CI LABORATORY NOTEBOOK

VOL XXVIII

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Electromagnetic Studies.

I have solved on problem already & still have a couple more of immediate need.

& have solved for a model of the electron density and the skip distance of a lower level reflective layer subjected to a frequency.

The factors are

1. $CF_{Hz} = 9\sqrt{N_{m^3}}$ CF = critical frequency (plasma frequency)

2. $MUF = \frac{CF}{\cos\theta}$ N = electron density per m3 CF in Hertz

MUF = maximum usable frequency
θ = zenith angle

3. $OWF \cong \frac{MUF}{.85}(.85)$ OWF = optimum working frequency (a more practical value)

Since we have $CF = MUF \cdot \cos\theta$ $MUF = \frac{OWF}{.85}$

$MUF \cdot \cos\theta = 9(N)^{1/2}$ & $MUF = OWF(.85)$

$OWF = \frac{MUF}{.85}$

$\frac{OWF}{.85} \times \cos\theta = 9N^{1/2}$

$N^{1/2} = OWF\left(\frac{1}{9(.85)}\right) \cdot \cos\theta$ $N = \left(\frac{OWF \cdot \cos\theta}{9 \cdot .85}\right)^2$

So $N = \left(\frac{OWF \cdot \cos\theta}{7.65}\right)^2$

or $N = \left(\frac{OWF \cdot \sin\alpha}{7.65}\right)^2$ α = Vertical angle

and for skip distance (flat planar approximation ok for short distances, e.g. 100 ft in 100 miles)

$$d = \frac{2h}{\tan\alpha}$$

Now the law has been implemented into a javascript program.

Inputs are:

1. Optimum Working Frequency in Hz
2. ~~Zenith~~ Vertical angle of radiation (deg)
3. Height of layer in miles

Outputs are:

1. Electron density per Cm^3
2. Skip distance

The use of the program is already very insightful.

Now I should have two important questions (or more) ahead of me.

1. How much power is received at the receiver location from a transmitted signal?

2. What current can be induced into the human body

3. What amount of current is induced by a conductor (ie) human being in the presence of a magnetic field

(including ambient earth magnetic field as well as that added internally to the body, such as by injection)

The general topic is that of induced currents into the human body and by what mechanisms.

1. Induction via electromagnetic field
2. Motion of a magnetic field within

Intensity proportional to $\frac{1}{\text{distance}^2}$

We have one case of 200 mA @ 50 meters in human body w/ broadcast antenna

200 mA @ 50 meters

@ 100 meters (ratio of 2) = 100 mA

Choose 1 mA to 200 mA

$2^n = 200 \qquad n \log 2 = \log 200$

$n = \frac{\log 200}{\log 2} = \frac{\log 200 - \log 2}{2.301 \quad .301} \quad n = 7.64$

Δ

so $7.64(50) = 382\text{m} \cong \frac{1}{4}$ mile

That would be standing next to the antenna. Transmit and reflect the energy to obtain location.

Voltage decreases linearly
Current decreases linearly
$P = I \cdot V$ so power decreases as the square.

We are working w/ current here.

So we are actually working w/ $\frac{1}{r}$ not $\frac{1}{r^2}$

So you would need attenuation in free space.

But regardless, current demodulated will be much much less than power, we extend for a much greater distance.

but Watts / ~~sec~~ m^2 will decrease as the square

Because any signal is a result of voltage & current.

I would think that you will need the lowest frequency signal that will produce significant electron density. This does seem to be in the VLF range

But power absorption by body is apparently greatest @ VHF levels.

Our look @ Maxwell equations:

1. Electric flux through a closed surface is proportional to the total charge enclosed by that surface

Closed Surface → $\oint \vec{E} \cdot d\vec{A} = \frac{Q}{\varepsilon_0}$ — ε_0 = proportionality constant

$EA = \frac{q}{\varepsilon_0}$

E field on surface is a constant

also called "Gauss Law"

this is $\vec{dIV}E$

This is $\nabla \cdot \vec{B}$

Gauss Law

2. $\oint \vec{B} \cdot d\vec{A} = \emptyset$

Field lines that leave the surface must enter (enclosed surface) again

back through the surface to reach the South Pole.

3. Is a more generalized version of Faraday Law

This is induction

This is Curl $\vec{E}$

$\oint \vec{E} \, d\vec{l} = \frac{-d\Phi_B}{dt}$ ← (magnetic flux)

a line integral over a closed loop

Voltage Generated $= -N \frac{\Delta(BA)}{\Delta t}$

Changing magnetic field makes a "curly" electric field

Changing magnetic field ⟷ Induced EMF

4. Started w/ Ampere's Law

Current through wire induces a magnetic field around a path surrounding the wire.

This is Curl $\vec{B}$

$I_d = \varepsilon_0 \frac{d\Phi_E}{dt}$ ← (electric flux)

"displacement current"

Changing electric fields make "curly" magnetic fields

1. Changing magnetic fields produce a current
2. Changing electric fields produce a current

Our target mechanisms are an

1. Induced EMF
2. Change in magnetic field producing a current.

An electromagnetic wave is an oscillating electric field that creates an oscillating magnetic field that creates an oscillating electric field — notice the chain and these keep cycle.

Aug 19 2022

Let's look @ gain a bit.
We know it in terms of power.

3dB ≈ 2x power.

$10 \log\left(\frac{2}{1}\right) = 3.01 \text{ dB}$

$10 \log\left(\frac{10}{1}\right) = 10 \text{ dB}$

$dB = 10 \log(\text{Pwr Ratio})$

$\log\left(\frac{\text{Pwr}}{\text{Ratio}}\right) = \frac{dB}{10}$ ~~20~~ 10

$\text{Pwr Ratio} = 10^{\frac{dB}{10}}$ ~~20~~ 10

$\text{Current Gain}_{dB} = 20\left(\log_{10} \frac{\text{Current out}}{\text{Current in}}\right)$

ie

$\text{Current Gain dB} = 20 \log(\text{Current Ratio})$

$\log \text{Current Ratio} = \frac{\text{Current Gain dB}}{20}$

$\text{Current Ratio} = 10^{\frac{\text{Current Gain dB}}{20}}$

Aug 20 2022

There are at least four methods whereby current is likely to be available:

1. Induced current - AC - more harmful than AC

2. Motion in a magnetic field

3. The inherent bioelectric field of humans

4. Electromagnetic research for ID
disrupted
10 kHz signal

5. Satellite
6. Ground Wave
7. Haarp

8. Enhancement of inherent electrical nature through internal [illegible] - modifications by vaccines, esp those that might increase the level of magnetism in the body

Note: typo to use square root term

Stat error here

32 mA not 1 mA !!

Error Here

$I = \frac{E}{R}$

Human body stated R 100,000 Ω

Human body stated @ 100 – 2000 Watts

$P = IV \qquad P = I^2 R$

$I^2 = \frac{P}{R} \qquad I = \left(\frac{P}{R}\right)^{1/2} = \frac{100 \text{ Watts}}{100{,}000\ \Omega} = (.001\ A)^{1/2}$

$.032\ A = 32\ mA$

$= 1\ mA$

How about that – right @ threshold.

X Early sign of increased current ~~might be~~ likely to be detected.

Wet skin may drop the resistance to as low as 1000 Ω $\quad I = \frac{100}{1000} = .1\ A = 100\ mA$

Now what is the voltage here?

$E = IR = 1E\text{-}3\ Amps \cdot 100000\ \Omega$

$= 100\ V$

How feel that ~~that~~ body voltage cannot be measured. Current is the focus.

So indeed attenuation of current and voltage is expressed as

$dB = 20 \log\left(\frac{I_1}{I_2}\right)$ for current

$dB = 20 \log\left(\frac{V_1}{V_2}\right)$ for voltage

and Power (watts) is

$dB = 10 \log\left(\frac{P_2}{P_1}\right)$

so you are on the right track here. However there should be a factor of 4π since the current radiates out over a spherical surface. ie $4\pi r^2$

So we should add the 4π term.

Current intensity should decrease as $\frac{P_1}{4\pi r^2}$

dB = r, not r^2 for current
r^2 for power.

Ok, there are some things to think about here. $4\pi r$ is not the square area of a sphere. So reconsider what you are doing here.

There is a quantity called current density. Units are Amps/m^2.

Calc would certainly be simpler if you worked in Power (Watts / m2) However your final target is current, not Watts

One source even did emphasize that what matters to the body is current, not voltage (ie Power = I . V)

But finally any one to attend in terms of Current flow and field intensity by that current seems to be more harder to come by.

