

Developing a Rational Approach to Supplementation for Health & Performance | Huberman Lab Podcast

In this episode, I explain how to design a supplementation protocol to support maximum mental and physical health and performance depending on your specific needs, nutrition, lifestyle and finances. When most people hear about “supplements,” they think they are vitamin supplements, but there are many compounds that are powerful and sold over-the-counter that can enhance our health in performance and that can’t be obtained from foods. First, I discuss “foundational” supplements to support overall health, including water and fat-soluble vitamins, minerals, digestive enzymes, adaptogens, and prebiotics/probiotics. Then I explain how to use single-ingredient supplements to enhance specific aspects of your physiology, such as aiding sleep, cognitive enhancement, and focus supporting healthy hormone levels (e.g., testosterone, estrogen and growth hormone, thyroid). Finally, I explain when it makes sense to add supplements to your lifestyle and discuss how best to use supplements, including how to determine dosage, sourcing, continuous schedules and cycling, and how to layer different supplements most effectively. This episode will explain how to design the safest, most biologically effective, cost-effective supplementation protocol to meet your particular goals and support your overall health, including vitality and longevity.

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welcome to the huberman Lab podcast where we discuss science and science-based tools for everyday life I'm Andrew huberman and I'm a professor of neurobiology and Ophthalmology at Stanford school of medicine today we are discussing supplements or more specifically a rational guide to supplementation now to be forthright I want to tell you that I am not a fan of the word supplements because it stems from this idea that all supplements are somehow food supplements or designed to compensate for what one could otherwise get from food and that's simply not the case many supplements are compounds that are extremely efficacious for instance for enhancing sleep or for enhancing hormone function or for enhancing focus and many of those compounds are

simply not found in food or are not found in enough abundance in food to have the desired effect now that raises the issue as to whether or not these compounds are good to take safe to take and whether or not they are actually beneficial for us and the short answer is that like everything else supplements can either be good for us or dangerous for us depending on dosage sourcing Etc but more importantly we need to think about supplements and a rational guide to supplementation as taking into account a number of different factors and we need to set aside the idea that all non-prescription compounds that fall under this umbrella term supplements are simply things that could be extracted from food but most people don't either ingest enough of those Foods or pay enough attention to their diet in order to obtain them in fact during today's episode I'm going to give you a number of different very specific questions that you can answer in order to decide whether or not you should be taking any so-called supplements or not and whether or not you should be taking one type of supplement or another type of supplement more or less than the other I'm also going to discuss safety of course and I will discuss cost because obviously monetary cost is a serious consideration for most if not everybody considering the use of supplements during today's episode I will also discuss which specific supplements are optimal for achieving specific endpoints such as improved sleep such as improved focus and such as improved hormone function among other things I plan to cover the full range of what I referred to as supplements including so-called foundational supplements that are designed to act as a sort of insurance policy against any deficiencies that might exist within your diet all the way up to very targeted outcome supplements and compounds that is compounds that are non-prescription that are designed to achieve very specific endpoints such as enhanced Focus over the next four to six hours of physical work or mental work so on and so forth plan to cover everything in between that as well and I promise to cover how supplements interact with other things such as behavioral tools prescription drugs when supplements might be a good alternative to prescription drugs when they might not be a good alternative to prescription drugs when supplements can serve as an augment to already excellent nutrition and prescription protocols and every feature of supplements as it relates to mental health physical health and performance by the end of today's episode you should be armed with a number of different questions as I mentioned before that will allow you to develop the most biologically effective and cost-effective supplement regimen for you and of course I want to acknowledge that for some people the total amount or dosages of a given supplement were supplements that you might need to take could be zero

there are such individuals but that many people can in fact arrive tremendous benefit from supplements in a way that can be more cost effective than trying

00:03:38 Hierarchy of Tools/Interventions, Developing a Supplementation Protocol

to obtain the same non-prescription nutrients from food as we head into today's conversation I want to emphasize something very important not just as it relates to supplements but as it relates to all aspects of mental health physical health and performance and that is I take the stance that behavioral tools that is specific actions that we take and specific actions that we avoid form the foundation of mental health physical health and performance so things like viewing morning sunlight and exercise are behavioral tools they don't require the ingestion of anything within the realm of Behavioral tools there are also some don'ts or do not that can greatly enhance our mental health physical health and performance such as avoiding bright light exposure to your eyes between the hours of 10 pm and 4 AM or avoiding caffeine too late in the afternoon because even if you can fall asleep after ingesting caffeine in the late afternoon we know it disrupts the architecture of your sleep in ways that greatly diminish your mental health physical health and performance the following day for instance so behavioral tools form the foundational layer of all tools for mental health physical health and performance second to that I would say the next layer is in fact nutrition no amount of supplementation or non-prescription compounds or prescription compounds for that matter can never compensate for poor nutrition at least not for very long okay so this is a key Point even though many supplements are not simply food supplements because they are not designed to compensate for anything that you could otherwise get from food that is not to say that you can live on supplements you know I suppose you could live on whey protein and fish oil capsules and vitamin capsules or tablets for a short while but before long you'd either suffer from boredom to the extent that you'd want to go back to food or some other deficiency would show up I think it's the rare individual that tries to survive entirely on food supplements and things of that sort most everybody and I would hope everybody is paying attention to their nutrition so I would Place behavioral tools do's and do Nots as layer one the deepest layer the Bedrock of all mental health physical health and performance on top of that I would Place nutrition and of course that's going to mean different things to different people with the understanding that there's a huge array of different food choices and nutritional programs nutrition is

fundamentally important for macronutrients for storage of energy in the form of glycogen fats and phosphocreatine stores and so forth but also for obtaining basic nutrients vitamins minerals and micronutrients Okay so we've got behavioral tools nutritional tools then on top of that I would place what is typically called supplementation although today I'm trying to expand that word to include not just things that compensate for food deficiencies or that are layered on top of food as a way to enhance the amount of nutrients that you could get from food but as I mentioned before compounds that are non-prescription that can be for a variety of different purposes and many of which are not available in food so I would place supplementation right on top of nutrition then past that I would say prescription drugs obviously prescribed from a board-certified MD can serve a very vital purpose in the treatment or augmentation of mental health physical health and performance goals so some people do in fact need prescription antidepressants other people do not some people do in fact need prescription drugs for attention deficit hyperactivity disorder or sleep Related Disorders so on and so forth the whole issue of whether or not there is an over prescription epidemic or not um is a separate conversation for a separate podcast I would argue that many prescription drugs do in fact save lives this includes the category of prescription drugs related to statins and cardiovascular health related to any number of different things even sleep disorders and insomnia narcolepsy and so forth that said there are many instances in which people can either reduce their dosages of prescription compounds or can replace those prescription compounds with quality behavioral tools nutrition and supplementation but there are many instances in which prescription drugs are the only route by which people can achieve the mental health physical health and performance goals that they wish to achieve so I would place that as the fourth layer in this stack of layers directed towards mental health physical health and performance so just to list off again I fundamentally believe that behaviors do's and do Nots form the foundation of mental health physical health performance and next in line would be nutrition that is the specific Foods we eat the amount that we eat the combinations of foods that we eat in a given sitting and the timing in which we eat our food then on top of that I would Place supplementation the topic of today's episode and finally prescription drugs and of course all of these things interact in important and interesting ways many of which interactions we will discuss during today's podcast as we drill into the topic of supplementation developing a rational supplementation protocol and one that is most biologically and cost effective before moving further into today's episode I want to emphasize a very important point which is

that I am not a physician that is I'm not a clinician so I do not prescribe anything nor am I going to do that today I'm a professor I review the research literature I describe tools gleaned from the research literature and developed from the research literature so I profess many things but I do not prescribe anything and I think it's vitally important that anytime you are thinking of adding or subtracting any behavioral protocols nutritional protocols supplementation based protocols and certainly prescription drug based protocols for whatever purpose that you consult a trusted board-certified physician that's absolutely essential I don't say that merely to protect me I mainly say that to protect you the most important aspect of today's episode is not going to be that you discover one particular supplement or category of supplements or blend of supplements that is going to transform your mental health physical health and performance no the purpose of today's episode is for you to understand where you have needs that can be met by supplementation better than any other approach and most importantly how to think about supplementation that is how to think about the different categories of supplements that are out there and how those interact with your nutrition and your behaviors so that you can maximize your immediate and long-term health what I mean by this is that we have this word supplements or supplementation but that means many many different things it means vitamins it means minerals it means adaptogens most people probably don't even know what an adaptogen really is and in fact many people talking about adaptogens never actually Define what an adaptogen is or designed for or the fact that many adaptogens are also used for other purposes so today's discussion is really about you learning how to think about supplementation the same way you would learn to think about nutrition or exercise or anything related to brain and body health for that matter in a way that lets you navigate this vast space that we call supplementation and develop protocols that are optimal for you and indeed it may be the case that the ideal dosage of a given supplement for you is zero milligrams for instance if I ask you are you sleeping deeply and enough each night do you feel rested throughout the day maybe you need a short nap and that's it or maybe you don't and you say yes I feel great I sleep great I wake up feeling great I only need a short nap or no nap during the day to feel rested throughout the day well then there's really no discussion about sleep supplementation to be had between you and me however if you are not sleeping well then a big discussion opens up as to what the reasons are as it relate to nutrition or when you're exercising or ingesting caffeine in other words no discussion about supplementation can be had in a vacuum rather discussions about supplementation need to be considered in a larger

context so today you're going to learn how to place the discussion and thinking about supplementation in a larger context and think about how specific supplements that is specific ingredients and combinations of ingredients can

00:11:51 Momentous, LMNT, Helix Sleep

indeed be used to buffer and support your overall health and lead you to specific health and performance outcomes before we begin I'd like to emphasize that this podcast is separate from my teaching and research roles at Stanford it is however part of my desire and effort to bring zero cost to Consumer information about science and science related tools to the general public in keeping with that theme I'd like to thank the sponsors of today's podcast our first sponsor is momentous momentous makes supplements of the absolute highest quality the huberman Lab podcast has decided to partner with momentous because of the extremely high quality of momentous supplements and because they have single ingredient formulations as we'll discuss more on today's episode single ingredient formulations are essential for most all aspects effects of developing a rational highly efficacious supplement regimen and that's because the ideal supplement regimen allows you to adjust the dosages of individual ingredients as well as alternate days in which specific ingredients are consumed it also allows you for instance to assess whether or not one given ingredient works for you and another ingredient does not and it also allows you to assess whether or not any side effects originate from a specific component of your supplement protocol another advantage of momentous supplements is that they ship anywhere in the world because we realize that many of you reside outside of the United States if you'd like to try any of the supplements mentioned in today's or other episodes of The huberman Lab podcast so for instance things related to sleep augmentation hormone augmentation enhancing Focus metabolic health or otherwise you can go to live momentous spelled ous so livemomentous.com huberman and you'll get 20 off any of their products today's episode is also brought To Us by element element is an electrolyte drink that has everything you need and nothing you don't that means plenty of sodium magnesium and potassium the so-called electrolytes and no sugar getting sufficient hydration and electrolytes is key to brain health and body health and that's because every cell in your brain and body relies on having enough electrolytes available in order to function this is especially true of the so-called neurons or nerve cells in your brain they actually require sufficient amounts of

sodium and potassium and magnesium but especially sodium and potassium available to them in order to fire what are called Action potentials or electrical signals that's what allows you to think to feel to move what gives you energy so on and so forth so when you are dehydrated oftentimes you will need to get electrolytes and that's true if you're exercising a lot or if you sweat a lot but for many people it's just true because they're not consuming enough water and electrolytes in the form of liquids and Foods throughout the day element contains a science back electrolyte ratio of 1 000 milligrams of sodium 200 milligrams of potassium and 60 milligrams of magnesium if you'd like to try element you can go to drink element that's [lmnt.com](https://www.lmnt.com) huberman to claim a free element and sample pack with your purchase again that's drink element [lmnt.com](https://www.lmnt.com) huberman to get a free sample pack today's episode is brought To Us by Helix sleep Helix sleep makes mattresses and pillows that are absolutely phenomenal I've been sleeping on a helix mattress for close to two years now and it's the best sleep that I've ever had one of the reasons is the mattress is customized to you so you simply go to the Helix site you take a brief two minute quiz it asks you questions like you tend to sleep on your back your side of your stomach or maybe all of those across the night or maybe you don't know you tend to run hot during the night or cold during the night or maybe you don't know and they match you to the ideal mattress for you for me it was the dusk dusk mattress that allowed me to achieve the best sleep of my life if you're interested in upgrading your mattress you can go to [helixsleep.com](https://www.helixsleep.com) huberman take their brief two minute sleep quiz and they'll match you to a customized mattress for your sleep needs and you'll get up to 200 off all mattress orders and two free pillows they have a 10 year warranty on their mattresses and you get to try it out for 100 nights risk free three they'll even pick it up for you if you don't love the mattress although I think you absolutely

