then phagocytosed and **are stored as neuromelanin**.[4]"*

When excess dopamin is stored as melanin, could this melanin be recycled to dopamin?

Step 5: Melanin → Dopamin?

Melanin + Hydrogen → Dopamin?
Looking at the molecular structure formulas of melanin and dopamin, the question rises: "Could neuro-melanin be converted into dopamine by adding hydrogen and water energy?



$C_8H_7NO_2$ + 2 x H_2 + Energy → $C_8H_{11}NO_2$ (?)

We assume that for this recycling of melanin into dopamin energy is needed. Melanin captures light (photons) as a source of energy. Some Watergas4Parkinson participants have experimented with infrared light helmets (aimed at the black mass).

With that light (photons), the melanin can split water into hydrogen and oxygen. Subsequently hydrogen can neutralize the toxic 6-OH Dopamine.

Unfortunately, we have so far not found publications on biochemical pathways from Melanin to Dopamin.

From evil to worse
Here you see a process from evil to worse. Hydrogen is not only made in the intestines by bacteria, but also in the brain by Melanin.

Less melanin means less hydrogen production. Hydrogen is a strong antioxidant that also has the task of removing unwanted substances. But then there is not enough hydrogen left to neutralize 6OH-Dopamin - which causes the black mass to shrink - and therefore produces too little dopamin.

So, there is a second reason to take hydrogen more seriously in Parkinsons research. Hydrogen neutralises the toxic 6-OH Dopamin. But there is more to hydrogen.

Step 6. Magnesium at play

Hydrogen -- → magnesium deficiency?
I refer to Dr Sirkus' statement that hydrogen deficiency is always accompanied by a magnesium deficiency. The process starts with dehydration. Constipation in Parkinsonians indicates dehydration (fluid deficiency). So: Too little water → too little hydrogen → less dopamine and risk of damage to the black mass due to 6-OH-Dopamine. But what is the link to Magnesium?

Magnesium prevents the incorrect folding of the alpha-synuclein protein (AS). As we know, AS is an early predictor of Parkinsons.

Alpha-synuclein is PD-biomarker
Recently it has been discovered that the protein alpha-synuclein (AS) is a useful biomarker for Parkinson's.[72] With AS you can determine at an early stage whether you have Parkinson's. The AS protein can stick together. It then forms fibres that ring-shaped clusters. These vibrous rings in turn stack into strands. The strands form tangles that stick to the wall of neurons. And then you have 'the puppets dancing'! (Dutch saying for 'You get into trouble').

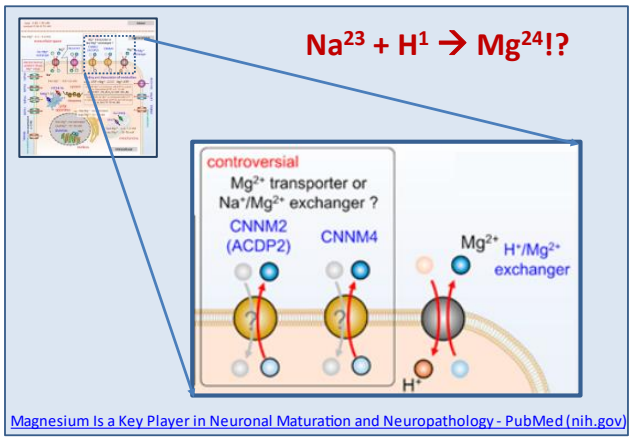
Dopamin is contained in small sacs that flow from the center of the cell to the ends of the neurons (the nerve cells). Deposition of AS hinders the flow of dopamine.

So you have to ensure that the AS protein does not clump in the first place! We suspect that hydrogen plays a role in this process - to keep acidity in check. Think of making cheese. Adding acid from the stomach of new-born calves causes the milk protein to clump.

It is said that the consumption of power water balances acidity in our system. Does this power water ensure that the acidity is optimal and the AS protein does not stick/clump? And what is the role of bicarbonate (HCO_3^-) in this phenomenon? [73] It might be a bit more complicated.

Could hydrogen play a role in magnesium supply – indirectly preventing incorrect folding of AS? Does the 'congested' dopamine develop into toxic 6-OH Dopamine?