What if you were to solve the problem w a unit Value of 1 Volt? Then you could work with power and then your multiply it out @ the end.

Assume 1 V and 1000 Amp for instance (not likely but you could actually compute it)

There are undeniably attenuation.

We know we deliver ~ 20 Amp @ 110 V so we see a ratio of approx 5 to 1 there.

Also let's allow the distance to be the sky distance?

I have rearranged the model to be based upon power emitted & current.
Now I need to check all computations.

Use OWF = 1000 Hz
Use $\alpha = 30°$
Use h = 10 mi
Use Current = 1000
Use Gain = Ø

Alert = St 327.1 = skip distance in meters.
Step through computation.

Electron Density = $\left(\frac{1000 \cdot \sin 30°}{7.165}\right)^2 = 4272 = 4272$

Ammeter Voltage = 5000V. Correct (St)
1E3 · 5E3 = 5E6 Watts OK
Skip distance $\frac{20}{\tan 30} = 35$ mi OK

Attenuated Power Chart Skip Distance 35 mi = ~~5263~~ 56327 m OK

$4\pi r^2 = 4(\pi)56327^2 = 3.99E^{10}$ A huge no.

Value is Correct Ø. 125 mW

Now does the math make sense?

Does it make any sense to you in free space that a signal of 500,000 Watts 35 miles away would be @ a signal strength of 0.125 mW?

Not yet!

My Computation are Correct. I have Cross Checked them w/ an independent source.

Now let's say antenna gain or transmission gain, back into the picture.

I can only anticipate that "free space propagation" is not @ all dependent on what the model is simulating, i.e. in a variable plasma state.

Ok, we now get numbers that are reasonable. Gain is the answer.
With a gain of 36 dB you now see a more reasonable number like 500mW attenuated power.

So now we have Current * Voltage = Power

Bus voltage = 5 · Current

~~to~~ $X \cdot 5X = \text{Power}$

$5X^2 = \text{Power}$

$X^2 = \text{Power}/5$

$X = (\text{Power}/5)^{1/2} = (500{,}000\text{W}/5)^{1/2} =$

$5E6\ \text{W}$

$X = \text{Current} = 1000\ \text{Amps}$

And that is correct respect

~~to~~ with 500 ~~mA~~ mW

$X = \left(\frac{500\text{mW}}{5}\right)^{1/2} =$ ~~X = 10mA~~ 32mA

~~32mA (158 mV) =~~ $X = \left(\frac{500E-3W}{5}\right)^{1/2} = .316A$

$.316A(5) = 1.58V$ OK

$.316A(1.58V) = 0.5$ Watts OK very good.

So our current is 316mA. Very high.

Ok, now I am getting very reasonable values.

$$CF_{Hz} = 9 (N_{m^3})^{1/2}$$

$$N^{1/2} = \frac{CF}{9}$$

$$N = \left(\frac{CF}{9}\right)^2$$

$CF = 7 MHz = 7 EG Hz$

$\left(\frac{7EG}{9}\right)^2 = 6,05 EH\ m^3$

$= 604938\ cm^3$

$MUF = \frac{CF}{\cos\theta} = \frac{CF}{\sin\alpha}$ $\alpha = 20°$

MUF in our light 20,5 MHz

OWF = 17,4 MHz

Now $MUF = \frac{CF}{\sin\alpha}$ so ~~CF~~ so $CF = MUF * \sin\alpha$

$CF_{in\ Hz} = MUF_{in\ Hz} * \sin\alpha$

~~BBB~~ $OWF = MUF * .85$ so $MUF = \frac{OWF}{.85}$

so $CF = \frac{OWF}{.85} * \sin\alpha$

~~BBB~~ so $N^{1/2} = \frac{OWF}{.85} * \frac{\sin\alpha}{9}$ $N = \left(\frac{OWF_{in\ Hz} \cdot \sin\alpha}{7.65}\right)^2$

Aug 21 2022

The "Lower Ionosphere" propagation model that has been developed looks to be pretty much guide well now and the numbers have been confirmed.

Other than atmosphere effects (relatively short distances are involved however with a "boundary layer") the path actually is generally through free space. Only the reflection point does not. So the actually results reasonable and realistic.

It does help a great deal to work the logic in terms of power vs current. The equations for power are more straightforward.

You were able to back out the current, voltage out of the power because of an assumed voltage/current ratio @ the beginning of the source transmission

I may be the only one that understands the model and function but it does seem to be working quite well and the results are perfectly in accord with expectations.

It appears to be a success; it looks like sufficient current (e.g. 10 mA) can be delivered remotely (e.g. 100-200 mi) with a powerful transmitter, e.g. 1M watts.

Lets look @ the drop in voltage across a ~~huma~~ human body.

Screwed Up Here!

10 mA into 100 K circuit

1000 V

E=IR or $I = \frac{E}{R}$

$E = IR = \frac{10E{-3}}{100E3\,\Omega}$ = ~~7E-3 V~~ ~~1E-7~~ V

$I = \frac{E}{R}$ × ~~1E-7V~~ ~~7E-3V~~ 1000 $(100E3\,\Omega)$ = .01A

= 10mA

Power = IV $I = \frac{E}{R}$ or $E = IR = V$

so

Power = I^2R we would have $(10E{-3}A)^2 \cdot 100E3\,\Omega$ =

= 10 watts

So this is becoming of interest. We have unrelated info coming from different sources.

Human power estimates: 100W up to 2000W for extreme athletes. 100W is base value.

Human resistance 5K to 100K Ω ohms
Although moisture can lower. 100K Ω is a base value.

I have estimated human current flow based on base values:

$P = I^2V \rightarrow I^2 = \frac{P}{V}$ $I = \left(\frac{P}{V}\right)^{1/2} = \frac{100W}{100K\,\Omega}$

= 1mA

So there are lower values for the human body, at least as a reference point.

Now we come from another direction, w/ independent values.

We hypothesize a 10mA environmental current for resistance.

We then assume a 100kΩ resistance in the form of a human being (whose value can apparently vary to some degree, moisture, etc.)

And we ask how much current would flow through that resistor? We also ask, does that value relate to the power produced by a human body, i.e. low value of 100 watts.

So the voltage drop across the "resistor" would be.

$$I = \frac{E}{R} \rightarrow E = IR = (10\,mA)(100\,K\Omega) = 1000\,V$$

For human body, $I = \frac{E}{R}$ $E = IR = (1\,mA)(100\,K\Omega) = 100\,V$

$$Power = IV = I^2R \quad \text{If } V = \frac{P}{I} = \frac{100}{1.5} =$$

We need a voltage reference value for the body.

Safety voltage for the body is stated as 36V and safe current is 10mA.

But static electricity on the body can reach as high as 20K to 25KV.
So obviously the current is the factor and we understand the 10mA reference value.

Now keep working on a voltage reference value.

What kind of power are going through the body w/ 36V and 10mA?

$P = IV = 0.36$ Watts Quite low.

Now, notice the model I have data developed is operating just about exactly @ the same level. A typical output from my low level ionospheric propagation model is @
10mA @ ~~0.5W~~ Not true, we are operating @ .5mW.
So our current is exactly in range but our power is considerably lower than a tolerable by the body. But current is the primary factor of safety.
A cell is designed to operate @ 25mV.

At 10mA, this equates to 0.25W Right in same when our model is

So our model is only @ the copper safety limits @ the cellular level it would seem.

Let's continue to try and identify reference values for human voltage. We do have one of a safe voltage being 36 V (and 10 mA)

"Under conditions of low current, a person can easily withstand tens or hundreds of thousands of volts with relatively little discomfort"

Remember our Van de Graff generator? So there is no true. The current levels are what we going to injure or kill you and that is why we have focused on that parameter.

But it would still be like to know a reference value for the human body.

It would seem as though it will be approximately

Power stated as 100 watts
R stated @ 100 kΩ

~~$P = I^2$~~ $I = \frac{I}{V}$

$P = I^2 R$ ~~$E = I$~~ $I^2 = \frac{P}{R}$ $I = \left(\frac{P}{R}\right)^{1/2} = \left(\frac{100W}{100E3\,\Omega}\right)^{1/2}$

$= .031\,A = 31\,mA.$

Check for an error earlier. Yes error was made earlier. It was not 1 mA, it was 32 mA

Ok, then now give us a different insight.
32 mA of reference current sounds too high. Commonly used safety limit is regarded @ 10 mA. I do not think you would want to be sustaining 32 mA in the body.

Therefore the reference values of 100 W and 100 K Ω are being called into question.
For example these, there the resistance would be higher or wattage would be lower a lot.