00:15:38 Role of Supplements, Foundational Supplements, Water/Fat-Soluble Vitamins

will again if you're interested you can go to [Helix sleep.com](https://www.helixsleep.com) huberman to get up to 200 off and two free pillows let's talk about supplements and supplementation and how to develop a rational supplementation regimen one of the things that's really emerged over the last 20 years is that supplements and there I'm referring to non-prescription compounds designed to augment nutrition prescription drugs and behavioral protocols have emerged as a Mainstay within the health and wellness but also the medical communities that are focused on developing mental health physical health and

performance for their patients and their athletes and for the everyday person essentially what I'm saying is that 20 years ago a discussion about supplements would mainly take place within the niche communities of health food stores or particular athletes but nowadays I think almost everyone is familiar with the fact that yes indeed there are standard vitamin supplements but that there are also supplements such as Vitamin D3 which are designed to make sure that people have certain amounts of hormones in their bloodstream because they might not be getting enough Sunshine although I'll be very clear over and over throughout this episode that there is no pill replacement for Sunshine nor is there a pill replacement or food replacement for that matter for exercise or for social connection or for sleep or for simply getting smarter again there is no pill that's going to replace excellent behavioral protocols in fact a physician friend of mine has a great saying that I think everybody should keep in mind as we wade into this conversation which is that Better Living Through Chemistry still requires Better Living I think that's a very important phrase to keep in mind when thinking about the optimal supplementation or prescription drug protocol for you so what is an ideal supplementation protocol well I think what we need to do is to take a step back and ask what are different supplements designed to do for instance there are foundational supplements these are supplements that are designed to establish a foundation or provide insurance along with your nutritional intake to ensure that you're getting all the things that you need in order to have a basic level of mental health physical health and opportunity for Optimal Performance now this is the one category of supplements for which I think it's appropriate and in fact advantageous to have multiple ingredients in a given supplement throughout the rest of today's discussion I'm going to talk about the advantage of mainly focusing on taking single ingredient formulations for a variety of reasons but when it comes to foundational supplements what we're mainly talking about are supplements that contain vitamins and minerals that are designed to compensate for any deficiencies you might have from diet or from lack of adequate diet how would such a lack of vitamin and mineral intake arise well for instance if you're somebody that practices intermittent fasting or other components of fasting or if you're somebody who does not get enough vitamins and minerals from vegetables and fruits and Grains and meats well then taking a supplement that can act as a insurance policy against any vitamin mineral deficiencies in many ways can be advantageous although I will talk about some of the safety concerns in just a few minutes now I want to acknowledge that as soon as we talk about vitamin mineral supplements the Skeptics immediately raise

their hands and say well all that vitamin and mineral supplements do is give you very expensive urine and there the Skeptics are referring to the fact the reality that when you ingest high levels of water-soluble vitamins so think vitamin C and some of the other vitamins that indeed you will excrete them in your urine however it's also the case that many people are not getting enough of the water-soluble vitamins from their foods and it's also the case that many people are and it's also the case that ingesting higher than needed amounts of most water-soluble vitamins provided those levels aren't exceedingly High is or at least we should say can be safe and again this is provided that the levels that they're ingesting are not exceedingly high so the typical vitamin mineral supplement is indeed going to cover any gaps or deficiencies that might arise in the water-soluble vitamins from your food intake but the reality is that most people are getting enough of the water-soluble vitamins from their food if they are paying attention to a couple of things and those things are very simple to lay out regardless of whether or not you're a vegan a vegetarian a more traditional omnivore eating from both animal-based and plant-based sources grains Etc or even if you're in the pure carnivore or strict I guess it's called The Lion diet where it's just meat and salt regardless of what type of nutrition you follow you will get vitamins and minerals but you'll get more or fewer of them depending on the nutritional program you follow and of course depending on how often and how much you eat that's just sort of obvious most people who take a vitamin mineral supplement will indeed excrete a lot of the water-soluble vitamins they will retain the fat soluble vitamins and there again the Skeptics will raise their hands and say you do not want to take high levels of fat soluble vitamins because they will be stored in your system potentially to levels that are dangerous again provided that vitamin mineral supplements are not taken in excess it's unlikely that you're going to have such

00:21:07 Supplement Considerations: Cost, Nutrition & Schedule

a buildup of the fat soluble vitamins in your system that they're going to be a problem so that raises a very specific question that you need to ask do you want to take a vitamin mineral supplement well the answer to that will be highly individual but you really just need to address two things first of all is the cost within the range that you can afford and want to pay right oftentimes these vitamin mineral supplements can be quite inexpensive but some of them can be quite expensive and you can see the full range of ones that are pennies per day all the way up to many dollars or tens of dollars per day because of

what are reported to be variations in quality and sourcing and so forth I'm not aware of any real differences between the quality of the water soluble and fat soluble vitamins found in the less expensive versus the more expensive vitamin mineral supplements more typically the cost scales with the dosages of these different vitamins and minerals and as could probably be expected the more expensive to obtain and source vitamins and minerals tend to be in lower quantities in the less expensive versions of vitamin mineral supplements that's just kind of obvious so you need to ask yourself can you afford it financially and then you need to ask yourself are you able to regularly ingest enough foods with enough variety to cover your vitamin mineral needs just from food and for some people the answer is going to be an immediate yes they are careful to get enough of the foods that allow them to obtain their vitamin and mineral quota and for other individuals the answer will be no I would say for people that are extremely physically and or mentally active and for people that perhaps are following a intermittent fasting schedule so they are not ingesting a lot of food in general or restricting their food intake to specific times of day well then a vitamin mineral supplement likely makes sense for them however it's going to be very important to ingest that vitamin mineral supplement with food and ideally early in the day so that can set up a little bit of a challenge for the intermittent fasters who are restricting their feeding window to late in the day why do I say this well many of the water-soluble vitamins in particular the B vitamins need to be ingested with food because otherwise they can cause some stomach upset and again there's a range there some people like myself can take B vitamins on an empty stomach and feel fine other people feel really lousy when they take B vitamins there are a few other things that we'll talk about later namely zinc and coenzyme Q10 that really should also be taken with food but the best time to take a vitamin mineral supplement is with food and I believe that if you're going to take a vitamin mineral supplement that you want to take it with food and you don't want to take dosages of vitamins and minerals from supplements that are exceedingly high for a couple of reasons one is the buildup of fat soluble vitamins that we talked about before the other reason is that when people tend to take very high levels of vitamins and minerals from supplements they tend to spend less time and focus on making sure that they're optimizing their nutrition or at least trying to get their nutrition right what do I mean by getting their nutrition right well I think regardless of whether or not your keto omnivore carnivore vegan or any other nutritional plan the key thing is to get most that is about 75 to 80 of your Foods or more from non-processed or minimally processed

sources I think there is agreement across the board that most people should avoid highly processed foods highly processed foods are going to be foods with very long ingredient lists that have very long shelf lives so this often includes snack foods it does include snack foods like chips Etc pastries that could sit on the Shelf a long time but it also includes things like canned soups and number of different other foods that have many many ingredients preservatives most people would do well to avoid those kinds of foods and focus most of their intake on things that are non-processed so these would be things like fruits and vegetables you'll notice that the non-processed foods will tend to have very short shelf life or require refrigeration in some cases such as meat eggs Etc or minimally processed foods such as you know rice and oatmeals and pastas beans and things of that sort beans oftentimes can be completely unprocessed as well of course these are two general categories unprocessed and minimally process that should make up about 80 or more of your

00:25:25 Foundational Supplements, Digestive Enzymes, Adaptogens

food intake if your goal is health and obtaining adequate amounts of vitamins and minerals the so-called foundational supplements include of course vitamin and mineral supplements but has expanded over the last decade or more to also include supplements that have vitamins and minerals but also things like digestive enzymes and again here we have an example where indeed you can get digestive enzymes from foods for instance eating a bit of papaya or even a little bit of Pineapple can assist in the digestion of certain aspects of macronutrients because these are naturally occurring enzymes that help digest things like carbohydrates fats and proteins and there are other food-based sources of enzymes you're welcome to look those up online if you just put food based sources of enzymes and you'll find those but nowadays A lot of the foundational supplements will include papain or they will include different lipases or anytime you hear the word Ace by the way it means an enzyme an enzyme is designed to break down or to catalyze some sort of reaction in biology and nutrition in particular so you can find foundational supplements that include vitamins and minerals and digestive enzymes and nowadays more and more the quality foundational supplements are also including things like adaptogens and here the name adaptogens is sort of vague and it indeed has no specific operational definition this is something really important to understand about supplementation is that companies and indeed podcasts can talk

about adaptogens without actually defining what an adaptogen is in an operational way when we say operational what we mean is a definition that everyone in a given Arena or space research for instance can agree on so that when we talk about the adaptogenic effects of a given compound we're all talking about the same things well foundational supplements nowadays include vitamins minerals digestive enzymes and the so-called adaptogens and the adaptogens broadly speaking are thought to improve the body and brain's ability ability to buffer against various stressors so these could be things like herbs like ashwagandha that are designed to reduce cortisol levels in that sense ashwagandha is an adaptogen but ashwagandha has other effects related to hormone augmentation in both the testosterone and estrogen and maybe even the thyroid Pathways we'll talk about this a little bit later when we talk about supplements for hormone augmentation so foundational supplements has really expanded to include a lot of different categories of nutrients and micronutrients vitamins and minerals digestive enzymes designed to achieve a broad spectrum of effects again this is the one category of supplementation where I think it makes