What does magnesium deficiency do?
Ryu Yamanaka et al. confirm that "Magnesium Is a Key Player in Neuronal Maturation and Neuropathology".[74] The cited publication contains a long paragraph about Parkinson's and magnesium. Yamanaka et al. have studied the flows of elements and compounds IN and OUT over the diaphragms of our cells and mitochondria.



Source: Magnesium Is a Key Player in Neuronal Maturation and Neuropathology - PubMed (nih.gov)

Hydrogen ions (protons) and electrons play an important function in getting the materials from the inside to the outside and vice versa.

One flow not yet explained is the apparent exchange of sodium (Na – IN) and magnesium (Mg – OUT) (which is called 'controversial'). On the other hand an IN-flow of hydrogen and an OUT-flow of magnesium are not 'controversial'.

Origin of magnesium
But where does that magnesium come from? And what is the relationship with hydrogen?

Of course we get magnesium out of our food, especially in vegetables and fruit. Wild vegetables like nettles often contain more elements than cultivated vegetables like spinach.

But there may be another source of magnesium. Let's look at this phenomenon through the lens of 'biotransmutation'.

Step 7: Bio-transmutation?

Biotransmutation is known for centuries
Bio-Transmutation is the process in which living beings transmute elements into another element. You can also watch the documentary of Seethepattern.[75] Apparently we are a complex bio-nuclear reactor!

As early as the 17th century, researchers were looking for the origin of the elements that plants and animals are made of. Researchers like van Herzeele (19th century) and Kervran (20th century) have executed numerous experiments in which bio-transmutation is proven.

More recently researchers found that germinating seeds emit light! In these germinating seeds a shift of content of elements is registered.

Magnesium plus oxygen would give calcium and a little mass ($Mg^{24}+O^{16} \rightarrow Ca^{40} + m$). The excess mass is transformed into energy or light (bio-luminiscence). [76]

Mg	24,305 u	Ca	40,078 u
O	15,999 u	m	0,226 u
	40,304 u		40,304 u

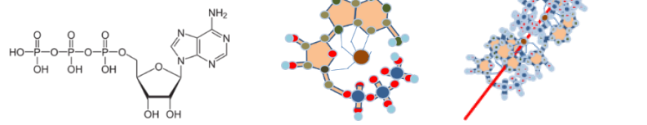
Vysotskii is an Ukrainian scientist.[77] He remarks that the work of Kervran and von Herzeele took place in the era before nuclear science developed. Vysotskii prefers to use the term 'transmutation of isotopes'. governed by the laws of physics. He studied transmutation of radioactive isotopes in several kinds of bacteria.

Where in our cells would this transmutation take place? He criticizes the supposition of Kervran that an unknown enzyme is at play. We would better apply modern nuclear science to explain the transmutation of isotopes in a living environment.

Researcher Goldfein (NASA) applies modern insights, resulting in an interesting suggestion.

The Bio-Cyclotron of Goldfein[78]
Transmutation of isotopes probably takes place in the mitochondria. After all, the mitochondria are the energy factories of our cells.

Dr Goldfein/NASA imagines that a kind of bio-cyclotron is formed on a nanoscale by rolled-up Mg-ATP molecules. Very interesting! A complex 'magic ring'! Since a magic ring creates an electromagnetic torus field (electrons spinning around), it acts as a magnet. The rings stack themselves one on top of the other. The SAM team has made a nice video about how the bio-cyclotron works (a Patreon production).[79] Very smart!



ATP **Mg-ATP** **Bio-Cyclotron**

The SAM Team gives a number of examples of bio-transmutation that have been demonstrated. [80]

Hydrogen + Sodium → Magnesium?
If we look at the above-mentioned 'controversy' from a bio-transmutation perspective, we see pieces of the puzzle falling together.

Let's assume that nature likes simplicity. Then sodium and hydrogen might be combined to produce magnesium.

Sodium Na^{23} + Hydrogen H^{1} → Magnesium Mg^{24}

Hence, does hydrogen and sodium indirectly prevent deposition of Alpha-Sirtuin against the wall of the nerve cells?

Sodium and our brain
So, let's have a closer look into sodium (Na). What is known about sodium for the proper functioning of our body?

