

Speed your recovery  
from Long Covid via ...

# The Autophagy Protocol

version 3.2 5/26/2022 Thomas Bunker PhD

## DISCLAIMER

This is not medical advice and I am not a medical doctor. This protocol is what has worked for me and for some others in this group. I have fine-tuned the protocol based on what seems to be working the best. Advice offered or implied is based on what seemed to speed recovery for a small number of individuals. If you have medical issues or specific questions about how this protocol might affect them you should contact your doctor or other medical professional. While I strive to provide accurate information, be aware that information contained herein could be incorrect or dated.

CAUTION: If you have DIABETES, you are at increased risk for ketoacidosis while fasting or eating a low carb diet.

# Keys to Recovery

In the big picture of Recovery from long covid I believe the most important factors are:

#1 Breakdown a percentage of viral proteins in our cells. To do this **induce cellular housecleaning (eg autophagy) ONLY one or two days per week**. Autophagy “primes” or enhances our antiviral immune responses. This schedule allows 5-6 days a week for antiviral responses and cellular rebuilding.

#2 **Avoid "extra" supplements** that constantly stress your cells and may interfere with periodic strong autophagy. (see Appendix A)

#3 Daily time restricted eating - **choose an 8 to 10 hour window in which to eat your meals**.

#4 **Follow a no added sugar, no processed carb diet** and eat lots of beans, legumes and vegetables. Lower your meat intake if you eat beef, pork or chicken daily. Avoid all breads, white rice, and alcohol.

#5 **Avoid all strenuous exercise** and major emotional stressors. **Pace yourself**. Avoiding relapses is key.

Autophagy is a basic cellular housecleaning process that happens in every cell in our bodies. There is normally a low level of nightly autophagy. Periodic autophagy is a way for our cells to clear out virus particles, viral protein aggregates, recycle damaged mitochondria, down-regulate inflammatory signaling and improve cellular health. The SARS-CoV-2 virus produces proteins that inhibit cellular autophagy in infected cells. Blocking autophagy helps the virus to hide from our immune system by preventing the presentation of viral fragments on the cell surface. We can prime our antiviral immune responses by triggering moderate/strong autophagy.

Choose two consecutive days each week to fast or otherwise induce autophagy. For example, every Sat and Sun or every Mon and Tue. Then each week select one way to induce AUTOPHAGY.

Fasting is a proven way to induce autophagy but do not try a 1.5 or 2.5 day fast until you are strong enough. To fast efficiently, don't eat anything after supper on Friday. Take some sugar-free electrolytes (salts) along with lots of water on Sat and Sun. **1/2 teaspoon of Morton Lite Salt** (50% less sodium and more potassium) dissolved in a warm glass of water makes a cheap effective electrolyte solution. Drink two glasses a day when fasting and also take 200 mg of Magnesium Glycinate (or Magnesium Citrate) twice a day. Begin eating again either Sunday or Monday morning with a light breakfast. Initially do a night-day-night (1.5 day) fast. If that goes well, try to do night-day1-night-day2-night (2.5 day) fast **every other weekend** to speed your recovery.

If you are too weak to fast or do not have any extra weight to lose then you can instead take **600 mg Resveratrol** at noon on Saturday and again on Sunday. This induces moderate evening autophagy comparable to fasting. There are also many alternative ways to induce autophagy (See Appendix C).

## Phase I - How to get started     Diet and Time-restricted Eating

*Just concentrate on diet and time-restricted eating for at least 3 to 4 weeks. This alone may improve or get rid of some of your symptoms.*

### **a) Choose a window for time-restricted eating**

I think most long-haulers should start with changes to their diet and limit their eating to an 8 to 10 hr window per day. *The optimum eating window is earlier in the day... like 8 am to 4 pm.* But if it fits your schedule better 10 am to 6 pm is fine. And try to avoid routine snacking between meals. Some women find that an 8 hr eating window induces nightly autophagy, in that case increase to a 10 hr eating window as our aim is to ONLY induce moderate or strong autophagy one or two days each week. Doing this gives our bodies 5-6 days a week for cellular rebuilding, tissue restoration and normal cellular functions. When first starting, allow yourself to eat an evening meal once or twice a week.

