NOTICE

(I finally got around to compiling a list of the recipes people have posted to the sub, which can be found below.) This wiki hasn't been updated in a while, and some of the links are (still)

broken. Sorry about that, I'm working on it. (This wiki should be back to form in the next couple days.)

All information found here is for personal use only and is not in violation of any legal statutes. None of the information here is intended to infringe on any copyrights or patents, nor is it used to promote, market, or sell any product in any way. Please contact me with any legal questions or cease and desist threats, so that I may enjoy politely instructing you to repeatedly impale your gaping corporate sphincter upon the greasy chodes of your scuzzy, oligarch-ball-gargling lawyers. - Lily <3 (DeathMetalTransbian)

INTRO

Transitioning and aging both come with plenty of difficulties. Having regular access to efficient HRT treatment methods is a tough challenge, often requiring money, insurance, and many expensive appointments with (hopefully) open-minded doctors. Even then, not all drugs are available in every country, and local pharmacies can offer more hurdles with gatekeeping or an inability to fill certain prescriptions. Therefore, many of us simply "DIY" - purchasing the medications from abroad, through somewhat questionable means. This is often insufficient, as meds can sometimes be seized at the border or delayed in shipping, and the quality controls of medications done outside the traditional pharmaceutical system are uncertain. The current online marketplaces for HRT have proven to be relatively reliable most of the time, but the level of trust is naturally higher for what someone can do and verify for themself at home, and making homemade goods means never having to deal with waiting times again. During the pandemic, many of us DIYers were affected by shipping delays and business shutdowns, so we decided to start doing things differently, by "seizing the means of production" in our own specific way.

Therefore, on r/estrogel we talk about homebrewing HRT gel and spray for both feminizing and masculinizing effects - because we feel that HRT should be easy to obtain for everyone who needs it, and we don't want to take risks with ingesting possible hazards through pills, or even worse, injections that may not be completely sterile and could place harmful contaminants or viruses inside of your body. Your skin is the best barrier against infections and a lot of chemicals, so why not use it? Safety and simplicity are our top concerns, so we study existing patents, and try to devise better, simpler, and cheaper generics of existing drug. This is "guerrilla science". Our goal is simple: HRT should cost less than $1 USD per month, all inclusive, to be accessible to even the poorest among us. This means everyone without or unable to afford health insurance, those without regular access to healthcare, or those stuck in remote or less fortunate areas of the world.

We do not make money out of our research. We do not sell anything. We just share with you the recipes to reproduce medications and the sources for where we found the information to do so. The information is all free to use and share. Think of it as cooking: we tell you how you can make an apple pie, at home, by yourself. We discuss how to make your pie better, and

cheaper than the pie you can buy at the supermarket. We tell you all about the risks of the various ingredients, and which ones you can decide to omit. We compare the original recipe published in your grandma's cookbook with the latest research by food scientists. Except you're on your own to get the most important part, the apples, and this isn't an apple pie you're making :) And yes, it's your own responsibility to wear safety equipment and ensure that you properly measure and mix the ingredients (ideally with a precision digital scale and a magnetic stirrer, but you could resort to something as cheap and simple as a $3 milk frother), and to store them properly in safe, sterile, air-tight containers, protected from UV light, oxidation, or swings in heat and humidity. We are not responsible for anyone's actions, and you should always do your best to verify everything with external sources and consider your own safety before using any of the information found here. Estrogens and progestogens are not considered controlled narcotics in most countries (*testosterone and other compounds are, however*), but manufacturing your own medication, even just for personal use, may or may not be legal where you live, so please consider your local guidelines and use caution. Never do something if you are not comfortable with the risks that you are taking, and always try to minimize those risks.

At the moment, we are continuing to explore and compare various "plans" inspired by commercially available medications. We want to replicate them, and improve them to reach our goal. We talk about ways to verify the purity and the safety of the compounds before use, how to find supplies at the lowest costs, and how to make existing formulas more powerful and effective. We are already very close to breaking the psychological price barrier of $1 USD per month for feminizing HRT - with one of our recipes for an estradiol spray (plan C), you can make enough estradiol solution to last you about 7 years for about $90 USD with an easily obtainable vodka base that already contains the optimal 60% ethanol mix for skin absorption.

We believe the best currently-available feminizing recipe (the spray listed above), which has been reverse-engineered from a product that's been in use since the 1970s, can be further improved using a recently-patented fatty acid mix that will further improve absorption by a factor of 28x, therefore further reducing the costs exponentially. With a decrease in costs by yet another order of magnitude, this could help us reach costs below the psychological barrier of $1 USD per year! This is extremely important in many parts of the world, where access to these sorts of treatments can be nearly impossible due to the financial constraints of crippling poverty in third world economies.

We care about ALL people (all of our transgender and non-conforming siblings, post-menopausal women, men with low-T, and all others who can benefit from this research), and we want everyone to have access to the help they need. If you can share information that could improve others' lives at any point, please do so! And, if this is also who you are, especially if you're educated in the fields of chemistry, biology, or pharmacology, please join our collective at r/estrogel to help!

As time goes on, we'll try to keep all of the information here in this wiki comprehensive and up to date. Please let one of the mods know if there's anything you'd like to see added, or if you find any errors, miscalculations, or incomplete formulas (specifically, you can message the group moderators directly at any time, but please be patient with this constant work in progress), and we hope that you find this amalgamation of research data and recipes to be very helpful! <3

SAFETY AND PURITY TESTING

We'd like to offer you another reminder to always wear safety equipment (especially gloves) when handling any of the substances mentioned in these formulas, and to store them properly in safe, sterile, air-tight containers, protected from UV light, oxidation, or swings in heat and humidity. We are not responsible for anyone's actions, and you should always do your best to verify everything with external sources and consider your own safety before using any of the information found here. Estrogens and progestogens are not considered controlled narcotics in most countries (testosterone and other compounds are, however), but manufacturing your own medication, even just for personal use, may or may not be legal where you live, so please consider your local guidelines and use caution. Never do something if you are not comfortable with the risks that you are taking, and always try to minimize those risks. Also, consider the possible risks of transferring these chemicals to others through physical contact, and do your best to use these formulas in the safest manner possible, both for you and the people around you. Safety first!

Please check any ingredients that you plan to use for "denaturing agents," such as methanol or pyridine, which are poisonous if ingested. Such toxins can be very harmful through any route of ingestion - oral, transdermal, or otherwise. Only use a gel sanitizer base if it contains pure ethanol or isopropyl alcohol, and only use liquid alcohols that are specifically meant to be ingested by humans or used on human skin, such as everclear or pure isopropanol that does not contain any added denaturing or bittering agents.

It is always in your best interest to know what you're putting into your body. When manufacturing medications, we recommend that you have individual ingredients tested for purity. Again, SAFETY FIRST!!!

You can view our full medical and legal disclaimer here.

Methods for testing at home

We are currently trying to evaluate different methods of chromatography to find if there is an easy way to test samples for purity and contaminants in a home environment. So far, we are looking into the possibilities of using either high-performance liquid chromatography (HPLC) or thin layer chromatography (TLC), which could possibly be performed with just a camera, an

arduino, and a UV LED. It is not yet clear if other options may work, such as paper chromatography or fluorometry.

If you're looking for information on how blood serum level tests are performed or how to interpret the results of such tests, you can find resources detailing tests for estrogens here and testosterone here.

Labs for testing

These are independent laboratories that are capable of testing samples for purity and contaminants. They are in no way affiliated with or endorsed by this subreddit, but we do encourage you to try to be as safe as possible, which includes researching the reputation of each laboratory before relying on their results. You might also consider speaking with individuals in the chemistry department at your local university who could have access to proper testing equipment.

> Energy Control
> Janoshik Analytical

DOSAGE EQUIVALENCIES

The values listed herein are approximated equivalencies, compiled and deduced from several sources, and presented relative to cis-AGAB hormone levels. These values are estimations and should not be considered as gospel, nor as a replacement for dosages prescribed by a physician. Always try your hardest to monitor the amounts of each medication that you might be putting into your body, and pay close attention to the effects that your dosage levels yield, preferably with quantitative values based on lab results whenever possible. Remember to always start slow and safe with any new medication, and to discontinue use or seek medical help if you are feeling any negative effects.

Estradiol

This table is derived and extrapolated from data based on treatment of cisgender females experiencing hormonal deficiencies. For transgender women, higher doses may be needed to increase overall concentration to desired levels and should be considered situationally. For transdermal applications, total volume used per dose will be dependent on the concentration of estradiol in the solution.

note: When preparing transdermal or sublingual applications, it is best to use plain 17 beta-estradiol powder (CAS 50-28-2). Do not use estradiol valerate, estradiol cypionate, or any other estradiol ester, as they do not absorb through the skin properly.

Method	Initial Dose	Low Dose	Moderate Dose	High Dose	Extreme Dose
vaginal estradiol ring (Estring)	0.05 mg	0.01 mg	0.02 mg	0.04 mg	0.08 mg
oral conjugated equine estrogens (Premarin)	0.3 mg	0.625 mg	1.25 mg	2.5 mg	5 mg
oral esterified estrogen (Menest, Estratab)	0.3 mg	0.625 mg	1.25 mg	2.5 mg	5 mg
oral micronized estradiol (Estrace)	0.5 mg	1 mg	2 mg	4 mg	8 mg
oral estradiol valerate (Progynova)	0.75 mg	1.5 mg	3 mg	6 mg	12 mg
oral estropipate (Ogen, Ortho-Est, Harmogen)	0.625 mg	1.25 mg	2.5 mg	5 mg	10 mg
oral ethinyl estradiol (Levonorgestrel)	0.01 mg	0.02 mg	0.04 mg	0.08 mg	0.16 mg
oral multiestrogen tablets (BiEst, TriEst)	1.25 mg	2.5 mg	5 mg	8 mg	16 mg
buccal/sublingual micronized estradiol (Estrace)	0.25 mg	0.5 mg	1 mg	2 mg	4 mg
buccal/sublingual estradiol valerate (Progynova)	0.4 mg	0.75 mg	1.5 mg	3 mg	6 mg
transdermal estradiol patch (Estraderm)	0.014 mg	0.025 mg	0.05 mg	0.1 mg	0.2 mg
transdermal estradiol spray (Evamist, Lenzetto)	1.53 mg	4.59 mg	14 mg	41 mg	124 mg
transdermal estradiol gel (EstroGel)	0.25 mg	0.5 mg	1 mg	2 mg	4 mg
transdermal estradiol emulsion (Estrabsorb)	8.6 mg	17.2 mg	35 mg	70 mg	140 mg

More information about how the various transdermal delivery methods work can be found in this article.

Progesterone

Method	Dosage Equivalency
medroxyprogesterone acetate (Provera)	5 mg
micronized progesterone (Prometrium)	200 mg
norethindron acetate (Aygestin)	5 mg
norethindrone (Micronor)	.7 mg
progesterone gel (Prochieve 4%)	every other day for 12 days (delivers 45 mg of progesterone per application)

USER RECIPES

Estradiol gel

DeathMetalTransbian text + video, store-brand enhancement text

UseApasswordManager text + pictures, more text

hrthrthrthrthrthrt text + pictures, text only

EstradiolSister text, more text

GC146 text

torsby text

anotherhuman101 text

LeleBeatz text

diyhrtstuff text

ombena text

caissonposting secret finds text, Acheronta*Movebo* breakdown text

ethel855 Chinese text

deleted user text

NBAntigone phytoestrogen text

DHT gel

darthemofan text

RESEARCH PLANS

Feminizing treatments

Gels, sprays, tinctures, emulsions, and every other treatment method under the sun - we're taking them all on, trying to find better ways to make them all cheaply and safely at home, whether they're based around estradiol, estriol, or progesterone. If you want female hormones, but you don't want pills or pokes, this is the section for you!

note: When preparing transdermal or sublingual applications, it is best to use plain 17 beta-estradiol powder (CAS 50-28-2). Do not use estradiol valerate, estradiol cypionate, or any other estradiol ester, as they do not absorb through the skin properly.

A - Basic hand sanitizer estradiol gel

Since several gels seem to be comprised of 60% ethanol, carbomer, and trolamine as pH stabilizer, it should be possible to just add some estradiol and maybe a penetration enhancer in a base of Purell, however the use of denaturing agent could be a problem. More research is needed to find if the estradiol precipitates from this solution, but it is expected to remain shelf-stable indefinitely.

A regular-strength estradiol gel (0.06%) could be a simple as mixing 0.06 g (60 mg) of estradiol into 100 ml of 60% ethanol hand sanitizer gel. Dissolving the estradiol powder in a couple ml of ethanol before combining with the hand sanitizer could aid in mixing the solution evenly while bringing the overall ethanol content closer to 63%, which optimizes absorbency. For a double-strength estradiol gel (0.12%), instead use 0.12 g of estradiol (preferably dissolved with a couple ml of ethanol) in 100 ml of hand sanitizer gel.

B - Experimental supersaturated estradiol gel

We are trying to understand a patent that use an acid/ester mix to drive the hormones into the dermis, with more ester allowing for a longer half life, meaning a longer release, with a smaller volume, meaning it would be faster and easier to apply. This is HIGHLY EXPERIMENTAL. We haven't mixed anything yet, we are currently trying to understand how it works. Please help us if you can.

https://www.reddit.com/r/estrogel/comments/g7j8i0/plan_b_supersaturation_with_polyethylene_glycol/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/g5stm0/thickener_or_using_an_existing_base/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/g7m1nc/patent_with_formula_for_conventional_006_estrogel/

https://www.reddit.com/r/estrogel/comments/gn5pyu/plan_b_addendum_a_teg_base_with_glycol_monomethyl/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/gua29g/data_for_blood_levels_achievable_by_high_dose_gels/?utm_source=share&utm_medium=web2x

C - Basic estradiol spray

Another transdermal estradiol administration method that should be easy to replicate is the "Lenzetto" spray that is commonly used in Europe. Although it may require more effort to ensure consistent doses (as spray bottles are not always perfect and can get air trapped in the dispensation tube), the recipe should be exceedingly easy to replicate, and could even be produced to have higher concentrations or remove the penetration enhancers. So far, the simplest formula lacks penetration enhancers, but should still produce several years worth of usable HRT spray (or tincture) by simply adding 7.5 g of estradiol powder to a 750 ml bottle of 120 proof Everclear or Vodka (63% ethanol appears to result in the best absorption, so 60%

alcohol should work just fine). For improved absorption, one could add a penetration enhancer, such as the commonly-used octisalate, which has proven effective in commercial products. A replication of the currently-marketed 1.53 mg/dose transdermal spray would include 1.7% estradiol and 8.5% octisalate, dissolved in ethanol (the other 89.8% of the mixture). The amount of octisalate used in commercial products is approximately 5-times the amount of estradiol used, so we will be developing formulas based on that 5:1 ratio. For 100 ml of a spray with a pretty typical concentration, similar to what is sold in pharmacies (approximately 1.53 mg of estradiol per dose), combine and mix the following:

estradiol: 1.7 g
octisalate: 8.5 g
ethanol: 89.8 ml

It should be noted that estradiol sprays do not deliver a linear increase in blood serum levels of estradiol, as additional sprays to the same location have diminishing results. It should, however, be possible to circumvent the diminishing returns of additional sprays by changing the location of administration or by increasing the concentration of the spray, as a single ml of ethanol can theoretically dissolve up to 20 mg of estradiol. For 100 ml of a double-strength spray (containing approximately 3%, or 3 mg of estradiol per dose), combine and mix about twice as much of each powder into slightly less ethanol as follows:

estradiol: 3 g
octisalate: 15 g
ethanol: 82 ml

This double-strength spray is completely experimental, and the dosage efficacy has not yet been tested. The formula should not be harmful in any facet, but please proceed with caution.

Alternatively, adding estradiol and octisalate to perfume spray would be a suitable way to make a wonderful smelling transdermal application. The perfume could even stand to be watered down a bit, as most perfumes are about 80% alcohol and the best absorption rate is closer to 63%.

D - Generic estradiol gel from scratch

We have found that it should be very easy to make a generic version of the currently marketed estradiol gel that is known to be safe and effective. Based on patent US7404965, it appears that the original formula for commercial transdermal gels at regular strength (0.06%) is fairly simple:

estradiol 0.06%
lauryl alcohol 2.00%
diethylene glycol mono ethyl ether (Transcutol P) 5.00%
propylene glycol 6.00%
ethyl alcohol 44.57%

distilled water 39.55%
Carbomer (Carbopol 980 NF) 1.21%
triethanolamine 0.35%
disodium EDTA 0.06%

The patent notes that estradiol can be up to a 3.00% concentration in this formula. However, we can make a comparable formula much easier, with fewer ingredients, and it should still be able to deliver estradiol well at the same concentration levels. The formula below is for a very simple double-strength gel (0.12%).

For 100 grams of estradiol gel at 0.12%, dissolve these in order, making sure you have the correct amount of each first:

17 beta-estradiol (active principle): 0.12 g
ethanol (lower alcohol, could also be isopropanol): 59 ml (60% alcohol seems to have the best absorption tendencies)
add purified water: 38.53 ml (or enough to bring overall formula to 100 ml after adding final ingredients)
carbomer 980 (thickener or gelling agent, could also be carboxymethylcellulose or another polyacrylic acid like 934P or maybe even sepimax zen, with some adaptation of the recipe): 1 g
triethanolamine (neutralizing agent for the carbomer): 1.35 g

This stripped-down formula was derived from information found on page 39, line 171 of this patent, as is similar to the US product Estreva 0.1%, and from line 261 of this other patent, which is similar to the UK product EstroGel 0.06% (but the above recipe would have twice the concentration of estradiol, therefore needing half of the volume to deliver the same dose).

E - Experimental emulsions for estradiol, estriol, progesterone, or spironolactone

An emulsion may be a suitable method of administration for progesterone and estriol, or even for administering estradiol or spironolactone. More research on this topic is needed, but here are two of the formulas that have been used commercially for spironolactone administration, as described by their manufacturers:

> "Spironolactone-loaded nanostructured lipid carriers (SL-NLCs) were prepared by an emulsion solvent diffusion and evaporation method followed by ultrasonication, as reported by Eskandari et al10 but with slight modification. Fifty milligrams of SL was dispersed in the liquid lipid (olive oil alone or containing 50% Transcutol®) then added to molten Compritol® at 5% or 15% levels with respect to total solid lipid in the formulation. Following that, 10 mL of acetone and ethanol mixture (1:1) was added to the lipids maintained in a water bath at 80°C until complete dissolution of lipids in the organic phase. The latter was dispersed in an aqueous solution containing Tween 80 (1% or 2%) at 80°C and mixed using a magnetic stirrer rotating at 1,000 rpm for 1 minute. The resulting pre-emulsion was then ultrasonicated for 3 minutes to produce an oil/water nanoemulsion that was cooled

> down at room temperature while stirring at 500 rpm until evaporation of the organic solvent to form SL-NLC dispersion."

And:

> "Plain methylcellulose (MC) gel (1%, w/v) was prepared by gently dispersing the required amount of MC in 100 mL of boiling deionized water, followed by magnetic stirring at a high speed. Stirring was continued until a thin, lump-free hazy dispersion was obtained. The gel was left overnight in the refrigerator. To prepare SP LeciPlex-loaded gel, a given weight of the LeciPlex F1 pellet obtained after centrifugation of the LeciPlex dispersion was mixed with a given weight of MC plain gel (1%, w/v). Control SP gel was prepared by adding a given weight of SP to 100 mL of boiling deionized water, followed by the addition of the required MC weight, and the rest of the process was the same as the plain gel. SP concentration in all of the preparations was 1%, w/v."

F - Experimental estriol hydrogel (for vaginal use)

Estriol has been shown to have some rejuvenative properties, due to a change in the collagen and elastin content of the skin. This principle has been used by some to rejuvenate the appearance of the skin on their hands and face, and the same principle could theoretically be used to lessen scarring and aid in dilation of the neovagina after sexual reassignment surgery. Because alcohol should not be used inside of the vagina, we are exploring the possibility of using cyclodextrins or hypromellose to create a hydrogel that would release biologically active compounds through intravaginal application. Research on this topic is scarce.

FU - Experimental estradiol tincture (estro-booze)

Given that estradiol absorbs into the body at similar dosage rates with transdermal gels as it does through sublingual or buccal administration, it should be fairly simple to concoct an estradiol tincture that could be administered either sublingually or transdermally. By adding 7.5 g of estradiol to a 750 ml bottle of either 120 proof everclear or 80 proof vodka (60% alcohol is optimal for absorption, but 40% should still be plenty effective while limiting any burning sensations), you get a 10 mg/ml solution (1% estradiol), and only a few drops would be needed for each dose. The solution would be safe to consume while greatly diminishing the risk of others being inadvertently contacted by the dose, and octisalate could be used to further increase the speed and effectiveness of absorption when applied on the skin, while penetration enhancers appear to be completely unnecessary during sublingual or buccal administration. Please remember to always mark your medications clearly, especially when they could appear to others to be a fun alcoholic cocktail, as unintended consumption or extreme doses could cause health complications! *Do NOT use rubbing alcohol or anything else that could be toxic!*

Alternatively, a sublingual microemulsion could be created with a base of propylene glycol for those who cannot or choose not to use alcoholic drinks or who wish to experiment with extreme potencies.

G - Experimental enhanced-penetration estrogels

https://www.reddit.com/r/estrogel/comments/gpy1sw/plan_g_a_gel_using_carbopol_940_and_isopropyl/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/g5svfj/penetration_enhancer_which_and_how_much/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/gt3tir/the_basics_of_absorptions_suggest_a_plan_b3_a/?utm_source=share&utm_medium=web2x

H - Experimental enhanced-penetration recipes from the steroid community

For decades, there has been an international community of steroid users that have gradually refined a transdermal formula that may suit our purposes. They have crafted this recipe largely through trial and error over a long time (from an initial time-tested recipe of 60% isopropyl alcohol, 30% isopropyl miristrate, and 10% oleic acid), and many people have contributed to tweaking the formula:

40% isopropyl alcohol or ethanol (99%)
15% isopropyl miristrate
15% isopropyl palmitate
10% oleic acid
10% propylene glycol
10% DMSO

If you want to make this into a gel solution instead of a spray, first combine carbomer with the isopropyl miristrate and some d-Limonene, then let the mixture sit for at least 15 minutes to minimize clumping in the full solution. You may need to add more d-Limonene later in the process to prevent stratification of the final product. The pH range should be maintained at 7.0-7.4 and should be checked by accurate means. It should also be noted that DMSO carries certain potential health risks, so please exercise caution. If you'd like to avoid using DMSO, there is another recipe floating around:

50% isopropyl alcohol or ethanol (99%)
25% isopropyl miristrate
10% oleic acid
10% propylene glycol
5% glycerol

The Glycerol seems superfluous, and may be a placeholder for the DMSO, as the 10% PG would already make the solution greasy enough to perform like a moisturizer.