Lethality - danger - determined by a day.

How the current flows through the body.

A few milliwatts to the heart can kill you.

Ok, the 100 watt value was close.

Wikipedia basal rate is 80 watts.

A bicyclist can produce 400 watts for an hour and sometimes bursts of 1000-1100 watts.

These numbers match quite well what he had but are slightly reduced.

These are smaller wattage numbers now.

A rough value for the internal resistance of the body is 300 - 1000 Ω. Quite low.

Ok, resistance can vary from 100 000 to 1000 Ω
Quite a range!
1000 is wet or besoke skin
100000 is for dry condition

So we can see that resistance can vary quite a lot and that there is a tremendous difference between external and internal resistance.

If we accept a external reference of ~~50 Ω~~ 50K Ω and internal as 500 Ω there is a factor of 100 to 1 external to internal. There is an important difference to keep in mind Keep this in mind as we progress.

Now lets go back and assume $P = 80\ W$
Now what is I? $R = 50K\ \Omega$ external

external $P = I^2R$ $I^2 = \frac{P}{R}$ $I = \left(\frac{P}{R}\right)^{1/2} = \left(\frac{80\ W}{50K\ \Omega}\right)^{1/2} = 40\ mA$ external

Internal $P = I^2R$ $I = \left(\frac{P}{500\ \Omega}\right)^{1/2} = \left(\frac{80\ W}{500\ \Omega}\right)^{1/2} = 400\ mA$ Internal

This tells us internal current levels are likely much higher, what more soon.

It also makes sense as to why the safe current level is ~ 10 mA.

Now we have a little sense of reference values for I & R and we know that we must always distinguish between internal and external circuits.

Now let us estimate voltage values for these for external & internal conditions

Ex $I = \frac{E}{R}$ $E = I \cdot R$

External Voltage Estimate $E = (40E-3\ mA)(5K\Omega)$
$= 200\ V$

Internal Voltage Estimate: $E = (40E-3\ mA)(500\Omega)$
$= 20V$

Ok, the math a bit of sense. External body is anticipated to accommodate voltage levels 10 times higher than internal levels

We seem to have some workable reference values now, but we must also distinguish between external body conditions and internal.

External body schematic: as depicted below

Voltage : 2000V
Current : 40 mA
Power : Assume 80 Watt load
Resistance : 50,000 Ω given

Internal body schematic:

Voltage 200V Backed out from Ohm Law.
Current 400 mA $P = I^2R$ (Computed)
Resistance ~~500 Ω~~ 500 Ω given
Power : Assume 80W load

These values assert a great deal. It shows how the body acts as a protective shield against external damage.

~~Presents the statement a~~
Now the next adjustment likely has to do with the power we likely produced almost entirely externally, also likely an order of 10 to 1 ratio.

So if we have 80 Watts load, maybe 8 watts approx is produced external & 72 watts internal. The should be close to reality.

Now examine again

External Body Assessment

Now we adjust to...

External:

Resistance ~ 50,000 Ω — Resistance Higher
Power ~ 8 Watts — Power Less

Then all we need:

$P = I^2R \quad I = \left(\frac{P}{R}\right)^{1/2} = \left(\frac{8}{50{,}000}\right)^{1/2} \simeq 13\,mA$

Current Lower

It make sense that we would have so much lower current flow through the skin.

$I = \frac{E}{R} \Rightarrow E = IR \Rightarrow E \simeq (13\,mA)(50\,K\Omega)$

$= 650$ Volts — Volts Higher

Therefore: Sustain Higher Voltage, Produce Low Current, High Resistance, and Low Power Production. Make Sense.

Internal Body Assessment

Internal:

Resistance ≅ 500 Ω — Resistance Less
Power ≅ 72 Watts — Power Higher

$I \cong \left(\frac{72W}{500\Omega}\right) = 380mA$ — Current Higher

$E = (380mA)(500\Omega) = 190$ Volts — Voltage Less

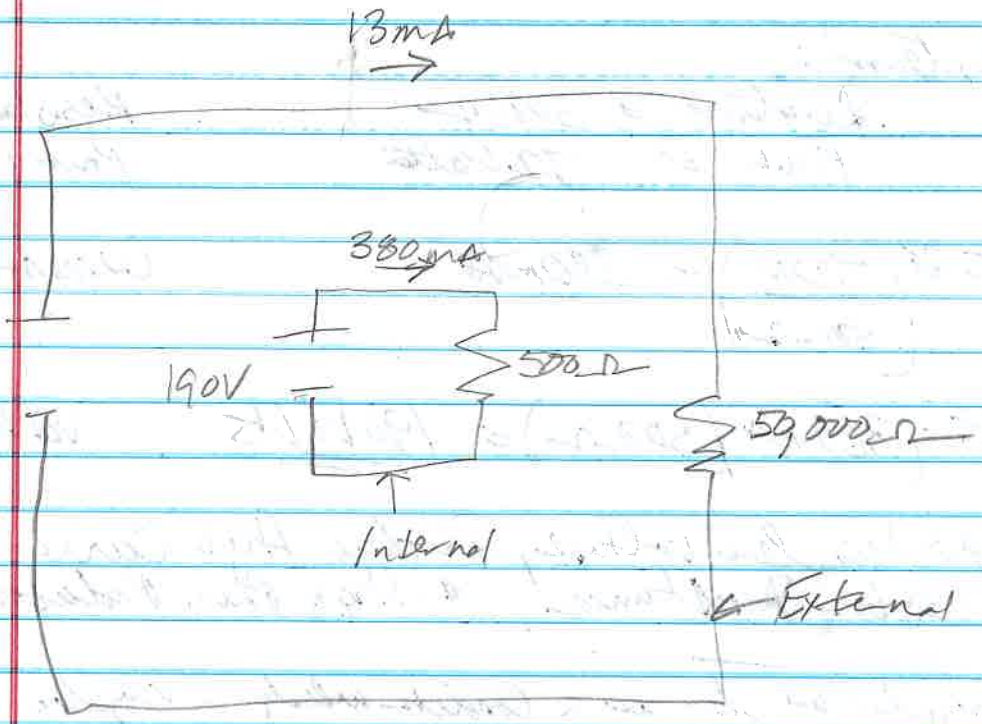
Sustain low voltage, Produce High Current, Very Low Resistance, & High Power Production

Now what we have is a Condition whereby a very low amount of current (eg 1 mA or less) is producing blood change. So even though the internal body current is high, only a very small amount of current is required to activate the process.

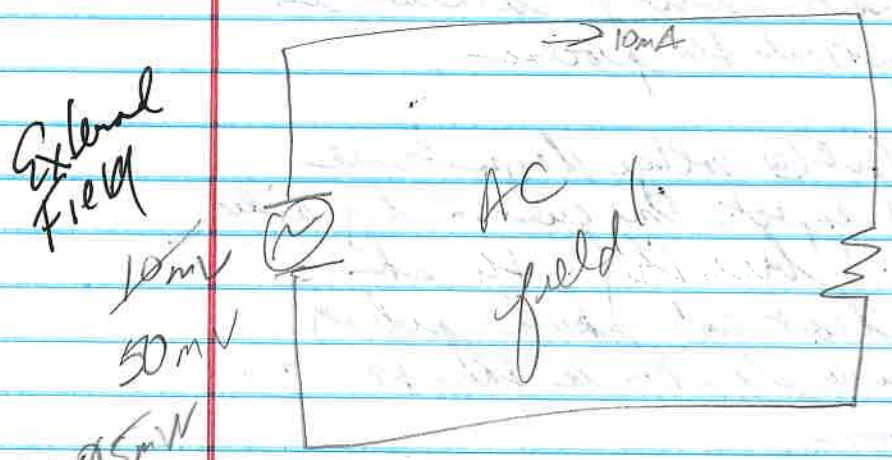
Now let's try to look @ voltage drop to see what we might expect. One question being asked is what it takes to break through the skin barrier? The heart and skull probably take much less as the skin is thin there.

Difficult question —

Let's say you have 10mA encountering a 50K Ω resistor
Voltage Drop = $I = \frac{E}{R}$ $E = IR = (10mA)(50K\Omega)$
= 500 Voltage Drop.



Now consider subject & additional external field of



How would this interact? Circuit Simulation?

$I = \frac{E}{R}$

$R = \frac{E}{I}$

$= 5D\Omega$

$P = I^2 R \quad R = \frac{P}{I^2} = \frac{5E-3W}{(10E-3A)^2}$

So here is a question. How could you address the impact of interacting one field on circuit upon another?

Could circuit simulation software be used to advantage here?