00:28:04 Gut Microbiome, Probiotics/Prebiotics & Nutrition

sense to explore multi-ingredient formulations and the other thing that's often included in these so-called foundational supplements are probiotics or prebiotics which are designed to augment and support the so-called gut microbiome the gut microbiome is the collection of trillions of little micro bacteria that exist in all of us they mainly exist in the mucous membrane-lined tissues of the body so that would be your nasal passages your mouth the vagina the urethra and the gut the whole way from your mouth all the way out the other end so not just your stomach trillions of bacteria live there trillions of microbacteria also live on your skin in fact every time you shake someone's hand you're exchanging microbacteria these micro bacteria often are healthy for us good for us they support a huge number of positive biological functions but there are other microbacteria that live in our gut and Elsewhere on those mucous line tissues that can be disadvantageous for us that can harm our health a growing idea these days based on a number of different Laboratories work including the laboratory of my upstairs neighbor at Stanford Dr Justin Sonnenberg who's been a guest on this podcast is that having a great diversity a range of microbiota as they're called microbiome microbiota and these microbacteria are all essentially referring to the same thing the microbiome is the whole

collection of these microbacteria but having a lot of different so-called species of these microbacteria is known to be advantageous for immune system function hormone function it supports the so-called gut brain axis that's important for a number of things including mood and motivation actually supports the production of neurotransmitters in the brain and body that can help keep you motivated elevated mood support the general function of neurons well not surprisingly there are ways to support the gut microbiome and there are ways to harm the gut microbiome I'll refer to to the podcast episode we did with Justin Sonnenberg you can find that at hubermanlab.com if you want to learn all the different ways you can support your gut microbiome but for sake of today's discussion I want to emphasize that some of those methods of supporting the gut microbiome are through the direct consumption of particular foods and there are two categories of foods that if you're getting enough of them it's likely that your gut microbiome is diverse and is going to support all those important functions I just listed off and other functions as well the two sources of gut microbiota supporting foods are low sugar fermented foods so these would be things like sauerkraut kimchi Greek yogurt again low sugar Greek yogurt um kombucha in particular as a drink things like kefir there are a bunch of other varieties of fermented foods different cultures have different fermented foods so Japanese natto is um another source of of ferment that is very good for the gut microbiome and work from Justin sonnenberg's lab and close by Labs at Stanford School of Medicine have shown that if people ingest four servings a day of these low sugar fermented foods it greatly improves the function of the gut microbiome and in particular enhances the function of the immune system and it reduces the so-called inflammatorium it reduces inflammation in the brain and body in the ways that are helpful and effective for brain and body that is mental health physical health and performance so there are ways to support your gut microbiome strictly from food but it should come as no surprise that most people are not ingesting four servings a day of fermented foods hopefully they're getting enough fiber especially Prebiotic fiber which is one other way to support the gut microbiome although the studies from Justin sonnenberg's lab point to the fact that fiber intake itself was not directly supportive of the gut microbiome in everybody it was in some individuals but not in others and some had no effect and in other individuals it actually made the category or I should say the array of inflammatory markers worse it actually led to more inflammation so that's not to say that fiber is bad in fact in the episode that we did with Dr Lane Norton he discussed the many benefits of getting enough fiber there are a lot of reasons why people should get enough fiber in their diet

but at least for supporting the gut microbiome four servings a day of low sugar fermented foods seems to be the best way to support the gut microbiome through the intake of nutrition again most people are not achieving that and therefore these foundational supplements that can be just vitamin and mineral supplements or it could be vitamin and mineral supplements plus digestive enzymes or both of those things plus adaptogens now also tend to include prebiotics and probiotics that are designed to support the proliferation and maintenance of

00:33:06 Supplements for Gut Microbiome, Brain Fog

enough gut microbiota in order to support the gut microbiome and the gut brain axis now because of the importance of the gut microbiome and because most people are not getting enough support for the gut microbiome in the form of low sugar fermented foods and Prebiotic fiber from their diet I think perhaps one of the most essential foundational supplements irrespective of whether or not it includes vitamins and minerals adaptogens and digestive enzymes is some way to support the gut microbiome now this gets into a whole dimension of categories of Prebiotic and probiotic capsules and one needs to be very careful there I do want to say that most of the Prebiotic and probiotic capsules that you can buy first of all are very expensive the best ones are going to be refrigerated or required Refrigeration just as do any good low sugar fermented foods by the way so for instance pickles are a low sugar fermented food that can support the gut microbiome but if you're buying pickles from the section of the grocery store where they the pickles are not refrigerated well then you're not going to get the gut microbiome supporting effects from those pickles it's so funny we're even having this conversation talking about pickles but the reality is they can greatly enhance the microbiota if you are getting the pickles that are and require refrigeration and include the brine which is the the liquid around them the same is true for sauerkraut non-refrigerated sauerkraut is not going to support your gut microbiome it will supply some other things perhaps but it's not going to support your gut microbiome it has to be the refrigerated versions for the reason that most people are not getting enough food based support for the gut microbiome and because of the importance of the gut microbiome one of the key categories of foundational supplements are supplements that create support for the microbiome through prebiotics or probiotics again they tend to be the refrigerated varieties are the ones that are actually going to work those also tend to be very expensive and there are

some evidence that taking excessive amounts of prebiotics and probiotics that is typical of these capsule forms of prebiotics and probiotics if they're taken ongoing not for short periods of time but if they're taken ongoing can lead to some issues like brain fog there's a nice literature on this that and a growing one at that so my suggestion is that if people are going to take supplements to support the microbiome that those supplements include low enough levels that is small enough amounts of prebiotics and probiotics that you don't start to venture into the realm of brain fog and some of the other issues that could be associated with taking too much Prebiotic and probiotic in the form of supplements I'd like to take a brief break and thank our sponsor inside tracker inside tracker is a personalized nutrition platform that analyzes data from your blood and DNA to help you better understand your body and help you reach your health goals I've long been a believer in getting regular blood work

00:35:59 InsideTracker

done for the simple reason that many of the factors that impact your immediate and long-term Health can only be analyzed from a quality blood test the problem with a lot of blood and DNA tests out there however is that you get data back about metabolic factors lipids and hormones and so forth but you don't know what to do with those data inside tracker solves that problem and makes it very easy for you to understand what sorts of nutritional behavioral maybe even supplementation based interventions you might want to take on in order to adjust the numbers of those metabolic factors hormones lipids and other things that impact your immediate and long-term Health to bring those numbers into the ranges that are appropriate and indeed optimal for you if you'd like to try inside tracker you can visit [inside tracker.com](https://www.insidetracker.com) huberman and get 20 off any

00:36:44 Adaptogens & Broad-Spectrum Foundational Supplements

of inside tracker's plans that's [inside tracker.com](https://www.insidetracker.com) huberman to get 20 off the other category foundational supplements are those adaptogens that we mentioned earlier adaptogens again being a very poorly defined category but these are typically micronutrients herbs sometimes they go into the mushroom category again these are non psychedelic mushrooms that provide either some buffering to the stress system by reducing cortisol typically or that are thought to or known to based on research studies to

enhance things like blood flow to the brain or to enhance some aspect of cognitive function by way of enhancing neurotransmitter function this category of so-called adaptogens is an important one we'll get back to this a little bit later the reason I mention it now is that it is indeed hard to get the so-called adaptogens in sufficient concentrations from food-based sources I have to assume that most people aren't out there collecting chaga mushroom or the ashwagandha herbs and then combining them with their salads or their foods and so that's why this adaptogen category fits into foundational now this opens up the category of foundational supplements that are broad spectrum that is that include vitamins and minerals that have digestive enzymes that have adaptogens and that also have prebiotics and probiotics at the appropriate dosages this is one reason why I'm a big fan of supplements like athletic greens which is as many of you know a sponsor of this podcast and does really nicely cover all of these categories of foundational nutrition but I do want to emphasize that this is not a way to focus on athletic greens specifically there are other categories and brands of excellent foundational nutritional supplements that cover these categories of vitamins and minerals probiotics prebiotics digestive enzymes and adaptogens it just so happens that that athletic greens is the one that I

00:38:35 Core Supplement Questions & Meeting Foundational Needs

discovered and that works best for me and that many people find works really well for them so this is why when people approach me and they ask me as they often do very very often do I should say if I'm only going to take one supplement what supplement should I take rather than just give them one specific answer I actually asked them three questions first question I ask them is how well are you sleeping at night are you getting enough sleep are you waking up feeling rested because if they're not that opens up a whole different set of interactions that we need to have and discussions around what sorts of things they need to do and possibly take in order to get their sleep right because sleep is the foundation of mental health physical health and performance we will have that discussion a little bit later in this episode the second question I asked them is how's your nutrition that is are you eating regularly have you found the combination of macronutrients or which diet is right for you do you think you're getting enough vitamins and minerals how's your digestion we have that conversation and then the third thing that I ask which is extremely important is what's your budget because if somebody has

ten dollars a month total to spend on supplements versus a thousand dollars a month to spend on supplements total well then there's a different set of conversations to be had as to which supplements they should take now once those three questions have been answered assuming that somebody is able to spend about a hundred dollars or more on supplements per month then my recommendation is that they not focus on any specific supplements directed towards sleep or toward Focus or hormone augmentation but rather that they focus on buffering and enhancing their foundational nutrition adaptogens probiotics prebiotics and digestive enzymes because of the simple fact that if they do that they're going to raise the tide on all the biological and organ systems that are going to lead to enhanced mental health physical health and performance including sleep so this is one reason why if people say well if I can only take one supplement what should I take I say well what's your budget if they say they can meet that hundred dollar threshold per month then my recommendation would be athletic greens or something like it or that they invest the time and energy to go find the various combinations of vitamins and minerals and probiotics and prebiotics and adaptogens and so forth in individual components that they can then take in combination in order to meet their foundational needs but most people are not interested in doing all that homework and legwork to figure out exactly what those dosages are that's one reason why indeed I have taken athletic green since 2012. I like it it makes me feel better I have more energy I sleep better my digestion is certainly better and it supports the gut microbiome I do that for that reason but again I want to emphasize that there are other great sources of all the relevant things within those foundational formulas that athletic greens contains so it's certainly not the only route to covering your foundational Health needs there are other ways to do that now if somebody has a budget lower than a hundred dollars per month to spend on foundational supplementation well then there are a couple of discussions to be had now if the amount of money that they have to devote to foundational supplementation is zero of course respect that and then it becomes a discussion about what sorts of foods and patterns of food intake are going to best support their mental health physical health performance now if somebody has somewhere between zero dollars and fifty dollars to spend on supplementation for sake of this thing we're calling foundational Health per month well then a different category of supplement discussion arises and we'll have that in a moment but to sort of close the conversation on foundational supplementation again that means many different things it's vitamins and minerals sometimes that's one vitamin and mineral supplement it means digestive

enzymes that could be its own supplement or in combination with vitamins and minerals it means often not always adaptogens things like ashwagandha different plant-based and mushroom-based formulations that can buffer stress and provide other brain and body support and it often although not always but should I believe include the probiotics and prebiotics or anything that supports healthy gut microbiome once again I think a broad spectrum supplement that has many many ingredients of high quality that covers all these bases is going to be the best route to ensuring foundational supplementation is covered and I do think that should be the starting place for any and all supplementation regimens I'll say that once again I think covering your foundational needs in the realm of vitamins minerals probiotics digestive enzymes and adaptogens is going to give you the most benefit by cost and the most benefit across the board in terms of brain and body systems that's going to allow you to feel better overall sleep better overall focus better overall and support all the different systems in your brain and body that are going to allow you to be at your best while of course also paying careful attention to your nutrition because you simply cannot abandon