Merged plans B, G, and H - Ultimate experimental estrogel

https://www.reddit.com/r/estrogel/comments/guy2hq/state_of_the_research_a_detailed_plan_b_from_the/

https://www.reddit.com/r/estrogel/comments/g7yvn3/adding_an_antioxydant_agent_to_prevent_e2e1/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/gvmif7/a_tutorial_explaining_how_to_prepare_carbomer_gels/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/hb8bwv/revision_of_the_plan_b_family_ex_ghb3_into_2/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/hbodqf/thickening_microemulsions_with_carbomers/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/hcee1f/making_microemulsions_the_pokemon_problem_of/?utm_source=share&utm_medium=web2x

https://www.reddit.com/r/estrogel/comments/hsy4f2/finished_the_preparations_for_my_own_e_gel/?utm_source=share&utm_medium=web2x

I - Progesterone spray

https://www.reddit.com/r/estrogel/comments/hb2wv2/for_progesterone_plan_i_spray_with_pg_j_cream/?utm_source=share&utm_medium=web2x

J - Progesterone cream

https://www.reddit.com/r/estrogel/comments/hb2wv2/for_progesterone_plan_i_spray_with_pg_j_cream/?utm_source=share&utm_medium=web2x

K - Progesterone microemulsion

https://www.reddit.com/r/estrogel/comments/hcamu3/plan_k_progesterone_in_a_ipm_microemulsion/?utm_source=share&utm_medium=web2x

Further experimentation - Application sites, "stop-and-go" method, and different topical uses

Theoretically, a lot of the research done for the various transdermal products that are discussed in this subreddit could be expanded to use in other, non-hormone related serums and creams for the application of many different health or cosmetic compounds, like B, C, and E vitamins, topical painkiller creams, or even complex anti-aging creams. There is research ongoing into the possible formulation of a topical serum that may have effects to reduce the size of sebaceous glands, which could minimize both sebum production and the appearance of facial pores. It appears that triethanolamine, which is used in many formulas as a neutralizing agent for the various necessary carbomers, can be useful for cleansing

sebaceous follicles and helping to prevent acne. These theories are based in fairly old research, but these avenues have not been properly explored until now.

We are also experimenting with different uses, application sites, and timing of doses, and their efficacies relative to current commonly prescribed practices. It appears that the currently prescribed application sites for transdermal estradiol were chosen based more on minimizing cancer risk than on effectiveness of absorbtion. It is hypothesized, therefore, that transgender women with a substantially lower risk of developing breast cancer could theoretically apply estradiol solutions directly to the breasts to stimulate growth, though this idea is widely disputed. It has also been proposed that, for women who have experienced minimal or stalled growth after significant time on HRT, cycling off and back on to HRT medications might be able to re-engage growth production better than simply increasing dosage, based on theories about receptor desensitization, dosage derivatives, and growth retention. We are also examining the effects of added growth hormone secretagogues relative to various estradiol administration methods, as it appears that oral estradiol has a negative overall effect on IGF-1, while other administration routes like transdermal or sublingual could possibly have better results, potentially depending on timing or cycling of the secretagogue doses. This particular subject is still vastly under-researched and highly controversial, as it is still unknown what exact combination of biological mechanisms may be responsible for starting, stopping, and maintaining breast growth. It is hypothesized that TGF-beta may have a negative role in regards to both breast growth and the appearance of aging, so TGF-beta inhibitors could potentially improve results in both categories. Additionally, some folks are looking into how best to combine estradiol with a topical hair-growth formula to reverse male-pattern baldness, or how to do so with only an estradiol gel.

Also on the horizon, is the possibility of reverse-engineering transdermal hormone patches, for those who may be interested in making their own, or the potential for microemulsions which could affect the redistribution of subcutaneous and visceral fat or even facial fat through a topical application. Some of the ingredients that may lead to the fat redistribution effects carry significant health dangers and possible medical complications, however, and these formulations should not be used without a full understanding of the risks involved in utilizing such substances which could be hazardous.

Masculinizing treatments

FTMs can substitute testosterone or DHT for estradiol in some of the above formulas, but they need to add a penetration enhancer, such as a small amount of isopropyl myristate.

Please also check this patent for dihydrotestosterone gel if you need more details about how andractim is made, be sure to read from line 47 explaining how to make a 70kg batch and adjust the volumes depending on how much you want to make.

We are looking at 2 alternative plans for both more concentration (plan Z) and for a spray (plan Y).

Z - Experimental supersaturated DHT gel

There is a concept for a low-alcohol DHT gel that could be applied to the face and groin to stimulate growth of facial hair and genitalia. It appears that genital skin may absorb such formulas more effectively than the skin on the forearm. This is very experimental, as there has been very little research in this field, however, a possible formula could be a simple as combining the following in order, stirring in each ingredient and mixing completely after adding each one:

> DHT: desired concentration
> water: 90%
> propylene glycol (co-solvent): 5%
> oleic acid: 2%
> ethyl oleate (fatty acid ester): 2%
> carbomer 934 (gelling agent): 1% or as needed for desired consistency
> remember to stir in each ingredient and to mix the solution completely each time something else is added

Y - DHT spray

It should be relatively easy to create a spray to release DHT by following the following formula to create 70 grams of spray:

> ethanol 95%: 49 g
> isopropyl myristate: 0.5 g
> DHT: 0.5 g
> mix well before adding water
> water: 20 g, mixed in last to complete the solution

Another possible formula for a testosterone spray could be created by mixing appropriate ratios of testosterone (50mg/ml), methyl-testosterone (10mg/ml), and DMSO into a solvent base, such as ethanol.

X - Topical DHT for hair growth

A patent was uncovered that highlights the potential for a topical application of DHT to promote the growth of facial and body hair.

> (DHT could be) used alone or in fixed combination with other hair growth medications, including other androgens, bimatoprost, other prostamides, prostaglandins, minoxidil or apocrine hair growth factors to promote and enhance hair growth of terminal mustache hair, beard hair, also chest hair, and other male androgen sensitive or dependent hair growth in humans or animals.

Hormone Suppressants

1 - Experimental tamoxifen gel

There is research showing that transdermal application of tamoxifen is significantly safer than oral consumption, while still maintaining efficacy. More research needs to be done, and much caution should be used, as tamoxifen carries potential risks.

DeathMetalTransbian text + video

The recipe I ended up using:

1000g of 0.2% estradiol gel (1mg estrogen per 0.5g dose of gel) -

2g raw estradiol powder (CAS 50-28-2)

98g orange oil (d-limonene is a good penetration enhancer)

100g propylene glycol (solvent and penetration enhancer)

800g hand sanitizer (solvent and gel base)

(edit: if you are allergic to d-limonene, a different penetration enhancer should be used)

store-brand enhancement text

I don't have the expertise to make my own gel

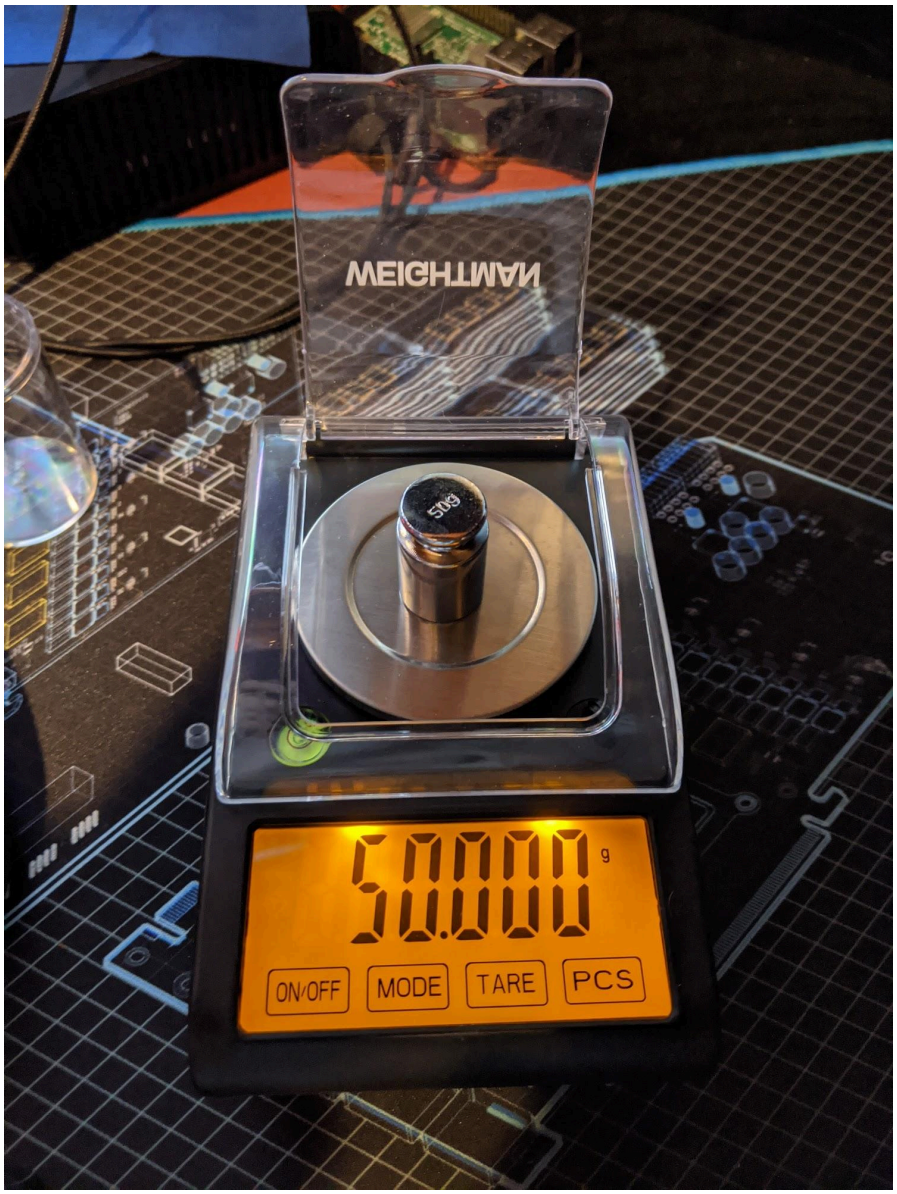
It's really not too difficult. If you have a half-decent scale, it's pretty easy to get ahold of the requisite materials and mix them together to get something more effective. I've posted a video about how to make gel with only 4 basic ingredients, in case you need a visual example, and there are several other recipes around here with simple ingredients and directions. Don't doubt yourself, you can do it!

As for modifying existing .06%, my recommendations would be adding appropriate amounts of a penetration enhancer and extra E powder to raise effectiveness in both departments. I can help you out with the ratio math on that if you'd like.

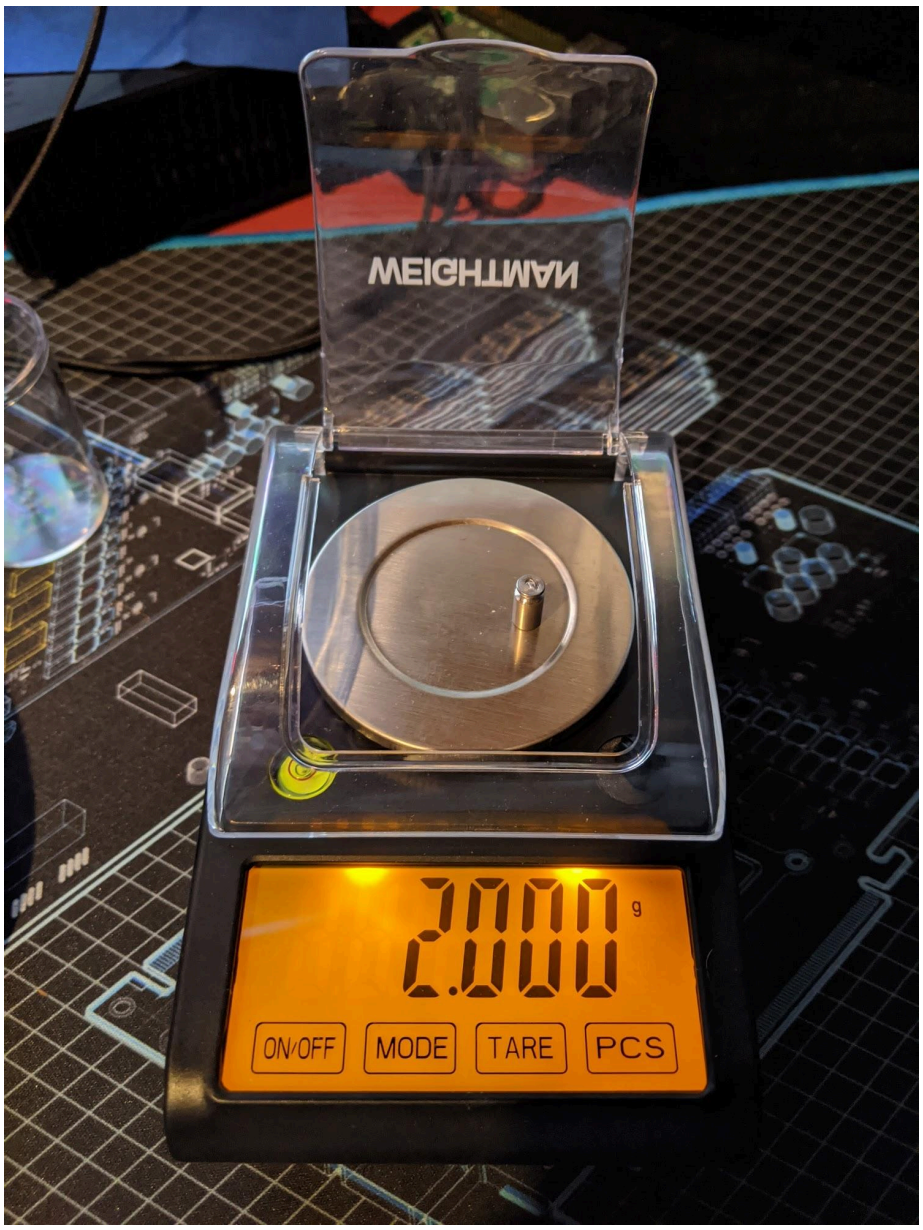
UseApasswordManager text + pictures

https://imgur.com/a/Tn6XIxa
I made an illustrated step by step guide for plan A from the wiki, as I was making mine

Here's the link to the excel sheet



First step is to calibrate + verify your scale. Mine calibrates to a 50g weight

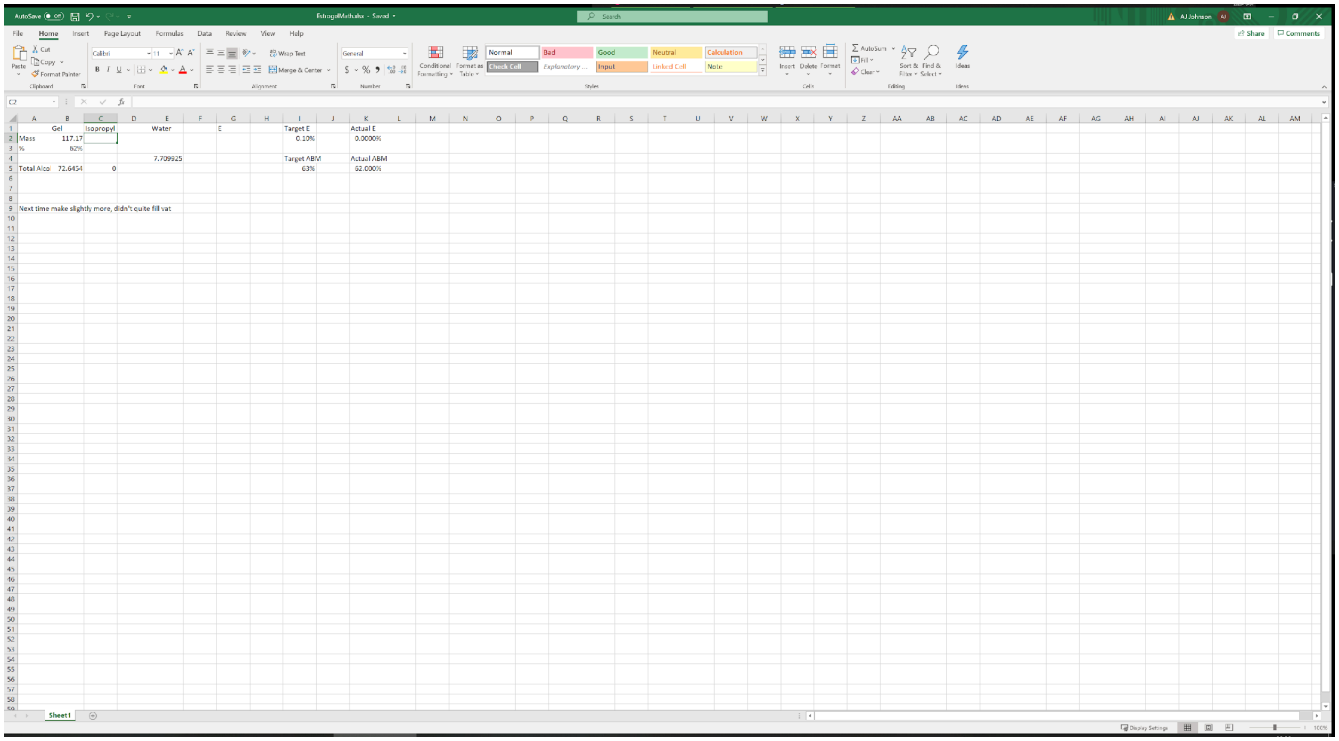


I then verified it with a couple smaller weights. Occasionally I've seen scales that are inaccurate at low masses even when calibrated correctly at higher ones


WEIGHTMAN
1.000
g
ON/OFF
MODE
TARE
PCS

First ingredient today is our hand sanitizer base. I am aiming for 120-130g, which was put in the blue bottle

This took multiple fills of my measurement cup To get an accurate measure, you have to subtract whatever doesn't get poured into your container (blue waterbottle in this case). The most efficient way I've found it to do: fill 1 weight + fill 2 weight + fill 3 weight ... - final weight (pictured), without cleaning out the cup between fills.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1		Gel	Isopropyl		Water		E		Target E		Actual E																											
2	Mass	117.17							0.10%		0.0000%																											
3	%	82%																																				
4					7.709925				Target ABV		Actual ABV																											
5	Total Alco	72.6454	0						63%		62.000%																											
6																																						
7																																						
8																																						
9	Next time make slightly more, didn't quite fill vat																																					
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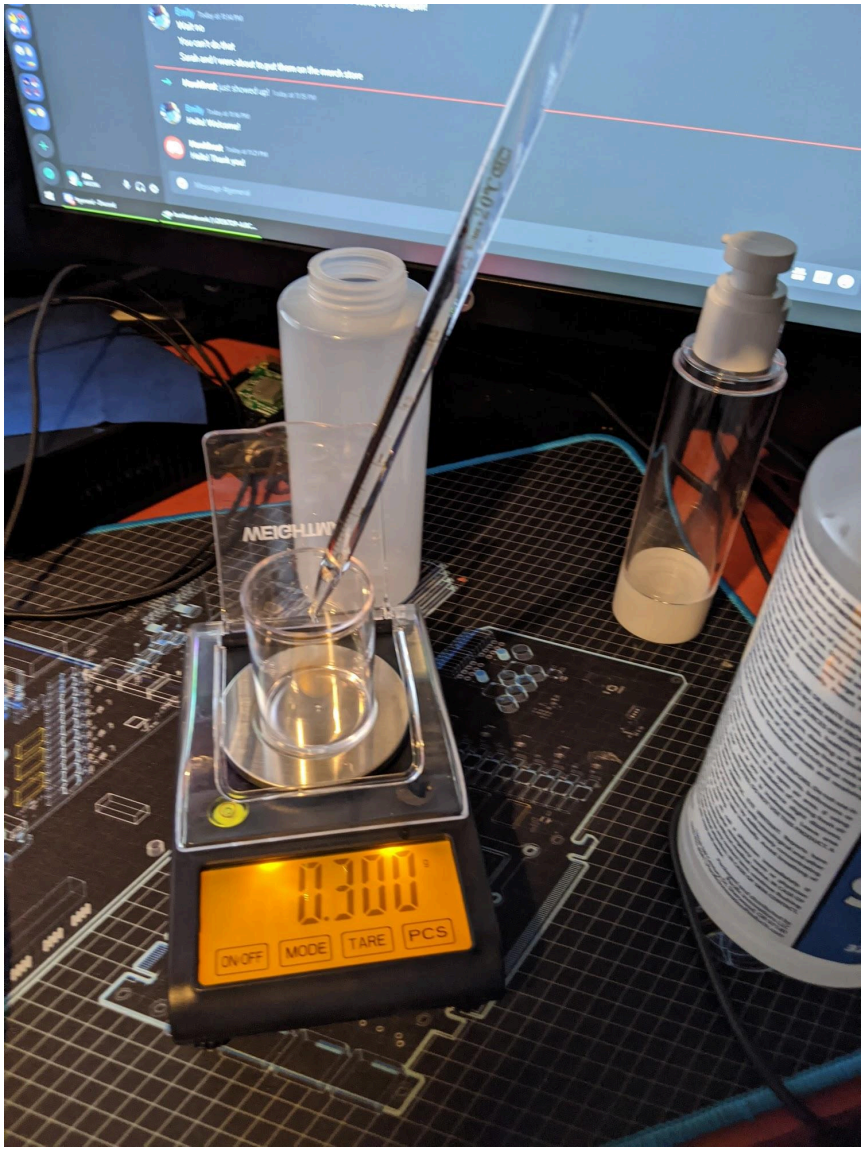
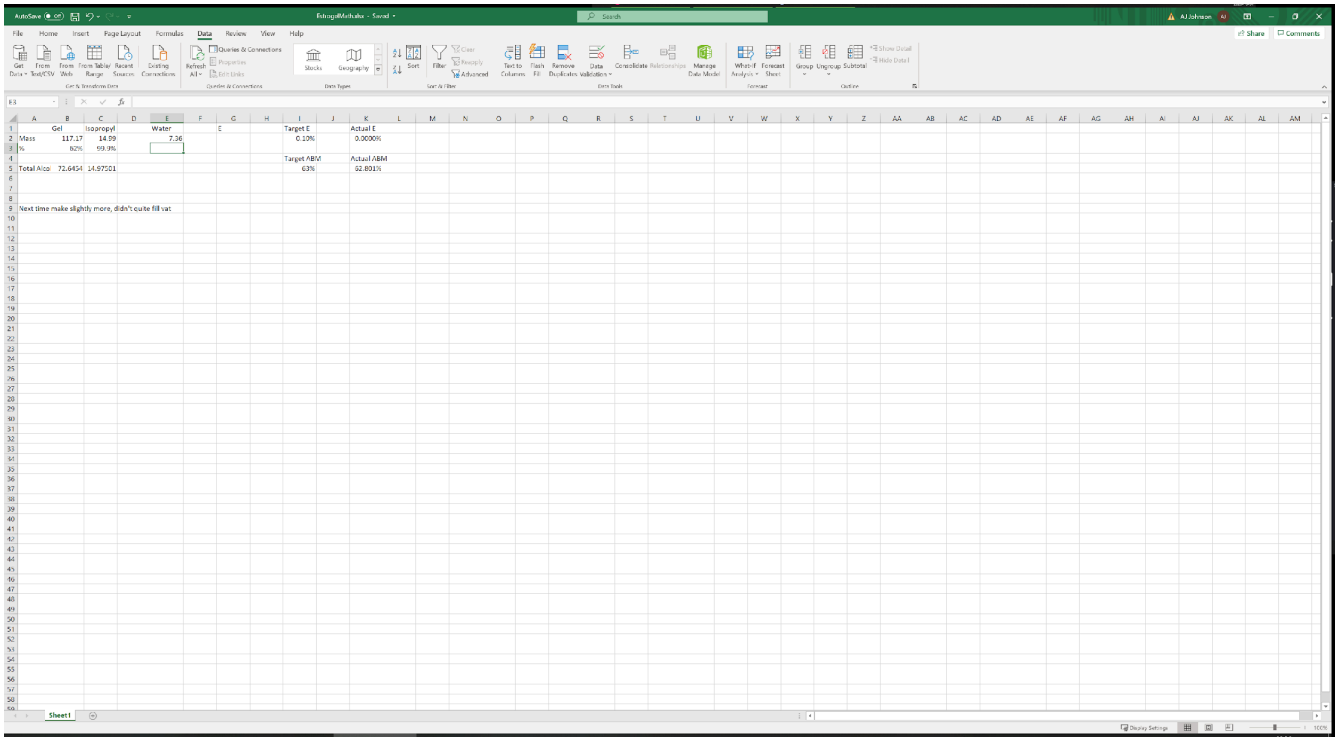
Sheet1