I find: [81]

source:www.voedingcentrum.nl

"Sodium is an essential nutrient involved in regulating the fluid balance in the body, regulating blood pressure. Sodium is also important for the proper functioning of muscle and nerve cells. A sodium deficiency is mainly a problem for the brain (!). The complaints are therefore usually neurological in nature: drowsiness, headache, confusion, falling, lack of attention, difficulty with walking"

Sodium is primarily important for the well-functioning of our brain!

And what is said about hydrogen?
In his great book 'Hydrogen Medicine', Dr Sircus writes that dehydration is not dehydration per se, but a shortage of hydrogen. In our cells, water is converted into hydrogen and oxygen (by melanin). Because much of the water in our body is already bound, we must always ensure a fresh supply of water.

Hey! So, could it be that if you don't have enough hydrogen available, you no longer make magnesium (from hydrogen and sodium)?

From this perspective, it is probably better to ensure the intake of sufficient amount of sodium and water. Our body produces the necessary magnesium itself.

And next, could we make calcium from magnesium plus oxygen? Calcium is important for a well-functioning brain and producing milk.

Magnesium Mg^{24} + Oxygen O^{16} → Calcium Ca^{40}

So….animals and humans that produce milk need to get enough sodium – not so much magnesium or calcium. Is that why cows get a salt lick (= block of salt = NaCl)?

With food we also take in sodium. For example, by eating olives. Does the healthy Mediterranean diet contain more sodium?

It is known that Mediterraneans suffer less from cancer.

Yet another hint to use baking powder (sodium bicarbonate) as a supplement?

The End: Hydrogen Helps!

Our reconnaissance study results in a better understanding why our project Watergas4Parkinson is successful.

- Parkinsonians produce too little hydrogen in their microbiome;
- Hydrogen is a basic in many biochemical processes in our cells;
- Hydrogen neutralizes toxic 6-OH Dopamin;
- Water is a source of energy, made available by melanin;
- Water deficiency → magnesium deficiency;
- Magnesium is important for properly folding the protein Alpha-Synucleine (an early biomarker of PD).

Of course new questions arise! To name a few:

- Is fecal transplantation sufficient to counter PD?
- Are hydrogen (H_2) and watergas H_2O^{--}) equally effective?
- Do free electrons indeed work as an antioxidant?
- Does dehydration indeed lead to magnesium deficiency?
- Does hydrogen recycle melanin into dopamin?
- Why is resveratrol so useful a supplement? Can it be turned into dopamine?

And, if we take biotransmutation into account;

- Can we find the ‘biocyclotron’ in the mitochondria?
- Does sodium + hydrogen make magnesium?
- Does magnesium + oxygen make calcium?

We hope this publication rises the interest of scientific researchers.

We hope that hydrogen or watergas therapies will be more widely adopted in Europe and the Netherlands in particular. Hydrogen helps to alleviate the symptoms of Parkinsons.

Suggestions for research

Scientific research opportunities
A lot of research has already been done in this area, especially in Asia. On the website of producer Aqua2Heal you will find a mountain of publications about the healing power of hydrogen (and watergas).

We hope that the Watergas4Parkinson patient project will inspire many PhD students to excel in their field with hydrogen therapies. Let’s go!

Repeat Watergas4Parkinson
Our project only had a population of approximately 20 people. That is a bit small for detailed research – for example into the effect on sub-aspects. It is positive that we have worked with the (international) method of the Parkinson Monitor (PM). Less strong was the regularity of data collection.

The 'energy' aspect is not addressed by the Parkinson Monitor. That however is an important effect of watergas therapy. How to quantify this aspect?

With a sufficiently large population, different equipment can be compared. What equipment is best suited for use by Parkinsonians? What level of guidance should be provided to ensure safe use?

Experiences with watergas therapy
There are currently approximately 250 to 300 people in the Netherlands who have purchased a watergas appliance from suppliers with whom we maintain contact. These people use hydrogen not only against Parkinson's, but also against Alzheimer's, MS and many other conditions. We suggest to have an intern from a ROC, MBO or HBO visualize the experiences.

Compare hydrogen (H_2), watergas (H_2O^{--}) and hydrogen-enhanced water
Determine physical properties of hydrogen, watergas and 'power water' (hydrogen/watergas-enhanced water).