00:43:45 Supplements to Support Sleep: Myo-Inositol, Theanine

nutrition again Better Living Through Chemistry still requires Better Living so now that we've had that discussion about foundational supplementation and again highlighting the fact that that's the one category of supplementation where multi-ingredient formulations make the most sense I'd like to now shift our attention to single ingredient formulation supplements that are designed to achieve specific endpoints and here again rather than focus on specific ingredients and supplements to achieve specific endpoints because we've done that already in episodes related to sleep and focus Etc I'd like to take a step back and focus on the larger theme of today's episode which is how to think about supplementation in a rational cost effective and biologically effective way for each of these categories and the three categories that I'm going to cover are sleep hormone support and cognitive enhancement and focus cognitive enhancement and focus being the final third category let's talk about sleep and the rational approach to thinking about supplementation for sleep as I mentioned earlier in this episode and on many previous episodes of this podcast sleep is the foundation of mental health physical health and performance you might be somebody who can do an all-nighter and feel okay the next day or maybe even great but most everybody once they start to have minimal sleep for

one or two nights in the form of broken sleep poor sleep not enough sleep or sleeping at the wrong time of night there is such a thing or day they start to suffer their mood starts to suffer their cognitive Clarity and performance starts to suffer their mental health can suffer severely and physical performance definitely suffers hormone suffer everything suffers conversely when people are sleeping well that is deeply and enough eighty percent of the nights of their life mental health physical health and performance all flourish and I think most people start to be almost amazed at how well they're doing in various domains of life that previously they might have struggled with so sleep is fundamental that's that's established when thinking about supplementation for sleep we need to ask ourselves a number of important questions first of all you should ask yourself how well that is how deeply and how much are you sleeping per night assuming you're somebody who can fall asleep easily stay asleep through the night wake up feeling relatively rested maybe a little groggy and then can move about your day with plenty of energy and focus you're not falling asleep in class or at work or behind the wheel whereas a passenger on public transportation well then you're probably getting enough sleep and by the way it's perfectly normal to require anywhere from a 10 minute to a 90 minute nap in the afternoon for some people if you're not a napper no big deal it's known that naps can disrupt nighttime sleep but provided that they're early enough in the day if you take a nap and you are still able to fall asleep at night then naps are fine for you if you're somebody who doesn't like naps because you wake up groggy or grumpy which often happens to certain people then don't nap you certainly do not need to nap but if you're feeling energetic throughout the day chances are you're getting enough sleep at night but there are people of course who are struggling with sleep either falling asleep staying asleep or they're not feeling alert enough during the day or all of the above and then it makes sense to step back and take a look at what supplementation can provide if you are one of those people who is not sleeping enough or well enough at night that you are suffering during the day in whatever way mild to severe there are two questions you should ask yourself first of all are you ingesting caffeine after 2 pm if the answer is yes you want to limit or eliminate caffeine after 2 pm maybe even push it back to noon or earlier I know that can be excruciating for some folks but it can really help with your ability to fall and stay asleep at night second thing is most people would do well to avoid food within the two hours prior to bedtime but of course you don't want to be so hungry that you can't fall asleep all right so those are the nutrition and behavioral tools that everyone needs to consider if you are not ingesting caffeine 2 p.m or onwards

and you are not eating excessively immediately prior to bedtime or within the two hours prior to bedtime and you're not hungry when you go to sleep well then there are certain supplements that can support your sleep and we've talked about these in the perfect sleep episode and in the episode with our guest expert Matt Walker from University of California Berkeley and in the master your sleep episode and we have a tool kit for sleep that you can access zero cost by going to hearinglab.com and going to the menu go to the newsletter and you can find that toolkit you can sign up for other free toolkits like it but the point here is not to go systematically through each of the supplements that is beneficial or has been shown to be beneficial for sleep but rather to address specific aspects of sleep that can suffer and why and how certain patterns of supplementation can support or alleviate those pain points if for instance you're somebody who falls asleep just fine but wakes up in the middle of the night around 2 or 3 A.M or any time for that matter and has trouble falling back asleep there are two categories of supplements that you might want to consider the first is myoinositol typically taken as 900 milligrams of myoinositol myoinositol can help shorten the amount of time that it takes to fall back asleep if you wake up in the middle of the night myoinositol has other beneficial uses as well for mood Etc if you'd like to see many of the different effects that have been explored in the scientific literature from myoinositol you can go to examine.com it's an excellent site not just for inositol but for all supplements for that matter talks about the human effect Matrix that is the different effects of different supplement compounds on different aspects of hormone brain and body Health where the evidence is strong where the evidence is weak has links to studies and so on again it's examine.com amazing website wonderful website it's provided such a rich resource for me and for you know many many other people other people who wake up in the middle of the night will wake up because their dreams are very intense or they were having dreams that were so vivid that suddenly they were jolted from their dreams those people would do well to avoid certain supplements so in a moment I'll talk about the value of a supplement called theanine for falling asleep but theanine which typically is taken in dosages anywhere from 100 milligrams to 400 milligrams depending on body weight and experience and what you find to be most effective for you minimally effective for you well the Indian can be great for many people but for people who have excessively vivid dreams those excessively vivid dreams can lead to immediate waking and sometimes a little bit of anxiety upon waking in the middle of the night so some people who wake up in the middle of the night so jolted mentally and physically out of sleep because of their intense

dreams would do well to avoid theanine supplementation I've talked about this a bit before but it's something that I think a lot of

00:50:52 Supplements for Falling Asleep: Magnesium Threonate/Bisglycinate, Apigenin

nighttime middle of the night wakers might be familiar with and would want to take into consideration now for those of you that are not waking up in the middle of the night or not having excessively vivid dreams but are having trouble falling asleep two supplements in particular have been shown to be effective for shortening the transition time to sleep and allowing people to ease into sleep more readily and those are magnesium 3 and 8 which is interchangeable with magnesium bis glycinate magnesium bisclycinate and magnesium threonate both have transporter systems that allow them to readily cross the blood-brain barrier and they lead to a mild form of drowsiness mild in the sense that it's not going to prevent you from operating a motor vehicle or kind of any conditions under emergency that might arise in the middle of the night or if they did a rise during the middle of night you'd still be able to function so it's not like a sleeping pill but people who take those often find that their transition time into sleep is much faster and their sleep is also much deeper incidentally those supplements are also thought to be useful for cognitive support and neuroprotection although there's less data on that okay so that's for falling asleep that's one category either magnesium magnesium three and eight or bis glycine would be interchangeable for assisting the transition time into sleep and then the other supplement is apogenin API g-e-n-i-n apogenin which is a derivative of chamomile I've talked about this in various podcasts before also acts as a bit of a anxiety lowering compound which is essential prior to sleep for people to essentially turn off their thinking or to be able to reduce the amount of ruminating and problem solving and future anticipation that they're doing which is a requirement for falling asleep so what's the rational approach to supplementing in a way that allows you to fall asleep more quickly and stay asleep well would you immediately take magnesium three Nate and apogenin together well that depends if you have the budget and you just simply want to fall asleep quicker and you don't care which of those two ingredients is going to be more effective for you well then you could try one for instance magnesium three and eight and try it for perhaps a week and see how that affects your latency to sleep time that is how quickly you fall asleep or you can try apogenic in the first week or you could combine them both or you could try magnesium three night for a week then

switch to only apogenin for a week and evaluate which one works better for you if neither works for you I do recommend trying the combination together again this is just the way that any scientist would design an experiment to try and understand which variables that is which ingredients are most effective for the result that you want as opposed to just lumping them together and taking them that said a lot of people want excellent sleep so badly that they just say okay I'm just going to take magnesium 3 and 8 I'm going to take apogen and I'm going to take theanine if my dreams are too Vivid and I'm waking up in the middle of the night from excessively vivid dreams I'll drop the theanine and many people actually derive great benefit from that approach but because today we're talking about the most rational cost effective and biologically effective approach to supplementation if you're not sleeping as well as you would like to or if you want to explore what sleeping even more deeply might do for your mental health physical health and performance well then it makes sense to think about the various supplements for falling asleep versus remaining asleep what to include what not to include and to do that systematically and again I think one week's time of taking something provided it doesn't induce any negative effects right if something induces a negative effect I recommend ceasing taking it immediately but if something does not produce any negative effects then I think you want to try a single ingredient formulation for about a week while not varying anything else not changing anything else in your overall Protocols of nutrition or supplementation I mean it's impossible to clamp everything perfectly from week to week but you know don't change anything else dramatically and just add that supplement for a given week see how it benefits your sleep maybe add in a second second supplement if you like or rather Swap and try a different supplement for a week and then see what works best and see if the combination works even better now I acknowledge that what I just described is exceedingly basic but it's something that I don't think most people do most people either decide they have the budget and the interest in just improving their sleep across the board and they don't care what ingredient is providing the maximum benefit or they simply try something and decide oh well it didn't work for me and so I'm not going to try anything else supplements don't work for me or magnesium doesn't work for me or um you know I woke up in the middle of the night from vivid dreams and that's because they're taking more of a shotgun approach without teasing out the different variables in fact if there's an overriding theme of today's conversation it's really about learning how to isolate variables in the realm of supplementation because once you do that and once you start to develop that Intuition or sensitivity of sorts to how different

ingredients impact you it is an enormously powerful stance to have because you're going to keep your costs limited you're also going to find the things that work particularly poorly

00:55:55 Melatonin Caution

for you and more importantly the things that work particularly well for you toward your goals any discussion about supplementation for sleep I feel has to include a discussion about melatonin I've talked about melatonin before on numerous podcasts mine and others and I will say once again I am not a fan of melatonin for a couple of reasons melatonin is a hormone known to induce sleepiness but not keep us asleep so oftentimes people will take melatonin fall deeply asleep and then wake up and have trouble falling back asleep the other reason is that melatonin supplements almost always include levels of melatonin or amounts of melatonin that far far exceed the normal biological levels or so-called endogenous levels of melatonin that we would normally produce and yes it's true that as we age we produce less melatonin but melatonin as a hormone also impacts other hormone systems in particular the reproductive hormone access testosterone estrogen Etc which is not to say that if you've been taking melatonin for some period of time that you've disrupted your fertility or those hormone axes but it's possible that you've disrupted them somewhat and it's very clear that melatonin can impact not just sleep but other systems in the brain and body it can be useful for jet lag and for occasional use but they're also I want to voice a message of caution there have been studies exploring the dosages of melatonin contained in various supplements and whether or not what's listed on the bottle matches what's actually contained in those formulations and despite those formulations coming from quite reliable quote unquote or thought to be reliable sources it was found that these supplements contain anywhere from 15 percent of what's thought to be or is told to be in those supplements or many times more melatonin than is listed on the bottle so the dosaging does not seem to be consistent with what's often listed on the bottle and this is even true within some of the more reputable Brands so that's a real concern so we need to highlight melatonin as perhaps something that's only used occasionally if you want to talk about dosages for melatonin use for jet lag Etc go to examine.com there's some excellent references to studies there just put melatonin into the search function it'll