To keep track of my measurements, I used an excel sheet (linked in the post). It has the duel role of keeping notes and doing the math for me



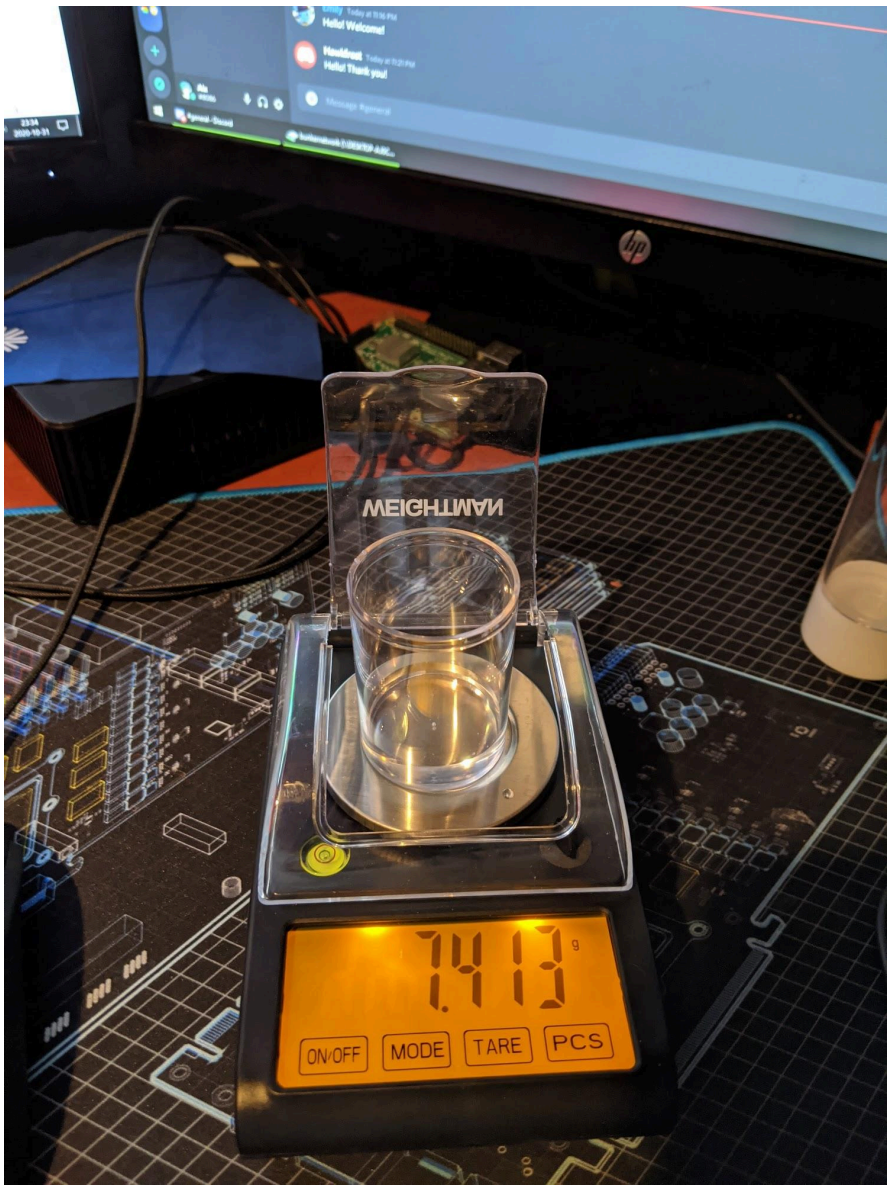
Next up is the isopropyl alcohol. I used a pipet to transfer it, but still measured using the scale; I find it's easier to do everything by weight. I was aiming for ~15g, I've found that's enough to dissolve the E and is convenient for working with

Pour it into a second container, and remember to weigh you cup before & after for an accurate measurement

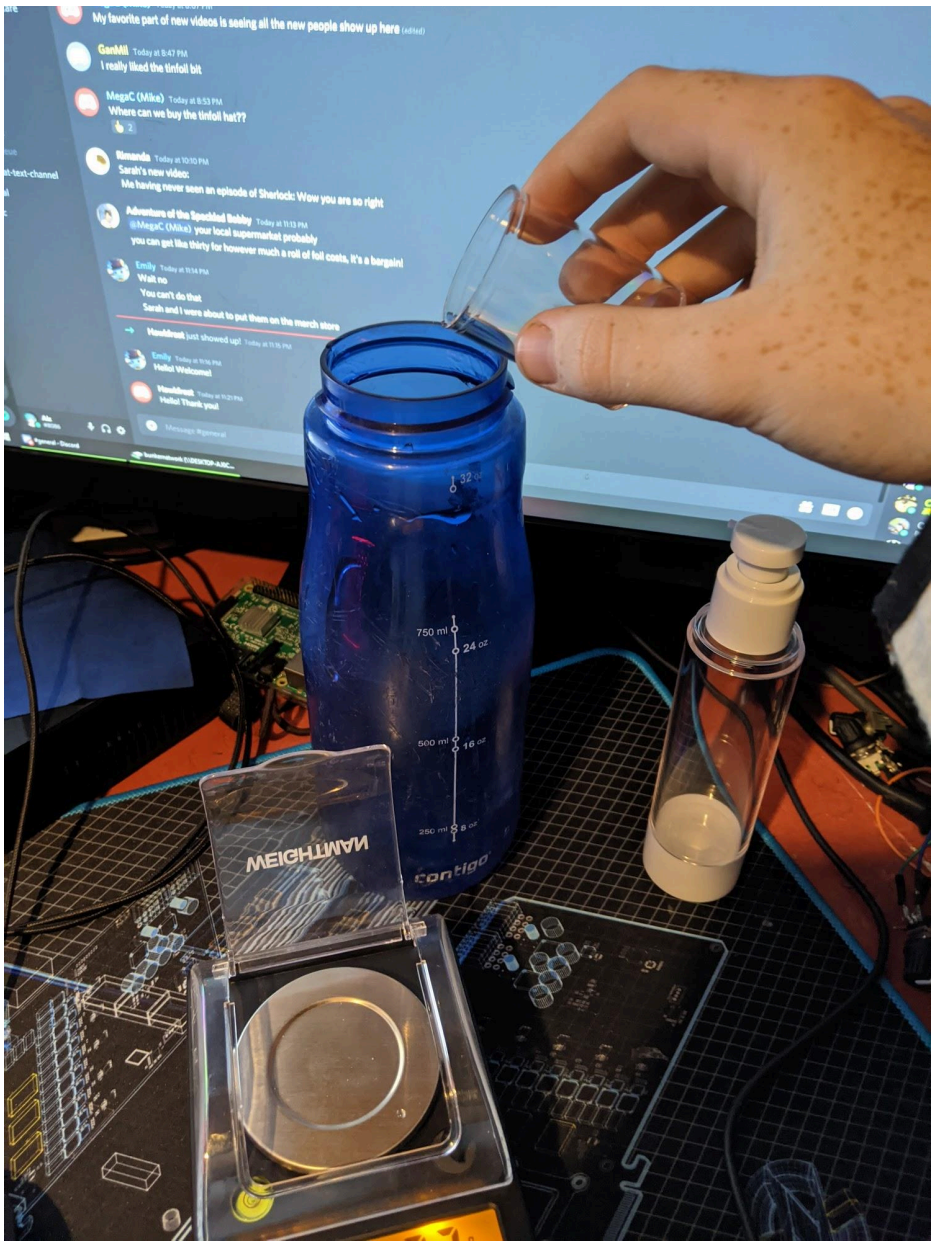


	A	B	C	D	E	F	G	H	I	J	K
1		Gel	Isopropyl		Water		E		Target E		Actual E
2	Mass	117.17	14.99		7.36				0.19%		0.0000%
3	%	82%	99.9%								
4									Target ABV		Actual ABV
5	Total Alco	72.6454	14.97501						63%		62.891%
6											
7											
8											
9	Next time make slightly more, didn't quite fill vat										

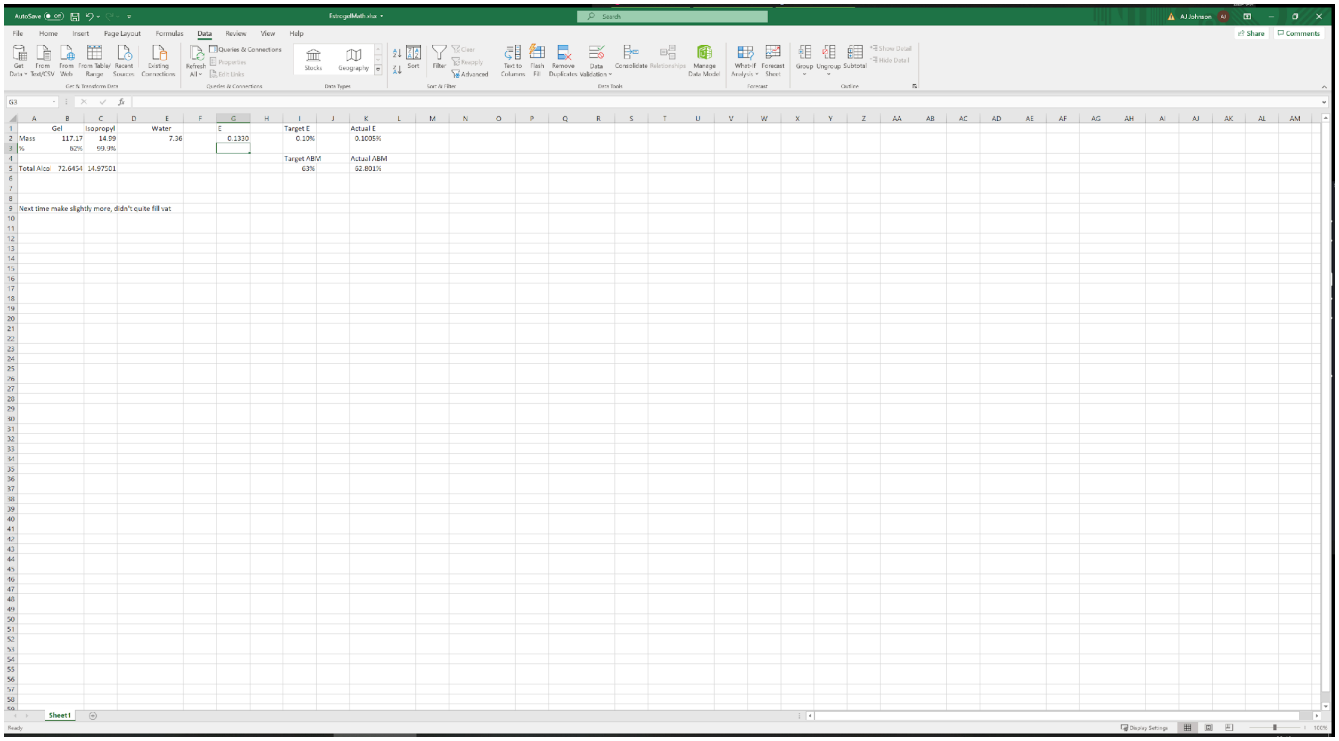
Next step is to add some water so our final solution is ~63% alcohol. Excel's goal seek function comes in handy for this



Measure out the water, go slightly over to try to make up for what doesn't get poured out

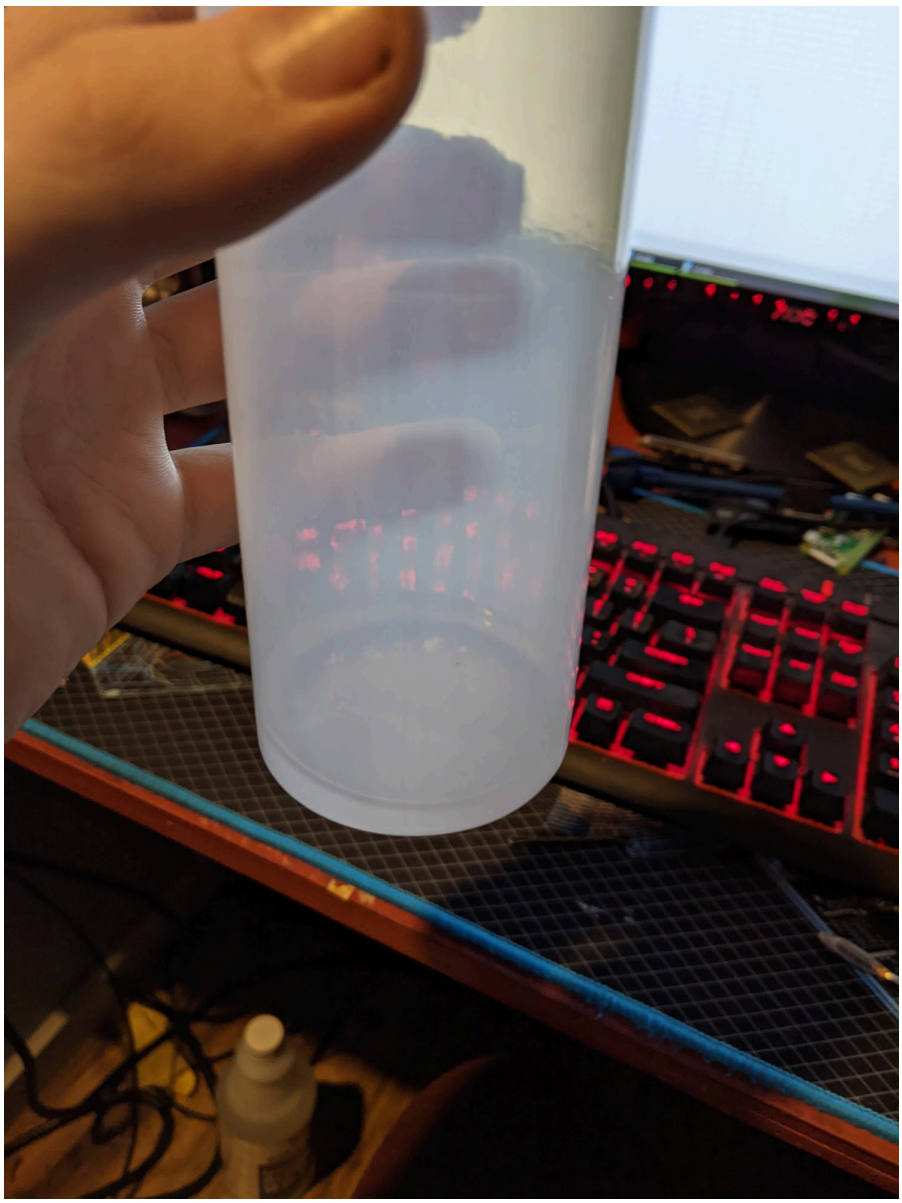


Add the water to the same container as the hand sanitizer



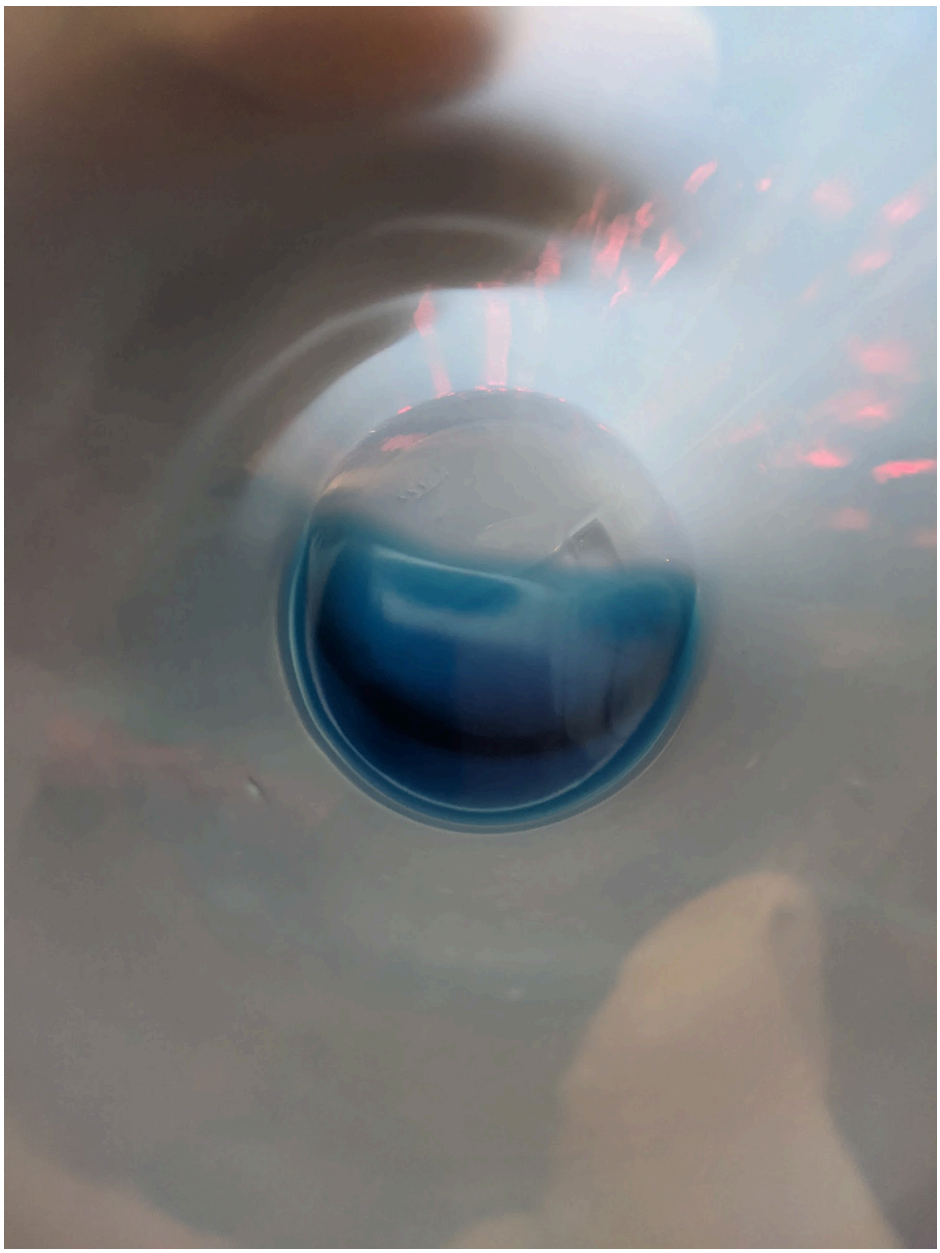
	A	B	C	D	E	F	G	H	I	J	K
1		Gel	Isopropyl		Water		E		Target E		Actual E
2	Mass	117.17	14.99		7.36		0.1330		0.10%		0.1005%
3	%	82%	99.9%								
4									Target ABV		Actual ABV
5	Total Alco	72.6454	14.97501						63%		62.891%
6											
7											
8											
9	Next time make slightly more, didn't quite fill vat										

Next figure out exactly how much E we need. Goal seek doesn't work well on numbers this small, but it doesn't take long to home in by hand



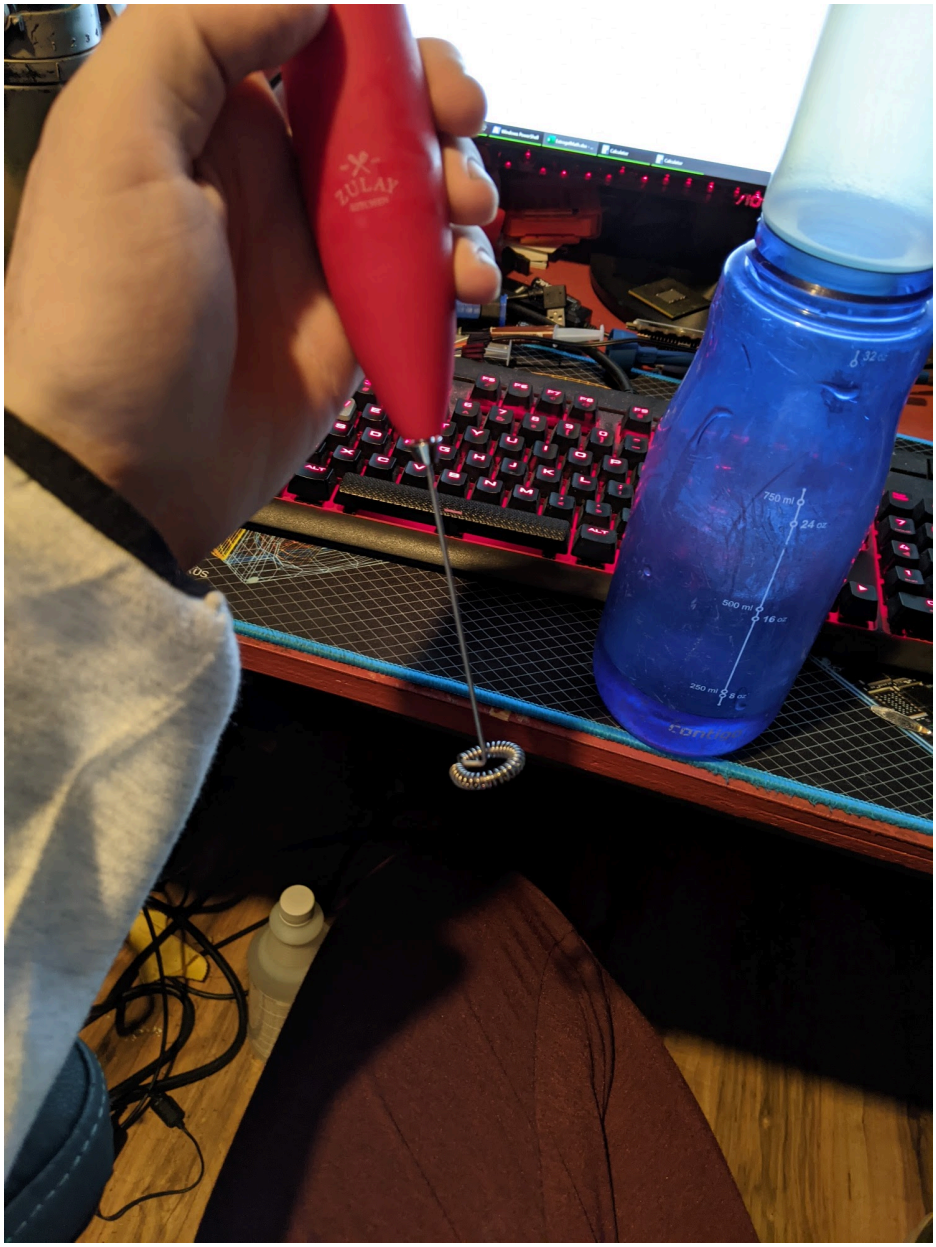
Once measured, add your E to the isopropyl. Measuring this out tends to be the hardest part, so take it slow and make sure you get as close as you can Don't be afraid to check the spreadsheet to test if it's close enough, an error of a few hundreds of a percent can be corrected when figuring out dosing

Once combined, shake the mixture until the E is fully dissolved; this doesn't take that long



Optionally at this point, you can add a drop of food coloring. It's helpful to see when the next step is fully mixed, but isn't strictly necessary. If you do add food coloring, try to add as little as possible, not more than a drop.