We know from the Related Data paper that the brain and the heart are 4 to 10 times more conductive than other parts and almost always @ least 2 times higher. The brain and heart are thereby more vulnerable.

The paper also gives Conductivity of the body and also the Conductivity of blood. It would be good to Compare these.

Aug 25 2022

I have created a model of the human body circuit combined w/ AC EMF fields.

Around the bar a current flow of 9 mA on skin surface w/ 50K-Ω resistance.

We will get current flow into the organism of 9 mA ~~of the~~ from the AC signal of the calculated resistance remains @ 50 K.

If the current flow from the AC signal is extremely high, of very low resistance then the current will alter its path and flow through the skin model in addition to the organism model.

If the current flow from the AC signal is extremely low (e.g. 1 mA) and i.e. the resistance very high (e.g. 400K-Ω) then the path of electric flow is almost entirely through the organism.

The part that I don't understand is that if I add the AC current flow the electron speed seems to vary but the current magnitude always stays the same.

What is really interesting is about @ 1000 Ω the AC path electron varies and starts to split into two directions. This happens when the current flow in the AC segment is greater than the original current
(e.g. 450 mA as opposed to 380 mA)

There is always some current flow from the AC field under the assumption of the AC current is injected.

We can acquire 2 mA or more when the AC resistance is ~ 230 KΩ or greater, considerably higher than the estimated skin resistance of ~ 50 KΩ.

We will acquire the skin current up to the value of the skin current down to that same resistance level, e.g. 50 KΩ.

Correct. So we have current flow it would seem, into the organism.

Recall that it takes less AC current to have a detrimental effect, a ratio of 5 to 1 ratio.

So instead of needing 2 mA AC, we may only need ~ 0.4 mA AC,

= 400 uA.

This would allow the AC resistance to approach 1.25 MΩ, a ratio of 25 to 1 over skin resistance.

Everything says the field will affect the human body, it's not the only way they classified to low level, eg 2 mA.

Now there are questions about how it established values for the external AC field.

My model (propagation) indicates I can easily detect:

Power received = 0.5 mW

Current Received = 10 mA

Voltage Received = 50 mV

So I can ask what is the resistance of that field? It's AC, but you may say DC

Power $= I^2R$ ☒ $I = \frac{E}{R}$

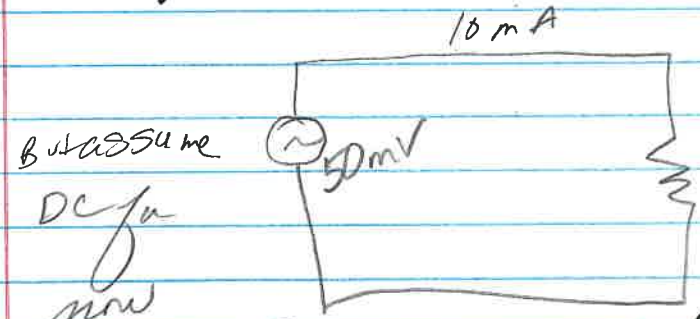
So $R = \frac{P}{I^2} = \frac{0.5E\text{-}3\,W}{(10E\text{-}3)^2}$ $\qquad R = \frac{E}{I} = \frac{50mV}{10mA}$

$= 5\,\Omega$ $\qquad = 5\,\Omega$

So your field strength is highly questionable but you have erred on the safe side.

That value says that there is a extreme low resistance in the external receiver AC field. But you apparently said the resistance is at least the skin resistance, which seems like a prudent move.

So they use your external model field of



But assume DC for now

Two different ways of looking @ the external field. Act conservatively.

$I = \frac{E}{R}$ $\qquad E = IR = 500$ Volts (Breakthrough Voltage)

or

$P = I^2R = (10E\text{-}3)^2 \cdot 5\,(\text{Nokia})\,\Omega = 0.5\,mW$

Very good.

Both the propagation model and the linear conductance model + EMI susceptibility model are both looking fairly decent.

Aug 27 2022

A very interesting topic: Motational EMF
Induced Voltage

A great example given by Steve Levy Steve Levine.

It leads to:
$V = Blv$

v = velocity of wire
V = induced voltage
l = wire length
B = magnetic field strength

l = 12cm (in meters)
B = 0.5 mT
V = 1.5m/sec V will be 9E-5 V

Another example:
Earth's magnetic field 5E-5 T.
1.75m l = 70m
V = 200 m/sec (very fast)
let l = ~~2m~~ (body)
B = 5E-5 T (earth's field)
V = 60 mph = 26.8 m/sec V = 2.~~1~~68E-3V
= ~~2.68~~ mV
2.34 mV

Power lines are on the order of 50 mG It is also ~ 50 mT
1 gauss = 1E-4 T

1 T = 1E4 Gauss

$P = IV$

$I = \frac{P}{V}$ let $P = 1$ watt $\quad \frac{1\,W}{2.34\,mV} = 427.35\,A$

if we had 2 mA of current

$P = (2E{-}3\,A)(2.34E{-}3\,V) = 4.68\,uW$

$\frac{4.68\,uW}{80\,watts} =$

2.34 mW is comparable w. $\frac{2.34\,mV}{5} \Rightarrow .468\,mA$ which is significant.

We see that 2 mA of current and likely less are able to transverse the blood.

We know that the heart rate is ~80W
If we use a factor of 5
$10\,mV \cdot 2\,mA = 20\,uW$ we expected to drive the process.

Then would be $\frac{4,000,000}{}$ of the heart rate power and it could be a lot less.

$I = \frac{E}{R} \qquad RI = E \qquad \frac{I}{E} = \frac{1}{R}$

$R = \frac{E}{I}$

If your load $E = 5V$ $I = 1A$

then $\frac{E}{I} = R = 5\Omega$

R is often much more likely. The means the ratio of voltage & current is commonly much higher.

Instead of a factor of 5 it might be a 100 to a 1000?

If Ratio is 100 $P = 200mV(2mA) = 400UW = .4mW$

Meeter Trial

I think that I have made some progress.

Set up is.

1. Dynamic mic on short boom is about a foot from bluetooth speaker and Dragon volume is up about 1/4. The bluetooth speaker is down about 6" from the top. Set for most volume on the Meeter microphone tests.

2. Camera MIC is at top of the picture. USB Camera MIC is also at top of the picture.

3. The mixer settings are.

1. Gain is @ about 60%
2. Phone is @ about 50%
3. Mic is @ about 60%
4. Main Mix is about 40%

Both voice input and the MIC input cause the mixer lights to blink blink off and on and look great. Mic Level on Meeter is set to about 50%.

Now the new Connections are

1. Mixer powered up

2. Boom MIC into mic jack.

3. Output jack from mixer goes to Buddy jack Line In. Line in is plugged into Computer MIC jack. Output jack from buddy is not used.

3. Headset jack of mixer has my good headset on from which I can monitor all levels.

4. Mic jack selected in Meeter in Realtek Audio.

The main question is what do I do to test how people listen to me now?
The is a serious question as they cannot hear me talk if they cannot hear me. ?????

Sep 03 2022 " "

Shannon Counts per Minute - ionization event

Dose Rate - Energy

2869 1824 501 267 163 201 118 45

Radiation Study took place here.

Claim: Bulletin MT has extreme radiation
tests place.

Evaluated Claim: No evidence to support
based upon review of Citizen science
radiation network data as well as
EPA radiation data. No basis for
claim is identified.

Sep 10 2022

From the examination of a paper, I am beginning to think that I have already actually determined what is known as the flux density, or also known as the power flux density. The reason because I took the strength of a signal transmitted and by the formula I used it already determined the light energy distributed on the sphere of radius R.

I have found the following:

$$S = \frac{P_t}{4\pi R^2}$$

S is the power flux density in units of W/m2 (not Watts!)

P_t = Power of the transmitter, assuming no gain. (My model will allow gain)

R is the radius of the sphere in meters.

And these are exactly what I have already computed as I recall. I therefore also need to do some dimensional analysis of my result it will end up as W/m2 (not Watts)

Now the look up key very important.

The reason is that my scenario is already giving me a result of 0,5 mW

but the mean that it should actually be a power flux density of

$\frac{0.5\,mW}{m^2}$ not $0,5\,mW$!

A very important difference.

This would equate to $\frac{500\,uW}{m^2}$

Becker is talking about EMF sensitivities of antennas that are of the magnitude

$10^{-9}\,\frac{uW}{cm^2}$ This equates to $\frac{.001\,uW}{m^2}$

and we have a field strength of $\frac{500\,!!!\,uW}{m^2}$

in our scenario already.