Short-term effect on bio-markers
Determine biochemical effects of hydrogen/watergas inhalation and consumption of 'power water'. Double-blind research is important for rapidly responding bio-markers. But for slowly responding effects we have doubts about control groups. Parkinsonians are not guinea pigs!

Joint watergas- and infrared therapy (PBM)
Participants have experienced that hydrogen therapy is enhanced by infrared therapy (confirmed by publications). Much has been published about Photo-Bio-Modulation (PBM) (with or without a combination of hydrogen).

Determine the effect of short-wave infrared (mitochondrial processes?) and long-wave infrared (storage of energy in 'jelly water' (or similar)?).

Determine the effect of hydrogen and/or PBM on dopamine production in the substantia nigra.

Watergas/hydrogen, melanin en 6-OH-dopamin
Does watergas or hydrogen and/or PBM enhance the function of melanin in the black mass? Does watergas or hydrogen neutralize toxic 6-OH-Dopamin?

Watergas/Hydrogen and Alpha-Sirtuïn (AS)
AS appears to be a suitable biomarker for Parkinson's. We suspect that the formation of Lewy bodies is caused by an unbalanced acidic environment. Does watergas refrain the formation of Lewy bodies (AS clusters)? Do the supplements sodium carbonate and resveratrol enhance such a process?

Dehydration → H - - → Mg-deficiency?
Magnesium deficiency causes problems with the functioning of enzymes.

Does dehydration indicate hydrogen deficiency – as Dr Sircus states? And does hydrogen deficiency indeed result in magnesium deficiency?

Hydrogen production by bacteria in the intestines
Does restoration of endogenous hydrogen production by intestinal bacteria lead to restoration of dopamine production in the intestines and brain?

Is fecal transplantation an efficient therapy for this? Can hydrogen-producing bacteria be grafted into the gut microbiome? Is gene manipulation a realistic option (NB Ethical aspects)?

Resveratrol, Sodiumcarbonate and Sirtuine
Resveratrol triggers the protein sirtuin, sodiumcarbonate balances pH, what effect do these supplements have on the development of Lewy bodies in our neurons?

Bio-Transmutation a step forwards!
Over the past centuries, researchers have confirmed bio-transmutation again and again. We urge Science to take a step forward now – in particular in finding remedies to counter Parkinsons Disease?

Discover which conversions take place in our mitochondria. Which species of bacteria produce hydrogen? Do bacteria exist that produce magnesium?

Bio-Transmutation 1: Na + H → Mg?
Magnesium is important for the proper functioning of enzymes. Therefore we propose to investigate whether hydrogen and sodium fuse to form magnesium (in the mitochondria?). Does administering hydrogen and sodium bicarbonate result in an increase in magnesium production and therefore less formation of Lewy bodies?

Bio-Transmutation 2: mATP-Bio-Cyclotron?
Can we find the bio-nuclear fusion reactor as suggested by Dr Goldfein? Does it indeed consist of stacked mATP molecules?

Can bio-luminescence be useful in determining the compounds produced?

Development of instruments
We currently develop – together with some companies – better watergas generators.

The electrolyzors (or better electrifiers) need electrolyte such as sodiumhydroxide. Maintenance is an issue for parkinsonians. Another point is the use of inox steel in the production cell. We are looking for affordable cells made of titanium. We aim to develop a device at a price less than about Euro 1000,-.

Communication
We want to make the results of Watergas4Parkinson known, especially to Parkinonians. Parkinsonians should at least know about our experiences. We recommend that they consult with their neurologist to consider watergas therapy.

Disclaimer
It is important that the equipment is properly maintained. And not all Parkinsonians are equally good at this. We assisted some participants with (technical) advice and assistance – insofar as this was not already done by the suppliers.

We base this report on the experiences of the participants of Watergas 4 Parkinson. The participants have decided themselves - often in consultation with their neurologist - to follow watergas therapy. Ultimately the user the boss. We are therefore not liable for any damage caused by following the water gas therapy.

This report is a lay reconnaissance study. Please be so kind to forgive me that this publication is not always written conform standards of scientific writing. I hope you liked reading it. And may this story inspire you for new research.

Acknowledgements
I wish to express many thanks to the participants and in particular the members of the core team of Watergas4Parkinson.

Also a word of thanks to the suppliers of watergas generators. They supported the participants when needed.