### **b) Cut out all foods with added sugars and processed carbs**

Especially breads, baked goods and sugary drinks. Avoid fried foods. Eliminate wheat flour, white rice, and alcohol. Eat lots of colorful vegetables. Cook your own meals as much as possible. Substitute tea for coffee. See Appendix B for "What can I eat?"

### **c) Review your medications and supplements**

Not everyone is able to "feel" autophagy. Often because they have other supplements or medicines that are interfering with the weekend induction of strong autophagy. As much as possible *eliminate all supplements other than those recommended in the autophagy protocol.* Try the autophagy protocol exactly as written for 6 to 8 weeks before you decide to "tweak it". See the list of foods, medications, and supplements to avoid in Appendix A.

### **e) Pace yourself and avoid moderate and strenuous exercise**

When you are tired, rest. Walking is helpful if you feel up to it but do not push yourself. Better to go slow than to overdo it. Avoid all strenuous exercise. Many recovering long haulers trigger relapses by hiking too far, running, or doing anything that elevates their heart rate and breathing for 10 min or more. *If you are breathing hard, stop what you are doing.*

## Phase II - Periodic Fasting or other Autophagy: 1 to 2 days per week

After about 1 month of eating in an 8 to 10 hour window you may be ready for your first fast. However, the severity of your long covid symptoms must also be considered. If you are mostly bed or couch bound you may not be strong enough to successfully do a water fast. Also, some long-haulers that have a "mild" case may see gradual improvements with just the time-restricted eating. Those fortunate long-haulers may not need to do any fasting.

For the rest of us, start with a night-day-night fast (1.5 days), for example stop eating Friday evening, just drink water on Saturday and have 2 glasses of salt water during your day of fasting. Then begin eating on Sunday morning with a small breakfast of say an egg, a piece of fruit, and some steamed vegetables. The fast triggers strong autophagy, typically in the evening. This results in increased long covid symptoms often for 4 to 8 hours.

Interestingly, some long-haulers get the increased symptoms *after* they resume eating the next day. Most long-haulers feel better once their body is fasting as it is a strongly anti-inflammatory state and many immune cells

retreat to the bone marrow. **CAUTION:** perhaps 10% of long-haulers have a major increase in their symptoms after their first short fast. Old symptoms can reappear and existing symptoms can get worse for one, two, or even 3 days. Be patient, and know that your immune system is taking appropriate action against the virally infected cells that the fast has made visible via autophagy. If you have a strong reaction to your first fast, try again in a few weeks.

Once your 1.5 day fast goes well, many long-haulers are ready to try 2 full days of not eating. It is best to go from say Friday evening until Monday morning to get maximum evening and nighttime autophagy. The second day of your fast is especially beneficial as lipid droplets within your cells are tapped for energy reserves and any associated viral particles are also degraded. If you are concerned about your weight going too low, then the best alternative method appears to be 600 mg Resveratrol. For people weighing more than 200 lb. use 900 mg of Resveratrol. It is good to alternate 2.5 days of fasting one weekend with Resveratrol the next weekend. This is also your chance to try alternative methods of inducing autophagy such as Omega 3 Fish Oil, Alpha Lipoic Acid, Acetyl L-Carnitine and Fisetin. Curiously, only about 2/3rds of long-haulers feel the increased long covid symptoms and the accompanying edgy/jittery feeling. Typically, this can be a slightly worse headache, worse head pressure, worse gut ache, increased heart rate etc. It is not necessary to “feel” autophagy to see gradual improvements in your symptoms.

## Expectations

Some people respond very well to the autophagy protocol and have symptoms begin to disappear at the rate of one per week. Others unfortunately, do not seem to respond at all. On average, the respondents of the Autophagy Protocol’s 2021 weekly symptom survey saw ***FIVE symptoms completely go away in the first sixteen weeks*** of following the autophagy protocol. Because autophagy is less and less effective at clearing the last bits of viral debris, it may be easier to get to 85-90% recovered than it is to get to 100% recovered. A fortunate few will recover with just the time-restricted eating and clean diet. A few more long-haulers may fully recover following the 1-2 day a week autophagy regimen. However, it seems that the majority will plateau at 85 to 90% of normal function. We may need the development of new safe and effective antivirals for SARS-CoV-2 that can be taken for months at a time. In the meantime, stay as healthy as possible.