So our value is kept from the "Type 5 processes" mentioned by Becker on p 159 of Electromagnetism & Life

Things to Clarify the issue:

1. Reexamine your formula used and also examine the source of it with the Physics book.

2. Check with dimensional analysis
You may need a table to figure a unit change from Watts to Watts/m2.

In the end this will make by a lot easier.
As it will bridge the connection between transmitted power @ a source and power density, or power flux density, a flux density or you want to call it.

Next topic in paper under item 4 will be

1. Absorption of freq. varies by the human body

2. Beckler Chap 9 in Electromagnetics & Life book

Then end up by very important topics.

Come to think of it I have most certainly computed current density as well as Volts/m —

Dimensional analysis is now complete.

Sep 12 2022

Ok, let's look @ our code and square away the units.

Our power attenuation factor is

$4\pi \cdot R^2$ · R in meters

Well that sure enough is our answer.

We have $S = \frac{P_t}{4\pi R^2}$

P_t is a point transmission in watts.
4π is a constant
R^2 so it is m^2 so our result is in W/m^2

This is a density, ie a flux density as observed, it is not a point power!

Then all must be logical.

Ok, then take care of the Power density.
Now we have a quantity called V/m
and Amps/meter? If so, what are they called.

$I = \frac{E}{R}$ $E = I \cdot R$

Now let's look @ these.
We have
$P = IV$ but what we really have is a power density, i.e. $\frac{P}{m^2}$

So for us to get

$\frac{P}{m^2} = \frac{I}{m} \cdot \frac{V}{m}$. is the only way we can get there.

Now we let $V = 5I$ numerically.

$\frac{P}{m^2} = \frac{I}{m} \cdot \left(\frac{5I}{m}\right)$ (Volts)

the means:
$\frac{P}{m^2} = \frac{5I^2}{m^2}$ VOID

$\therefore I^2 = \frac{P}{m^2} \cdot \frac{m^2}{5}$

$\therefore I = \left(\frac{P}{5}\right)^{1/2} = \left(\frac{.5E-3mV}{5}\right)^{1/2} = .0316$ Amps

.01 A = 10mA

OK now

.05V = 50mV

$= 31.6$ mA

now $V = 5I = .1581$ Volts

$= 158.1$ mV

Now let's ~~$P = I^2 \cdot V$~~ =

$P = IV$ $I = \frac{E}{R}$ $E = I \cdot R$

$\therefore P = I^2 \cdot R$ $\therefore P = \frac{E^2}{R} = \frac{V^2}{R}$

Now our remaining question is

first: Are not our values of current and voltage now in

$\frac{V}{m}$ and $\frac{Amps}{m}$ since they multiply together to give $\frac{V \cdot I}{m^2}$

What is the power density sought?

Volts per meter is indeed "Electric Field Strength"

and ~~Current~~ Magnetic Field Strength

Amps per meter is the ~~Electric Current~~ density

Ok, then all much better. We have reconciled the units.

We should, it seems, be looking up with:

1. Power Density W/m²
2. Electric Field Strength V/m
3. Magnetic Field Strength Amps/m

We then postulate that

Electric field strength · Magnetic field strength = Power Density

$\frac{V}{m} \quad \frac{Amps}{m} \quad \frac{Watts}{m^2}$

It would be helpful to validate this from a separate source. By dimensional analysis it seems to be the logical configuration.

I have found one source that seems to say roughly what I am doing however they are using input as dBm, not watts.

So I am not sure how to equate yet.

dBm is a unit that expresses a power level in decibels with reference to one milliwatt.

dBm is a concrete measurement of the power level. dBm is measured in very small values, now @ all what we are doing w.r.t. input power.

Now let's take our model and compare it to Becker Type 5.

Beebe Type 5 is 10^{-9} uW/cm2

We want $\frac{mW}{m2}$ so mW = uW/1000

So this would be $\frac{10^{-12}\ mW}{cm2}$

and $m^2 = cm^2 * 1E{-}6\ m2$

So $1cm^2 = 1E{-}6\ m2$

$1\ mW = 1uW * 1E{-}3$

so $\frac{1E{-}9\ uW}{1cm2} = \frac{(1E{-}9)(1E{-}3)\ mW}{(1E{-}2m)^3\ \ m2}$

$= .000001\ \frac{mW}{m2} = 1E{-}6\ \frac{mW}{m2}$

and we now have a value of 0.5 mW

Factor = 500,000

If it acts as a square root function, what it would do, our factor will be 707

Then reduce

1.25E6 Watts at the transmitter

~1800 Watts a very reasonable and understandable number

That is a really interesting statistic to look at. We are expecting 1.25 Mega Watts.

The biggest < 2000 W in the system is what we need to be extra aware of.

Let's solve for actual value for ~ 2000 Watts and see what we get.

We are off a current density at the order of 1 zero nanowatt / sq. meter!

Sep 14 2022

Our model gives outputs in mW/m²

We need to also present it in uW/cm²

So lets figure out the conversion factor

mW to uW: multiply by 1E3

m² to cm² multiply by ~~1E6~~ ~~1E6~~ 1E4

1 m² = 1E4 cm²

1 mW = 1E3 uW

so conversion factor: $\frac{1E4}{1E3} = 0.1$

OK

this means we multiply our values

However, the actual conversion is

1 milliwatt/sq meter = .0001 millicwatts/sq. cm

~~and this then = = 100~~ 0.1 uW

~~in microwatts/cm²~~ Sq cm

So $\frac{1\ mW}{m^2} = \frac{0.1\ uW}{cm^2}$

Sep 15 2022

I now have a superb book and reference on NIR analyses.

CRC press - Practical Guide and Spectral Atlas for Interpretive Near Infrared Spectroscopy.

Far more detailed than any reference or book that I have ever seen. The book will help to considerably expand the use of NIR analyses.

There is a question now if a drop of blood on a 3x5 card can be used now for more detailed analyses.

A more detailed analyses of blood may now be possible.

1/9/2023

Oct 06 2022

Now, let's look @ our item # 9

Motion of a magnetic field (human body) within a conductive environment.

Ok, the topic has been introduced and therefore the paper:

Abbreviation

Blood Alterations V: Source of Current

is now complete for the final edit review process.

Oct 18 2022

There is increased use of ultrasound over the last week or so. I hope to write extensively on the issue of ultrasound @ a later point.

It is apparent that my left leg has myofascial nerve blockage and cardiovascular embolization. The situation has actually been underdevelopment for many years, concludes back to Rickey days in Santa Fe NM. A primary symptom is that of numbness, more so in the left foot but some numbness in both.

I am now required to institute an even more aggressive campaign w/ the use of ultrasound. It is important to realize and acknowledge that ultrasound has been a primary metabolic strategy for several years now and its use has been absolutely essential to maintaining a reasonable level of stability in health.

The use of Ultrasound (US) in a focused way upon the leg nerve and circulation may be responsible for displacement of the "problem" now to found different areas of the body

1. The left leg
2. The right ear and neck
3. The chest area, especially the upper right lung area
4. The right kidney and lower back region.

There is now a fairly complex and demanding VS agenda that is active and now required:

VS takes time.
Even @ 15 minutes per target region, there requires an hour + of sustained VS application along w/ corresponding pain in each.

The primary proposal here is that the rapid extension to four different regions of the body actually simultaneously may be in response to disruption of the more developed bloodflow and innervation (nerve and circuitry) in the left leg.

Varicose veins are also treatable here and it has been shown that VS is also effective at reducing their severity.

The microbe is characterized by constant network migration in the body and this has always been the case.

Four simultaneous regions of the body in need of VS does represent a challenge.

The general pattern and strategy is to exchange one network location for another in an attempt to prevent advanced development

of the network in any one location. The strategy has been in operation for several years now on a daily & weekly basis w/ the use of US.

There is more than ample evidence that the strategy has been very effective, and this is one of the most important points of the discussion underway. It is understood that few people will read these notes, or for that matter, even be able to read them.

They will be ~~elaborate~~ elaborated upon more in the future to make the information more available. It has been in operation for many years now and I credit my survival to this date largely to it.

The aromatic chemistry underlies, along with extensive supplement augmentation, will also be presented more fully in the future.

Due to the obscure mode of presentation of information here, it can and will be understood that I am not directly advocating any health or medical advice. I am simply complementing the research record that is already in place in hope that it will be beneficial to some in the future as it obviously has been to me over many past years.

Mar 19 2023

I will gradually assume some blood studies as I acquire or am able to reestablish the laboratory equipment.

I do not have at all what I thought I had brought w/ me. I do have some equipment but not what I thought.