00:58:11 Supplement Dependency?, Placebo Effects

tell you everything you need to know about melatonin but now you know my stance on melatonin one question I often get about supplementation for sleep is does it create a dependency that's an excellent question to ask I think most people worry about even fear relying on something so heavily that if they did not have it for whatever reason that they couldn't sleep in my experience there is no problem falling and staying asleep in the absence of a supplement for sleep even if you've been taking that supplement for sleep consistently seven days a week for months and months maybe even years on end I confess that I occasionally fall asleep having not taken my pre-sleep supplements and I happen to take magnesium three and eight theanine and epigenin I also take inositol it greatly enhances my sleep and there have been nights when I've fallen asleep not having taken any of those things and I've slept fine that said if I were to explore multiple nights of trying to sleep without that supplementation I find that my sleep is not as good I'm still able to fall asleep but the depth of my sleep and the duration of my sleep is not as good as when I'm supplementing so I think that's refreshing news at least to me that there isn't a dependence on these supplements in order to be able to fall asleep it's not the same sort of dependence that people experience from things like sleeping pills that said any compound any compound can create a placebo type effect where we think we need something in order to achieve a certain effect we had a guest on this podcast some time ago Dr Ali Crum who's a professor at Stanford and works on these mindset effects belief effects and Placebo effects and Placebo effects can be very real and in some sense dovetail with any conversation about dependency meaning if you are somebody who loves your sleep supplements and sleeps great with them and one night you discover you don't have them or you can't access them for whatever reason that can create a little bit of an anxiety around the idea that oh in the in their absence you're not going to be able to sleep and that's a sort of a placebo effect in Reverse if you will because what it suggests is that there's a emotional or a cognitive association with taking these things that allows you to sleep well I would highly recommend that people explore this issue of dependency and Placebo effects for Sleep supplements on their own and under conditions in which there's nothing pressing the next day that is you don't have a big presentation Etc so what I recommend is that every two weeks or so maybe every month or so take one night off completely from all your sleep supplements or leave out one sleep supplement try to understand to what extent you might have established a dependency either real or Placebo based on these sleep supplements and again I

suggest doing this on perhaps a Friday night so that you know it's a weekend the next day so you don't have to work if perhaps you don't sleep well I think what you'll find is what most people find and that's in the absence of taking your supplement stack for Sleep one night you're still gonna sleep just fine now does that mean that these supplements are not actually working under normal conditions where you're taking them each night no what this means is that many of these things magnesiums in particular can build up in the body and brain in a way that can be beneficial and what probably explains the fact that you can still sleep if you miss a night of taking them is that the neural circuits that are involved in turning off thinking or in not thinking and falling asleep those neural circuits undergo what's called plasticity in other words if you get better at falling and staying asleep over time even if you got better at that through the Assistance or with the assistance of some supplement or combination of supplements well then those circuits are still going to function just fine even in the absence of not taking those supplements just once we'll get back into this conversation a little bit later when we talk about cognitive enhancement and focus it's the same story there where indeed there are things that people can take in stimulant form and non-stimulant form that can enhance cognitive ability and focus but that does not mean that you become so dependent on those that you can't focus unless you take them this has been shown multiple times over so again to answer the question is there a dependency established by taking supplements for sleep the short answer is no with the caveat that Placebo effects and belief effects are always going to be at play whether or not you're talking about

01:02:45 AG1 (Athletic Greens)

supplementation prescription drugs or even behavioral protocols for that matter I'd like to take a brief break and acknowledge our sponsor athletic greens athletic greens is an all-in-one vitamin mineral probiotic drink that also contains digestive enzymes and adaptogens I started taking athletic Greens Way back in 2012 so that's 10 years now of taking athletic greens every single day so I'm delighted that they're sponsoring this podcast the reason I started taking athletic greens and the reason I still take athletic greens is that it covers all of my foundational nutritional needs so whether or not I'm eating well or enough or not I'm sure that I'm covering all of my needs for vitamins minerals probiotics adaptogens to combat stress and the digestive enzymes really help my digestion I just feel much better when I'm drinking athletic greens if you'd like to try

athletic greens you can go to athleticgreens.com huberman and for the month of January they have a special offer where they'll give you 10 free travel packs plus a year's supply of vitamin D3 K2 vitamin D3 and K2 are vital for immune function metabolic function Hormone Health but also calcium regulation and heart health again that's [athletic greens.com](https://athleticgreens.com) huberman to claim their special offer in the month of

01:03:53 Nutrition & Behavior for Hormone Health

January of 10 free travel packs plus a year supply of vitamin D3 K2 the next category of supplementation that I'd like to talk about is hormone support improving or so-called optimizing your hormones is a critical aspect of mental health physical health and performance we've done multiple episodes about hormones including testosterone and estrogen for both men and women and for people of different ages we've also had episodes on thyroid hormone growth hormone and so on you can find all those at hubermanlab.com in fact you can go to the hubermanlab.com website there's a search function where you can just put in a keyword and it will take you to all the episodes and specific time points where that topic happens to be covered now Hormone Health is such an important topic to discuss in the context of supplementation because indeed there are compounds that are non-prescription based so-called supplements that can improve hormone function again anytime we are discussing a particular aspect of mental health physical health or performance we need to start with a mention of the few behavioral tools and nutrition-based tools or at least some top Contour coverage of those in a way that frames up the discussion about supplementation appropriately so in the context of hormone support and augmentation and optimization if you are not getting adequate calories from high quality sources hormones like testosterone and estrogen will suffer this is one of the reasons why women will stop having their periods if they're not ingesting enough calories this is one of the reasons why testosterone levels will drop if people are not ingesting enough calories in fact on the episode with expert guest and medical doctor Peter attia he described how sex hormone binding globulin this is a protein that's present in males and females that binds to testosterone and other hormones and prevents it from being in its free form which is the more active form well insulin which of course is going to increase after the ingestion of carbohydrates in particular insulin actually inhibits or reduces sex hormone binding globulin what this means is that for you intermittent fasters or people that are ingesting very few

carbohydrates or have very low blood glucose or perhaps are taking things like metformin or berberine which is a supplement based approach to reducing blood glucose well your sex hormone binding globulin is going to increase dramatically conversely if you are eating enough calories in the form of foods that allow your insulin to be a bit higher not excessively High we hope but a bit higher well then sex hormone bonding globulin will go down and free testosterone will go up so the discussion about hormone support and augmentation has to include some nod toward or understanding of the fact that nutrition and the way that nutrition impacts hormones and the way that hormones such as insulin impact other hormones such as free testosterone that all has to be acknowledged that is not the topic of today's discussion but it's important that I remind everybody that nutrition matters for General hormone status it's also important to remember that behaviors matter for hormone status getting morning sunlight increases cortisol levels cortisol levels are very important to have elevated early in the day for focus and alertness and for immune function and to make sure that cortisol levels are low at night and thereby levels of growth hormone and testosterone which is secreted mainly in the early morning can be elevated at night and in the early morning so getting morning sunlight getting strenuous exercise in the form of both cardiovascular exercise but also relatively short meaning an hour or less bouts of intense resistance training a few times per week can also dramatically alter hormone profiles in fact in the episode that we did with Dr Duncan French again you find that episode at hubermanlab.com he described a very strenuous but still brief two day a week protocol of using resistance training specifically to increase testosterone and free testosterone and growth hormone and so on so nutrition matters exercise matters when it comes to increasing supporting or augmenting different hormones and that's just the discussion about testosterone free testosterone and estrogen there's also the vast discussion about thyroid hormone Etc again we've covered all those topics in previous episodes but once those behavioral tools are in place once you're doing the right things and you're avoiding the wrong things doing the right things to support your hormones and avoiding the things that diminish hormones in the ways that can be detrimental once your nutrition is in place to support your hormones then it makes sense to turn and consider what supplements can support hormones but I do believe that you want to get your behaviors and your nutrition correct before you start thinking about supplementation for hormones again I'll repeat that get your nutrition and your behaviors correct for sake of hormones and for other health purposes before you start thinking about supplementation for hormones and certainly

before you start

01:08:59 Hormone Health: Shilajit, Ashwagandha, L-Carnitine, Maca Root

thinking about prescription-based approaches to improving hormones once all of those other elements are in place the supplements that make sense in terms of augmenting hormones come in two forms one are broadband support for multiple hormones and then the others are supplements that are designed to increase or in some cases decrease specific hormones or hormone Pathways so let's consider each of those in tandem there are certain supplements things like Sheila G for instance something from ayurvedic medicine which may mainly uh has the active ingredient fulvic acid which is known to for instance increase things like FSH follicle stimulating hormone which in women is going to increase certain aspects of egg growth hence the name follicle stimulating hormone it's going to stimulate certain aspects of fertility it's Pro fertile and in males can make for more sperm production or more motile sperm FSH is also going to indirectly increase testosterone in males it's known to increase libido in both males and females so things like shilaji can indeed augment multiple hormones and support multiple hormone systems generally in the direction of pro-fertility pro libido and increasing estrogen and testosterone now there are other supplements such as ashwagandha that also fall into this category of affecting multiple hormones ashwagandha is a very potent supplement in terms of reducing cortisol levels it has also been shown to increase testosterone levels but probably indirectly and that's because cortisol and testosterone sort of exist on a seesaw in terms of Pathways they're on separate Pathways but those Pathways interact enough that when cortisol is lowered in general testosterone tends to increase now it is important that with certain hormones like ashwagandha that you don't take them for more than two weeks at a time at high dosages if you want to know more of the specifics around ashwagandha and how long to take it how to cycle it Etc please see our episode on Master stress please also see the examine.com website and put in ashwagandha it will get into some of that description but Sheila G ashwagandha and things for instance like L-Carnitine a supplement that we often discuss in terms of fertility because it can indeed improve sperm motility and quality and egg quality so it's a pro fertile compound but it also impacts various mitochondrial Pathways so it's having a more indirect effect on hormones there are many other compounds present and available supplements that are purported to be pro-hormone support in particular for

testosterone or estrogen fertility and libido there is a description for instance of things like maca root maca root can increase libido it's found to be particularly effective in women but in men as well and in all people who are suffering from lower libido due to intake of ssris selective serotonin reuptake inhibitors for whatever reason ssris are used to treat OCD they're used to treat depression any number of different things maca root can be in many instances effective in increasing libido it does that however through augmentation of dopamine related Pathways and some of the hormone Pathways Upstream of testosterone and estrogen the reports that Maca increases testosterone are somewhat scant and a little bit weak to be honest so it's having these indirect effects that may impact testosterone Downstream so again I'd put Maca alongside ashwagandha alongside shilaji as supplements that are impacting multiple hormone Pathways toward increased libido