Pour the isopropyl into the hand sanitizer, doing your best to get every drop in



Then mix it thoroughly. For this I use a milk frother I bought off amazon. If you added colorant, you can use that to try to estimate when it's mixed enough (once the color is even through the whole) If you didn't, just mix it a fuckton

The penultimate step, pour your estrogel into your dispenser. I'm using airless cosmetic pumps from amazon.

If you don't quite fill your container, there a hole in the bottom you can push with a hairpin or paperclip to push all the air out

Final step, calculating dosing. To do this, I pumped out 25x pumps onto the scale, to figure out what the average dispense of this particular bottle was. Once you have that, you can do the math to figure out how many pumps you need for some amount of E

M	N	O	P	Q
	Target Dose (mg)		Ideal Pumps	
	3		13.31328	
	Pump Cou	Pump Mass		
	25	5.318		
	Per pump		E per pump	
	0.21272		0.225339	

The excel sheet also has this math, so you don't have to do it

more text

Measured out the hand sanitizer (just some generic one https://imgur.com/51Q2162

by weight

Then measured out isopropyl, also by weight

Then did the math for how much water would bring the mix to 63% alcohol, and measured that out

Added total masses together, and did the math for how much E to bring the final mix to 0.1%

Added the E to the isopropyl, mixed until dissolved, then mixed in the water and sanitizer

Finally poured the result into an airless pump with a mostly known amount per pump, double checked the pump was still consistent, and then started using it

Numbers wise, this first batch was really small, doing it again I figure I'll scale things up by 5x or so

The pump I used is this one from amazon, this one does 0.21g ±0.01g, but anyone getting it should double check theirs

I targeted 20g of sanitizer and 15g of isopropyl, ended up with 20.51g and 15.79g respectively (pro tip for measuring liquids by mass, measure again after pouring and subtract whatever didn't get poured)

Formula for adding water is

((gel mass * gel abm) + (isopropyl mass * isopropyl abm))

(gel mass + isopropyl mass + water mass)

If you don't have abm (alcohol by mass) you can use abv (alcohol by volume), it will be slightly less accurate but this step has margin of error. Either way, make sure you use a decimal (0.7, 0.91) instead of a percent (70%, 91%)

If you hate math but have excel, I made a spreadsheet to help me with the math https://www.dropbox.com/s/xl11jw9hp7aaqgg/EstrogelMath.xlsx?dl=0

Cut to the chase, I added 9.36g of distilled water, bringing the total alcohol to 62.9% and total mass to 45.66g

I was targeting 0.1% E (mostly for easier dosing math than 0.12%), so 0.045g. This was the hardest, since I was right up against the precision my scale. That's the main reason I'd scale up doing it again

Bit under 2 weeks; I'm at 3mg a day so the full 45g would have lasted 15 days, but because of container size limits for this batch I tossed a bit.

This batch was basically the smallest I could have made, doing 5x would have been just as easy and even 20x would have been viable

hrthrthrthrthrthrt text + pictures

The final product: https://i.imgur.com/JPw7Hwc.png

Thank you u/LeleBeatz for the helpful discussion :)

I have produced about 100ml of 0.12% gel using the wiki's instructions. My ingredients are as follows:

66ml 95% grain alcohol (Spirytus Duch Puszczy, similar to Everclear)

34ml Water

0.12g Estradiol (Purchased from Wuhan Nutra Biotech co. on Alibaba for about 135USD for 50g. Arrived inside of a cardboard box, customs declared as a beauty product.)

1g Carbomer 980 (from eBay, I used 980 over 940 for safety reasons but that's mostly my own paranoia)

1.35g Triethanolamine (also eBay)

Tools (eBay or aliexpress):

Digital mg scale

100ml Beakers (try to get larger ones, even if you are only making 100ml - it makes mixing easier!)

Pipettes (annoying. get syringes instead.)

Airless pump (make sure it isn't a spray nozzle!)

200ml syringe (to get the gel into the bottles)

Coffee frother (to mix)

---

1 - Measure out the alcohol into a beaker

2 - Measure out estradiol, add to alcohol, mix and make sure it is **fully** dissolved

3 - Measure out your carbomer with a digital scale and add to the alcohol mix. Carbomer is messy so try to be careful.

4 - Measure out water into another beaker, add into alcohol mixture

5 - Carefully mix together with frother

6 - Mixture is likely to be clumpy and thickened, so leave it for 30 minutes covered with plastic wrap before mixing again. Keep repeating until mixture is smooth without clumps, should be cloudy

7 - Cap off large syringe to prevent leaks and pour in mixture into the top of it.

8 - Add triethanolamine to mixture and mix together. Should rapidly thicken up. Mix very well.

9 - Squeeze mix out of syringe into bottle and cap the bottle off

10 - Pump air out of the bottle until gel starts coming out

Feel free to ask any questions :)

text only

I've been looking at E2 gel monotherapy for some time and having experimented on myself, I can confirm that it's not only possible to do but convenient too. More convenient than taking pills, imo, and without any needles (I hate needles).

With my homebrewed batch of 0.24% estrogel (method here) I was able to achieve very high levels - too high, in fact, and I need to tone it down lol. With 2.1mg applied scrotally daily for about a month, I got the following results:

Estradiol: 1418 pmol/l (386pg/ml)
Testosterone: 0.6 nmol/L (17ng/dl)
FSH and LH <0.1U/L
SHBG 66 nmol/L
Prolactin: 1314 mU/L (62 ng/mL)

My prolactin is very high as a result of too high estradiol, but it 100% shows that T suppressing monotherapy is possible and easy to do. I'm halving my dosage to 1mg daily and I will take another blood test in a couple months to see if it still works fine.

The reason you can't really do this so easily with standard branded estrogel is the concentration being 0.06% means scrotal application is messy and sticky. You'd ned 4x the amount of gel on a small surface area, which is totally possible, just quite inconvenient and unpleasant.

EstradiolSister text

So, I started HRT with homemade estrogel on 2022/05/20 (see post here), and I want to share with you how I make my own estrogel.

The subreddit r/estrogel has a lot of dead links, and I could only find fractions of recipes, so I put together my own recipe from all the information I could find.

I use orange oil as a penetration enhancer, because that's what darthemofan recommends. As I said, I'm using Plan A, which means I use hand sanitizer as a base, so I don't have to mess with chemicals like carbomer myself. But because Estradiol is not very easily soluble in hand sanitizer, I first mix it with alcohol. You can use undenatured ethyl alcohol, which is expensive or the cheaper IPA which is not really great for your skin, but we're only using a little bit, so this isn't really a problem. According to Emmasissybisex, 1ml sould dissolve 40mg, so 1g (slightly more than 1ml) should dissolve 50mg, which means a soluability of 5%. I didn't get this much to work, so I used more IPA, so I dissolved 3.33% E by weight.

I use cheap 100ml pump bottles, they hold around 80-90g, so here is the recipe for 80g (just use the table to scale to 90g if needed):
(ingredients were mixed in this order)

> Isopropyl Alcohol (IPA): 6g (to dissolve the E)
>
> Estradiol (E2) : 200mg (so 0,25% of 80g)
>
> Orange Oil: 8g (so 10% of 80g)
>
> Hand sanitizer: 65,8g (so it's 80g in total)

(If the E doesn't dissolve, just use slightly more IPA, if 6g isn't enough, use 8g.)

I've made these calculations in a Spreadsheet, you can download the LibreOffice flie and the Google Spreadsheets file here (I think you can even play around with the Google Spreadsheets file online without downloading it by doing rightclick, open in Spreadsheets). Make sure that you only modify the green values, because the other fields countain fomulas. **I changed the dissolve percentage from 2.5% to 3.333%, in theory up to 5% should work.**

For commercial Estrogel sometimes Estradiol Hemihydrate

is used, which may lead to more stable levels, but for DIY I've pretty much only seen people use raw 17β-Estradiol, also known as CAS: 50-28-2.
I bought the E from Hubei Vanz on made-in-cina.com (just search for the cas number) and I bought all other ingredients on Amazon or Ebay.

I myself apply ~3mg~~ 5mg estrogel scrotally, split up to 2 times 2.5mg, so 2 times 5 pumps. I'm doing monotherapy, so I take enough E to block my T without blockers, whcih is only possible with gel or injections, to reach the required levels with gel, I've opted to apply it scrotally because this is 5x as efficient. For more info read my Summary of different HRT options, or look at this post, to see the lab results of another women who also uses scrotally applied estrogel. (I think less E2 might also be enough, but I'll have to do blood tests.)

If you have any questions, feel free to comment right here, or you can also DM me, if you want.

more text

EDIT: **not really first attempt, I've added everything I've learned while making my first 2 batches. You can read my full guide/recipe here.**

So, yesterday I tried to make my first batch of estrogel, but I made a few mistakes. This subreddit has a lot of dead links, so I didn't find a complete guide, so I tried to piece together what I did.

I want to share what I did, so we all can learn from my mistakes.

So, my goal was x4 estrogel, with 0.24% estradiol. I don't see a reason why I should've tried to make gel with less estradiol. I wanted to go the hand sanitizer route so I don't have to mess with complicated chemicals.

That's what I did and why it was a bad choice. Advice what I can do better are welcome.

[EDIT: Ingredients were added in this order:]

> 30g 10g Isopropyl Alcohol (bad choice, I should've used Ethanol) [EDIT: 5g 10g would've been enough, thanks, Emmasissybisex] [EDIT 2: IPA works ok, just not so good for the skin, some other people use it, too.]
>
> 0.24g E2 [for 0.24%, or 0.25g for 0.25%]
>
> 10g Orange Oil (contains d-limonene, a penetration enhancer)
>
> 60g 80g Hand sanitizer (with 75% acohol, with carbomer for gel thickness) [EDIT: for a total weight of 100g, if I'll use less IPA, I'll use more of this]

Mistakes I made:

> 100g are around 110ml, so more than my 100ml pump bottles
>
> > next time I would make a smaller volume, so if I mess up, I don't waste that much
>
> I used IPA instead of Ethanol, I read that in some post where they made a spray
>
> > this was a bad choice
> >
> > When I apply this "gel" to my skin, I get a strong burning sensation. Is this normal, or is this because I used IPA?
> >
> > [EDIT 3: IPA is OK, I guess, only uncomfortable if too much is used]
>
> I used 30g of alcohol, maybe I should've used less of it and more hand sanitizer? [EDIT: Yes, 10g is better. (In theory 5 would be possible, but I didn't get the E to dissolve)]
>
> > the "gel" is pretty thin, not much like gel, more like a spray.
> >
> > [EDIT 3: This is better with only 10g IPA.]
> >
> > I used this much alcohol because I've read somewhere, that E is soluble at a rate of 1%, so to dissolve 0,24g E I would need at least 24g alcohol, is this true? [EDIT: I've been informed, that 1ml of Alcohol can dissolve 40-50mg of E, which is 4 or 5 times the amount which I thought, so 6ml = 4.71g of IPA would've been enough (Next time I'll use 5g, not 30g [EDIT 3: I used 10gt]), Thank you Emmasissybisex]

I measured how much on pump is by weighing the amount of 10 pumps, which was 2g, so 1 pump is 0.2 g. With a concentration of 0.24% E one pump contains 0.48mg of Estradiol. I wanted to take 6mg/day, but I wanted to start out slowly with 3mg/day. I want to split this over 2 applications (1 in the morning, 1 in the evening), with ~1.5mg each. I calculated that 3 pumps would be 1.44mg so I went with this for now.

When I apply that there is a burning sensation, so do you think I should redo this with ethanol instead of IPA? [EDIT: tested it with IPA without E, that's the reason for the burning. It starts 3-5 seconds after application, and lasts around 30 seconds] [EDIT: I applied it to scrotal skin, because I've read that scrotal or armpit gives best absorption, thanks for the question, darthemofan]

I don't know the exact alcohol concentration, because of the conversion between % by volume and % by weight, but I think it is way more than the recommended 63%...

I think I should use less alcohol and more hand sanitizer to get more like a gel like substance, but I don't know how how... Maybe I should try dissolving the E directly in the hand sanitizer? but because of the consistency, I would need to stir a lot, but with my magnetic stirrer, that shouldn't be a problem, right?

I don't know if E is soluble in oil, if so, I could dissolve it in the oil and mix that to the hand sanitizer, this way we get a more gel like consistency and we don't need extra alcohol... Well, you see, that I don't know as much as I thought... What are your thoughts and suggestions?

EDIT: I bought the E from Hubei Vanz.

Link to my detailed recipe here.

GC146 text

People asked to anounce my project here, did some testing to see if the gel was good and if the bottles where working well, always expelling the right amount of E.

here's the result

Used a mixture of carbopol, Isopropyl miristate, alcohool, destilled water and 17b E.

the bigger ones I'll probably use for Progesterone Gel/Cream, because they expell 1.4ml. I'm just not sure what people want, if they would want something more topical or something that would go into the bloodstream with relation to progesterone.

I made in the proportion 10mg/ml each pump 0.20ml =2mg. the smaller ones are filled with 55ml. (2pumps/day (4mg daily) it would last roughly 3 months). I also plan on doing other things.

If you want to DIY try to find airless pumps, found mine for 7 USD each (unfortunately in my country I found just one company selling it, and they sold only in big bulks, but if you can find

in yor country, ti's really worth it as they'll always drop the same amount of gel/cream. (also if you're buying E17b, don't buy it's micronized powder, buy cristaline, micronized powder tends to get stuck in things a lot easier and it's harder to clean and you might even lose some amount in the package).

torsby text

My base formula for 1000 ml is as follows, I experiment a little bit between batches, but mostly with consistency (so that's mostly the dose in HPM cellulose that varies when I use different sanetizer as a base). 2000 mg estrodiol 75000 mg orange oil 923000 mg hand gel 150000 mg isopropylmyristate 15 mg hydroxypropyl methylcellulose 100 mg glycerol

anotherhuman101 text

Hi, i would like to share the recipe that i have been using on myself for the last 12 month with great results after experimenting with estrogel recipes for around 2.5 years.

Hope this helps somone as i found it all very daunting and made many mistakes when first learning all about it all.

The recipe is for making 500ml estrogel at 0.12mg. This will fill 5 100ml bottles.

Ingredients.....

Estradiol b17 powder 0.6g.

Alcohol 300ml.

Water 190ml.

Isopropyl Myristate 25ml.

Propylene Glycol 25ml.

Carbomer 980 4g.

Triethanoline.

Exipment.....

1liter glass measuring beaker.

Small scales.

Tea spoon.

Coffee mixer, megnetic starer is better.

Silicone spatular.

Litmus paper.

100ml airless pump bottles.

All ingrdients and exipment can easily be found online, Use all food grade ingredients or 100%. Foodgrade 95% alcohol can be found for around £20 per liter.

Method.

Add the 300ml of alcohol to the beaker.

Then add 0.6g of estradiol powder and mix with the coffee mixer untill fully disoved.

Add the 190ml of clean water.

Add 25ml of isopropyl myristate.

Add 25ml of propylene glycol and mix.

Add 4grams of carbomer, add this very slowly a bit at a time whilst mixing slowly with the spatular to avoid clumping, if you get clumps cover the beaker with foil to avoid avapouration and place in the fridge for 30mins then mix again until smoothe and consistant.

Add the triethanoline now again use the spatular to mix slowly and add the triethanoline slowly one drip at a time untill a thick gel is created. Mix slowly hear as to avoid itroducing air bubble into the gel as it thickens.

You can check the ph with the litmus paper but i found its almost aways ph neutral when the gel is the rite cosistancy.

Use the silicone scraper and a pair of spoons to decant the gel into the airless pump bottles and press the lids on.

Or if you dont feel you can make your own gel il happyly send you some for 20 per bottle uk

This recipe will work without the isopropyl myristate and the glycol, but i found the isopropyl myristate is well worth adding as it makes the gel much more potent in my experiance.

LeleBeatz text

This is a little write up after my first seemingly successful batch of gel. I made 100 grams of Estrogel based on the stipped down formula from the estrogel wiki. I live in the US, so all the stuff I used is stuff that is easily accessible in the southwestern US. That being said, all of it, aside from the estrogen, should be really easy to access just about everywhere in the world where you have access to a computer and a grocery store.

Ingredients Used:

> isopropanol 70% (Isopropyl alcohol. Easy to get at the drug store. Like a dollar for a 500ml bottle.)
>
> Distilled water (Like literally any store)

Carbomer 940 (980 or 934 is what is mentioned elsewhere, this is what I could obtain, seems to work perfectly fine. From what I hear 980 is safer, but 940 seems to be used in a whole lot of cosmetics so I'm really not concerned personally.) (Sourced from makeyourown.buzz)

Triethanolamine (also sourced from makeyourown.buzz)

And of course cas. 50-28-2 17-beta-estradiol (dm me for what I know about sources)

Materials:

Milk stirrer / frothier (amazon)

Aluminum foil (store) (for covering beaker, I was doing everything I could to prevent the oxidation of the estradiol. Also for measuring powders and triethanolamine on scale and easily transporting to beaker)

600ml beaker (amazon) (this is my main mixin' pot)

250ml graduated cylinder (amazon) (for measuring) (I would recommend a smaller one for more precision)

syringes I had around for transporting fluids (drug store) (you don't need these)

table spoon for transporting powders

digital scale that measures to 0.001 grams (ebay)

rubber baking spatula (used for getting gel out of beaker and into piping bags)

frosting piping bags and tips (most stores will sell this) (This is crucial, I used them to get the gel into the final containers)

Procedure *(not a scientist but I'll try and be clear****)*

Keep in mind, these measurements are based upon the ingredients above at the concentration and purity noted. This is for a 100mg batch of gel.

1. Add [93ml] isopropanol to graduated cylinder
2. Add [4.53ml] of water to graduated cylinder (solution should be 97.53 ml)
3. Pour Water/Alcohol solution into Beaker. Stir with stirrer.
4. Add [0.12 grams] estradiol to beaker. Stir with stirrer. Take your time, make sure everything is fully incorporated. v important
5. SLOWLY add [1 gram] carbomer 940
6. Stir WELL, make sure all carbomer 940 is dissolved.
7. Let mixture sit while covered for ~5 minutes. (how long you let it sit is debatable) Check pH if you can. (I couldn't)

8. Start adding triethanolamine. 1.35 grams is what I added but you can add slightly more or less depending on the pH of your gel if you have the ability to check that. Things are going to get *VERY THICCCC* at this point, so I recommend stirring with rubber spatula. I was kinda spreading it around the breaker and pressing with the spatula. Stir well.

EDIT: I will post the math on how I got all my measurements and shit later. But I went out of my way here to make sure the end alcohol concentration was 63%. I will also post pics of the gel and whatever.

I felt like there wasn't any like.. detailed info on how to actually do this? My first time around I made a bunch of mistakes and it was a real messy time. I wanna thank /u/hrthrthrthrthrthrt for the talk last night. The final stages when working with the gel can be a fucking mess if you don't have a plan. Rubber spatula and a decent piping bag go a long way to making those last steps possible.

diyhrtstuff text

Hai there,

I am just starting out on this journey and have collected some information to plan out what I am going to do. If you have any feedback I'd be very thankful! If you have any input on sourcing, I'd also be very appreciative (as I really dont know how to find out which suppliers are trustworthy).

Estrogen E2 Gel Recipie
Tools

- Digital mg scale
- 3x Beakers 200ml *get a little bigger than the result, to make mixing easier*
- Small Plasic Containers for weighing solids in
- Coffee frother *for mixing*
- 3x Syringes *for accurately measuring liquids*
- 1x Syringe 200ml *to fill the pump bottles*
- Airless pump 100ml *for gel, not spray*

Ingredients
Estrogel Ingredients

	Ingredient	CAS	Amount	Ex. Amt*
1	Estradiol 99%	50-28-2	<0.33% ethanol	0.12g

	Ingredient	CAS	Amount	Ex. Amt*
2	Ethanol 65%		weight remaining (<99% tw)	(100ml) 86g
	-> Ethanol		*65% of volume*	*(65ml) 51g*
	-> Water		*35% of volume*	*(35ml) 35g*
3	Carbomer 980	139637-85-7	1% total weight	1g
a	Trolamine or			
a	Triethanolamine	102-71-6	1.35% total weight	1.35g
b	d-Limonene	5989-27-5	ca. 9% total weight	---

Additional Info

Description / Roles of Ingredients

No. 1 Estradiol: active ingredient

No. 2 Ethanol & Distilled Water: solvent, 65% ethanol + 35% water

No. 3 Carbomer: viscosity agent

No. a Trolamine / Triethanolamine: emugaltor & acidity regulator, helps with consistency

No. b d-Limonene: skin absorption enhancer

Concentration & Maximale soluable E2

(E2 can be max. 0.5% of enthanol, -> for 100ml enthanol 65% (ethanol weight 51g) => max. 0.255g E2)

0.05% can be hard to mix tho, so it may be better to use max. 0.33%: -> for 100ml enthanol 65% (ethanol weight 51g) => **max. 0.168g E2** *-> result ca. 1.68mg E2 per 1ml*

Testing of Ingredients

https://pubchem.ncbi.nlm.nih.gov/source/hsdb/3589

While we can rely on blood level testing after the fact, for safety, we want to make sure the powder is actual estradiol by either testing it's chemical properties ourselves, or giving it to a lab.

DIY Tests

If we have known good samples we can keep a little to compare to the next batch.

White or slightly yellow, small crystals or crystalline powder

Melting Point Test

- melting point of 173ºC

Solvent Test

- almost insoluble in water (3.90 mg/L)
- Very soluble in acetone, ethanol

Lab Tests

Testing of:

- purity
- heavy metal contamination

To find labs in the area:

- google
- ask chatGPT
  - Europe:
    - Eurofins: https://www.eurofins.com/contact/
  - USA:
    - ALS: https://www.alsglobal.com/en/contact-us
  - International:
    - SGS: https://www.sgs.com/en/contact-us
    - Intertek: https://www.intertek.com/contact-us/
    - Bureau Veritas: https://www.bureauveritas.com/en/contact-us
    - TUV SUD: https://www.tuv-sud.com/en/contact

Sample EMail:

Subject: Request for Quote - Chemical Purity Testing

Dear [Lab Name],

I am writing to request a quote for chemical purity testing services. I am interested in having Estradiol powder tested for very basic purity and heavy metal content and would like to know the cost of this service. I am interested in the most cost effective way you offer, as accuracy is not of highest importance.