So the means are:

1. Electrochemical interface - explore this thoroughly.

2. NIR analyzer

3. I lost external visible light spectroscopy. this is unfortunate.

4. I am acquiring EC & pH meters fairly quickly. they should help some.

5. Can I do anything w/ the light sensor on the VIS spectrometer?

We probably need to start w/ this and see what can be developed later.

6. How about oxidation potential?

1. Guess what?!! We have EIS available!
This is a fantastic capability.

It could really act as an unique detector
This is likely going to be important.

I now think that we have enough to work with.
This is good.

Open Circuit Potentiometry is a simple tool that
may reap benefits.

1. You can have 0 current, and the record open circuit potential.
2. You can also introduce a fixed current and record potential.

This seems to me to be a way to get Conductivity.
Ex. $I = \frac{E}{R}$ and we know $\alpha = \frac{1}{R}$

This is incredibly simple.

Therefore
1. Electrochemical analyzer
   1. OCP (Palmsens)
   2. EIS (Palmsens)
   3. EC (meter)
2. pH (meter)
3. NIR

are going to be more than enough to get started.

One of the first questions to answer is if and how the NIR spectrum of blood changes with time.

A fresh sample (UNVAX) of 70 years collected today. After drying, let's try to collect a spectrum once per day for the reference experiments.

Unfortunately you are not picking up any NIR signal from the coffee filter samples. I do not know why @ the point. Moisture still in sample also?

It may not be able to conduct NIR experiments in the manner that is desired?

No, everything is fine.

The issue was that the reference needed to be established as NEW, whereas it had defaulted to PREVIOUS.

We have a very good control and acquisition of the NIR spectrum of gelatin.
Reference is the 3×5 card.
Very good peak definition now.

Now let's go on to blood sample and see if a good spectrum can be acquired.

Ok, we do have an identifiable spectrum.
Primary peaks @ ~917 peak
1446 inflection
1520 peak

Reference is a white coffee filter.

Next examination is blood on a brown coffee filter. Reference is brown coffee filter. Same blood origin, a little older item. We have:

~935 peak
~1408 weak peak
~1514 moderate peak
~1620 small peak

There seem to be a bit more activity discernible in the plot. ~45 min older. H_2O depletion, oxidation factors?

Repeat run:

~920 peak
~1435 inflection
~1501 peak
~1680 possible small peak

Ok, we are getting some repeatability.

Ok, we are a beginner to lay examination. I actually do not expect detectable variability in the relatively coarse method of examination, but will see if variability is statistically identifiable.

& will be able to establish reference values to an acceptable level by taking conductivity readings of gelled alone in distilled water vs time). The well remove most if not all of any ions with the gelled stock as the transfer medium.

Now we also need to deal w/ concentration issues. The hole punch idea to establish geometric consistency as well as mass conditioning in the sample remains that a viable approach.

Mar 20 2023

I am under methods development here.
Hole punch mass analysis
3x5 Card hole punches $n = 21$ mass = 0.11 gms
1st estimate of hole punch mass = $\frac{.11}{2021} = \frac{X}{1}$ $X = .0055$ gms
5.24 mg .00524 gms
= ~~5.5~~ mg This is 3.5 stock. CARD STOCK

4 Coffee filters weigh 3.45 gms (brown filters)
Diameter of a coffee filter is ~~19.5 cm~~ 20 cm 20.0 cm

Therefore a single filter weighs $\frac{3.45 \text{ gms}}{4} = 0.8625$ gms

The area of the filter is $\pi r^2 = \pi (10.0 \text{ cm})^2 = 314 \text{ cm}^2$

Therefore our mass of filter is $\frac{.8625 \text{ gms}}{314 \text{ cm}^2} = \frac{X}{1 \text{ cm}^2} = .00275 \frac{\text{gms}}{\text{cm}^2}$

A hole punch is 0.7 cm in diameter.
Area $= \pi r^2 = \pi (.35 \text{ cm}^2) = .385 \text{ cm}^2$

Our mass estimate is best from the set of 4 filters.
That is
$.00275 \frac{\text{gms}}{\text{cm}^2}$ or $2.75 \frac{\text{mg}}{\text{cm}^2}$

Card hole estimate for a hole punch is $\frac{2.75 \text{ mg}}{\text{cm}^2} (.385 \text{ cm}^2) = 1.059$ mg

And this is or $\frac{1.059}{5.24} \approx 20\%$ of mass of card stock which is quite reasonable. These are very light weight filters.

We now have a decent estimate for the mass of a single hole punch.

$\cong$ 1.059 mg for a single punch out of the lightweight Brown Coffee filter.

The mass of blood (dried) in the coffee filter is an estimation and likely will remain so, but the data gives us a reference of what to expect.
The mass difference will be very very small considering this is dried blood. I would not be surprised with a 5-10% differential.

This would therefore be on the order of 1.059(.075)mg (presumption, estimate) = .0794mg = 79.4 ug

This is our first estimate, therefore that a filter punch out contains on the order of ~ 80 ug/punchout.

A 25% differential $\cong$ 265 ug

We can generalize the relationship as

$$1.059\,mg\left(\frac{X}{100}\right) = \frac{X}{.01059\,mg} = .01059\,mg\,(X^{\%})$$

$$= 10.59\,ug\,(X^{\%})$$ and $X^{\%}$ is now a variable

So tabular estimates are (per punch out) of blood mass:

$5^{\%}$ = 10.59(5) ≈ 53 ug
$10^{\%}$ = " (10) ≈ 106 ug
$20^{\%}$ = " (20) ≈ 212 ug
$30^{\%}$ = " (30) ≈ 318 ug
$50^{\%}$ = " (50) ≈ 530 ug.

A reasonable estimate may therefore be on the order of 100 ug/punch
* There is based on an estimate of 10% dried mark on out absorption.

In no sense, it does not really matter, Conductivity tests can now be normalized in a proportional sense.

We can basically assume that the mass absorbed by a hole punch is reasonably constant and that the magnitude is a proportion of the yielded punch out mass.

In addition, any background activity involving soluble testing can now be isolated and removed. This is helpful.

I think we are now in position to collect the NIR spectrums of the unwaxed samples.

Unvax Sample 1

OK, we have now collected the first set of NIR scans from 6 unvaxxed rabbits.

We now want to begin collecting the data and start assessing the variability of the plots.

Sample Name	Peaks (Strength)	Inflections ( )
01_MALE_TO_032123	935 (2)	1389 Asc. (2)
	1520 (2)	
	1579 (weak) (1)	
	1692 (weak) (1)	
"	938 (2)	1384 Asc (2)
	1448 (1)	
	1526 (2)	
	1579 (1)	
	1683 (1)	
"	930 (2)	1382 Asc (2)
	1424 (1)	
	1518 (2)	
	1583 (1)	
	1678 (1)	
"	930 (2)	1375 Asc (2)
	1428 (1)	1643 Des (2)
	1520 (2)	
	1699 (1)	
"	932 (2)	1384 Asc (2)
	1440 (1)	
	1520 (2)	
	1577 (1)	

* ArOH is phenol Maybe a problem here... Likely encountered before 2015

Polymeric phenols are discussed with emphasis in Vol II of Lab Notes

Peaks: Unvax Sample 1 Rank Score

n=5 Weighted Averages and Scores for 01_MALE_032123

[935(2)+938(2)+930(2)+930(2)+932(2)] / 12 = 933, σ=3.5 10

n=4 [1448(1)+1424(1)+1428(1)+1440(1)] / 4 = 1435, σ=11.0 4

n=5 [1520(2)+1526(2)+1518(2)+1520(2)+1520(2)] / 10 = 1521, σ=3.0 10

n=4 [1579(1)+1579(1)+1583(1)+1577(1)] / 4 = 1580, σ=2.5 4

n=4 (1692+1683+1678+1699) / 4 = 1688, σ=9.3 4

Inflections (Asc)

n=5 [1389(2)+1384(2)+1382(2)+1375(2)+1384(2)] / 10 = 1383, σ=5.1 10

Inflections (Des)

n=1 1643 1643 2

Our peaks here are:

Ranked	Peak		Score
1	933	CH ROH	10(5) = 50
2	1435	CH_3, CH_2, ROH	16
1	1521	RNH_2	50
2	1580	NONE	16
2	1688	CH_3, CH_2, CH_3	16
1	1383 (Asc)	CH_3, ArOH*	50
3	1643 (Des)	ArCH	2

1. 933, 1521, 1383 (Asc)
2. 1435, 1580, 1688
3. 1643 (Des)

You do not need to determine functional groups @ this point.