## The End Game

Once you are to no long covid symptoms... YEAH! ... AND you no longer feel long covid symptoms during fasting or other autophagy induction your level of virus/viral debris is very low. **DO NOT ASSUME** that you can now go and do strenuous exercise or start drinking alcohol or eating sweet treats. **This virus is very sneaky and very persistent.** It will take advantage of any weakness. **DO NOT** give it an opening. I have talked to several long-haulers that thought they were fully recovered... YET still suffered a long covid relapse after a night out drinking, a run, or an episode of emotional stress. Unfortunately, this can happen after 4 weeks, 8 weeks, or even 12 weeks. Error on the side of caution, do not underestimate this virus!

**Disclaimer** – Please do not misconstrue any of this as medical advice. I am not a doctor. This is based on my personal experiences and my attempt to connect the dots in an intelligent way. This is a long way from a scientific double-blinded placebo controlled clinical trial! Nothing is proven yet. Especially be careful if you are having heart complications, vision issues or bad neuropathy. Consider your situation carefully and **review your plans with a doctor** before starting any supplement or fasting regime.

## Diet

Please follow a strict no added sugars, no processed carb diet. This means no wheat flour, no baked goods, no candy, few fried foods and avoid processed foods. Surprisingly, Ketogenic diets do not appear to be helpful. The Autophagy Protocol restricts foods that spike your blood sugar. This means avoiding foods that have a high glycemic load and high glycemic index. Avoid all foods with more than 7 or 8 g of sugars. This means no bananas, dates, raisins, prunes, or cantaloupe. Other fruits such as apples and kiwis are good to eat. Avoid white potatoes, white rice and other starchy foods that are rapidly digested. Lightly boiled sweet potatoes that are then cooled are ok. Quinoa and lightly cooked steel-cut oats are fine. Some meat and fish are OK, but avoid highly processed meats. Try to avoid eating meat every day and reduce the serving size when you do eat meat. *Strive to have at least half your plate at each meal covered with vegetables.* Hearty soups are great with lots of beans, split peas, and vegetables. Salads with walnuts, feta cheese and a no sugar vinaigrette dressing are good.

If you suspect that you may have developed an intolerance to histamine, eliminate all high histamine foods (eg avocado, tomatoes, spinach, walnuts) from your diet for a couple of weeks. Then slowly add back high-histamine foods one at a time to test for reactions.

## Supplements

Supplements are a relatively minor part of the Autophagy Protocol but they may aid recovery. The schedule below assumes fasting or other autophagy methods on Sat and Sun.

Take with your 1st meal M-F or as noted:

- **Vit D** 2000 IU - Promotes autophagy and healthy immune responses.
- **Vit K2** as MK7 100 mcg - To prevent Calcium bone loss with high Vit D
- **Vit C** 500 mg twice a day
- 1 g **Lysine** At the beginning of every meal and anytime you eat nuts. This seems to help my gut health and definitely improved

my stools. It may reduce viral replication by lowering the cellular Arginine/Lysine ratio