01:12:48 Growth Hormone: Behaviors, Arginine, Prescriptions

increased fertility increased testosterone or estrogen likely through indirect pathways now with all that said I'd like to provide some examples of supplements that work more directly on specific hormone Pathways aimed at achieving more specific goals such as elevated testosterone or elevated free testosterone or elevated growth hormone for that matter and elevated thyroid hormone I'd like to talk about growth hormone first because it's actually a pretty short discussion first of all the best way to augment growth hormone is to get quality deep sleep especially the sleep that occurs in the first three or four hours of the night is when growth hormone is released and it's going to be beneficial to avoid caloric intake in the two hours preceding sleep again don't go to bed so hungry that you wake up an hour or an hour and a half later or you have trouble falling asleep but avoiding food intake in the two hours prior to sleep and certainly avoiding alcohol and cannabis is going to facilitate growth hormone release in the first hours of sleep many people use intermittent fasting or even longer periods of fasting to increase growth hormone one of the interesting things I learned from an expert guest Dr Kyle Gillette who's a medical doctor on this podcast is that indeed while lengthy or fast or intermittent fasting can increase growth hormone levels very substantially it has indirect effects on the genetic Pathways and The receptors for growth hormone that actually are detrimental for the function of growth hormone so avoiding food for the two hours prior to bedtime is a good idea if you avoid food for longer that's just going to assist even more

certainly isn't going to hurt in terms of growth hormone release but extended fast specifically for the purpose of increasing growth hormone are not really logical when you look at the broader effects of extended fast that is not to say that extended fasting is not appropriate for some people it can be in certain instances or that intermittent fasted so-called time restricted feeding is not beneficial for some people it can be here I'm only referring to the effects or in this case the lack of effects of intermittent fasting time restricted feeding on growth hormones specifically now in terms of supplements to increase growth hormone there are very few supplements that have been shown to augment this pathway there is some idea that Arginine supplementation prior to bedtime can further Elevate levels of growth hormone especially when fasted that literature is rather weak to be honest I encourage you to go to examine.com if you want to peruse those particular studies really the things that increase growth hormone very potently fall outside the realm of supplementation they include exercise again look at the Duncan French episode or in the Kyle Gillette episode on optimizing hormones in males in particular but this also pertains to females that avoiding food two hours prior to bedtime really can boost growth hormone significantly in sleep beyond what it would be otherwise but it's really only once you get into the realm of prescription compounds things like peptides like sermorelin which increase igf-1 and growth hormone things like growth hormone itself by prescription if and only if it's prescribed by a doctor of course and is safe for you that's when you start getting into really significant increases in growth hormone

01:16:04 Testosterone/Estrogen: Fadogia Agrestis; Bloodwork

not a lot of supplements out there to increase growth hormone potently now it's a different story when you start thinking about and talking about testosterone and free testosterone and luteinizing hormone luteinizing hormone is released from the pituitary which is this gland not far from the roof of your mouth and its nearby neighbor the hypothalamus is a collection of neurons that sits above the roof of your mouth and talks to the pituitary talks to it through neural connections and hormone-based connections there is a hormone called GnRH gonadotropin releasing hormone that is released from the hypothalamus into the pituitary it stimulates the release of luteinizing hormone or LH which then travels in the bloodstream to impact multiple tissues in the body but mainly the ovary in females and the testes and males to stimulate estrogen production and

testosterone production there are supplements that can potently increase GnRH and or luteinizing a hormone and then indirectly increase testosterone and estrogen and I always like to remind people testosterone and estrogen are present in both males and females okay and both are important for things like libido muscle growth and so on a lot of people think that oh in males you know having very high testosterone and low estrogen is actually ideal it's actually not ideal if you want to keep your libido anything that lowers your estrogen too far is going to reduce your libido you don't want estrogen too high but you also do not want it too low so supplements that can tickle this pathway or actually can act as a bit more of a directed hammer on this luteinizing hormone pathway may also impact GnRH are things like fedojia agrestis this is an herb that I've talked about before on the podcast that when taken at dosages of 600 milligrams per day many people not all report elevated levels of libido elevated sperm production elevated testosterone in some cases elevated estrogen a bunch of hormones Downstream of luteinizing hormone now are you going to be a fedojia agrestis responder or a non-responder there's simply no way to know except by trying it if you are going to go down this route there are two very important considerations first of all there's a fairly extensive literature on the fact that fidoji agrestis can be toxic to testicular cells and perhaps other cells when taken at very high dosages so obeying the particular dosages of fedogio aggressus that are recommended on various product labels and cycling for doji Augustus can be important some people need to cycle it eight weeks on two weeks off other people opt for 12 weeks on a month off I know a few people who have taken it continuously with no issues but I do want to suggest caution when taking fidochio agrestis the cautionary notes are stay within the recommended dosage ranges you can go lower but certainly don't go higher and I think it is wise to cycle every eight weeks or so to come off it for two weeks and then going back on if that's your choice if you feel it benefited you or taking it for 12 week periods of time and then cycling off for a full month before repeating again the best way to know whether or not fedojia or any of these other supplements is impacting your hormone levels in the direction that you want and not impacting your hormone levels or other aspects of your biology in ways that you don't want is from a blood test there is simply no better tool to evaluate whether or not these supplements are working to support your hormones in the ways that you want and not causing issues except to take a blood test this podcast has inside tracker as a sponsor that can do in-home blood tests and give you blood panels there are other sources of blood tests that are quite good as well of course and in the first episode of The

huberman Lab podcast that I did with Dr Kyle Gillette again a medical doctor expert in hormones diabetes and various other aspects of medicine he described and it is time stamped how to stand the best probability of getting your insurance to cover a blood test how to talk to your doctor about getting a hormone panel and so on so I'll refer you to that episode for that but blood tests are going to be very important I recommend taking them before adding in any supplement to increase hormones of any kind or decreased hormones of any kind for that matter and then again after about four to eight weeks of taking that particular supplement in order to evaluate whether or not it worked and whether or not it had any negative effects that you would like to avoid I also wanted to remind people of the dosage conversation that we had earlier just because there's a recommended dosage of fedogio agrestis of say 600 milligrams per day first of all that is not an invitation to take twice as much and expect twice the positive effects that is not a good approach especially with something like fedogiograstis which can at high dosages be toxic but it's also important to perhaps consider taking a lower dosage and seeing how that affects your hormones that approach requires a bit more patience I know most people are thinking I want the effect and I want it now but I think it's very important when thinking about exercise your nutrition or supplementation to really play the long game to think about what's going to work for you in the immediate end in the long term and to ease into any kind of supplement regimen for instance by taking one thing at a time varying One supplement out and One supplement in starting at minimal effective dose and build up your protocols over a year or several years it really can be beneficial I can say for myself I started exploring the supplement space and taking different supplements in different combination and alone evaluating which ones worked and did not work for me some were absolutely dreadful for me I have tons of stories about supplement fail some of which were just kind of innocuous meaning they were a waste of money which isn't innocuous but at least it wasn't detrimental to my health other supplements which fortunately don't exist on the market anymore um I think actually uh were quite dangerous and I feel lucky that I did not experience even greater negative effects from them other supplements have been tremendously useful for me and for other people for things like sleep and hormone support focus and so on so for Doja gracias is a good example of a supplement that is known to have potent effects but you need to approach it with the appropriate um I would say respect for the fact that the dosage ranges in which it works um have to be kept pretty narrow without causing issues it does increase luteinizing hormone and thereby testosterone and estrogen so if you're somebody who's

already excessively high in one or the other it's going to be very hard to just direct it to only testosterone or only estrogen now the topic of today's episode is not about fedoiji Augustus per se I highlight it because it is one of the more potent supplements for sake of hormone augmentation but it's still fairly Broadband it's a little more specific than something like shilaji but it's still fairly Broadband in terms of hitting multiple endpoint hormones

01:23:06 Testosterone Supplement: Tongkat Ali, Libido

testosterone and estrogen and maybe some other hormones as well there are other supplements in particular Tonga Ali which is known to for instance increase libido whether or not it does that by way of augmenting dopamine related Pathways or testosterone Pathways still isn't clear it is known to increase free testosterone by reducing sex hormone binding globulin Tonga Ali can be beneficial both for men and for women in dosages anywhere from 200 milligrams to 600 milligrams per day so there I would say scale according to body size although start with the minimum amount and find the minimal effective dose for you again blood work is going to be the most effective way to determine what's working or not working at the level of objective numbers but subjective experience matters too you know if you take it at 400 milligrams for four weeks and you don't notice any effect you might try it at 600 milligrams but not higher and if you still don't see an effect well then it doesn't appear to have worked for you other people experience dramatic effects from things like fedoja and Tonga Ali why would that be the case well if you look to the scientific literature what you find is that the studies that report the biggest effects of any supplement usually start with a population that somehow diminished or back on its heels in one particular Dimension so for instance people that are hypogonadal that are not making enough testosterone or free testosterone in fact their levels are very very low they're subclinical off range in terms of the charts below the normal well those people when they take supplements like Tonga Ali fedoja tend to experience greater effects because they're starting from a lower level than people who perhaps are close to the optimal levels achieved through either age genetics exercise nutrition or some combination of those so that's an important thing to think about these are called floor effects and ceiling effects ceiling effects are for instance if an individual already has very high testosterone and free testosterone and they take a supplement to increase it further they might not see any increase whereas

somebody who sits more in the middle to low range stands to experience a much greater increase in fact one individual I know who took Tonga Ali admittedly on my recommendation his testosterone was initially very low and he was having a number of different symptoms he did blood work he that's how he knew it was low and he then took Tonga Ali and fedoja in combination because he decided he just wanted results he didn't care which What which thing was going to give him the results and he experienced big increases in testosterone this would be not free but total testosterone of he experienced as much as 600 nanograms per deciliter increase from where he was before which is very dramatic it was a near tripling of where his testosterone had started off to where he ended up I don't know if he's ever done the experiment of removing fidojia or Tonga to find out which one it was and this is why many people just take them in combination and if you have the budget for it and you are interested in just finding what works but not isolating what works at the level of single ingredients that would be the approach I recommend however again I think most people do well to figure out which specific ingredients are going to work best for them by isolating the variables the way I've described repeatedly throughout this episode to my knowledge Tonga Ali does not need to be cycled meaning you don't have to take periods of time off from it I should note that the effects of Tonga Ali can take a little bit longer to experience so perhaps blood work should be done 8 to 12 weeks after initiating the Tonga Ali protocol as opposed to earlier and it does seem to have sort of cumulative effects on libido and that points to the likelihood that it's having some impact on neural Pathways as opposed to hormone Pathways hormone Pathways can be slow but in general neural pathways are the ones that are going to explain slow Rising shifts in any kind of physical or mental aspect that then remains stable over time so the exact effects of Tonga Ali and where meaning where they arise in the brain and body aren't known I will provide a link to a really beautiful review article that covers the literature on tonganali this came out fairly recently and that I've reviewed with a number of other um MDS and medical or medicine related podcasters it's a really nice review I'll provide a link to that gives a