The chemical is:
Estradiol powder
CAS 50-28-2

Please let me know the sample size you need me to provide.

I would also like to know how long it would take to get the results.

Please also let me know if you offer your services to private individuals.

Thank you for considering my request. I look forward to receiving your quote.

Sincerely,
[Your Name]

Instructions

on the amounts used: figure out how much one pump dispenses by weighing it. Then calculate backwards to your desired concentration (mine: 1.5mg per pump)

1. Measure out the alcohol into a beaker
2. Measure out estradiol, add to alcohol, mix with frother. *Make sure it is fully dissolved*
3. Measure out carbomer, add to the alcohol mix. *Carbomer is messy so try to be careful, slowly add small amounts while stirring*
4. If not using 65% ethanol but 99% + distilled water:

    Measure out water into another beaker, add into alcohol mixture
5. Mix together with frother
6. If mixture is clumpy and thickened:

    leave for 30 minutes covered with plastic wrap before mixing again.

    Keep repeating until mixture is smooth without clumps (cloudy color)
7. Cap off large syringe to prevent leaks and pour in mixture into the top of it.
8. Weigh out triethanolamine in beaker
9. Add triethanolamine to mixture and mix together. Should rapidly thicken up. Mix very well.
10. Squeeze mix out of syringe into bottle and cap the bottle off
11. Pump air out of the bottle until gel starts coming out

ombena text

I recently received E powder from china a week ago that took a month and a couple of days, i was impatient to start making my topical E.

i decided to make it as an emulsion so i got a ready to use emulsion from the pharmacy (intended for skin parasites) a 100 ml composed of **BB 25 g** , **polysorbate 80** and **ethanol 96%**.

for starters i made the first batch with **120 mg E**.

since the final result has a liquid consistency, i apply it using a spray bottle. i apply **1.5 ml** a day on my armpits that is **13 sprays** roughly which is supposed to deliver **2 mg of E** (i know it is not exact).

It has been 8 days now and my nipples are sore, sensitive to touch and pointy. when do you think i should get blood test done to see my levels and to confirm the success of my concoction?

caissonposting secret finds text

Patent with formula for conventional 0.06% estrogel and up to ***0.36%*** gel with up to ***25x*** better absorption compared to 0.06% E2 in ethanol gel

This patent is a great resource for information of stock estrogel (ethanol only) and more importantly provides a clinically tested formula that, in most optimized form, delivers 25x more estrogen than stock estrogel at equivalent total mass dose. This requires a couple more chemicals to act as penetration and retention enhancers, which may be a barrier to production for some, but all the critical components are available from standard lab supply stores. Currently working on transcribing and interpreting the most critical parts and will post when the result is readable.

https://patents.google.com/patent/US20190160077A1/

AcherontaMovebo breakdown text

How're you progressing on that?

I found the interesting part to be the new estrogel recipes line 261:

> A: 0.36% Estradiol gel containing 2% oleic acid, 2% ethyl oleate, 5% propylene glycol Carbonate Buffer - 1.7% Klucel HF
>
> B: 0.36% Estradiol gel containing 2% oleic acid, 2% ethyl oleate, 5% propylene glycol No buffer - 3.0% Carbopol 981
>
> C 0.36% Estradiol gel containing 2% oleic acid, 2% ethyl oleate, 5% propylene glycol Carbonate Buffer - 2.0% Pemulen TR-1
>
> D 0.36% Estradiol gel containing 2% oleic acid, 2% ethyl oleate, 5% propylene glycol Carbonate Buffer - 3.0% Klucel HF

The main differences seem to be the gelling agents. They compared the super concentrated recipes to the traditional T : Estradiol 0.06%, Ethanol 40%, Carbopol 980 1%, triethanolamine (TEA) 1% water 100%

The result comparing T A B C D are in line 262, and show formula C worked the best giving the 25x factor, and " the amount of drug delivered increased with increasing concentration of

estradiol applied." : at the regular 0.06%, 10x more is delivered which "make it possible to deliver an equivalent dose to the existing commercial transdermal gel product with 10 times less applied volume"

They mention however in line 290 that the acid/co solvent proportion can increase variance of the dose delivered: " it may be advantageous to select ranges of fatty acid and co-solvent concentrations that do not encompass the highest and lowest propylene glycol/oleic acid concentrations studied here"

On line 296 they indicate the high ethynyl oleate seems to cause the slow release - up to 2 says for line 299 This means, less surface to apply to, and an easier rotation.

Pemulen TR-1 is an emulsifier.

The final recipe seems to be on line 301 and calls for mixing in order (line 309):

71.65% ethanol

5% propylene glygol

0.36% E2

2% oleic acid

2% ethynyl oleate

0.007% sodium bicarbonate

16.91% water

0.07% sodium carbonate

2% permulen TR1

Ethynyl Oleate should be Ethyl Oleate (you won't find the former available for sale anywhere afaik, but best to head off confusion). Also, make sure you get at least USP grade (and for your other stuff as well). Use deionized water, not from your tap. https://www.sciencecompany.com/Learn-Chemical-Grade-Definitions-from-Highest-to-Lowest-Purity..aspx

Most of this stuff appears relatively easy to find and buy (you'll need to look around for best prices though - this seems doable with a bit over a hundred bucks in materials), with the exception of pemulen (not permulen, seriously, get your chemicals labelled properly, it's a minor thing, but you need to be rigorous about this or you can end up killing someone) TR-1 which looks to be a pain to source in small quantities. Don't go with pemulen TR-2 which is used more in sprays and seems to be able to be found easier. A link here I found that's relatively cheap, I'm unsure of quality, should be fine. There's a 15 euro minimum I think, and it's italian, so you'd need to get 3 25g tubs, which would be enough for a kilo or several (even if you don't shoot for it, google translate it in chrome and read the procedures, you'll find them

helpful). Here's one for ethyl oleate if you're still looking. I assume you already have E2 raw powder sorted. Ethanol here, difference between 95 and 96% should be functionally irrelevant, though I think they offer 96, so... :shrug:

It's important to state that those percentages are by weight. Going by volume would end very badly.

Your main issue is going to be knocking up your buffer and getting it properly sorted (it doesn't need to be exact, since pH works by order of magnitude, but it needs to be close). Prepare that first and separately. DO NOT mix your sodium carbonate and sodium bicarbonate around, color code those labels. Remember to use deionized water. Thankfully your carb and bicarb are cheap, as is deionized water. Make a larger amount than you need, so that you can properly add by weight, the larger you go, the more accurate, but you don't need to be perfect, you're working with orders of magnitude. Then take 17% of your intended total weight from that mixed buffer and add it straight to your mixture (this will also prevent you from screwing over your other chemicals from high alkalinity).

In terms of materials, you'll probably want several beakers, a good set of electronic scales, and a pipette. I'm unsure of the viscosity of estrogel, using a magnetic stirplate might not work at high viscosities, otherwise, it oughtn't be a problem.

The final thing: gloves, eyewear, and a lab coat if possible. This is stuff that absorbs through your skin, keep it to the intended amounts.

Pemulen, ethyl, ... oops! My mistake :)

Thanks a lot for the correction it is a bit late in the US, I will fix the names later.

I have no idea how buffer work. I am still learning everything. Can you recommend a cheap pH meter? Some cheap electronic scales? If people can get them from aliexpress it may be better.

Do you mean I should take 17% of the volume after having dissolved the right weight of carbonate and bicarbonate? Or just the solid powder to avoid the alcalinity problem?

If you can make a new post correcting the recipe, it may be better.

Ignore a pH meter, you don't really need it if you mix your buffer properly, just get some universal ph litmus paper, that should get you in the right ballpark.

It's not that your recipe is wrong, it's just that there are dangers to not calling the right chemical by its right name. With the ones you misspelt, it was fine, but there have been numerous avoidable deaths from people using polyethylene glycol and ethelene glycol in lieu of propylene glycol, and vice versa. This is serious, failing to identify the proper chemicals can not just kill you, but everyone who tries to replicate the recipe after you.

For scales, I can't personally recommend anything in particular, but you do need to get an electronic scale with a minimum precision of 0.01g (10 mg), 0.005g (5 mg) is even better, and

if you can find an accurate one 0.001g (1 mg) will serve you well, although it might be hard to find one that can weigh up to what you want. It might be worth getting a milligram jewellry scale for weighing out your smaller components and another scale for larger components, since they often have different capacities (large mixes will solve this problem but will prevent small formulations). Also, don't ever cook up something where the smallest ingredient is 0.001g. There is variance to every scale. if you have +/- 0.002-0.004 for every scale, that variance can kill someone. 0.008-0.01g will be safer even if it results in wasteage. Honestly, I would rather recommend getting a slightly better set of scales, maybe one with a calibration function and one with appropriate calibration weights.

Get a lab spatula (several is even better) and some plastic weighing boats (these are for holding powders). Dispose of the latter once you've used them, make sure to clean your spatula(s). Zero (tare) in the weight of the weigh boat or any beakers you use before you add stuff. Get plastic pipettes to transfer liquid back and forth. Dispose of these once you use them. Gloves and paper towels nearby are enough. Always clean spills. A separate bin/bin-bag is always helpful, don't mix lab waste with household waste.

Get a permanent marker and stick labels. Write on labels and the bottles/jars themselves and the caps. You'll thank me when your label peels or your marker rubs off.

Get sealed jars to hold the powders. Clean with ethanol, then deionized water, beforehand. Leave to dry.

With regards to pH, your pemulen will not work if you get the pH wrong. Here's the trick. You can make more than you need and just take as much as you need for the other recipe. So, say you're making 100g total gel. You whip up your buffer, 84.55 grams deionized water. 0.035 grams bicarb. 0.35 grams carb. You get 85 grams total buffer more or less, you take 17g of those, add it to your recipe and toss the rest.

About Pemulen. This is a solid, but when you add it in, it will look like it dissolves. Let this happen. It's not actually dissolving, it's just spreading out through everything making it harder to see, like spreading out a net that's been crumpled together. The purpose of Pemulen is to thicken everything and prevent your oil from separating from your ethanol from separating from your water. This will mean that the ethanol containing your E2 is spread evenly throughout. If you can't get a gel of consistent thickness/eveness, throw it out. If your gel suddenly separates, throw it out. If your gel suddenly turns into cheesecake, throw it out. If you can't get a gel-like consistency, throw it out. A medication with uncertain amounts of active drug in uncertain distributions in uncertain areas is not worth your life. With that done, here is the preparation instructions from the patent. [274-279]

Formulation Preparation:

1. Add ethanol and propylene glycol and mix until uniform.
2. Slowly add estradiol and mix until completely dissolved.
3. Add oleic acid and mix until uniform.
4. Add ethyl oleate and mix until uniform.
5. Slowly add Pemulen TR-1 and mix well until completely hydrated.
6. Slowly add the carbonate buffer solution to the above gel matrix and mix until uniform.

Now, let's make an example. You want to make 100 grams of gel (i'm using the 0.36% E2 formulation here, this will deliver 2.4 micrograms (not milligrams, greek m, not latin) in 48 hours. check the chart

to vary dosage, for each equivalent weight of E2 you remove, add the equivalent weight in ethanol). And yes, I've fucked with the names to make all your lives more difficult so you actually read this shit properly. Hell, write it out yourself in a way you understand.

0) LABEL ALL YOUR FUCKING CHEMICALS, EVEN THE GODDAMN WATER. CONSIDER PUTTING DOWN THE QUANTITIES YOU NEED AS WELL IF YOU'RE SET ON CREATING A CONSISTENT QUANTITY EACH TIME.

1ai) Measure out 71.65g ethanol (EtOH).
1aii) Measure out 5g propylene glycol (PG).
1b) Mix EtOH+PG together.

2a) Measure out 0.36g (360mg) estradiol (E2).
2b) Mix E2 with EtOH/PG mix.

3a) Measure out 2g Oleic Acid ($C_{18}H_{34}O_2$).
3b) Mix $C_{18}H_{34}O_2$ with EtOH/PG/E2 mix.

4a) Measure out 2g Ethyl Oleate ($C_{20}H_{38}O_2$).
4b) Mix $C_{20}H_{38}O_2$ with EtOH/PG/E2/$C_{18}H_{34}O_2$ mix.

5a) Measure out 2g Pemulen (PTR-1).
5b) Mix PTR-1 with EtOH/PG/E2/$C_{18}H_{34}O_2$/$C_{20}H_{38}O_2$ mix.

6ai) Mix up your carbonate buffer separately. In this case, I'll show it exact, but don't feel as if you have to not waste anything. It's better to waste a little bit than try to count and squirrel away every grain you find. First get 16.91 grams of water, put it in a separate beaker. (but make 169 grams if you need to, it's not worth fucking up your buffer for the sake of being perfect)
6aii) Measure out and add 0.07 grams of sodium carbonate (Na_2CO_3) to 0.007 grams of sodium bicarbonate ($NaHCO_3$). (I hope you can see how getting 0.007 grams is difficult if your

scale is too imprecise. With 0.005 precision, it's stupid, with 0.01g precision, you're stupid)
6aiii) Add Na_2CO_3 + $NaHCO_3$ to your water. Honestly, just mix this with a spatula. It's easier, just give it a good stirring.
6b) Add 17g carbonate buffer to EtOH/PG/E2/C18H34O2/C20H38O2/PTR-1 mix.
6c) Mix it.

If you want to go with 0.07% E2 instead of 0.36% for 100 grams, repeat the above, but take note of these equations.

0.36 - 0.07 = 0.29g (this is only when you're making 100 grams. with 1000g, it would be 2.9, with 10 grams it would be 0.029, with 50 grams it would be 0.145)

71.65 + 0.29 = 71.94 (ethanol)

0.36 - 0.29 = 0.07 (E2)

This is how you get the trialed formulations seen in [341] of the patent. Refer between the chart

and your dosage to figure out what concentration you need. Never go above 0.36%, never go below 0.07%. If the upper end is too low, use more gel, if the lower end is too high, use less gel. If you try and make 0.50%, science Santa will shove coal up your asshole and set you on fire.

Test your blood levels after application. Patent appears to view 1.0g as a single dose. 100g will last 100 doses maximum, likely closer to 95 given that some will be lost in transfer.

Operating at 0.07% E2, you will be able to make 14.2 formulations (1420 doses) with $20 of E2. If you only have 25g of Pemulen, Pemulen will be your limiting factor, as well as quantities of 96% ethanol.

Operating at 0.36% E2, you will be able to make 2.8 formulations (280 doses) with $20 of E2. Your limiting factor here is essentially your supply of E2.

At high concentrations, prioritize supply of E2, at low concentrations, prioritze supply of Pemulen and ethanol.

I'm unsure of whether a magnetic stirrer will do the job, if not use a clean dry spatula.

All spatulas should be dry and clean.

Measures of powder should be placed into weighing boats, liquids into beakers. Do not label your powders sugar or flour or salt or cocaine. Do not snort these powders. They'll make you the opposite of high. 6 feet under to be precise.

Powder should be transferred into weighing boats using spatulas. Powders should be transferred from weighing boats into liquid by pouring GENTLY (let's not get a mushroom cloud). Liquids should be transferred in large quantities by pouring and then adjusting weight with disposable pipette (do not transfer liquid or powder taken out of its container back into its container. dump that shit). Liquids should be transferred in small quantities by disposable pipette only (if you think you can pour 16.91 grams of water, you're an idiot).

Store your gel in a dry cool place away from sunlight.

When you're done, rinse everything with deionized water, do not leave anything crusty. Store away from dust and clean before use always. Everything you use should be dry and clean. If you see so much as a water stain, clean again.

Do not dispose of anything in your kitchen sink. Have a separate bottle to dispose of liquids, with a funnel if needed. Have a separate bottle/bin to dispose of powders. Do not rinse off with deionized water into your sink, rinse off (dirty spatulas for example) into your waste liquid container. Dispose responsibly, this is chemical waste, you don't want someone's cat/dog drinking this, depends on how annoying your neighbors' kids are though.

Wash your hands, even if you were wearing disposable gloves. Do not touch the outside of the gloves with your fingers.

deleted user text

So I decided to buy some CAS: 50-28-2 powder back in March after learning of supply problems where I am and had been meaning to try it for peace of mind. Ironically whilst testing the gel I got my regular prescription of Oestrogel filled but I'm very glad I went ahead as the results were pretty much what I'd hoped for.

I tried to make the gel around the same 0.06 w/w and repurposed some old empty bottles I had been putting aside. I didn't account for fluid density difference(alcohol vs water) so the gel dried quite fast in comparison and being paranoid of this I then bumped my dosage to 6 pumps a day instead of 4. As it turns out this wasn't needed as after two weeks of using homebrew my results came back at 2831p/mol(771pg/mL) as opposed to 4 pumps of Oestrogel at 1656 p/mol(451.07pg/mL).

So I used 50% extra volume that yielded about 70% extra serum levels; considering it's gel and I'm using a cheap jewellery scale I don't think that's too bad, also I used a smaller area of skin than usual to compensate for the faster drying.

Obviously I need to adjust my dosage down again but I'm relieved I now have a stupidly huge surplus. Thanks very much to all on this community!(I looked through quite a lot of posts) one less stress! x

Edit: Just realised the tittle should read 'including blood test results'... nm.

Update: Just made a new batch so here's an image of the finished gel.

https://imgur.com/a/wcZk1Yh

Update 2: Just a small update for anyone interested; after a poster down below suggested freezer storage I did some research and found a suggestion online that storing at minus 20 in a sealed inert gas could extend the stability to 3+ years so I split my supply up into foil mylar bags(2g ishhh a bag); then filled with argon to push the oxygen out, sealed(straightening iron or a regular will do it) and then froze.

just add some estradiol and maybe a penetration enhancer in a base of Purell

Several gels seem to have 60% ethanol, carbomer, and trolamine as pH stabiliser

tocopherol and aloe vera are often present, but should not interfere with the absorption of estradiol

one of the first possible plan is therefore to solubilize estradiol power with ethanol, then mix that to the gel.

Pro: simplicity

Cons: hard to find in this pandemic, sometimes contains isopropanolol which may have unknown effects

Thoughts?

Experimental supersaturated estradiol gel

Plan B: supersaturation with polyethylene glycol or polyvinylpyrrolidone

Existing pharmaceutical recipes seem too conservative in their approach.

Research from 25 years ago studied alternatives like PEG or polyvinylpyrrolidone

Pros: It may allow for higher concentrations of estradiol, allowing to use just a few drops with faster absorption: "Generally, both the uptake and flux of OE through both human skin and

silastic membrane increased with increasing degree of saturation. Stratum corneum showed an 18.8 ± 4.88 times increase in uptake from a supersaturated solution of 18 times saturation"

Cons: 18x the doses may have negative side effects. The lack of existing pharmaceutical research means we would be guinea pigs

https://www.sciencedirect.com/science/article/abs/pii/016836599500062D

Thoughts?

thickener or using an existing base

Lots of people are brewing sanitizer gel for covid, and "Sepimax Zen" is recommended in many places as simpler to use than carbomers.

but carbomer apparently have the nice property of turning liquid when touching the salt from the skin

If anyone want to try, more suggestions on:

r/DIYBeauty/comments/fqhecv/what_thickeners_to_use_when_it_comes_to_santiser/

r/chemistry/comments/fjazyn/gelling_agent_for_diy_hand_sanitizer/

r/chemistry/comments/fjje4j/gelling_agent_for_sanitizer_gel/

I'll check amazon

Patent with formula for conventional 0.06% estrogel and up to ***0.36%*** gel with up to ***25x*** better absorption compared to 0.06% E2 in ethanol gel

This patent is a great resource for information of stock estrogel (ethanol only) and more importantly provides a clinically tested formula that, in most optimized form, delivers 25x more estrogen than stock estrogel at equivalent total mass dose. This requires a couple more chemicals to act as penetration and retention enhancers, which may be a barrier to production for some, but all the critical components are available from standard lab supply stores. Currently working on transcribing and interpreting the most critical parts and will post when the result is readable.

https://patents.google.com/patent/US20190160077A1/

Plan B addendum: a TEG base with glycol monomethyl ether/isopropyl palmitate

Following a discussion about versabase with Dr Powers, I found by accident an interesting paper that apparently can that apparently can get up to a 60x increase in aborption: "A binary

system of triethylene glycol monomethyl ether:isopropyl palmitate can improve estradiol delivery by 60-fold when compared to the individual components"

https://www.sciencedirect.com/science/article/pii/S000527360900296X

The context is on r/DrWillPowers/comments/gmwq8p/im_being_maligned_and_words_put_in_my_mouth_and_i/ and the safety study on https://www.ncbi.nlm.nih.gov/pubmed/17090481/

It is a bit late for me to check all the details, including the last one on safety, but that is very interesting, as TEG is what is used in the powers compounds, so we already know it is well tolerated by trans patients for transdermal HRT.

Even better- it may offer a potential collaboration: between Dr Powers preference for TEG and the work detailed in the patent, I see a lot of potential to have blood levels properly assessed thanks to a lot of his patients that care about things like the E1/E2 ratio that barely interest regular DIYers.

Also, a 60x increase means we could use 60 times less E2 powder. This is the real of HRT for about 1 USD **PER YEAR**. This alone would make it a good idea to consider adopting power excipient base (while I think he should use ours, as the risk/benefit profiles are quite different between his patient from his practice, and us. I know, its funny that we should switch around lol!)

This is the kind of price where trying to sell creates more overhead that just giving away. I mean, at this price, even myself could provide free HRT to hundreds of people in my birth country.

So all this makes TEG extremely interesting, and worth investigating for plan B.

We finally have a full moderation team.

Now we need chemists and biologists to study this kind of stuff.

Even if we haven't started mixing yet (USPS, please deliver my parcel! please!!) it may be the right moment to publicize the sub to more places.

So if you also believe this is the right moment, and if you have some free time, please consider announcing r/estrogel to a sub you usually go to.