- Daily 50+ **multivitamin** with 10 mg zinc - even if you are only 20 years old!
- 50 mg **Vitamin B3** as Niacinamide (or Niacin) to boost cellular NAD+. This dose is not enough to induce autophagy. Take mid-morning or at noon for best sleep.
- 600 to 750 mg **NAC**. It is a good mucolytic and boosts glutathione; our cell's main antioxidant. NAC makes it harder to induce autophagy so **Take only Mon. - Thurs.** If you do not tolerate NAC, liposomal Glutathione or S-Acetyl-L-Glutathione are alternatives
- **low dose aspirin** (75 or 81 mg) once daily to discourage platelet activation and the formation of blood clots.
- **Optional for fatigue:** Super **B Complex** (Igenus) 1 tablet (1/2 dose) or Vit B12 1000 mcg. Try taking for a month at noon to help fatigue. Be mindful of your total Niacin intake.
- **Optional for MCAS:** 500 mg **Quercetin**. To minimize activation of Mast Cells and block histamine release. May also help take cells out of a pro-viral growth mode. **Take only Tue - Fri.** Avoid Quercetin Phytosome as the dosing is different. More accurately, aim for 3.3 mg per lb or 7 mg per kg
- **Optional for cardiovascular health:** 5-10 mg of a **statin** or 3-6 mg of Monacolin K via **Red Yeast Rice** (about 300 mg or ½ capsule of Pure Naturals brand). Statins reduce the formation of cellular lipid droplets which may be important for SARS-CoV-2 replication.

It is fine to take your vitamins and any medicines when water fasting. But do stop Quercetin and NAC.

Beware of brain fog! Get a day-of-the-week double pill box to help organize your supplements.

## My approach to dosing

Many autophagy inducers impair mitochondrial function and cause Reactive Oxygen Species (ROS). ROS in turn damage cellular proteins, lipids, and DNA. I believe that we want enough cell stress to trigger moderate autophagy, but we want to do so in a relatively gently manner. The periodic nature of the dosing should allow our cells and tissues time to rebuild and repair. While the regulation of autophagy is complex, daily autophagy likely inhibits cell growth and replication. This may suppress aspects of your normal immune responses. **So please be careful to not stress your cells daily.** Allow time for normal functioning of our cellular “factories”.

“Too strong” autophagy in my opinion continues your increased Long Covid symptoms into the next day or evening and may interfere with your sleep. For me, I get 4 hours of sleep instead of my normal 7-8 hrs. It may also cause a deep fatigue the next day or two similar to PEM.

## Resources for the Autophagy Protocol

### Facebook group:

Long Covid – Recover via Fasting / Autophagy  
<https://www.facebook.com/groups/2559838777474649/>

### Website: Recover from long covid

[https://recoverfromlongcovid.com/?page\\_id=273](https://recoverfromlongcovid.com/?page_id=273)

### Patient led research:

#### Observational Study of Periodic Autophagy to treat Long COVID

[https://recoverfromlongcovid.com/?page\\_id=350](https://recoverfromlongcovid.com/?page_id=350)

### Score your Long covid or Vax Injured symptoms:

Have a calculator handy to add your symptom severity scores for 25 of the most common symptoms.

## Appendix A

### Supplements, foods and medications that likely interfere with the Autophagy Protocol

#### **Health supplements to avoid except as specified for an autophagy method:**

Fish oils, Omega 3s, Krill Oil, Cod liver Oil, Astaxanthin, MCT Oil, Coconut Oil, powdered coconut oil (more than 1 tsp per day), PEA, Taurine. Arginine, Leucine, Methionine, Serine and Glutamine are all pro-growth amino acids so avoid those. Take no more than 25 mg of Zinc daily as higher doses may trigger autophagy. High amounts of CoQ10 (200 mg as Ubiquinol) and L-Carnitine may also trigger autophagy.

#### **Herbal supplements to avoid taking on a daily basis as they are likely autophagy inducers:**

Many herbal and spice extracts have compounds known to induce autophagy, so while following this protocol **PLEASE avoid ALL additional supplements** including:

Tumeric/Cucurmin, Luteolin, Lions Mane, Reishi Mushrooms, St. Johns Wort, Wormwood, Knotweed or Resveratrol, Licorice root, Boswellic acids, cannabidiol CBD, Moringa oleifera, Epigallocatechin-3-Gallate (EGCG), Pterostilbene, French Marine Bark extract or Pycnogenol, Diindolylmethane (DIM), Ashwaganda, Rhodiola, Schisandrin, Bromelain, Sulphoraphane, Oregano oil, Rosemary Oil, MACA, Ginko biloba, Danshen or Red sage, Spirulina, Stinging Nettle, Black Seed Oil, Gota Kola, Berberine, etc., etc., etc.