01:27:24 Menstrual Cycle, Birth Control & Fertility

survey of Tonga Ali what people are discovering what they're finding what they're not finding and so forth as a final note on supplements for hormone augmentation and supplementation I want to make a brief mention of something specifically related to

female Health which is of course the menstrual cycle and across the menstrual cycle different hormones are present at different levels follicle stimulating hormone is very high during the so-called follicular phase right and then you have your luteal phase we have an entire episode coming up about female hormones and Hormone Health that will cover this we also covered a little bit of this in the other episodes on testosterone and estrogen but the point I'd like to make now is that for women they should fully expect that certain supplements not all but certain supplements because of the way they impact different hormones would have different effects maybe even opposite effects at different phases of the menstrual cycle and for that reason I believe it is especially important to have tight control over dosage and individual ingredients in your supplement regimen so for instance if you're somebody who takes Sheila Gene I know many women who take Sheila G or Tonga Ali for instance or Maca and you find that it really serves you well that is it provides the mental and physical benefits that you want and enjoy at certain phases of your menstrual cycle but at other phases of your menstrual cycle it feels like too much or it actually can start to give you negative mental or physical effects well then obviously having control over those specific ingredients is going to be extremely important so that you can titrate the dosage or increase the dosage as the case may be or cease taking those things entirely at certain phases of your menstrual cycle that's not to say that some women can't just continuously take these supplements throughout their menstrual cycle some can but some find that that makes them very uncomfortable or that they would do well to alter different ingredients at different phases of their cycle so again this speaks to the critical importance of single ingredient control dosage control and the ability to cease taking individual or multiple ingredients according to the backdrop of your health generally and obviously the menstrual cycle is a profound shift in the hormones and thus the entire biological and psychological milieu that exists in the body and of course there's the issue of birth control and whether or not people are taking hormone-based birth control certain forms of hormone-based birth control and women involve tonically elevating that means consistently elevating estrogen that's certainly going to reduce the fluctuations and thus the probability that certain hormones and hormone Pathways will change across the menstrual cycle but not eliminate it altogether also there's the key issue of fertility in both males and females one important note even though this is not an episode about fertility we're going to have one soon but the important point about fertility is that there are supplements not just Sheila G but there are supplements and supplement protocols such as L-Carnitine in particular injectable L-Carnitine which does

require a prescription at least in the US but also orally ingested L-Carnitine that can improve sperm health and motility and egg health and motility I mentioned that earlier but if couples are trying to conceive it is important that if you're going to take something that is a supplement directed towards sperm and or egg Health that you also consider how that interfaces with some of the other hormone-based compounds that is prescription drugs that you may be taking this is true for people who are doing IVF in vitro fertilization or not again that entire discussion will be handled in our episode on fertility and

01:30:54 Cognitive Enhancement & Focus, Sleep, Stimulants: Caffeine

on female hormone health and we already did the episode with Dr Kyle Gillette on male hormone Health optimization the next category of supplementation that I'd like to address is supplements related to cognitive enhancement and focus and here there are a number of very useful strategies that one could take I'd like to divide this conversation into two general categories of supplements to address cognitive enhancement and focus the first category are supplements that increase energy by way of stimulant properties so the most obvious of these is caffeine caffeine is of course a molecule that can increase levels of alertness it also can increase levels of focus provided that dosages are in the appropriate range the appropriate range in most cases is going to be one to three milligrams per kilogram of body weight taken 30 minutes or so before any kind of mental or physical Endeavor we did an entire episode about caffeine where you can learn lots of facts about caffeine how best to utilize caffeine and indeed I'll just give you a few of those now turns out that if your regular caffeine user you can still derive the cognitive enhancing and focus enhancing effects of caffeine if you ingest caffeine every day but if you were to take two days off from caffeine completely and right now I hear all the caffeine addicts out there just kind of cringing at the idea and then take caffeine in the 30 minutes prior to some especially important event physical or mental event where you really need to focus and be able to sustain that Focus for long periods of time it would have an even greater effect than it normally would but since most people are taking caffeine in a kind of ongoing regular way I just want to emphasize that it still has Pro cognitive and pro-focus effects even if it's taken every day or even multiple times per day again a cautionary note don't drink caffeine too late in the day past 2 p.m it can really start to impede uh your sleep at night even if you can fall asleep at night the architecture

of that sleep is not going to be great if you're ingesting caffeine in the preceding eight to ten and even 12 hours and that actually raises another tangential but still important point so I'm going to make it and then get back to supplements which is the best cognitive enhancer that you will ever take is a really good night's sleep of sufficient duration okay so sleep is going to be the Bedrock of your ability to focus and remember things in fact it's during sleep that neural connections remodel so-called neuroplasticity it's actually not when you trigger learning but it's when you consolidate and reinforce learning and a number of other things that relate to cognitive enhancement and focus the other thing of course is that you're going to need to have sufficient levels of nutrition so you don't want to be overly hungry or it's going to be hard to focus nor do you want to be overloaded with calories or a volume of food or have your blood glucose to be so high that it's going to make you sleepy there's a reason why when discussing stress and the so-called autonomic nervous system that the phrase rest and digest comes into play rest and digest as the name implies relates to the fact that when we have a lot of food in our gut it tends to make us sleepy in other words it's hard for us to focus and it's hard for us to maintain cognitive attention and remember things Etc so there are a bunch of Behavioral tools for enhancing Focus we did an entire episode on enhancing focus it does touch on supplementation again you can find links to that in all formats at hubermanlab.com we also have a newsletter related to this topic also at hubermanlab.com at zero cost with all of that said and in particular the Highlight about sleep being the best way to enhance your cognitive abilities and focus anytime we're having a discussion about supplements for enhancing cognitive ability and focus a major category of those supplements is going to fall into the stimulant category and that's going to include most often caffeine although there are other sources of stimulants I'm not going to touch on those for the moment just talk about caffeine when people hear caffeine they think well I can just drink coffee and indeed that's a great source of caffeine so is yerba mate I would caution people to um if you're going to use yerba mate for whatever purpose caffeine or otherwise that you avoid the smoked versions of yerba mate they are carcinogenic that is the smoked versions or carcinogenic I know and to consume the non-smoked uh varieties um instead the important thing to understand about caffeine is that while it can be ingested in the form of a drink or an energy drink to your coffee it can also be ingested as a pure supplement that is there are caffeine supplements and I know a number of people including a very very prominent podcaster whose name I won't mention who drinks herbal tea but takes a 100 to 300 milligram tablet of caffeine with the herbal tea so in

that case it is no longer herbal tea it is caffeinated herbal tea when you take caffeine in pill form it tends to have a much more potent and long lasting effect than when you take caffeine in the form of coffee or tea it's actually a world apart in terms of its effects and if you haven't experienced this before it might be something that you want to explore it might not be something you want to explore in particular if you're somebody who experiences anxiety or panic attacks be very careful with your intake of caffeine again see the episode of the huberman law podcast all about caffeine for more on that but it is the case that even 100 milligrams of caffeine in tablet form I suppose it could be in capsule form as well but in its pure form leads to much greater enhancement of alertness and focus than does often the comparable amount or even twice the amount of caffeine contained in coffee or tea now why would that be has a lot to do with the other things that are in coffee and tea so here I'm not encouraging people to become reliant on caffeine capsules or on caffeine tablets but if you want to increase

01:36:57 Adrenaline & Stimulants: Yohimbine, Rauwolscine

alertness and focus caffeine is a potent way to do that it works the other category of stimulant that can work in terms of enhancing alertness and focus are going to be things that increase adrenaline in some other way or epinephrine as it's also called adrenaline epinephrine same thing in some other way that are going to touch into or augment the so-called adrenergic and adrenaline systems and there are things like yohimbine and different forms of yohimbine like Alpha yohimbine um there are multiple forms of these things now I would go to examine.com to explore the different forms of your himbine about 10 20 years ago yohimbine was marketed primarily as a pro libido and pro-erectile agent turns out it has very low efficacy for both of those things but there are certain forms of yohimbine that act as stimulants that are effective and are separate from those claims and Pathways one particular form is called Alpha yohimbine it sometimes goes by the name raulstein and that's spelled r-a-u-w-o-l-s-c-i-n-e again that's Alpha yohimbine and it's used as a stimulant often to also promote fat loss and alertness I have to say that it's a very potent and somewhat um precarious supplement some people experience a lot of anxiety on it that could also be because they tend to take it on either an empty stomach or in combination with sub caloric diets it's a it's sort of getting out on the edge of things that for some people can work not so well for other people they might actually find it to be a very effective stimulant in general in terms of supplement based

approaches to increase cognitive function and focus caffeine either in coffee or tea form or in tablet or capsule form but at lower dosages than you would find in coffee and tea I think is actually a reasonable way to explore

01:38:55 Adjusting Neurotransmitters: Alpha-GPC, L-Tyrosine; Layering Supplements

stimulant-based approaches for enhancing cognitive function and focus I mentioned all that not because I think that you probably already didn't know that caffeine can enhance alertness and focus most people already know that and I acknowledge that but rather as a contrast point for the other supplement based approach for increasing cognitive function and focus which is to increase certain neurotransmitter Pathways that are not stimulant based so for instance Alpha GPC which is essentially a choline donor acts in the pathways related to the neuromodulator acetylcholine and can enhance Focus so at dosages of anywhere from 300 to 600 milligrams people experience heightened levels of focus for sake of mental work or physical work the half-life of alpha GPC is about four to six hours so it's relatively short lasting although you wouldn't necessarily want to take it right before bed I don't recommend that it is not a stimulant it tends to enhance focus by augmenting acetylcholine and acetylcholine Pathways specifically now it does create a little bit of an increase in alertness so some people actually perceive it subjectively as an increase in overall stimulation but it's different than a caffeine type stimulant so for instance 300 milligrams to 600 milligrams of alpha GPC taken alone will allow people to be more focused but doesn't tend to make people feel jittery or over stimulated similarly 500 milligrams to a thousand milligrams or somewhere in between of something like l-tyrosine which is amino acid precursor to dopamine a different neuromodulator taken alone or in conjunction with again I believe in separating these things out by product but I suppose you could take Alpha GPC NL tyrosine together if you had already tried them separately and decide they worked well for you then you decide to combine them what people tend to experience is that the cholinergic stimulation from alpha GPC and the dopaminergic stimulation from l-tyrosine or simply l-tyrosine alone or Alpha GPC alone leads to increased levels of focus without the kind of overall feelings of stimulant-based alertness that one would experience with caffeine and indeed or I should say of course there are products out there and there are people out there that combine all three of these things together caffeine Alpha GPC and l-tyrosine and while I'm not suggesting that's a good or a bad thing I would suggest that anytime you start to explore the

cognitive enhancing effects and the focus enhancing effects of any supplement that you ask which ones are stimulants so for instance caffeine and Alpha human being which ones tend to tap more into neuromodulator systems like Alpha GPC and L-tyrosine and to separate those out conceptually because whereas things like Alpha yohim binding caffeine will mostly serve the role of increasing levels of alertness but not tightening your focus things like Alpha GPC and L-tyrosine tend to serve the role of less elevation and alertness but more tightening of focus and this of course is why people often stack these and take them in combination so I think it's a very important distinction that most people aren't aware of and I'm not here to tell you that the stimulant-based approach or the neuromodulator based approach is better or worse they are simply different from one another although I will say that I think it is important to explore them separately if indeed you're going to explore any of them before you would start to combine them in a single formula again individual ingredients are going to be the way to go in terms of figuring out what's best for you if anything some people may find that even the slightest bit of caffeine or even the slightest spit of alpha GPC or L-tyrosine just places them into a state of mind and or body that's just uncomfortable and not compatible with the kind of work that they want to do whereas other people searching myself regularly rely on taking 300 milligrams of alpha GPC it turns out more than that kind of doesn't work for me or it tends to send my mind down a pathway that I don't like to be in for sake of cognitive work but I will routinely take 300 milligrams of alpha GPC prior to some cognitive work or prior to a workout I do often combine that with some caffeine not in capsule or pill form but rather in the form of cup of coffee or yerba mate and it turns out that for me just by way of example L-tyrosine is something that works very powerfully to elevate my level of focus but that I tend to crash pretty hard afterward and so I tend to error away from L-tyrosine but some people tolerate it really well and actually really like it I rely on something else for dopamine augmentation which is phenylethylamine which is a little bit more short lasting again I arrived at these protocols for myself by mixing and matching but mostly by trying individual ingredients alone before combining them into any sort of cocktail before taking them you for a workout or before a cognitive work bout and I suggest that you explore them in the same way because