You can use the template verbatim, or adapt it in any way you think will best match the language and the sub audience: r/estrogel/comments/gmu5i5/template_for_announcing_restrogel_on_other_subs/

Data for blood levels achievable by high dose gels

From r/MtFHRT/comments/c7awhx/highdose_transdermal_estradiol_gelointment/

"6 mg/day estradiol gel" was stated to deliver "600 µg/day estradiol" in Study 1:

E2 gel 3 mg/day 84.2 ± 54.3 pg/mL

E2 gel 6 mg/day 184.7 ± 98.46 pg/mL

"10 mg/day estradiol ointment" was stated to deliver "600 µg/day estradiol" in Study 2:

E2 ointment 10 mg/day 107 ± 81 pg/mL

20 mg/day E2 ointment ("1200 µg/day") estradiol in an ointment applied to the skin in four daily divided doses:

E2 ointment 20 mg/day 473 ± 375 pg/mL

Also, contains interesting insights like how we believe higher dose gels are needed :

> "E2 has been administered too weakly because it is too low in the commercially used ointment and because application to the thick abdominal skin has a lower absorption coefficient than a thinner skin such as forearms for example. It is possible that a dose equivalent to 15 or 20 mg of gel, applied on the forearms, may allow to lower the testosterone below [100 ng/dL]. The marketing of a more concentrated ointment is therefore desirable, as well as the use of a more efficient absorption site."
>
> "This work shows that E2 is well-absorbed percutaneously and causes practically no cardiovascular events. "

also noted from Aly:

> "The concentration and dosage of estradiol ointment in this study were double those of Study 2, yet the estradiol levels measured in this study were almost 5-fold higher than those in Study 2. It's possible that the higher concentration of ointment used may have resulted in disproportionately greater absorption, as a study found that the smaller the application area of estradiol gel (and hence higher the post-application concentration), the greater the resulting estradiol levels "

this could be because ointments dry slower, leaving a residue that could act like a moisturizer, which we know help suck the E2 remaining on the skin

Compare that to https://en.wikipedia.org/wiki/Pharmacokinetics_of_estradiol#Transdermal_gel :

> "Once daily application of 1.25 g topical gel containing 0.75 mg estradiol (brand name EstroGel) for 2 weeks was found to produce mean peak estradiol and estrone levels of 46.4 pg/mL and 64.2 pg/mL, respectively.[171] The time-averaged levels of circulating estradiol and estrone with this formulation over the 24-hour dose interval were 28.3 pg/mL and 48.6 pg/mL, respectively"
>
> "A higher dosage of estradiol gel containing 1.5 mg estradiol per daily application has been found to produce mean estradiol levels of 40 to 100 pg/mL and estrone

> levels of 90 pg/mL, while 3 mg per day has been found to result in respective mean estradiol and estrone levels of 60 to 140 pg/mL and 45 to 155 pg/mL"

C - Basic estradiol spray

Plan C: lenzetto spray instead of gel, just using octisalate and 96% ethanol

An even simpler recipe is mixing 17b E2 in 96% ethynil alcohol with octisalate as a penetration enhancer, a recipe known as Lenzetto spray and used in various countries:

https://mediately.co/ro/drugs/CF2IhW3SRGidAFyLkY9tCRnjlFV/lenzetto-1-53-mg-doza-spray-transdermic-sol#pharmacokinetic

https://www.medicines.org.uk/emc/product/11175/smpc#EXCIPIENTS

It may be hard to source 96% ethanol at the moment, but this is certainly the 2nd simplest recipe possible: just mix 3 ingredients in a spray bottle!

Status report on homebrewing estrogel : $89 gets you almost 7 years of HRT equiv to 4mg/day oral (plan C)

If you don't know, on r/estrogel we're DIY the meds that you can use here on transDIY. So it's like transDIYDIY

One of our #1 goals is to keep prices as low as possible, and be a full order of magnitude cheaper than Lena injectables

Given the equivalences from r/MtFHRTsuppl/comments/g43obl/table_approximate_comparable_dosages_of_estradiol 3mg/day gel should be equivalent to 4mg/day oral, and 1g of E2 powder = 1000mg should be enough for 250 days !!

Since 1g costs between 1 to 3 USD on alibaba, we should be well within our target of HRT for less than $10/year, as the active principle will cost less than $3 per year

Now, what to put this active principle it? A paper on penetration enhancers suggest 63% ethanol gives the best absorption for steroids: https://sci-hub.tw/https://doi.org/10.1016/j.addr.2012.09.032

Turns out, there's an easily available commercial product made of pure premixed 60% ethanol: Everclear 120

https://en.wikipedia.org/wiki/Everclear_(alcohol)

This makes plan C currently more interesting than anything else, as carbomer are hard to find since everybody is making hand gel against the virus.

We know E2 can be diluted in ethanol up to 20mg/ml, and Everclear 120 comes in 750 ml bottles.

Assuming a safety margin of about half due to the dilution, 10mg/ml means that in theory you could put 7500mg or 7.5 g into a bottle of Everclear.

As you need 3mg/day, this bottle should last you (7500/3)/365 = 6.8 years.

The 7.5 grams of E2 on alibaba cost between 1 to 3 USD per gram, assuming the worst case + 50 USD shipping, 7.5*3 +50=72 USD, add to that a bottle of Everclear 120 which costs 17 USD according to https://www.hangoverprices.com/everclear-prices/

72+17=89 USD, for almost 7 years worth of HRT.

We're still sorting out some details, including the dispenser (spray? vial making drops?) and the extra penetration enhancers as the original recipe for Lenzetto spray calls for 5x more octisalate in weight than E2. It is not clear how necessary this octisalate is.

Yet so far everything is going great, and now is the time to spread the word.

If you're into chemistry or pharmacology or biology, please join and help us!

If you're not in any of that but want to help, please share this information wherever - trans subs, blogs, twitter - the more eyeballs can help us fix details, the better!

For plan C: Solubility of estradiol and estriol, bio availability

The first problem is how much E2 or E3 can be diluted in ethanol before reaching saturation

Based on various sources, E2 is 20 mg/ml in ethanol, E3 10 mg/ml

Then we need a penetration enhancer to pass the skin, cf https://www.sciencedirect.com/science/article/pii/S0378517313001841 or sci-hub.tw/10.1016/j.ijpharm.2013.02.040 for the full text

r/drwillpowers use DMSO, which we do not want to use as fully opening the skin barrier looks like a very bad idea: everything will then go through far too easily, including impurities and contaminents. It seems much safer to make generic of known drugs, well studied, with known penetration enhancers.

Octisalate seems like the best option: 5x as much as E2 in weight for the Lenzetto spray, as the monograph in Hungary says: "Estradiol 1.53 mg/ transdermal spray 17-β-estradiol (1.7%) octisalate (8.5%) ethanol (to 100%)"

https://gedeonrichter.hr/wp-content/uploads/2018/01/10.-RJE%C5%A0AVANJE-MENOPAUZALNIH-TEGOBA-PRIMJENOM-TRANSDERMALNOG-SPREJA.pdf

And 8.5/1.7 = 5.0, so we need 5x as much penetration enhancer as E2, and since 1.7+8.5=10.2, you need about 9 times as much ethanol as the sum of the weigths (E2 plus penetration enhancer)

So if you have 30g of E2, you need 150g of octisalate, and 180*9=1 620 g or 1.62 kg of ethanol

That'd make a lot of Lenzetto!! We may want to reduce the volume, by concentrating E2 more up to the saturation point of 20mg/ml.

So going back to the 1.53mg delivered by each spray, multiply by 2 to get a round number 3.06 so about 3 mg we would need to add 5x more of the penetration enhancer, so 3.06*5=15.30 mg of octisalate so about 15 mg. Instead of doing 9 times that in ethanol, we know 20 mg can go in 1 ml, so 10mg can go in 0.5 ml, and so 3 mg which is like 1/3 of that could go in about 0.5/3=0.166 mg of ethanol, which we round up to 0.2 mg to have some leeway before reaching saturation.

To round up the numbers, 3 mg of E2 would take 15mg of octisalate, and dissolve in as little as 0.2 mg of ethanol. To reach the same concentration as lenzetto, we would need (3+15)*9=162 mg of ethanol, but to have something easier to apply, we can go in almost 1/1000th of that!!

According to https://www.aqua-calc.com/calculate/volume-to-weight, 1ml of ethanol weigths 0.79g or 790mg, so 0.2 mg of ethanol would occupy 13/790=0.016 ml which is very little - rounding it up (as we can increase the dilution without consequence, the goal is just to not have too much lotion to rub) we could aim for another round number, like 0.02 ml. As an insulin syringe is 1 ml, this means 2 units, basically a very little drop. So increase that 5 times to 0.1 ml, meaning 10 units or 1/10th of an insulin syringe -

End result: in an insulin syringe (to be precise on the volume), you could draw 10 units so 0.1 ml of ethanol, in which the mix of 2mg E2 with 10mg octisalate would be diluted very easily.

But mg and ml are very small and hard to measure. For the first batch, we assume we'll be using an imprecise scale, so we multiply everything by 1000 to reduce the risk of error without altering the concentration.

Then in 0.1 l so 100 ml of pure ethanol, mix 3g of E2 with 15 g of octisalate. Then use 1/1000 of that, so 0.1 ml of that mix, to be equivalent to 1 spray of Lenzetto.

To know if you have 0.1 ml, you can use the syringe trick to figure out how much your spray is giving on each push: draw 10 units of just ethanol with a insulin syringe (OTC at wallmart), put it in the empty spray, and see if everything goes out. If not, try a different spray until you get one that does approximately this, but no more: if you put 20 units and push one time, you should be able to pump back 10 units with a synringe - otherwise it means you spray is giving more than 0.1 ml

In the worst case, the spray could be replaced by the insulin syringe as a measuring instrument!

Also, it means each 3 grams of E2 should give you 1000 doses of spray, which should be very economical!! And if you order more than 3g of E2, just keep the leftover dry, and dilute again when you run out of the 1000 doses.

This is super crude and just some quick calculations. If anyone can verify the numbers and the logic, please do, as my rule of 3 is getting rusty (yeah I'm a dropout. blame me): I think I should get 500 doses somewhere, as 3/2=1.5 and lenzetto is 1.5, not 3.

https://en.wikipedia.org/wiki/Rule_of_three_(mathematics)

Plan C: multiple doses of lenzetto spray do not give a linear increase in blood levels

From https://pubmed.ncbi.nlm.nih.gov/19628730/ the abstract caught my eye:

> "The area under the serum concentration-time curve over 24 hours following the last dose of study drug (AUC(0-24 h)) on day 14 for the 1-, 2-, and 3-spray groups, respectively, was 471, 736, and 742 pg.h/mL for estradiol; 886, 1208, and 1367 pg x h/mL for estrone; and 16,501, 26,515, and 27,971 pg x h/mL for estrone sulfate."

So after 2 weeks to stabilize the blood levels, there are little differences between 2 and 3 sprays for E2, while E1 increases a bit more.

This points to some kind of saturation effet: delivering too much is useless. If we check the methods in their full paper https://sci-hub.tw/https://doi.org/10.1177/0091270009339187, there is no obvious mistake: the drug was applied by trained professionals in a non overlapping pattern

> "Each spray of study drug contained 1.53 mg of estradiol. Study drug was applied at the same time each day to each participant’s inner forearm by trained study personnel. The application site was left exposed to dry for 30 minutes before being covered by clothing. If more than 1 spray was applied per dose, the sprays were applied at non overlapping sites on the inner forearm."

They noticed:

> "The 2- and 3-spray doses appear to have similar mean serum concentrations following the last dose (Figure 2)"

They just reject dose proportionality for over 3 spray, while I would reject it even for 3 sprays!

> "Therefore, dose proportionality for AUC0-24 h over the range of 3 doses in this study is considered inconclusive; Cmax was not proportional (Table III). A supplemental analysis was carried out by examining dose proportionality based on

> trough (predose) levels of baseline-adjusted estradiol on each day from day 7 through day 13 (Table III). The 90% CIs were only partially inside the 0.80 to 1.25 range; all dose-proportionality assessments were therefore inconclusive"

They think the SC is not the problem:

> " If more than 1 spray was applied per dose, the sprays were applied at non-overlapping sites on the inner forearm to help ensure that absorption of each spray was independent of each other spray. This suggests that nonlinearity can-not be explained by saturable dermal absorption alone. However, despite this precaution against saturation, the systemic levels of estradiol for the 2- and 3-spray doses appear to indicate that either saturation of absorption or elimination may have occurred after estradiol had penetrated the stratum corneum."

However, except by giving us a few references about that effect which was apparently noticed before for other transdermal methods, they do focus on this very important detail:

> 24. Vivelle-Dot (estradiol transdermal system) [package insert]. Basel, Switzerland: Novartis Pharmaceuticals; 2004
>
> 25. Brennan JJ, Zhihong L, Whitman M, et al. Serum concentra-tions of 17β-estradiol and estrone after multiple-dose administration of percutaneous estradiol gel in symptomatic menopausal women. Ther Drug Monit. 2001:23:134-138.
>
> 26. Setnikar I, Rovati LC, Santoro A, et al. Estradiol and estrone plasma levels during application of three strengths of a 7-day estradiol transdermal patch. Arzneim-Forch. 1999;49:708-715.

We will have to check these references. I started with #25, but could not find any mention of the non linearity in https://sci-hub.tw/https://doi.org/10.1097/00007691-200104000-00007

Given the generally accepted 6h half life for transdermal estradiol, when using more than 3mg it may be necessary to wait 6h to administer the rest of the dose. If just the epidermis is to blame, using different limbs at the same time may be enough.

Plan C: dosage questions

So I was reading the monograph for lenzetto spray that I saw posted on here and I'm concerned about it being too weak. According to their monograph 3 sprays pre day resulted in mean estradiol levels of about 40pg/ml. Which is obviously far too little. I had really been leaning towards Plan C as the best option, and I still like it, but that's a major drawback. Could we make it stronger? If so I think that would definitely need to be done.

I'm also starting to think that making estrogel might be easier since we won't have those same dosage concerns. I believe on application of estrogel gets you 50pg/ml. Both seem pretty straightforward though and I'm excited to get to work on this!

Eau de cologne spray

Got curious about the alcohol percentage in eau de cologne...i.e. cheap perfume spray. Turns out most of it is about 80% alcohol. So....would that be a viable alternative for transdermal application of estradiol? Dissolve the appropriate amount of raw estradiol powder into a cheap spray perfume...and.....smell sexy and get your dose at the same time?

FAQ for the estrogel sub

Why now?

In the midst of the covid-19 pandemic, supply channels are disrupted worldwide. It is hard to receive shipments. Some people lost their jobs and are without health insurance. Also, drugs are way overpriced.

Why brew?

Even outside a pandemic, why give your hard earned money to some doctor just so they can write a piece of paper for you to take to a pharmacy? Do you enjoy some clown in a white jacket lecturing you on what you should do with your body and your money? Do you appreciate that pharmacies refuse to sell you drugs you've been taking for years if you don't have the magical piece of paper of if it's expired? Do you like this system created by big pharma under the pretense of "your safety" while it's just to profit from you? We don't.

Why say "brewing" instead of making?

Because it evokes DIY like making beer or cooking drugs at home. This means it may or may not be illegal where you live. Not our problem.

Why brew a gel instead of pills?

Because when swallowed, pills are subject to a first pass in the liver. Besides being bad for the liver, this makes estrone, which can give blood clots. Letting pills dissolve sublingually is a poor workaround, as you'll always swallow some.

Why brew a gel instead of an injectable?

Because of safety first. It is almost impossible to create safely an injectable at home. Sterilization requires many specialized tools like autoclaves, UV lights, aspiration - a pressure cooker in your kitchen is not enough. Even professionals get bacteria or fungal contamination in their batches sometimes. Even if you managed to reduce the risks to some level you find acceptable, what do you know about the contamination of the active substance you acquired? It is very easy for say a virus to sneak in. Contamination during the industrial manufacturing process is also impossible to control without lab tests you can't afford. Also, not everybody is comfortable injecting, and it can be hard to buy syringes in some places, even if insulin syringes can often be found OTC at places like walmart.

Why brew a gel at all given these risks?

With a transdermal gel, you bypass the liver. You put nothing in your mouth or your veins. Your skin is nature best defense against various infections. It is not perfect, but far less risky than the alternatives. Also, the alcohol in the formula will prevent bacterial and fungal contamination

What is the goal?

The composition will be based on https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=762ac371-bb8b-47e7-b48f-e80d452c9dd4

So is it a generic (a copy) of the commercial drug?

No. Given than most people need more than one dose from the usual estrogel 0.06%, the recipes will aim to make 0.12% estrogel instead.

Is it dangerous? Will I get in trouble with the DEA?

Maybe? The nih.gov website says "unscheduled", so it's not a controlled substance. But we're not doctors or lawyers. Did nobody warn you about following advice from random people on the internet? For us, your body, your rules. Don't do something if you're not comfortable with the risks you are taking.

What to buy

Accessibility is the #1 goal. The recipe and material required should be as cheap and simple as possible for all the readers not in rich countries, or on a fixed income.

Before wasting 99% pure hormone, you may want to buy the 98% pure version made for animal use, to test your instruments, your skills, and the lack of precipitates in the final version.

Preliminary research suggest a $3.99 milk frothier from Ikea will be required if you can't afford a magnetic stirrer going at 2000 rpm, which according to /u/HiddenStill would be the ideal tool to mix cf https://en.wikipedia.org/wiki/Magnetic_stirrer

A precision scale would be handy for excipients measured in tenth of grams ; if you can't get that, dilute in water and use divisions with a measuring glass like what is used for cooking : if you have 2g of something and want 1.5g, dissolve in 10 ml of water, then keep 10*1.5/2 = 7.5 ml.

To avoid oxydation of estradiol into estrone, the final gel will have to be protected from air. As recommended by /u/caissonposting, get a few airless cosmetic dispensers for storage. The way they're built is like a syringe with a pump on top, so the reservoir shrinks as the contents are used, keeping air out instead letting it in to fill up the extra space. The metered pump also makes for consistent dosing. Can be bought on amazon or similar sites.

A: No recipe

It should be possible to just add some estradiol and maybe a penetration enhancer in a base of Purell, however the use of denaturing agent could be a problem. More research is needed to see if it precipitates. This is plan A.

B: Riskier recipe

We are trying to understand a patent that use an acid/ester mix to drive the hormones into the dermis, with more ester allowing for a longer half life, meaning a longer release, with a smaller volume, meaning it would be faster and easier to apply. This is HIGHLY EXPERIMENTAL, we haven't mixed anything yet, we are just trying to understand how it works. Please help us if you can. This is plan B.

C: Simpler recipe

It should be possible to just mix hormones and alcohol to create a spray, as was used in Eastern Europe before. This is plan C.

YOLO, gimme the default recipe!

It is a work in progress, but better than any of the alternative plans as we will just make a generic of what is know to be safe and to work. Depending on your finance and your tolerance for risks, it will cost you between $8 and $60 in raw ingredients for a 2 year supply.

For 100g at 0.12% based on line 171 and page 39 of https://patents.google.com/patent/US20070154533A1/en which will also be similar to the US Estreva 0.1% and from line 261 from US20190160077A1 which will also be similar to the UK Estrogel 0.06% (so we double up the estradiol)

Dissolve in order, making sure you have the correct weight first :

> 17 beta estradiol (active principle) : 0.12 g
>
> ethanol (lower alcohol, could also be isopropanol) : 59 ml (or 40%?)
>
> add purified water to reach 100 ml total
>
> carbomer 980 (thickener or gelling agent, could also be carboxymethylcellulose or another polyacrylic acid like 934P or maybe even sepimax zen, with some adaptation of the recipe) : 1g
>
> triethanolamine (neutralizing agent for the carbomer) : 1.35g cf https://en.wikipedia.org/wiki/Triethanolamine

We are looking at 3 alternative plans called plan A, B, C as indicated above: respectively for more simplicity, more concentration, and a spray.

X, Z: What about guys?

ftm can substitute testosterone or DHT for estradiol in the formula, but they need to add a penetration enhancer: Isopropyl myristate 0.50g

Please also check https://patents.google.com/patent/EP1317921B1 if you need more details about how andractim is made, be sure to read from line 47 explaining how to make a 70kg batch and adjust depending on how much you want to make!

We are looking at 2 alternative plans called plan Z and Y for more concentration and for a spray

I found an error in the recipe!

Please immediately make a reply explaining what and how, this way nobody else will risk making the same error. Then please make a post to call our attention to the error, so we can try to fix it.

Another possible generic formula

An anonymous benefactor told us about patent US7404965 for transdermal gels like Elestrin, and the composition is something like this (all percentages w/w): estradiol 0.06%, lauryl alcohol 2.00%, diethylene glycol mono ethyl ether (Transcutol P) 5.00%, propylene glycol 6.00%, ethyl alcohol 44.57%, distilled water 39.55%, Carbomer (Carbopol 980 NF) 1.21%, triethanolamine 0.35%, and finally disodium EDTA 0.06%. The patent notes that estradiol can be up to 3.00% concentration.

The other excipients are interesting. We need to understand their role, to see if this could help make a plan D

E - Experimental emulsions for estradiol, estriol, progesterone, or spironolactone

Plan E: a simple emulsion

An emulsion may be suitable for progesterone and estriol, given https://www.ncbi.nlm.nih.gov/pubmed/25474862 :

> "Progesterone was the drug with the highest permeation (37.02 mcg cm(-2) at the end of the experiment). Estradiol and estriol in Biest had permeations approximately 4-fold lower (9.44 mcg cm(-2) for estradiol-Biest and 14.02 mcg cm(-2) for estriol-Biest)" ... "For progesterone, using the percentage of permeation by dose, one can infer that a patient using the 1-g emulsion dose released by the pump containing 50 mg of progesterone will have 38.4 mg of progesterone liberated into his bloodstream, gradually and continuously for 48 hours. The results

> indicate that the vehicle was able to provide percutaneous absorption rates compatible with and higher than clinical treatment needs. Using the same rationale, the Eemuls would deliver practically the entire amount of estradiol load per dose (1.0 mg), approximately 0.5 mg of estradiol per day. As for the Biest, the dosing used would deliver almost 0.5 mg estradiol/day and 2.0 mg estriol/ day"

For plan E and F: how to make liposomes or water gel

Here is an egyptian recipe from Int J Nanomedicine. 2014; 9: 5449–5460. "Follicular delivery of spironolactone via nanostructured lipid carriers for management of alopecia" https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4251754/ that has verified the liposomes delivered drugs into the follicules

Best used with spironolactone to reduce hair, or estradiol to reduce sebaceous glands

"Spironolactone-loaded nanostructured lipid carriers (SL-NLCs) were prepared by an emulsion solvent diffusion and evaporation method followed by ultrasonication, as reported by Eskandari et al10 but with slight modification. Fifty milligrams of SL was dispersed in the liquid lipid (olive oil alone or containing 50% Transcutol®) then added to molten Compritol® at 5% or 15% levels with respect to total solid lipid in the formulation. Following that, 10 mL of acetone and ethanol mixture (1:1) was added to the lipids maintained in a water bath at 80°C until complete dissolution of lipids in the organic phase. The latter was dispersed in an aqueous solution containing Tween 80 (1% or 2%) at 80°C and mixed using a magnetic stirrer rotating at 1,000 rpm for 1 minute. The resulting pre-emulsion was then ultrasonicated for 3 minutes to produce an oil/water nanoemulsion that was cooled down at room temperature while stirring at 500 rpm until evaporation of the organic solvent to form SL-NLC dispersion."

See also https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7022583/ for another egyptian recipe (don't know why they like that so much!): a methylcellulose gel published in Pharmaceutics. 2020 Jan; 12(1): 25. "Spironolactone-Loaded LeciPlexes as Potential Topical Delivery Systems for Female Acne: In Vitro Appraisal and Ex Vivo Skin Permeability Studies"

"Plain methylcellulose (MC) gel (1%, w/v) was prepared by gently dispersing the required amount of MC in 100 mL of boiling deionized water, followed by magnetic stirring at a high speed. Stirring was continued until a thin, lump-free hazy dispersion was obtained. The gel was left overnight in the refrigerator. To prepare SP LeciPlex-loaded gel, a given weight of the LeciPlex F1 pellet obtained after centrifugation of the LeciPlex dispersion was mixed with a given weight of MC plain gel (1%, w/v). Control SP gel was prepared by adding a given

weight of SP to 100 mL of boiling deionized water, followed by the addition of the required MC weight, and the rest of the process was the same as the plain gel. SP concentration in all of the preparations was 1%, w/v."