#### **Longevity supplements to avoid taking daily as they are autophagy inducers:**

ResveraCel, NMN, Nicotinamide Riboside (NR), Niacin or Niacinamide (more than 100 mg), Spermidine, Fisetin, Resveratrol, etc.

#### **Medicines to avoid or limit:**

Inducers of autophagy:

**Statins** such as Fenofibrate and Atorvastatin

*Atorvastatin* at 5-10 mg/daily may be helpful but avoid higher doses as it strongly induces autophagy at 20 - 40 mg/ day.

**Metformin** 300 mg or 500 mg or 1000 mg. If you are on Metformin for diabetes, you are likely experiencing autophagy on a daily basis.

Rapamycin (Sirolimus) at 2mg and above.

**Ivermectin** 0.2 or 0.4 mg/ kg, especially avoid taking Ivermectin daily as it has a plasma half-life of 18 hrs and can persist in tissues for 6 days.

Pantoprazole (aka Protonix), Valcyclovir and Memantine. Carbamazepine.

#### **Blockers of autophagy:**

**Colchicine**, hydroxychloroquine, quinone, the beta blocker **Propranolol**. The antibiotic

**Azithromycin**. The tricyclic antidepressant Anafranil (generic **clomipramine**)

#### **Blockers of the Ubiquitin-Proteasome System:**

**Proton Pump Inhibitors** (PPIs) such as lansoprazole (Prevacid), omeprazole (Prilosec), pantoprazole (Protonix), rabeprazole (AcipHex), and esomeprazole (Nexium) as these may block degradation of damaged proteins.

#### **Foods to avoid as they induce autophagy**

Olive Oil. > 1-2 teaspoons (5 -10 ml)

Broccoli sprouts

>1/4 fresh pineapple

> 1/2 oz 85% Dark Chocolate

> 1/8 Cup red lentils

> 20 Cherries

>1/2 C Pumpkin Seeds

>1/2 clove garlic

#### **Other foods that may induce autophagy**

Avoid juicing or eating significant quantities of:

Parsley, Celery, Watermelon, Ginger

Many spices... including Saffron, Nutmeg and

Cinnamon

#### **Other treatment modalities that may induce autophagy:**

Acupuncture and cupping

HBOT – hyperbaric oxygen chamber therapy

NAD+ IVs and patches

Ozone treatments

InfraRed Saunas

HELP Apheresis

Cryotherapy (cold water treatments)

## Appendix B What can I eat?

The most important thing is to NOT eat for 14-16 hours of each day. Typically, that means skipping breakfast or skipping dinner. Personally, I prefer to skip dinner and eat between 7 am and 4 pm each day. This puts our bodies into a semi-fasted state for at least half of each day and slows down our cellular metabolism. Slowing our metabolism likely means less viral replication.

Keeping our cells out of the growth mode is key to fighting our long-haul infections. The virus wants 'full-speed ahead' cell metabolism so it can create the maximum number of new virions. To slow our metabolism it is important to avoid sugars and refined carbohydrates. Basically, anything that promotes growth is good for the virus. By avoiding sugars, we avoid spikes in insulin and insulin-like growth factor, hormones that promote cell growth and proliferation. Also, avoid big meals, snacking and excess protein as these promote cell growth.

### Best to avoid:

- Added sugars in any form (high fructose corn syrup, sorbitol-sweetened "diabetic" foods, sodas & etc.)
- Refined flour in bread, pancakes, cookies, breakfast cereals, pasta, spaghetti, corn chips, etc.
- Highly processed packaged foods
- Beer and wine or any alcohol
- Fruit juices
- Potatoes (except lightly boiled yams or sweet potatoes)
- Rice (white, wild and brown)
- Milk and Kefir
- Consuming meat daily

So, what can I eat?

The short answer is anything with a lower glycemic index and lower glycemic load.

<https://lpi.oregonstate.edu/mic/food-beverages/glycemic-index-glycemic-load>

For example, let's compare eating rice to eating quinoa.