01:43:58 Cognitive, Mood & Metabolic Support: Omega-3 Fatty Acids

that's going to deliver you to the best possible protocols for you which only you can

determine and then of course there's the category of supplements that can support cognitive function and focus but that also touch on other General functions related to brain and body Health such as metabolic Health mood Etc and the one that comes to mind here are the omega-3 fatty acids I've talked a lot about omega-3 fatty acids that are available in the form of foods so for instance fatty ocean fish there's certain plant-based sources for these as well certain algae and things of that sort touched on this in the episodes on depression that I've done but this topic mainly comes up around the issue of fish oil fish oil capsules and liquid and this is a discussion I think is worth having early on in the episode we talked about foundational nutrition and supplements that include a bunch of different ingredients we touched on the idea that some people might have the budget to take one such product or any number of different products that combine all those ingredients I should say that for those that are interested in taking a supplement but have a lower budget than would allow for taking one of those General categories of supplements we talked about earlier for foundational nutrition that combines everything vitamins minerals probiotics prebiotics adaptogens digestive enzymes I do think that there's a category of supplements that can greatly enhance the probability of offsetting depression and maybe even improve mood directly or indirectly there's evidence for what I'm about to tell you within the scientific literature and or offset the amount of antidepressant medication that people need to take that's also been demonstrated and improve metabolic function cardiovascular function and also enhance our ability to do focused work and here I'm referring to the so-called omega-3 essential fatty acids in particular the omega-3 form of the essential fatty acids there's now a lot of data showing that ingesting one to three grams of EPA in particular in the form of either fish oil capsules or liquid can be beneficial for a number of different aspects of brain and body health and can enhance focus and cognitive ability this is especially true in developing brains and there's actually an extensive data out of a laboratory at University of California Santa Barbara talking about how mothers who supplement Omega-3s in particular the epas although they also need to get the dhgs that leads to Greater brain weights and health of Offspring this is something we will definitely explore in a future episode likely with an expert guest who's doing that work in that laboratory at UC Santa Barbara the point here is that if somebody has a limited budget to purchase supplements and cannot afford a foundational supplement in the sort that we talked about earlier athletic greens are similar but they do have a budget that would allow them to purchase a high quality Omega-3 fatty acid fish oil that would and to ingest it in quantity sufficient

enough to get above that one gram of EPA per day again this is really important if you look at the product labels you'll often see you know 1500 or 1600 milligrams of essential fatty acids but the key is you get above that one gram of EPA per day threshold and as high as three grams per day we had a guest on this podcast Dr Rhonda Patrick who takes anywhere from I believe three to four maybe even

01:47:25 Food-Mimic Supplements, Protein

more grams of EPA per day for a variety of reasons including some of the reasons we're discussing now before we move on to discussing some of the more Global themes related to developing a rational supplementation protocol I do want to touch on this vast category of supplementation that includes food-based or food mimic type supplements so this would be for instance whey proteins or milk proteins or egg proteins or plant proteins that's a discussion that in and of itself deserves an entire episode if you want to understand which types of protein and source of proteins are going to be the most bioavailable the best for protein synthesis for recovery from exercise building muscle Etc I'd like to refer you to a segment within the episode that I did with Dr Lane Norton where he talks about total protein needs per day it's about one gram per pound of body weight per day for most people although there's some variation depending on activity Etc and the quality of sourcing of those various proteins is extremely important and that of course leads to a discussion about the quality and type of protein that would be present in a supplement like a whey protein supplement or casein which is a milk protein based supplement that discussion is segmented and time stamped in the episode that I did with them you can find at hubermanlab.com he actually pointed to some interesting data on potato protein as perhaps being a great plant-based substitute for those that don't want to take whey-based protein but the fact that whey-based proteins can be very useful for getting to and above a protein threshold for all sorts of reasons not just for muscle building although it's great for that but for other purposes as well and that's about one category of food-based or food mimic type supplements there are for instance branched chain amino acids there are for instance green tea supplements there's a huge landscape of this far too much for us to get into in any kind of um reasonable detail but I do want to acknowledge that those all exist the key thing to understand is that while they can serve a great role in providing replacement for meals that you perhaps couldn't have consumed otherwise and while they often are very convenient because you can drink as

opposed to eat your calories I think that most people would agree that getting some significant fraction of your nutrition from Whole Foods is going to be useful for a variety of reasons in particular the fiber that comes along with it the bulk of the food that tends to make us feel satiated and of course the fact that a lot of vitamins and minerals and other things that are contained within Foods as well as essential fatty acids in foods like animal-based proteins are not going to

01:50:09 Kids, Aging & Supplements

be present in most if not all of those kind of food mimic type powders and replacements for food another point is this question about age-related effects so for instance should kids be taking supplements well I mentioned earlier that there's some evidence that making sure that kids are getting enough omega-3 fatty acids can be beneficial they certainly could get those from food-based sources just look up online food-based sources of omega-3 fatty acids and epas and you'll see lists there some people choose to supplement on top of that in particular in kids that are developing very quickly I regardless of whether or not they're consuming enough epa's from food some parents choose to supplement on top of that I am personally not a fan of children taking melatonin for the reason that melatonin is already chronically elevated in kids and there's a growing body of literature that melatonin supplementation in kids can be potentially harmful I don't want to create alarm among those who've already been taking it or giving it to their kids or that gave it to their kids in the past but I do think that melatonin in particular should be approached with a lot of caution especially for kids and then of course there's the issue of whether or not all these other supplements that we've discussed whether or not kids can take them safely and again it's highly individual I would say that for the supplements that relate to hormone augmentation and support unless your physician a board-certified MD specifically recommends them I would strongly suggest avoiding intake of those things until at least after puberty and probably in to the late teens and early 20s because the body and brain are still developing and hormone systems are still active even though puberty may happen between ages you know 11 and 14 or even 15. puberty can be a long lasting event with a long taper and tail on it so you want to be cautious about augmenting hormones in young people through the use of supplementation unless a physician is working very closely with you or rather you with them and then in ages of say 22 years old 24 and older I don't see any reason

why people who are in their 50s or 60s would have any different protocols than people in their 30s and 40s except perhaps in the domain of cognitive enhancement where it might make sense again might provide it it can be done safely and with the consult of a physician it might be beneficial for people who are approaching their later years to consider increasing dosages or the variety of things and approaches that they take for cognitive enhancement because age-related cognitive decline is a reality there is no person that escapes that the question is whether or not the slope of that decline is very steep or very shallow and of course this is an opportunity for me to raise the point that I made much earlier and that I'll make over and over again because it really is the most important point to today's discussion which is that behaviors both exercise sleep making sure that your relationship to light getting sufficient sunlight early in the day and throughout the day if you can and limiting your viewing of bright artificial light in the late evening and especially between the hours of 10 pm and 4 a.m things of that sort all the do's and don'ts and of course cardiovascular exercise and resistance training exercise and maybe even flexibility training exercise topics we've covered extensively on this podcast and for which we'll soon have a special series airing with Dr Andy Galpin that gets into a lot of detail and protocol development that you can all employ all of that needs to be done at every age certainly past puberty in order to maximize cognitive function in order to maximize cardiovascular function in order to maximize focus and every aspect that we really all stand to and want to enhance when we think about supplementation so again get your sleep right do that by getting your relationship to light right get your exercise right Quality Social connection right and then of course there's that landscape of nutrition that we talked about extensively earlier and for which we have other episodes that really dive deep including that episode or I should say in particular that episode with Dr Lane Norton where we really took a full survey of the landscape of nutrition everything from protein needs vitamins minerals fiber microbiome it's a deep deep discussion with a lot of actionable takeaways if you're curious about nutrition and in particular if you're a vegan or vegetarian or carnivore based but even for the more common omnivores such as myself I found that to be an incredible Learning Journey thanks to Dr Lane Norton just so much useful knowledge in that episode if you want to learn more about nutrition the behavioral tools the nutritional tools are really going to serve as the primary two layers upon which your supplementation Protocols are going to rest and again I want to emphasize that your supplementation protocol may be zero supplements it could include no supplements whatsoever and that would be perfectly

fine provided that you're sleeping as well as you want to and need to you're able to focus and work as well as you want to and need to you're able to perform physically as well as you want to and need to and you feel that your hormones and related functions are where you want them however for most people who are doing most everything right they want to explore how they can make things like their sleep their focus

01:55:25 A Rational Supplementation Protocol

their hormone function even better and that's where supplementation makes a lot of sense and when I say it makes a lot of sense I mean it makes a lot of sense to explore in a rational and regimented way there are a couple of big themes that we've talked about a few times during today's podcast that I'd like to reiterate now because they are so crucial to developing a rational supplementation protocol the most important of which is unless we're talking about foundational nutritional support that is coverage of vitamins minerals digestive enzymes probiotics prebiotics and adaptogens we should really be focusing on single ingredient formulations foundational supplements that include all those things I just listed off all combined in One supplement are fine I simply don't see any other practical or reasonable way to get each and every one of those things through single ingredient formulations however when you want to start thinking about and actually practically exploring things like supplementation for sleep or Hormone Health or cognitive function the single ingredient formulations are going to give you the most power and control they're going to make sure that you can find the minimal effective doses that you can rule out things that are not effective for you or that may be detrimental for you in whatever fashion and it's not just about cost Effectiveness it's also about arriving at small kits or cocktails of supplements that you can really manage and work with that you're not dependent on but that you really feel can augment the various aspects of your health that are important to you so that's really what today's episode is about even though we had coverage of specific supplements and their functions in these different domains of mental and physical health and performance today's episode was really geared toward giving you resources and a framework to think about how to approach supplementation how to navigate sticking points and pain points in supplementation how to get the most out of your supplementation regimen without spending an excessive amount of money and if you don't have finances to allow for a lot of exploration of supplements how to narrow in on the most effective supplements the

most quickly and derive all the benefits that you can from them and as a final point the that is redundant with a few of the themes we talked about today but that I don't think I ever really explicitly stated is that while the word supplement makes it sound like these compounds are something just to add on top of or compensate for deficiencies in nutrition or other areas of your life many of them are actually quite potent compounds these are potent non-prescription molecules that really can move the needle in terms of your ability to think more clearly sleep better support your hormone function but as always they are just one element within an ecosystem of other factors such as your behaviors which includes do's and don'ts such as your nutrition maybe even such as prescription drugs that you also might happen to be taking or hoping to be taking less of or removing completely again that has to be done in discussion with Physicians if you're going to do it at all but the real Point here is that what we call supplements are actually a powerful gear within a larger system aimed at each and

01:58:36 Zero-Cost Support, YouTube Feedback, Spotify & Apple Reviews, Sponsors, Momentous, Social Media, Neural Network Newsletter

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