Unvax Sample 2

02_FEMALE_42_030823

Peaks	Inflections
964 (2)	
1250 (1)	
1391 (1)	
1543 (2)	
909 (1)	1384 (2) (asc)
1515 (4)	
1690 (1)	
917 (2)	1390 (2) Asc
1515 (2)	1645 (2) Desc

Wgt Averages

	Peaks:	Combined Score	Score
n=3	934	15	5
n=1	1250	1	1
n=1	1391	1	1
n=2	1515	6	3
n=1	1543	2	2
n=1	1690	1	1
	Asc		
n=2	[1384(2) + 1390(2)] / 2 = 1387	8	4
			5
n=3	Combine 1384, 1390, 1391 = 1387	15	

Unvax Sample 2

Ranked peaks and their score

934	15	If 1383 nm was CH_3
1387	15	we expect to see peak @ ~
1515	6	890. We have no sign of
1543	2	this since descent is in
~~1250~~	1	place @ ~890 - 900.
1391	1	Most of identity shifts to ArOH
1690	1	-phenol again.

We can combine 1515 & 1543

$[1515(3) + 1543(2)] / 5 = 1526$ - w/ a score of 5

Therefore Peak	Score	If CH_3, we would also expect a peak @ ~1160.
934	15	We do not have it.
1387	15	All identity and previous
1522	8	mid IR work Voll lab
1250	1	notes supports ArOH.
1391	1	Polymeric Phenol a
1690	1	strong candidate

This is a perfect match with top tier of Sample 1

#1	Score	Rank		#2	Score	Rank
933	50	1	CH, ROH	934	15	1
1521	50	1	RNH_2	1522	8	2
1383	50	1	CH_3, ArOH*	1387	15	1

We now have high level top tier consistency between samples 1 & 2. Good work.

* Phenol Condensation a Concern.

Unvax Sample 3

Unvax Female 48 - Sample 3

933 (2) peak
1539 (2) peak
1699 (1) peak developing

n=1 1393 (2) asc
n=1 1644 (2) desc

	Peaks	Score
n=1	933	2(1) = 2
n=1	1539	2(1) = 2
n=1	1699	1(1) = 1
n=1	1393 (ASC)	1(2) = 2
n=1	1645 (Desc)	1(2) = 2

50

Peaks	Score
933	2
1539	2
1393 (asc)	2
1645	2
1699	1

Combined Score is now:

			Σ Score
Peak	[933(50) + 934(15) + 933(2)] / 67 = 933		67
Peak	[1521(50) + 1522(8) + 1539(2)] / 60 = 1522	CH, ROH^*	60
Asc	[1383(50) + 1387(15) + 1393(2)] / 67 = 1384	RNH_2	67
Desc	[1643(2) + 1645(2) + 1645(2)] / 6 = 1644	$CH_3, ArOH^*$	6
		$ArCH^*$	

Mar 21 2023

A definite pattern is emerging here

1. Strong evidence for ROH
2. Strong evidence for Ar
3. Strong evidence for ArOH
4. Strong evidence for ArCH

All individuals @ this time display all signals
We have some more info for Sample #3:

~~925~~(1) peak ~~948~~(2) ~~930~~(2) ~~1224~~(2) descend
1130(1) peak OUTLIER ~~1217~~(2) descend
~~1311~~(2) descend ~~1322~~ peak(1)
~~1377~~(1) peak ~~1391~~(1) peak ~~1393~~ (peak)(1)
~~1666~~(2) peak ~~1520~~ peak(1) ~~1638~~ peak(1)

This adjust our coincident data score to

	Σ Score
[933(2) + 925(1) + 933(10) + 934(5) + 948(2) + 930(2)] / 22 = 934	22
[1383(10) + 1387(9) + 1393(2) + 1377(1) + 1391(1) + 1393(1)] / 24 = 1386	24
[1521(10) + 1526(5) + 1539(2) + 1520(1)] / 18 = 1524	18
[1643(2) + 1645(2) + 1645(2) + 1666(2) + 1638(1)] / 9 = 1648	9

New additional data points w/ Sample 3 provide (2 ea) for

[1250(1) + 1224(2) + 1217(2)] / 5 = 1226	5
[1311(2) + 1322(1)] 13 = 1315	3

Note: The samples 1 & 2 were originally and previously overweighted. This has now been corrected and all samples have been treated in an equal weighting fashion depending upon the strength of the signal observed in the spectra.

We now have ranked:

SUMMARY AT N=3 UNVAXXED

Peak		Score	Rank
1380nm	~~CH_3~~, ArOH	24	1
934nm	CH, ROH	22	2
1524nm	RNH_2	18	3
1648nm	ArCH	9	4
1226nm	CH	5	5
1315nm	NO MATCH	3	6

The gets us through 3 unvaxxed samples

We see Connections between:

CH - CH LAB NOTES
ArOH - ROH - VOL II LAB NOTES
ArOH - ArCH LAB NOTES
Ar - Ar LAB NOTES
OH - OH LAB NOTES

At 1386, if we have CH_3, we also expect to see signals @ ~ 890-900. Our spectrum is on a decline towards 890-900 so we do not have support for CH_3 there.

We also would expect to see CH_3 @ ~ 1160-1175. We do not have it. Same conclusion.

We also expect to see it @ ~ 1680. We do not have it. Same conclusion.

We therefore conclude that 1386 is almost certain to be Ar-CH

If we have CH @ 934 then we expect to have CH @ ~ 1220. ~~We do not have it~~ - Yes we do have it.

We also expect to have CH @ ~ 1735.
We are outside of range but also no sign of developing peak @ 1700 nm. ~~CH aliphatic~~

We therefore have evidence for ~~both~~ CH.

Our functional group candidate ~~both~~ list is as stated.

These samples appear to be adequate to begin to stabilize the unreacted sample analyses under the NIR terms available.

Sample 4 Unvaxxed.

At this point, we can now look @ the spectrum in a more general fashion for both coincidence and anomalies. This sample is the oldest of the set @ age 72.

We do have an expected peak closer to 900 here
We have a very small bump @ ~1165
We also have a small confirmed peak @ ~ 1688.
We also have the peak of ~1303 which can go either way of CH_3 or ArOH
The sample therefore uniquely raise the spectre of CH_3 appearance, in ~~contrast~~ to the mg only sequence presented before.

The spectrum therefore may be deserving of additional attention depending what is found w/ sample 5 & 6, and eventually "vax" samples if they become available.

Questions Here. What is 1307nm? (& 1315)

Sample #5 Unvaxxed.

The sample also shows itself to be very interesting w/ some well defined peaks. 46 year old female.

Spectrum dominated strongly by a broad strong peak @ ~1035.

This comes out very strongly as ~~RHH2~~ RNH2 (protein)

~~a strong peak~~ A noticeable defined peak @ ~1307. *? The is close to our 1315 w/ one match. The therefore becomes very interesting.

We also have our expected peak @ 1386.
We also have a fairly small bump/peak @ ~1532.
We also have a very well defined peak @ ~1660.

What we do not have is a definite peak @ ~934.
We also do not have a defined peak a inflection @ ~1226.

The is a very interesting spectrum, it appears rather unique in several respects and also w/ very well defined peaks & spectral signatures.

The project is now increasing in interest. We see that we must now begin to examine inter-set variability in addition to the any generalized difference between the vaxxed & unvaxxed samples.

What we have thus far is these:

1. Three consecutive samples that demonstrate a low level of consistency that raises some question on aromatic / alcohol / poly issue.

2. Then we have sample 4 which introduces the greater probability of CH_3 presence.

3. But Sample #5 indicates some very marked differences from the other sets w/ an apparent Whey protein content. This could be important, and may indicate an improved state of health.

But sample #5 also has a strong unusual peak @ 1307 (we have 1315 also from a previous example). This is also curious because it is unidentified thus far.

Increased attention will be devoted to this

Sample #6 Unvaxxed' 42 year.

Appears Conventional in most respects.

Matches the 1386, 934, 1524 ~~four~~ top four of most samples

1648, 1226 & 1315 are non existent.

Appears to be Conventional in nature -

Sample No. 5 therefore stands out as being the most unusual, especially with respect to dominance of δNH_2 as well as a marked presence of the ~~unexpected~~ unidentified ghost peak @ ~1307.

We need to know what 1307-1315 is about.
We also need to repeat sample 5.
And ya need to look @ your blood manually

The 1307-1315 region seems difficult to come by, even w/ my superb CRC handbook. Best estimate now is that it is going to come from SH abstraction/deration. Glycolysis/nothing else seems to be touching this region.

Need to be able to convert from Con't to non.