- Quinoa has a glycemic index of 53 and a glycemic load of 13.
- Rice has a glycemic index of 73 and a glycemic load of 30.

**Quinoa** has a much lower glycemic index and glycemic load (GL) so it is the better choice. It also wins nutritionally since it has all the essential amino acids. I would say that some quinoa with steamed vegetables is very healthy, but it is at the upper limit of what is acceptable when trying to limit SARS-CoV-2 replication in your cells. While most fruits are OK in season, bananas are above the cutoff point with a glycemic index of 62 and a glycemic load of 11 for a very small *banana* to 22 for a very large *banana*. So, OK to eat **half a banana** now and then, but not an entire banana. It is better to eat quinoa and bananas with other lower glycemic load foods such as nuts and whole vegetables.

A **boiled sweet potato** has a low GI of 44 and a medium **GL** of 11. But if baked for 45 minutes, the same sweet potato has a GI of 94 and a **GL** of 42, both extremely high. Baking has essentially turned the sweet potato into candy. **Non-starchy vegetables, most whole fresh fruits, beans and legumes, whole grains and nuts** are low to moderate GL and they're packed with vitamins, minerals, and phytochemicals. **Wasa light rye crispbreads** are a good bread substitute. Also **pumpnickel bread** has the lowest GL of any bread at 7.

<https://extension.oregonstate.edu/sites/default/files/documents/1/glycemicindex.pdf>

Tom's long covid favorites –

### **Breakfast:**

**Steel-cut oats with blueberries** I make this ahead of time with 3 C water and 1 C oats. I boil the water then add the oats and turn off the heat and let sit 20 to 25 min. This lightly cooks the steel-cut oats to lower the Glycemic Index and Glycemic Load (GL). I then cool and add *lots* of frozen wild blueberries, 1 Tbsp ground flaxseed meal and 1 Tbsp Inulin prebiotic fiber. Store in small containers for a quick, easy, healthy breakfast. I generally eat this with a hard-boiled egg to further lower the GL of the entire breakfast. The blueberries are loaded with antioxidants and the flaxseed contributes some anti-inflammatory omega 3 fatty acids.

**Omelette** with a sliced green onion, mushrooms and diced tomato

### **Lunch/ Dinner**

Tempeh with broccoli slaw steamed to soften the vegetables. Add some peanut butter and chili powder or other seasonings.

Fresh or canned salmon or sardines with some canola mayo and mustard and pickle relish on a Wasa rye crisp with tomato slices.

Natural peanut butter with avocado or tomato slices on a rye crisp. Eat with some plain yogurt.

Salads with 1 tsp olive oil and balsamic vinegar and sunflower seeds with crumbled feta cheese.

Split pea soup with onions and carrots and a small amount of ham for flavoring.

Tofu with shredded cabbage, green onions, diced bell peppers, riced cauliflower and soy sauce.

Homemade chili with ground beef, onions, navy beans, black beans, diced tomatoes. Go light on the beef, heavy on the beans and tomatoes.

Chicken soup with carrots, celery, and broccoli - substituting riced cauliflower for noodles.

Madras beans with black beans, red beans and lentils on top of sliced steamed cauliflower.

### **Afternoon Snacks:**

Whole apple

Kiwi or Nectarine

Cauliflower or carrots or orange bell pepper slices and hummus

Greek yogurt (unsweetened) with added blueberries or raspberries or strawberries with added nuts

Slices of a hard Cheese such as Gouda or Cheddar

Cashews and Pistachios (but take w 1 g Lysine supplement)

### **Indian food ideas**

Suggestions are: Chicken papaya curry, green mango curry (not sweet use green unripe mango super tasty), Keralan omelette without bread or anything, chickpea curry, pretty much all Dal. And use riced Cauliflower instead of rice, although a little Dosa isn't too bad. Absolutely no sweets... have a little fresh fruit instead.