FU - Experimental estradiol tincture (estro-booze)

Plan F: a drinkable cocktail (yummy!!)

The dose in mg for transdermal and oral are approximately the same in r/MtFHRTsuppl/comments/g43obl/table_approximate_comparable_dosages_of_estradiol so the same recipe could be either drunk, or rubbed on the skin!

Everclear 120 is 60% ethanol, which is ideal for transdermal, but as it is sold for making cocktails, it is also perfectly safe to drink:

https://en.wikipedia.org/wiki/Everclear_(alcohol)

The only difference for oral would be a hepatic first pass, wasting a bit away.

Still, if you buy a 750ml bottle of Everclear 120 proof, and dilute 7.5g of E2 powder, you would get a 10mg/ml solution that you could use either way.

However, at this 10 mg/ml dilution, a normal dose of 4 mg would be 40% of one milliliter, meaning you should only drink a few drops.

But since it is just a few drops, that could be put under the tongue, to do sublingual and avoid the liver.

The exact same penetration enhancer used for the skin (octisalate) can also be used, without altering mucosal diffusion according to https://www.ncbi.nlm.nih.gov/pubmed/15236454 :

> E2 buccal transport was not altered following OS pretreatment,

This was also studied in https://www.ncbi.nlm.nih.gov/pubmed/15736191 which suggest octisalate could increase sublingual absorption, by moving it quickier into the mucosa:

> The final concentration of E2 associated with the buccal mucosa and donor chamber walls in the presence of each enhancer was also determined. The rate of E2 disappearance from the donor chamber was 3.1-fold greater than the rate of E2 appearance in the receptor chamber, indicating significant membrane storage of E2

This means less E2 would risk being swallowed with saliva.

However, it is not clear what octisalate would be metabolized into: https://www.ncbi.nlm.nih.gov/pubmed/31782973

So if you plan to make a drinkable cocktail, just don't add octisalate until we can be sure it's safe to drink too.

Also you may want to add some colored candy, like a gummy bear, to mark this bottle of everclear as spiked and avoid serving it to your guests by accident :)

Cheers! Prosit! Kampai! Sante! Skol!

Sublingual Administration of Ethanol Solution of Estradiol

(I haven't tried this and this is not medical advice. This is a first draft of a concept, not an instruction manual.)

Possible pros of sublingual EtOH solution:
-Don't have to worry about getting it on anyone else, like you would with a topical formula. Good to avoid accidental exposure of someone in your household.
-Greater bioavailability vs. oral administration, since you're mostly bypassing the first pass effect
-Decreased impact on the liver vs oral
-Simple formula with no need for thickeners, gelling agents, or absorption enhancers.
-Fast, easy administration. You can measure a dose with a 1mL dropper or similar
-Fast absorption with no fuss.

Possible cons:
-Potentially irritating if you have a sensitive mouth or are prone to cold sores.
-Causes your blood level of the hormone to shoot up higher, but also drop down faster, than an oral dose. This is okay for some people but not others.
-Not a big improvement over sublingual hormone in pill form.
-You will swallow some of it. This might be an issue if you're on a hormone that's known to be hard on the liver when taken orally.

If this works for any steroid hormone, it should work for all of them. Only use alcohol that you would drink. If you use rubbing alcohol, you'll poison yourself, so don't lol. 40% ABV vodka would work fine. I'd spend a little more for something drinkable that doesn't burn.

The general idea here is that you make a solution of vodka and E2, using serial dilution as necessary to get your desired concentration per mL. Your goal would be to get your dose in 1 or 2 mL. You can measure 1 or 2 mL with a syringe (no needle obviously) or with a feeding syringe that you can get from a pet store.

Sublingual administration is very simple. Stick the dose under the tongue, don't swallow for two minutes, don't eat or drink or rinse for a little while, and that's it. No need for a penetration enhancer, since the mouth has thin skin and is full of blood vessels. It's measurable in your blood within five minutes.

(You could also extract E2 from pills by putting them in vodka overnight to let them digest, and then running the solution through a blender, and then filtering the solution through a coffee filter. This method is most useful if you want to divide your doses down further than you could reasonably split a pill. Say, if you have 1mg pills, but you prefer to take 0.1 mg per day.)

Starting to look at trans mucosal delivery

Given the "Enhanced Buccal Mucosal Retention" paper, it suddently seems less interesting to use penetration enhancers for sublingual drops:

http://sci-hub.tw/https://doi.org/10.1002/jps.20240

G - Experimental enhanced-penetration estrogels

Plan G: a gel using carbopol 940 and isopropyl myristate as a penetration enhancer

This is GC146 recipe for 100 milliliters, coming from r/TransDIY/comments/gpvbbw/transdermal_progesterone_gel/ :

> Isopropyl myristate: 5ml
>
> 98% Ethyl Alcohol: 65ml (note: I believe 95% ethanol will work the same, as ethanol >95% will suck moisture out of the air until getting to 95%. The change in percentage is neglictible)
>
> Carbopol 940: 0.4g
>
> Trolamine: "just enough to make it into a gel, like add 0,5 ml then add more untill it reachs the desired consistency" (the more you add, the harder the gel)
>
> distilled water: "just enough to get to 100ml" (so you complete whatever you have obtained with distilled water)

Then you put that into a flask, protected from oxygen (E2 oxydizes into E1), light and heat (general safety, we don't know how it would degrade)

So it is a 63% w/w ethanol gel using carbopol as a gelling agent, trolamine as a pH buffer, isopropyl myristate as a penetration enhancer

penetration enhancer: which and how much?

I know about Dimethyl sulfoxide (DMSO) but I'm a bit fearful of it.

Triethanolamine is traditionally used as a penetration enhancer in transdermal gels like estrogel or testogel, the other options would be:

> Isopropyl Myristate
>
> Dimethyl Isosorbide + ethoxyglycol
>
> 1.3.propanidiol
>
> Propylene Glycol (PEG)

I have read more is not always better for transdermal properties as the agent should at one point "leave the solvent and enter the tissues: too much solvent may alter the partitioning between phases" - and only triethanolamine has been evaluated for estradiol

I'm learning chemistry it's fun, but any suggestions?

The basics of absorptions suggest a plan B3 : a synergestic Isopropanol–Isopropyl Myristate mix

Abbreviations used below:

> IPA isopropyl alcohol
>
> IPM Isopropyl myristate

Potentially interesting penetration enhancers:

> OA oleic acid
>
> PG propylene glycol
>
> octisalate
>
> trolamine

E2 is lipophilic, so to be absorbed, it needs to go first through the upper layer of the skin, the stratum corneum (a polar enhancer like IPA rocks that step) and then through the epidermis (a non polar enhancer like IPM rocks that step). Once it has done both, it can be distributed in the body: https://sci-hub.tw/http://dx.doi.org/10.1016/j.ijpharm.2013.02.040

> "Initially,the drug must be released from the vehicle followed by partitioning into the SC. Molecules will subsequently diffuse (as a result of a concentration gradient) through the SC before a further partitioning process into the viable epidermis, and further diffusion through the viable epidermis towards the dermis.The vasculature and lymphatic vessels in the dermis will clear the drug from the skin"

Historically, no separate penetration enhancer was used: just a solvent called a vehicle. They have been compared in the litterature: in vitro, Ethylene Glycol has the higher flux, almost

33% more than DMSO, but with a 13h lag vs the immediate effect of DMSO cf https://sci-hub.tw/https://doi.org/10.1016/0378-5173(83)90142-4

Time is a problem, because the very first step takes time: pure ethanol is a polar enhancer that can't be used, as it is a

> "non-vehicle system, since the ethanol evaporates within a few minutes and leaves the estradiol spread across the skin surface as a thin film without microscopically detectable crystals"

This is one of the reason a commercial moisturizer applied after evaporation is sometimes recommended on transdiy, even if most of the gel is absorbed within a few minutes, and why you can find in point 12 of https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=87bb0e2f-9fa6-438b-9d5f-d0a90af770ed

> "Site washing 1 hour after the application resulted in a 22% mean decrease in average 24-hour serum concentrations of estradiol"

and also why :

> "The study results showed that repeated daily application of sunscreen for 7 days at 1 hour after the administration of 0.06% estradiol topical gel decreased the mean AUC0-24h and Cmax of estradiol by 16%. Repeated daily application of moisturizer lotion for 7 days at 1 hour after the administration of 0.06% estradiol topical gel increased the mean AUC0-24h and Cmax of estradiol by 38% and 73%, respectively."

You may not see it, but a non neglictible amount of E2 is left where you put the gel, and you can "reclaim" it with just a moisturizer! Also, it is why estrogel works better on a clean skin, right after the shower, with no oil to add another barrier.

It is also true that a thinner skin, with fewer corneocytes, will have an easier first step - and even better if the skin is moist or folded onto itsef: this will act like a natural moisturizer! This is the reason why scrotal application is often mentionned on transDIY to get higher levels. However, for the exact same reasons, the armpit would be a perfect candidate (besides being much easier to access) and after some quick googling, I found it has been used for topical T in Axiron https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5987958/

But let's not get stuck on the first step, as the best first step in the world is nothing without the second step, even if the notion that "The rate of diffusion across the stratum corneum is the rate-limiting factor" is still floating in the monographs!

Problem is the first two steps are essentially opposite. If you think like the FDA boneheaded quote that you could use 95% ethanol as a nice workaround to avoid drying too fast while still allowing the E2 to go through the stratum corneum, and be done with it, this wont work: you

forgot the second step. Your E2 will remain stuck there, and that won't be helpful for your blood levels!

This is why 63% ethanol is used in practice: it is the "peak" mix, after which adding too much ethanol will be good for passing the IPA, but overall a net negative.

Some astute biologists have figured 12 years ago that a good way to maximize the final result, the distribution in the body, was to use a fifty-fifty mix of polar and non polar, like IPA and IPM: https://sci-hub.tw/https://doi.org/10.1002/jps.21459

In that publication, you can see that almost 100% isopropyl alcohol is not good, because that the second step can also act as a limiting factor (eat that, FDA!)

But why stop at 2 things? Too much of a good thing is wonderful, right? So let's add more! There are many penetration enhancers, and apparently adding an amine can further improve results: https://sci-hub.tw/https://doi.org/10.1016/j.bbamem.2009.08.015

There is a huge consequence: this means the trolamine in traditional estrogel may also have a penetration enhancement effect for ethanol, and not just be used to get the right thickness of the carbomer, something we hadn't properly considered until now!

Also, in this same paper, various mixes are compared, and the most synergy has been found with diethylene glycolmonoethyl ether:isopropyl myristate in a 40:60 mix: 80x compared to IPM alone - but for clepbopride, not for E2. How comparable this other lipophilic drug is to E2? How transposable are the results? Hell if I know.

Besides the amine, we could throw everything and the kitchensink by adding a fatty acid like oleic acid, and also a moisturizer like like PG, but then we would be going into unknown territory, as it would all be at best speculative and untested. Even for the diethylene glycolmonoethyl ether:IPM in a 40:60 mix mentionned above, there are no studies concerning estradiol, so we can't do that unless we are ready to make the heroic assumption that all lipophilic drugs are alike, and that it will work.

Yes we may do better at one point, but unless we have a lab, we can't hope throwing a bunch of stuff in the mix will work better. As wishful thinking can only go so far, it seems better to stick to with the known, at least until we find better. So let's exercise restraint and not add PG or OA

(BTW if you're a biologist and have access to lab animals, it would be nice to test that mix, and compare it to IPM/IPA alone, then + an amine, then + an amine and OA and PG, or the various combinations of thereof!)

IPA was chosen for a good reason: it forms the best tag team with IPM, as mentionned in https://sci-hub.tw/https://doi.org/10.1016/0378-5173(94)00253-2 :

> "Compared to the neat alkanol, the E 2 fluxes were enhanced approx. 2-, 5-, 8- and 18-fold by adding IPM to n-OcOH, n-PrOH, EtOH and i-PrOH, respectively

So Ethanol+IPM would be 8x better than ethanol alone, but IPA/IPM are 18x better than IPA alone.

Another advantage of IPA over ethanol is that E2 dilutes better. Saturation of E2 in ethanol is 31 mg/mL in alcohol at 25°C, and aroud 95 mg/ml in IPA cf page 4 of https://sci-hub.tw/https://doi.org/10.1016/0378-5173(94)00253-2 and page 23 and 24 of https://sci-hub.tw/https://doi.org/10.1016/j.molliq.2020.112599 meaning we can expect a higher saturation point for the IPA:IPM fifty-fifty mix - indeed, it is: in table 3 of https://sci-hub.tw/https://doi.org/10.1016/0378-5173(94)00253-2 about 68 mg/ml with a flux in table-2 of 1 ug/cm2/h

This is not bad at all: looking at the picture 1 from https://patentimages.storage.googleapis.com/96/bd/d1/4068fa172c9429/US20040028725A1.pdf you can read on the figure 1 that plan C (E2, ethanol, octisalate: lenzetto spray) should give *at best* one fourth of that, about 0.25 ug/cm2 after 1h.

So the IPA/IPM should give 4x better blood levels than the 30pg: 120 pg is a reasonable expectation, with no worry about dilution.

I think these are good reasons to go for a IPA/IPM mix: there are between 20 and 40 drops per ml given https://bmcophthalmol.biomedcentral.com/articles/10.1186/s12886-017-0473-8 so above 40 mg/ml, we can aim for 1 mg of E2 per drop even in the worst case of tiny tiny drops (at least until we standardize on a specific eyedrop vial giving a drop of a precise size).

Lenzetto delivers 1.53 mg per push, we could have 1 drop of IPA/IPM mix deliver 1mg, so in theory just 2/3 of Lenzetto, but absorbed 4x better, so equivalent to 8/3 or about 2.5x overall

So far, so good - but there is a bug!

The problem would be the flux: even at 1ug/cm2/h, this mean this 1mg would require about 1000 cm2, or about 31cm by 31cm which is 12 inches by 12 inches. Something seems very wrong in my calculation, as they were using a solution saturated in E2 at 68 ml/ml, while we already know that lenzetto using just 1.53 mg should give 30 pg/ml even with 1/4 of the flux (0.25 ug/cm2/h) in just 20 cm2

And this is even more of an issue as we know there can be problems of non linearity, where 3 sprays of Lenzetto are barely better than 2: https://old.reddit.com/r/estrogel/comments/gt6b3l/plan_c_multiple_doses_of_lenzetto_spray_do_not/ : we may not be able to make very concentrated drops, as the goal is absorption. Any E2 that stays on top of the stratum corneum will not help much (unless you follow with a moisturizer 1h later, then again, why not add PG?)

So can someone please proofread my analysis and figure out where I made the mistake? My best guess is that my flux in ug/cm2/h are wrong, because I forgot the effect of time somewhere)

If not, we may have to figure out workarounds, by targetting a favorable zone like the armpits, then anything would go: use a reservoir approach like Axiron, toy with supersaturation that establishes a gradient: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6311647/ etc

If we consider adding one or more penetration enhancers (octisalate, trolamine, propylene glycol, oleic acid...), these last 2 in the IPA/IPM mix look very close to the plan H found by juicers... 18y ago!

Thoughts? Opinion?

Merged plans B, G, and H - Ultimate experimental estrogel

State of the research: a detailed plan B from the fusion of G/H/B3: IPA/IPM 50%/50%

(this is has a partial copy/paste from a comments on r/estrogel/comments/gu568w/merging_plans_into_3_families_depending_on_the/ and original plans B3 and H)

Plan A is just making an equivalent of commercial estrogel (60% ethanol, carbopol, trolamine as needed for the thickness) by throwing some E2 into purell that has a very close composition to estrogel. Plan C is just making an equivalent of commercial lenzetto (ethanol, octisalate in a spray) - these 2 plans are just making generics of commercial products and did not require further research after finding the precise formula of the commercial products.

However, Plan B is about using the best science we have to have the most efficient mix: using the least E2 (expansive) with the fewest ingredients, as a base to be further improved with other penetration enhancers.

After having reviewed the alternatives, the best plan B is IPA/IPM, 50%/50% : just 2 excipients.

The flux according to figure 1 on https://sci-hub.tw/https://doi.org/10.1002/jps.21459 should be 2.5 ug/cm2/h - keep that 2.5 number in mind

In comparison :

> ethanol gives 0.06 ug/cm2/h according to https://sci-hub.tw/https://doi.org/10.1016/0378-5173%2894%2900253-2 (it could be improved by using 63% ethanol instead of 100%, but not by an order of magnitude
>
> DMSO gives 0.14 ug/cm2/h according to table 1 of https://sci-hub.tw/https://doi.org/10.1016/0378-5173(83)90142-4

plan C (Lenzetto: E2+OS in OH) gives 0.25 ug/cm2/h according to picture 1 from https://patentimages.storage.googleapis.com/96/bd/d1/4068fa172c9429/US20040028725A1.pdf , with 1.4 ug of CUMULATIVE absorption at 24h for an equivalent of plan C using 0.5% E2 and 5% octisalate according to https://patentimages.storage.googleapis.com/d0/11/66/354286eb82979e/US8435944.pdf

an equivalent of Axiron with E2 applied in the armpit in figure 3 of the same patent gives 2ug ug of CUMULATIVE absorption at 12h. So we get 10x better than the lenzetto, which has been on the market since the 1970s, so we can use it as a benchmark for the target blood levels, and see if we indeed do 10x better.

plan B is IPA/IPM, 50%/50% : just these 2 excipients get a flux of 2.5 ug/cm2/h according to figure 1 on https://sci-hub.tw/https://doi.org/10.1002/jps.21459 so 10x better than DMSO, and FYI, this is not the best theoretically possible result:

triethylene glycol monomethyl ether (PEG-ME3) + Isopropyl palmitate (IPP) peaks at 3 ug/cm2/h at 20h in https://sci-hub.tw/http://doi.org/10.3109/03639049709148476 , but:

it undergoes phase separation because of a (possibly osmotic?) backflux of water. This means the cool mix gets fucked quick and can't diffuse much E2 which cristallizes on the skin

also, even before that problems happen, given the phase diagram in figure 3, it would be very difficult to get right: the black area is small meaning any mistake would cause separation. From 2.5 to 3.0 I think it's not worth bothering too much.

Unfortunately, I can't find the plot of ug/cm2/h flux against time in h for the IPA/IPM ; I wanted to check when the peak was reached. 20h is a long time for PEG-ME3/IPP. That may not be a problem if adding DMSO to cause quick absorption, but it's not clear it would work.

For now, to minimize the number of moving parts, I recommend we all purchase the following ingredients:

IPA isopropyl alcohol

IPM isopropyl myristate

ethanol 95% (everclear 180) or 60% (everclear 120)

Carbopol 940 to make a gel

Trolamine to thicken the gel (but which also has penetration enhancer effects)

Why use gel by default, instead of spray that would require fewer elements? Because as found in plan H, a gel remains more homogenous and will not separate, meaning the E2 will not sink to the bottom. Also, it dries slightly slower, giving more time for the active principle to be absorbed in the skin.

If you have extra money, you could get the potential penetration enhancers we may later use for a lotion or a spray:

> OA oleic acid
>
> PG propylene glycol

However, please understand we will NOT add stuff willy nilly, as we can't be sure OA and/or PG would help. For all we know, it could be counter productive and reduce absorption or create skin reactions.

We will test things first. Then we will aim for using the armpit, to standardize on a body part.

Why? Because everybody has 2 of them, so we can do rotation even during the days if we decide on several applications per day or if more doses are needed as there may be a problem of non-linearity, even with non overlapping applications: 3 sprays of Lenzetto are barely better than 2 cf r/estrogel/comments/gt6b3l/plan_c_multiple_doses_of_lenzetto_spray_do_not/

Also the armpit is used by new drugs like Axiron for ftms because it has many characteristics that make it an ideal site: many annexes (hair follicle, sweat glands), a thin stratum corneum, large blood vessels nearby, a decent amount of fat very near to store the steroids in the back of the arm - it's the ideal site for a transdermal!

For existing drugs, is not the ideal best, contrary to what I claimed on r/estrogel/comments/gt9fat/the_best_site_for_transdermal_hormones_is_the/ the scrotum is, which would give 4x better results than the armpit, but not everyone has a scrotum (yet, feel free to test the mix there if you want) while we all have 2 armpits - so the difference should be at best 2x.

Also, as we are making our plan B from scratch, we can optimize it for the armpit, following the theoretical basis about say the reduced thickness of the stratum corneum, and using less polar solvent (IPA) if it's less of a problem : E2 is lipophilic, so to be absorbed, it needs to go first through the upper layer of the skin, the stratum corneum (a polar enhancer like IPA rocks that step) and then through the epidermis (a non polar enhancer like IPM rocks that step). Once it has done both, it can be distributed in the body: cf the details in https://sci-hub.tw/http://dx.doi.org/10.1016/j.ijpharm.2013.02.040

For reference, the original plan B3 contains more of the theoretical basis is on: r/estrogel/comments/gt3tir/the_basics_of_absorptions_suggest_a_plan_b3_a/

So I propose the following new plan B, in different phases:

> phase 1: skin test: we mix IPM and IPA, fifty fifty, and do skin tests. I would recommend the arm first, to check for lack of allergic reaction with just one small drop, then the armpit, as it is an ideal site to standardize on for ftm and mtf, pre and post op. Try to vary things: wash your skin or not, use deodorants, and report what weird things may

happen. You can do that with excipients even before receiving the E2 from alibaba, and it's a better idea to start with them to make sure there are no adverse effects. If we get skin reactions, we will dilute the 50/50 mix with some water

phase 2: volume standardization: we dilute E2 in the IPA then add an equal amount of IPM. We keep the final amount of E2 below the saturation point of the mix that is 68 mg/ml, say 40 mg to be safe, instead of the saturation point of IPA which is 95 mg/ml cf page 4 of https://sci-hub.tw/https://doi.org/10.1016/0378-5173(94)00253-2 and page 23 and 24 of https://sci-hub.tw/https://doi.org/10.1016/j.molliq.2020.112599 and we put that into small vials like that are used for eyedrops. There are between 20 and 40 drops per ml given https://bmcophthalmol.biomedcentral.com/articles/10.1186/s12886-017-0473-8 so at 40 mg/ml, we can aim for 1 mg of E2 per drop even in the worst case of tiny tiny drops (at least until we standardize on a specific eyedrop vial giving a drop of a precise size). Put 10 drops in a plastic vial, measure the volume using a syringe. Aim for 1 mg per drop

phase 3: actual tests as I can't figure out the flux calculations. based on lenzetto which uses 1.53 mg in just 20 cm2, and give 30 pg/ml even with 1/10 of the flux (0.25 ug/cm2/h vs 2.5 with our IPA/IPM mix). With 1mg per drop and 10x greater flux, it should mean one drop would give you 10x2/3 of the 30 pg/ml, so blood levels should be 200 pg/ml per drop, with linear increases at least up to 2 drops. So we apply the 1 or 2 drop to one or both of our armpits every day, eventually twice per day depending on the dose we usually take (2 drops on 1 armpits once per day: 2mg giving 400 pg/ml while 300 is generally recognized as a good target for transition), and 2 weeks later we get our blood levels of E2 tested. Or don't get blood levels tested. We could use the results of those who can pay for bloodtests as a baseline to make our first estimations

phase 4 : adjustment and optimization: if you get half the blood levels you want, use twice as much - and likewise if you blood levels are too high. But we also start introducing the most basic enhancement: moisturizing. If the blood levels are too low, we will also consider increasing the concentration of E2 closer to the point of saturation First, moisturizing: you may not see it, but a non neglictible amount of E2 is left where you put the gel, and you can "reclaim" it with just a moisturizer. From the litterature: in point 12 of https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=87bb0e2f-9fa6-438b-9d5f-d0a90af770ed : "Site washing 1 hour after the application resulted in a 22% mean decrease in average 24-hour serum concentrations of estradiol", and conversely "Repeated daily application of moisturizer lotion for 7 days at 1 hour after the administration of 0.06% estradiol topical gel increased the mean AUC0-24h and Cmax of estradiol by 38% and 73%, respectively" so you should expect to gain between 1/4 and 1/3 the dose you applied. Adjust accordingly. This means, 1 drop on 1 armpit per

day should be sufficient if moisturizing to get closer to 300 pg/ml if you got indeed 400 pg/ml from 2 drops on your blood tests. Or don't use a moisturizer if you don't want to. Your body, your rules.