I am grateful for the many research papers that can be found on internet. ‘Chapeau’ to the scholars that painstakingly have written their findings and have devoted many hours in laboratories instead of partying with friends! What a work to find out how our bodies function at the deepest levels! I hope I have cited you correctly. Thanks!

Watergas inhalation gives more energy, a better quality of life!

How amazing is the functioning of life!

References

1 www.watergas.nu

2 In chemistry watergas is a mixture of hydrogen and carbonmonoxide – produced by leading steam over hot coal. Here Watergas is perceived as water in gas phase. Watergas is also known as Oxyhydroxy gas, HHO or Browns Gas.

3 Wiseman G., What Is Brown's Gas? - Eagle-Research

4 Yull Brown, “Welding”, U.S. Patent 4,014,777 (Mar 29, 1977). "The invention also relates to atomic welding to which the mixture {of hydrogen and oxygen generated ion substantially stoichiometric proportions} is passed through an arc causing disassociation of both the hydrogen and oxygen into atomic hydrogen and oxygen which on recombination generate an extremely hot flame."

5 Muskiet F.,Waterstofgaswater: revolutionaire antioxidantentherapie | MMV

6 www.parkinson-vereniging.nl/archief/bericht/2018/05/16/Parkinson-Monitor

7 Ober, C., Earthing 2nd, ISBN 9781591203742

8 Low-level laser therapy - Wikipedia

9 How it works — Photobiomodulation Therapy (photobiomodulationstudio.uk)

10 Anders J., Photobiomodulation Therapy (PBMT): What is It? (youtube.com)

11 Yoritaka A, et al. Pilot study of H(2) therapy in Parkinson’s disease: a randomized double-blind placebo-controlled trial. Mov Disord. 2013;28(6):836–9. doi:10.1002/mds.25375.

12 Ichihara, M., et al., Beneficial biological effects and the underlying mechanisms of molecular hydrogen - comprehensive review of 321 original articles -. *Med Gas Res* 5, 12 (2015). https://doi.org/10.1186/s13618-015-0035-1

13 Ito M, et al., Drinking hydrogen water and intermittent hydrogen gas exposure, but not lactulose or continuous hydrogen gas exposure, prevent 6-hydorxydopamine-induced Parkinson’s disease in rats. Med Gas Res. 2012;2(1):15. doi:10.1186/2045-9912-2-15.

14 Matsumoto A, et al., Oral ‘hydrogen water’ induces neuroprotective ghrelin secretion in mice. Sci Rep. 2013;3:3273. doi:10.1038/srep03273.

15 Fujita K, et al. Hydrogen in drinking water reduces dopaminergic neuronal loss in the 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine mouse model of Parkinson’s disease. PLoS One. 2009;4(9):e7247. doi:10.1371/journal.pone.0007247.

16 Eckman Ch., ‘Plasma Orbital Expansion of the Electrons in Water’, PROCEEDINGS of the NPA 1, Idaho State University 2010

17 Sircus M., ‘Hydrogen Medicin’, ISBN 9781663223500, 2021

18 Li J. et al., Hydrogen-rich saline improves memory function in a rat model of amyloid-beta-induced Alzheimer’s disease by reduction of oxidative stress. Brain Res. 2010;1328:152–61. doi:10.1016/j.brainres.2010.02.046.

19 Mohaupt E., Brown’s Gas for Health: Background, Observations and Medical Data - DOI: 10.14294/WATER.2020.2

20 Ge L , · Molecular hydrogen: a preventive and therapeutic medical gas for various diseases – 2017, doi: 10.18632/oncotarget.21130

21 Suzuki, A., ‘Quantification of hydrogen production by intestinal bacteria that are specifically dysregulated in Parkinson's disease’, 2018, PMID: 30586410.

22 Fu Y, et al. Molecular hydrogen is protective against 6-hydroxydopamine-induced nigrostriatal degeneration in a rat model of Parkinson’s disease. Neurosci Lett. 2009;453(2):81–5. doi:10.1016/j.neulet.2009.02.016.

[23] Rabey, J. M.; Hefti, F (1990). "Neuromelanin synthesis in rat and human substantia nigra". Journal of Neural Transmission. Parkinson's Disease and Dementia Section. 2 (1): 1–14. doi:10.1007/BF02251241. PMID 2357268. S2CID 6769760.