## Appendix C

### Non-fasting methods to induce Autophagy\*

Instead of fasting, continue your time-restricted eating and take a Supplement listed below:

- a) **L Plantarum 299v** 10 billion cfu  
Jarrow brand probiotic  
Take **1 capsule** for **one or two consecutive days** per week. In Tom's opinion, best to not take daily as this is a strong immune modulator and autophagy inducer.
- b) 600 mg 98% trans **Resveratrol**. Take at noon for evening autophagy. (Optionally, 300 mg Resveratrol with 500 mg Quercetin) (not Quercetin Phytosome as the dosing is different) Quercetin w Bromelain is fine.
- b) **Omega 3 Fish Oil** or Cod Liver Oil with:  
850 mg to 950 mg of combined DHA and EPA  
Take at 1-2 pm
- c) 400 to 600 mg of **Alpha Lipoic Acid**  
Take w lunch
- d) Life Extension – **Senolytic Activator w Bio-Fisetin blend** 1 or 1.5 capsules. 1.5 capsules seems optimum for Tom at 165 lb.  
Take 1 hr before lunch
- e) 30 ml to 40 ml or 2 to 2.5 Tbsp extra virgin **Olive oil** taken at mid-morning or at noon can be used to induce autophagy. The plant compound Hydroxytyrosol derived from Oleuropein is the active ingredient.
- f) To avoid the batch-to-batch variation in olive oil, one can instead take  
4 mg/lb or 8 mg/kg of **Olive Leaf Extract**.
- g) **Acetyl L Carnitine** 500 to 750 mg taken at noon

\*Calibrated for a person that weighs 120 to 200 lbs. Adjust the dosage if you are less than 120 lbs

or more than 200 lbs.

Different autophagy inducers stress our cells in different ways. This may lead to different “flavors” of autophagy. For this reason, it may be helpful to rotate several autophagy methods on a regular basis. For example:

weekend 1: Fast night -> Day1 -> night (1.5 days)  
weekend 2: Resveratrol  
weekend 3: Fast 2.5 days  
weekend 4: Omega 3 Fish Oil  
weekend 5: Fast 2.5 days  
weekend 6: Bio-Fisetin

In basic research using human cell cultures, **omega 3 fatty acids** as in fish oil have been shown to induce lipophagy... the degradation of lipid droplets in lysosomes. In a human cell line, SARS-CoV-2 viral replication was blocked when lipid droplet formation was inhibited.

In animal models, **Fisetin** has been shown to kill highly inflammatory senescent or “zombie” cells. Quercetin has also been shown to have senolytic activity. Fisetin is currently in clinical trials for early Covid-19 and Long COVID.

**Resveratrol** is the best studied autophagy inducer and inhibits mTOR the master controller of cell growth and metabolism. It also extends lifespan of mice and triggers a reduction in liver lipids.

In fruit flies, **Alpha Lipoic Acid** has been shown to improve gut health via a beneficial effect on Intestinal Stem Cells. In rats ALA has been shown to have a multi-organ protective, anti-inflammatory effect in a model of bacterial blood infection (sepsis).

**L - Carnitine** is a natural amino acid that is important for mitochondrial function. It helps the body turn fat into energy. I am surprised that this induces autophagy. It is sometimes used for painful peripheral neuropathy.

**Lactobacillus Plantarum** has been shown to produce micro vesicles containing bacterial DNA that spread throughout our bodies. They fuse with our cells and are detected by cGAS-STING. That “alarm” triggers Interferon production and Autophagy - increasing antiviral responses.

## Appendix D

### Medications that could *potentially* aid recovery

**Disclaimer: Discuss the use of any medication with your doctor or general practitioner. They do have potential side-effects and interactions with other drugs and supplements.**

#### Statins

Statins reduce the formation of cellular Lipid Droplets by inhibiting an enzyme early in the formation of cholesterol. Statins are also anti-inflammatory and reduce CRP and/or circulating pro-inflammatory cytokines levels in patients with hypercholesterolemia, diabetes mellitus and metabolic syndrome.

Atorvastatin 10 mg or Simvastatin 10 mg  
Monacolin K 6 mg (via about 300 mg Red Yeast Rice)

Caution: Avoid higher doses on a daily basis as 40 mg Atorvastatin triggered strong sensations of autophagy for Tom.