After that, we do another blood test to confirm the results, and if they're good, will have a working lotion/drop/spray which we can announce to the regular trans subs.

So we could do the same with the gel following the order and the tricks listen in plan H (like IPM + carbopol first, then IPA to avoid wasting E2 until the mix is right), after which we can go back to the drops to start playing with the penetration enhancers one by one, using the knowledge gained from making both the gel and the drops to decide which one we like better. For reference, the original plan H that details the possible proportions of penetration enhancers is on r/estrogel/comments/gt9zr3/plan_h_exploring_the_mix_used_by_steroid_juicers/

Is any part unclear?

Thoughts? Suggestion?

Adding an antioxydant agent to prevent E2->E1 conversion

Many people that follow the Powers method fear estrone. In theory, estradiol could oxydize to estrone. This is a reason why H2O2 recommended by the WHO as a sporicide for sanitizing gel should only be used to clean the vials, but not as part of the recipe.

Someone reported having had high E1 levels on estrogel: r/TransDIY/comments/g7lbdg/homebrewing_estrogel_plan_a_walgreens_hand_gel/

A simple work around would be adding ascorbate (vitamin C) as an antioxydant, which is done in other skin creams: https://pubs.acs.org/doi/abs/10.1021/ba-1982-0200.ch022

Although the high ethanol content could turn ascobic acid into an ester, the paper mentions esters of vitamin C have similar properties.

As a side effect, vitamin C would also benefit the skin!

A tutorial explaining how to prepare carbomer gels

To follow up on a question that was asked to me by PM about making anesthetic gel using lidocaine, you will find some very simple explanation about the role of pH and electrolytes: https://skinchakra.eu/blog/archives/233-Working-with-Carbomer-part-I.html

Below pH 6, carbomer gels turn liquid - and with electrolytes too. The human skin is ascidic, and covered with electrolytes from sweat, so it's the perfect storm for a carbomer gel: it will become liquid very quickly!

For those who want to make gels that stick to the skin, as lidocaine requires a long contact, we will need to either use a penetration enhancer to have a fast absorption or a different gelling agent: I do not know much about xanthan gum, but it is one of the many alternatives to carbomer.

I wondered if IPM+IPA could help, as lidocaine is lipophilic, but apparently no, however phosphate buffered saline may be an option: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4078091/

Revision of the plan B family (ex G/H/B3) into 2 separate recipes, or just one?

For a quick recap:

> Plan A is just making a generic of estrogel using either hand gel as a base, or starting from scratch with carbopol. We know from publications like https://pubmed.ncbi.nlm.nih.gov/9651909/ that the skin flux is about 0.55 ug/cm2/h :
>
> "Sandrena Gel contains 0.1% (w/w) and Oestrogel 0.06% (w/w) estradiol (...) cumulative skin permeations of 0.65 +/- 0.15 microgram/cm2 and 0.45 +/- 0.15 microgram/cm2 respectively"
>
> Plan C is just making a generic of lenzetto using everclear (90% proof ethanol) and octisalate, which gives a flux of 0.25 ug/cm2/h (so about half less than estrogel) according to picture 1 from https://patentimages.storage.googleapis.com/96/bd/d1/4068fa172c9429/US20040028725A1.pdf , with 1.4 ug of CUMULATIVE absorption at 24h for an equivalent of plan C using 0.5% E2 and 5% octisalate according to https://patentimages.storage.googleapis.com/d0/11/66/354286eb82979e/US8435944.pdf
>
> Plan B is about making the best gel we can, using whatever technique or tool.

Previously, I suggested merging G/H/B3 together in the B family : r/estrogel/comments/gu568w/merging_plans_into_3_families_depending_on_the/

But what does "best" means?

For some people, it means the simplest, with the fewer number of ingredients. This gave the idea of a 50% IPA 50% IPM mix, that can achieve a flux of 2.5 ug/cm2 cf figure 1 on https://sci-hub.tw/https://doi.org/10.1002/jps.21459 - therefore about 5x better than commercial estrogel

I was uncertain which penetration enhancers could help, but when checking again an old paper, I realized the role of adding penetration enhancers to IPA/IPM has already been studied in https://sci-hub.tw/https://doi.org/10.1016/s0378-5173(02)00632-4 : we can go 4x

better to 8 ug/cm2/h using their microemulsion C, meaning about 20x better than estrogel (!), allowing the use of smaller surfaces

The formula is detailed as:

> 29.4 % oleic acid
>
> 11.8% isopropyl myristate
>
> 38.2% ethanol (why not IPA??)
>
> 11.8% PBS buffer to pH 7.4
>
> 8.8% Span 80 (aka sorbitane monooleate, sorbitan oleate), thanks to /u/johndifoolclassrpi for the correction!

I have to check if ethanol could be substitued by IPA, to simplify plan B to B1 (IPA/IPM) B2 (IPA/IPM/OA/buffer) but it is a technicality.

In either case, plan B is very interesting as lenzetto studies have found there is no linearity in the blood levels: even when using non overlapping surface there is no difference between doing 2 to 3 sprays: in r/estrogel/comments/gt6b3l/plan_c_multiple_doses_of_lenzetto_spray_do_not/

> "The 2- and 3-spray doses appear to have similar mean serum concentrations following the last dose (Figure 2)"

They just reject dose proportionality for over 3 spray, while given that, I would reject it even for 3 sprays; but it is likely people who use high doses of estrogel face similar issues: at one point, adding more gel won't make the blood levels bulge much - except maybe if we could use smaller surfaces, as discussed in r/estrogel/comments/ha9oko/plan_b_and_all_plans_studies_about_surfaces_and/

IPA/IPM are nice - it's simple, and who doesn't like simple? This means it's the best in simplicity. Also, it will be better than anything on the market - so best flux.

But we could still have the "best" plan B by sacrificing a little simplicity and adding just 1 more ingredient (OA) to go from 5x better to 20x better of what is commercially available. It makes it hard to resist.

What are your thoughts on this?

Thickening microemulsions with carbomers?

First, what are microemulsions? It's the fancy name of the plan B family: http://www.jsirjournal.com/Vol3_Issue4_12.pdf

> The term “microemulsion” refers to a thermodynamically stable isotropically clear dispersion of two immiscible liquids, such as oil and water, stabilized by an interfacial film of surfactant molecules
>
> Because the droplet size is less than 25% of the wavelength of visible light, microemulsions are transparent.

so basically 3 ingredient mixed does avoid the visible oil drops of say butter in ramen

> The microemulsion is formed readily and sometimes spontaneously, generally without high-energy input. In many cases a cosurfactant or cosolvent is used in addition to the surfactant, the oil phase and the water phase.

so sometimes 4 ingredients are required, but in exchange you don't need fancy mixer, something super important as our goal is to make this research accessible

> Oil in water microemulsions wherein oil droplets are dispersed in the continuos aqueous phase Water in oil microemulsions wherein water droplets are dispersed in the continuous oil phase; Bi-continuous microemulsions wherein microdomains of oil and water are interdispersed within the system.

So there're like 2 big types, and an inbetween mix

> The overall objective of this thesis was to develop stable salt-containing w/o microemulsions for possible release applications

this is not super applicable to us, as we are interested in the exact opposite, but at least it's nice start and it's very didactic

> Unlike coarse emulsions micronized with external energy microemulsions are based on low interfacial tension. This is achieved by adding a cosurfactant, which leads to spontaneous formation of a thermodynamically stable microemulsion.

spontaneous = sometimes no mixing is required! just shake shake shake it off, shake it off

> The surfactants used to stabilise such systems may be: (i)Non-ionic (ii)Zwitterionic (iii)Cationic (iv)Anionic surfactants

Now I understand better why stuff that's so different is used!

The differences are better explained in http://www.chm.bris.ac.uk/eastoe/Surf_Chem/3%20Microemulsions.pdf :

> Predicting microemulsion type A well-known classification of microemulsions is that of Winsor [21] who identified four general types of phase equilibria: • Type I: the surfactant is preferentially soluble in water and oil-in-water (o/w) microemulsions form (Winsor I). The surfactant-rich water phase coexists with the oil phase where surfactant is only present as monomers at small concentration. • Type II: the surfactant is mainly in the oil phase and water-in-oil (w/o) microemulsions form.

> The surfactant-rich oil phase coexists with the surfactant-poor aqueous phase (Winsor II). • Type III: a three-phase system where a surfactant-rich middle-phase coexists with both excess water and oil surfactant-poor phases (Winsor III or middle-phase microemulsion). • Type IV: a single-phase (isotropic) micellar solution, that forms upon addition of a sufficient quantity of amphiphile (surfactant plus alcohol).

as estradiol is lipophilic, we'll have to aim for type 1 using a water soluble surfactant

> Bancroft's rule was stated as "that phase will be external in which the emulsifier is most soluble"; i.e., oil-soluble emulsifiers will form w/o emulsions and water-soluble emulsifiers o/w emulsions. This qualitative concept was largely extended and several parameters have been proposed to quantify the nature of the surfactant film.

still a good rule of thumb, and we will use a water soluble emulsifier too. then it's more complicated but there're still a few nuggets:

> thus, by changing external parameters such as temperature, nature of the oil or electrolyte concentration, the spontaneous curvature can be tuned to the appropriate value, and so drive transitions between Winsor system

Ok, so salt and heat matters, thx dude. phase diagrams are explained p 82 with more details on how triangles and rectangles relate (temperature is orthogonal to the triangle, so a rectangle is like in 3d put on top of the triangle to avoid drawing a prism) but a bit too heavy for my taste

but back to the other paper.

> Preparation of MicroemulsionThe drug is be dissolved in the lipophilic part of the microemulsion i.e. Oil and the water phases can be combined with surfactant and a cosurfactant is then added

very interesting to know in which order we have to mix.

> at slow rate with gradual stirring until the system is transparent. The amount of surfactant and cosurfactant to be added and the percent of oil phase that can be incorporated shall be determined with the help of pseudo-ternary phase diagram. Ultrasonicator can finally be used so to achieve the desired size range for dispersed globules. It is then be allowed to equilibrate.

we may have to buy ultrasonicators? too bad for the Taylor Swift meme that remind me of my time in school :)

> Formation of monophasic/ biphasic system is confirmed by visual inspection. In case turbidity appears followed by a phase separation, the samples shall be considered as biphasic. In case monophasic, clear and transparent mixtures are

> visualized after stirring, the samples shall be marked as points in the phase diagram. The area covered by these points is considered as the microemulsion region of existence.

woa, like neo in the matrix, now I know what a phase diagram is, and how it's made!

table 1 explains visually the difference between emulsions and microemulsions, that's great too

> Topical drug delivery Microemulsions may enhance transdermal drug delivery primarily by thefollowing effects: Micro emulsions can exhibit a high solubilization capacity for both lipophilic and hydrophilic drugs, thus more drug can be loaded into the microemulsion, which increases the concentration gradient across the skin without depletion. Thereservoir effect of the internal phase maintains a constant driving force of drug from the external phase to the skin and prolongs absorption. Since the diffusion of the drug into the skin only occurs from the external phase of the micro emulsion, the internal phase continually supplies drug to the external phase so that it remains saturated with the drug

yeah we already know that now lol

This seems to just be student research, but they also seem to have many interesting points for us beginners: https://www.researchgate.net/publication/332290649_Comparison_of_Carbopol_934_and_941_as_Thickener_on_Diffusion_Rate_of_Ketoconazole_Microemulsion

> Low viscosity of microemulsions can also prevent clinical applications due to unpleasant use and make preparations less attractive [3]. Addition of thickener can increase the viscosity of microemulsions. Increased viscosity can slow particle movement resulting in slower particle deposition or phase separation and microemulsions becoming more stable. However, increasing viscosity can reduce the diffusion coefficient so that it affects the rate of diffusion of the active substance

As we know from estrogel, evaporation can be a problem. If recipe B3 isn't thick enough for a nice skin application, we may have to add some carbomer, which can impact diffusion

> This study aims to compare the rate of diffusion of ketoconazole in microemulsion with virgin coconut oil using carbopol 934 and carbopol 941 as thickener

that's great because it compares 2 thickeners. We can see the thickener reduce diffusion by a factor of 3x !

Also, they detail the method use: add the gel to the microemulsion at 300rpm

> TEA solution is added dropwise until the pH dispersion of carbopol reaches pH 5.5, then the carbopol dispersion is slowly added to the ketoconazole microemulsion,

> while stirred using a magnetic stirrer at 300 rpm for 15 minutes at room temperature

It also compares the acidity of polymers, and explains things I didn't know:

> The carbopol 941 dispersion is more acidic than the carbopol 934 dispersion. This is due to the crosslinking of carbopol 941 that is the pentaerithritol allyl ether is more acidic than the sucrose allyl ether which is the crosslinking of carbopol 941 (USP Convention 2007) [6]. These structural differences that affect the ability to stretch the polymer chain to trap water thus affecting the viscosity value

This could be helpful for cosmetic gels, or if making vaginal lubricants

> The addition of thickener can change the microstructure of the microemulsion which results in larger dispersion particles [16]. The enlarged particle size causes the viscosity and specific gravity to increase, but the particle size of the seven formulas is still included in the particle size requirement for microemulsion that is 10-100 nm

However, the increase particle size should result in a smaller flux.

> The thicker the preparation, the harder it will be to release the drug from the carrier. So that the diffusion rate constant is lower [4]. But the diffusion rate constant (k) increases as the concentration of carbopol increases. This can happen because carbomer exhibits very high adhesive bond strength in contact with tissues, enhancing the penetration of drugs [22].

Very true - we may want just a tiny bit of carbomer

> The diffusion kinetics obtained followed by the higuchi equation for the use of the two thickener, while the ketoconazole microemulsion without thickener (F1) followed the Korsmeyer-peppas equation with a diffusion rate of 9.444 %/minute. The diffusion rate of ketoconazole microemulsion with carbopol 934 (F2, F3, F4) were 4.354, 4.638, and 4.847 %/minute, respectively. Meanwhile, the diffusion rate using carbopol 941 (F5, F6, F7) were 4.695, 4.742, 4.751 %/minute, respectively
>
> It can be concluded that the use of carbopol 941 results in faster diffusion rate of ketoconazole compared to carbopol 934 in microemulsion systems.

yeah but not much. the choice of carbopol may be not that crucial

Making microemulsions: the pokemon problem of surfactants

Microemulsions are apparently what makes plan B so efficient.

To make them, several ingredients are needed - to simplify, anoil (like IPM), a surfactant (like OS), and a co surfactant (like IPA) that sometimes can be omitted, if so it's a ternary system, otherwise a pseudo-ternary system (https://pubmed.ncbi.nlm.nih.gov/17133772/)

If I knew enough chemistry, I would select an oil, a surfactant and a co surfactant that I'd know would work well together, and I would estimate the right doses with a wet finger. I don't know enough yet, so I try to piggy back on existing published research

Problem is every microemultion calls for its own set of ingredients!! And it's like the pokemons: unless you have all the ingredients, you can't do a recipe!!

Some are hard to find online and thus expansive in small amounts, like:

> Sorbitan monolaurate (span 20, CAS Number 1338-39-2): https://www.sigmaaldrich.com/catalog/product/sigma/s6635?lang=en&region=US
>
> Polyoxyethylene(4)lauryl ether (brij 30, CAS number 9002-92-0): https://www.fishersci.com/shop/products/brij-30-acros-organics-2/AC216725000

However, they are needed to make microemulsions with simple ingredients (cheap and easy to find) like IPM/IPA: https://www.researchgate.net/profile/Satya_Moulik/publication/236246830_ashis_currsci_o1/links/0046351757cebc17b0000000.pdf

> "Likewise, there is also little information on the preparation of microemulsions using surfactants that suit pharmaceutical requirements. The non-ionic surfactant polyoxyethylene (4) lauryl ether (Brij-30) is a non-toxic, biocompatible surfactant; thus the preparation of Brij-30-based microemulsions can be of considerable pharmaceutical interest."

Yeah, gimme some brij man!

Why not substitute that for octisalate? Check their phase diagram in Figure 1, then the figure 2: the biphasic part is small. It may be hard to find the right formula. So we can either try to reinvent the wheel, or reuse their phase diagram. Also octisalate like a buch of things may give cancer to the state of california (it should be renamed the rat state BTW, as everything seems to give cancer to rats and to the state of california lol)

Other formulas use limonene instead of IPM, great as it is easier to find online given its use for perfumes - however isotridecanol ethoxylate-6 is then needed as surfactant: https://www.jstage.jst.go.jp/article/jos/63/11/63_ess14041/_pdf/-char/en

Another paper studies "cosurfactants like ethanol,isopropanol, and propylene glycol were employed as microemulsion ingredients to study their potentialfor transdermal curcumin delivery" - all this is easy to find for us, but isotridecanol ethoxylate-6 not so much... fortunately, another one uses polysorbate 80 (10 bucks at walmart.com): https://sci-hub.tw/https://doi.org/10.1016/j.colsurfb.2010.08.018

Still, it hasn't arrived yet, and covid delays aren't helping. I have started some experimental brewing (mostly for cocktails bc baileys is too expansive, oops, I hope I will have some everclear left instead of drinking it all lol) as I hate hate hate that I have most ingredients for like 3 different recipes, but not all the ingredients for even a single one recipe.

Eventually, I'll have them all, but getting them may remain problematic outside the US. I think we should try to stick to things that have been 1) tested to carry estradiol or other steroids at known flux (in ug/cm2/h) or failing that 2) tested to give particles of known sizes (based on my understanding, the smaller, the better for absorption of steroids) and 3) that have other uses to make perfume, foods or DIY cosmetics (like limonene or octisalate or polysorbate)

Currently I have in my hands:

glycerol

isopropyl myristate

D-limonene

isopropyl alcohol

ethanol

octisalate

trolamine

carbopol 940

I have others things ordered weeks ago and "coming soon" fingers crosses, like oleic acid, polysorbate 20 and 80, propylene glycol and of course estradiol but it's so fucking frustating that I can mix some "optimal" recipes yet :(

If you're a chemist and can make some suggestions with what I have on hand, I'm all ears - especially if the surfactant is easy to buy at walmart and biocompatible!

I thought about using lecithin, but according to https://pdfs.semanticscholar.org/1d09/8fa397b9cc54af36230400269fcdec1e5034.pdf my best idea was a bad bad BAD idea:

> "Naturally occurring surfactants, lecithin and related phospholipids are preferred over synthetic surfactants, but they always need a co-surfactant because of the strongly lipophilic nature and its tendency to form rigid lamellar phase 60. But, microemulsions containing this class of surfactants show a potential increase in the permeability of the drug through biological membranes, which generally results in an enhanced intracellular drug concentration"

Yeah, we don't want the drug in the cells, but diffusing to the blodstream.

So instead they suggest the same thing as usual:

> "The commonly used synthetic, non-ionic surfactants are polysorbates 41 (Tweens), polyoxyethylene alkyl ethers 57 (Brij), polyoxyethelene stearate 62 (Solutol-15), polyoxyethylene hydrogenated castor oil 63 (Cremophor RH) and sorbitan esters 64 (Span). Low hydrophilic hypophilic balance (HLB) surfactants (such as sorbitan monoesters) are preferred for W/O microemulsions, whereas high HLB surfactants such as polysorbates 80 or 20 are preferred for O/W microemulsion 65. A mixture of lipophilic (low HLB) and hydrophilic (high HLB) surfactants is sometimes useful 66"

fuck you brij!! I know I need some but I just can't get my hands on some! And the twinks (oops, tweens) are not home yet. So I'm stuck.

If you have an idea to get polyoxyethylene ethers on the cheap, or to synthetize them at home with some easy to find stuff, I'm all ears!

If not, I may just go crazy and do without a surfactant (https://sci-hub.tw/17133772) as "IPM/iPrOH/water were found to form fair proportion of single-phase surfactant-less micro-emulsion": http://nopr.niscair.res.in/bitstream/123456789/3289/1/IJBB%2043%284%29%20254-257.pdf

These so called surfactant-free microemulsions are kinda new, as explaining their existance is still a research topic: https://www.pnas.org/content/113/16/4260#sec-18

But apparently, you can remove components ; this is called the ouzo effect, and it could explain what the IPA/IPM 50/50 mix initially studied for plan B was, with estradiol taking the place of the anethol. I wish someone with a good understanding of chemistry could confirm that, but after reading this paper it seems to make sense.

There are some articles giving some ideas of how other surfactant-free microemulsions could be made like https://sci-hub.tw/https://doi.org/10.1016/j.cocis.2016.06.013 so an experimental approach may be sufficient, like adding oil little by little until the solution turns turbid, then just a little surfactant like OS: if the solution turns clear again, we can suppose the micelles have formed.

This is what was done on https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4282703/ :

> "Methods
>
> Microemulsion Formation
>
> Microemulsions were prepared in a glass thermostated emulsor using the mechanical stirrer (Heidolph RZR 2021, Germany). The water phase was added dropwise to a mixture of the other components (oil phase, surfactant and polyol) until its solubilization limit was reached, (the system became turbid) under continuous stirring (300 rpm) (...) The isotropic region was identified when clear and transparent systems were obtained by visual examination of samples. "

Not as good as a study, but better than nothing

Finished the preparations for my own E gel production.

People asked to anounce my project here, did some testing to see if the gel was good and if the bottles where working well, always expelling the right amount of E.

here's the result

Used a mixture of carbopol, Isopropyl miristate, alcohool, destilled water and 17b E.

the bigger ones I'll probably use for Progesterone Gel/Cream, because they expell 1.4ml. I'm just not sure what people want, if they would want something more topical or something that would go into the bloodstream with relation to progesterone.

I made in the proportion 10mg/ml each pump 0.20ml =2mg. the smaller ones are filled with 55ml. (2pumps/day (4mg daily) it would last roughly 3 months). I also plan on doing other things.

If you want to DIY try to find airless pumps, found mine for 7 USD each (unfortunately in my country I found just one company selling it, and they sold only in big bulks, but if you can find in yor country, ti's really worth it as they'll always drop the same amount of gel/cream. (also if you're buying E17b, don't buy it's micronized powder, buy cristaline, micronized powder tends to get stuck in things a lot easier and it's harder to clean and you might even lose some amount in the package).