[24] Sircus M., Magnesium Articles, Dosages, Benefits, Uses and Warnings (drsircus.com)

[25] Yamanaka R., 'Magnesium Is a Key Player in Neuronal Maturation and Neuropathology', PMID: 31336935 PMCID: PMC6678825 DOI: 10.3390/ijms20143439

[26] Biberian J.P., 'Biological transmutations: historical perspective', Aix-Marseille Université, J. Condensed Matter Nucl. Sci. 7 (2012) 11–25

[27] See the Pattern, Biological Transmutation of Elements (youtube.com) , Patreon.com.

[28] Goldfein, S., 'Energy development from elemental transmutations in biological systems', NASA, Army Mobility Equipment Research and Development Center, 1978

[29] Wenwen XUE et al. The Effect of Magnesium Deficiency on Neurological Disorders: A Narrative Review Article., Iran J Public Health. 2019 Mar; 48(3): 379–387, PMCID: PMC6570791, PMID: 31223564

[30] Schellart, M., 'Krachtwater' bruist van gezondheid', Parkinson Magazine nr 3 mei 2021.

[31] Boost je gezondheid met waterstoftherapie - Boost your life! (h2booster.com)

[32] Fu Y, et al. Molecular hydrogen is protective against 6-hydroxydopamine-induced nigrostriatal degeneration in a rat model of Parkinson's disease. Neurosci Lett. 2009; 453(2):81–5. doi:10.1016/j.neulet.2009.02.016.

[33] M Ichihara, Beneficial biological effects and the underlying mechanisms of molecular hydrogen - comprehensive review of 321 original articles - DOI 10.1186/s13618-015-0035-1

[34] Sircus M., 'Hydrogen Medicin', ISBN 9781663223500, 2021

[35] Shang, L · Therapeutic potential of molecular hydrogen in ovarian cancer, 2018 - doi: 10.21037/tcr.2018.07.09

[36] Chen JB · Hydrogen gas therapy induced shrinkage of metastatic gallbladder cancer: A case report, 2019 - doi: 10.12998/wjcc.v7.i15.2065

[37] Chen J · Brain Metastases Completely Disappear in Non-Small Cell Lung Cancer Using Hydrogen Gas Inhalation: A Case Report - doi: 10.2147/OTT.S235195., 2019

[38] Chen JB · "Real world survey" of hydrogen-controlled cancer: a follow-up report of 82 advanced cancer patients, 2019- DOI: 10.4103/2045-9912.266985

[39] Zhu B., Hydrogen inhibits the proliferation and migration of gastric cancer cells by modulating lncRNA MALAT1/miR-124-3p/EZH2 axis, 2021 - doi.org/10.1186/s12935-020-01743-5

[40] Aoki K., · Pilot study: Effects of drinking hydrogen-rich water on muscle fatigue caused by acute exercise in elite athletes, 2012 - doi: 10.1186/2045-9912-2-12

[41] Muskiet, F., Waterstofgaswater: revolutionaire antioxidantentherapie | MMV

[42] Boost je gezondheid met waterstoftherapie - Boost your life! (h2booster.com)

[43] Hong C.T. et al., Effects of concomitant use of hydrogen water and photobiomodulation on Parkinson disease, Medicine (Baltimore). 2021 PMID: 33530211

[44] Anders J., Photobiomodulation Therapy (PBMT): What is It? (youtube.com)

[45] Pollack, G The 4th phase of water', Ebner and Sons Publishers; 1 may 2013

[46] Pollack, G, Cells, Gels and the Engines of Life, Ebener and sons, 2001, ISBN 0-9626895-2-1

[47] Hong C.T. et al., Effects of concomitant use of hydrogen water and photobiomodulation on Parkinson disease, Medicine (Baltimore). 2021 PMID: 33530211

[48] Ober, C., Earthing 2nd, ISBN 9781591203742

[49] Doorne van, Y., Elektrocultuur Van Doorne - elektrocultuur magnetocultuur, (website)

[50] Koolhydraatarm Keto Start & Weekmenu Eet je snel Slanker en Gezonder (thenewfood.nl)