#### SSRIs

A large analysis of medical record data showed that Covid-19 patients taking either of the SSRI medications below were 26% and 28% less likely to die.

Fluvoxamine  
Fluoxetine

To date, May 2022, there are no clinical trials studying potential efficacy of these for long covid.

#### Antihistamines

In addition to stabilizing Mast Cells, antihistamines may affect T Cells and have an anti-inflammatory effect.

#### Anti-thrombotic agents

A thrombus, commonly called a blood clot, is the final product of the blood coagulation step. There are two components to a thrombus: aggregated platelets and red blood cells that form a plug, and a mesh of cross-linked fibrin protein.

Medications that block platelet activation and aggregation:

Aspirin --- 75 or 81 mg once daily  
Clopidogrel (Plavix) - prescription only

*Caution:* Anti-thrombotic agents “thin” the blood and raise the risk of adverse bleeding events. Avoid before any surgery or before a visit to the dentist.

#### Metformin

Meta-analysis of 19 studies showed that metformin is associated with **34% lower COVID-19 mortality**

Note: Tom had sensations of autophagy with 300 mg, 500 mg, and 1000 mg of Metformin. The autophagy would turn off and on for a few hours at a time during the day. Best to not combine Metformin with any other methods of autophagy.

#### SARS-CoV-2 antivirals

PAXLOVID™ is a SARS-CoV-2 *protease inhibitor* antiviral therapy, specifically designed to be administered orally. This has not yet been studied for Long Covid. Recently approved for early COVID-19 infection as a single five-day course within 5 days of first symptoms. Avoid statins, antidepressants, and quercetin/resveratrol etc. when on Paxlovid.

## Informed Consent

I acknowledge that the Autophagy Protocol is experimental. Daily time-restricted eating, periodic fasting, and other methods of inducing putative autophagy are not proven methods to treat long covid or any other medical condition. While the supplements in the protocol are generally recognized as safe, some may have warnings for use by children, pregnant women or for breast-feeding. Also, some supplements may have negative interactions with other medications. For example, Quercetin can slow the breakdown of certain medications via the liver cytochrome C450 pathway.

A few cautions from WebMD or SelfDecode this is NOT a complete list:

**Quercetin** might make kidney problems worse. Don't use quercetin if you have kidney problems.

**Resveratrol** might change how quickly the liver breaks down these certain medications. This could change the effects and side effects of these medications. Resveratrol might slow blood clotting and increase the risk of bleeding in people with bleeding disorders.

Taking **alpha-lipoic acid** when there is a shortage of thiamine might cause serious health problems. If you drink a lot of alcohol and take alpha-lipoic acid, you should take a thiamine supplement. Alpha-lipoic acid might slow blood clotting. Taking alpha-lipoic acid along with medications that also slow blood clotting might increase the risk of bruising and bleeding.

**Fisetin:** Even at high doses, scientists found no evidence of side effects or toxicity in animal studies. Clinical studies, of course, are needed to confirm its safety in people.

**Fish Oil:** Some people who are allergic to seafood such as fish might also be allergic to fish oil supplements.

**L – Carnitine.** Talk to your doctor if you have a history of bipolar disease, neuropathy, hypothyroidism, or seizures. For most people, 1 gram or less per day is relatively safe and free from any serious side effects.

**Lactobacillus plantarum 299v** - a common probiotic found at lower levels in many fermented foods. From animal experiments it may be an immune modulator that stimulates antiviral host responses by triggering autophagy and INF-1 production.

**Fasting:** Fasting for a few days probably won't hurt most people who are healthy, provided they don't get dehydrated.

Your body needs vitamins, minerals, and other nutrients from food to stay healthy. If you don't get enough, you can have symptoms such as fatigue, dizziness, constipation, dehydration, and not being able to tolerate cold temperatures.

If you have diabetes your blood sugar levels could go dangerously low (this is called hypoglycemia). That's especially true if you take medication like insulin to control your diabetes.

I have consulted with my medical provider about the advisability of fasting or using specific supplements to treat my medical symptoms.