[51] Phillips M.C.L. et al., Low-fat versus ketogenic diet in Parkinson's disease: A pilot randomized controlled trial, Published online, 2018, PMID: 30098269

[52] Bryan, D., Parkinson en de B1 therapie, 2022

[53] Sircus, M., "Sodium Bicarbonate", 2014, INGP, EAN 9780757003943

[54] Bloem, B.,Waarom krijgt straks iedereen de ziekte van Parkinson? (youtube.com)

[55] Sinclair, D., NAD+ and resveratrol levels affect the aging process | (youtube.com)

[56] Feng Zhang et al. Resveratrol Produces Neurotrophic Effects on Cultured Dopaminergic Neurons through Prompting Astroglial BDNF and GDNF Release, Published online 2012, doi: 10.1155/2012/937605

[57] Sinclair D. (NAD+ and resveratrol levels affect the aging process | (youtube.com)

[58] Sircus M., Magnesium Articles, Dosages, Benefits, Uses and Warnings (drsircus.com)

[59] Xue Rufeng et al., Peripheral Dopamine Controlled by Gut Microbes Inhibits Invariant Natural Killer T Cell-Mediated Hepatitis, PMID: 30386344

[60] Waterstof therapie Aqua2heal. Vanaf € 699,- Browns gas, hydroxy H2 therapie

[61] www.molecularhydrogeninstitute.org

[62] Ostojic S. M. et al, Inadequate Production of H2 by Gut Microbiota and Parkinson Disease, https://doi.org/10.1016/j.tem.2018.02.006

[63] Bloem, B.,Waarom krijgt straks iedereen de ziekte van Parkinson? (youtube.com)

[64] Chernova V.A. [1]et al., Fecal microbiota transplantation for Parkinson's disease using levodopa - carbidopa intestinal gel percutaneous endoscopic gastro-jejeunal tube. PMID: 37150070

[65] Ostojic S. M. et al., Inadequate Production of H2 by Gut Microbiota and Parkinson Disease, https://doi.org/10.1016/j.tem.2018.02.006

[66] Suzuki, A., 'Quantification of hydrogen production by intestinal bacteria that are specifically dysregulated in Parkinson's disease', 2018, PMID: 30586410,

[67] Smith M.P., W.A. Cass, Oxidative stress and dopamine depletion in an intrastriatal 6-hydroxydopamine model of Parkinson's disease, https://doi.org/10.1016 j.neuroscience.2006.10.004

[68] Yuan Fu et al., Molecular hydrogen is protective against 6-hydroxydopamine-induced nigrostriatal degeneration in a rat model of Parkinson's disease, PMID: 19356598 , DOI: 10.1016/j.neulet.2009.02.016

[69] Herrera A.S. et al. Energy Production, the Key Role of the Melanin Molecule in the Human Body: Implications in the Context of Aging, DOI: 10.2174/978168108653811801001l

[70] Wikipedia - Melanin -

[71] Brenner, S., Parkinson's disease may be due to failure of melanin in the Substantia Nigra to produce molecular hydrogen from dissociation of water, to protect the brain from oxidative stress, https://doi.org/10.1016/j.mehy.2014.01.013

[72] Anzari Atik J. et al., Alpha-Synuclein as a Biomarker for Parkinson's Disease, PMID: 26940058\

[73] Sircus, M., "Sodium Bicarbonate", 2014, INGP, EAN 9780757003943

[74] Yamanaka R., 'Magnesium Is a Key Player in Neuronal Maturation and Neuropathology', PMID: 31336935 PMCID: PMC6678825 DOI: 10.3390/ijms20143439

[75] Biological Transmutation of Elements (youtube.com)

[76] Popp F.A. et al. Physical aspects of biophotons, Experientia, Volume 44, pages 576–585,1988

[77] Vysotskii, V.I., Kornilova A.A. Nuclear transmutation of stable and radioactive isotopes in biological systems, India, Pentagon Press, 2009.

[78] Goldfein, S., Energy Development from Elemental Transmutations in Biological Systems (dtic.mil), NASA, 1978

[79] SAM Team, Biological Particle Accelerator the size of a Molecule! - YouTube

[80] Discussing the Transmutation of Elements with the SAM Team: Part 2 Biological - YouTube

[81] www.voedingcentrum.nl