435 619 3308 435 613 9651

$\bar{\nu} = \frac{1}{\lambda}$ $5000 cm^{-1} = 2000 nm$

$\lambda = \frac{1}{\bar{\nu}}$ $\lambda_{nm} = \frac{1}{\bar{\nu}} \cdot 1E7$

so $\lambda_{nm} = \frac{1E7}{\bar{\nu} cm^{-1}}$ OK

So $\bar{\nu} cm^{-1} = \frac{1E7}{\lambda nm} = \frac{1E7}{1315 nm} = 7604 cm^{-1}$

Closest in the table is $1360 nm = 7353 cm^{-1}$
and there is the methyl group CH_3

However the does not match the SH table reference in the CRC book which does not seem to be discussed further.

The table really does match. The table on Chart actually coming for Workman & Weyer 2011. Appears There in my book except my version is 2012.

There the only reference in the entire handbook but it for polymers.

The absolutely seem to be the match. SH bonds hey difficult to find any NIR information on

This is a mercapto group.

Mar 21 2023

The mercapto group appear in thiol Compounds

I am collecting additional spectra from Sample #5 female 48. The results

920 (peak)(1) minimal data here
~1100 peak(2)
1318 peak(2)
~1650 peak(2)
~1386 peak(1)
We had prior
~1035
1307
1386
1532
1660

So Comparing

	Now		Prior
ArCH	1100	↔	1035 RNH_2
	1318	↔	1307
	1650	↔	1660
	1386	↔	1386
	Not visible	↔	1532

The few primary difference are

1035 shifts now to 1100 — ArCH
920 remains minimal or negative
~1315 holds — SH?
~1655 holds — ArCH

Therefore what appeared previously as RNH_2 now confirms ArCH even further. Along w/ SH presence presence this increases the possibility of detriment to health more than other parties.

Tomorrow I will look @ my blood and see if I can acquire a single "vaxxed" sample result.

Mar 21 2023

ArCH should be an arene.

The terminology and definition are vary in my books, but technically aromatic w/ C side chain are arenes it would seem.

Arenes are insoluble in water, this is already important w.r.t. blood.

Styrene looks to be a good example of an arene. Styrene is used to make plastics and rubber. Think about polystyrene as an example.

An arene is actually just an alternate name for an aromatic. So both nuclear and side chain substitution ArCH would seem to be a side chain such as styrene.

They are insoluble

In the lungs the rest in blood

Many thiols and disulphides have been shown to be toxic
Many are Aromatic thiols are haemolytic agents, ie toxic to blood. Thiophenol

Thiols have characteristics similar to alcohols.

Mar 22 2021

The electrical conductivity and pH meter have arrived. Both are battery powerable and this will be very practical.

One meter appears to be more capable and can be calibrated. The other will be small quick and easy to use, 2nd EC should be fair and pH may be best to use Δ pH.

All can soon begin Conductivity tests with blood (dried). Time will be important & blood. Mass/volume concentration will also be important.

I do now have my first "vax" dried blood sample available. This is an important accomplishment. It is a good sample.

I now start to work w/ Conductivity. Primary meter is in units of mS w/ a resolution of .01 mS = 10 uS. Range = 0-20 mS

Distilled water — 1st test = .01 mS.

I shall start by placing 2 blood filter punchouts in 6 ml of H_2O. Initial Conductivity VS time will be monitored. The Conductivity meter will not need to be on continuously. I will also occasionally agitate the solution. 2 punchouts equal approximately 1 drop of dried blood on the filter paper. The meter can be turned off and on

You will also establish controls w/ filter paper punchouts alone

The idea seems sound. Unfortunately your blood samples are generally very small so I will use samples of fresh blood @ variable concentrations to establish further controls

The blood actually seems to have dissolved from the paper sample surprisingly quickly, eg 10 min the paper look to be clear.

I think I must increase E 4 punchouts immediately however. I am ready 30uS but I would like that to be higher.

OK, that is better, I am up to 50uS now. This is enough to serve as a detection level. Now @ 60uS. Getting better. Let's go to 6 punchouts now. OK, now 6 punchouts 5ml of distilled water seems to be a suitable base.

How sensitive is EC to temperature. We are @ room temperature ~ 70°F.

We can also save these solutions in a test tube

I am seeing very consistent results.

$\Delta \cong 20\,\mu S$ per 2 punchout addition.
The mean each punchout contributes ~ 10 uS per punchout. Recall the reference solution of distilled water has EC = 10 uS.

My result on my pt's blood is:

	NO punchouts	UNVAX of	Time Elapsed	H_2O	EC
100	& 6	7 of 4 HRS 03/22	45 min	5 ml	80 uS.

The results seem to be both stable and predictable. Conductivity seems directly proportional to concentration of the point.

101	6	VAX & 6 7 4 HRS 03/22	45 min	5 ml	60 uS

A bit of a surprise here. Certainly no dramatic difference between the VAX and UNVAX sample. We are fortunately able to save the sample, now in H_2O, however.

The next most crucial step in the test of NIR analysis. Another thing that is a bit of a surprise is how rapidly the solution stabilizes. Seems to be dissolved w/ in about 10 min. Am letting it run for 45 min.

Here however, is a very interesting statement. Conductivity of blood is on the order of 10–20 mS/cm. Therefore 10K–20K uS.

Now the will be whole blood.
We currently estimate our mass of blood @ ~ 100 ug/ punchout. 6 punchouts ≅ 600 ugms.
Our dilution ratio is on the ug order of
5ml = 5gms = 5E6 ugms

This has the error that you are neglecting that your blood sample is dry, not liquid.

$\frac{5E6\ ugms}{600\ ugms} \cong 8333$ dilution factor.

≅ 8333 (80uS) = 666666 uS
This would equal 667 mS
(which would be radically higher than the estimated 10–20 mS.

See subsequent estimate

$\frac{667\ mS}{20\ mS} \cong 33$ times higher than anticipated.

This means that we would expect to measure a EC of ~ 2–3 uS but we are measuring 60–80 uS. So there is interesting

Skip this for now.

My meter has a max range of ~ 20 mS/cm.
This means my meter would max out with whole blood.

Mar 22 2023 (Cont)

Let's make another estimate of blood conductivity w/ a different approach.
Assume one punchout ≅ 1/5 of a drop of liquid, blood.
Let's depart from the dried blood study estimate
this time. We know a drop ≅ .06 ml.
Density of blood is very close to that of water
~1060 kg/m³ vs water of 1000 kg/m³.
Therefore we can assume a density of water, ~1 gm/cm³.

Therefore we make a first estimate that 1 punchout
≅ ~~0.02 gm/cm³ of the mean 6 punchouts is~~
~~≅ 1.2 gms of fresh blood~~, or another way of
stating is that is 1.2 drops of fresh blood.
$\left(6 \cdot \frac{.06\,ml}{5}\right) = .072$ ml of fresh blood,
fairly close to 1 drop. Therefore our dilution factor is
on the order of $(5\,ml - .072\,ml) / .072\,ml$
= 68.5. Which actually seems somewhat reasonable.

Now we measure ~80 uS conductivity / cm³
Next (68.5)(80 uS) = 5480 uS ≅ 5.5 mS

Now we know that fresh blood has a conductivity
of ~ 10-20 mS/cm. Therefore our estimated bone
conductivity would seem to be on the order of
1/4 to 1/2 of what is expected.

Now this is actually very interesting. Its to say is that intrinsic blood conductivity may be in a reduced state, not increased.

The does not mean that it could not be increased to a desired level (ie. Lyher) by an external influence, eg electromagnetic field.

But it does say this: If the intrinsic quality of the blood has a reduced conductivity

then the body will not work as well and chronic fatigue and decrease of energy would be expected.

This fits the real world situation actually quite well.

This mean that you would expect to see conductivity value in your experiments of 150 - 300 uS, not the 60 - 80 that you are seeing.

This seems like a reasonable estimate that is key made.

Chronic Fatigue Discussion

* * *

To not be in error here, a punchout ~~not~~ would be required to be on the order of 0.4 to 0.8 of a drop of blood and this does not seem plausible. ~~a drop of blood~~ seems to – A punchout contain ~ 0.2 of a drop of blood

The idea could be tested w/ a dye drop.

This is ~~[illegible]~~ fascinating as it indicates the opposite possibility. – ie that intrinsic conductivity of the blood may have been decreased, and that the "vax" may decrease it even further.

It can actually be increased to any desired level by external electromagnetic influences, to the point of transformation and lethality as declared in the Altered Blood paper series.

This is really quite interesting – it makes the case for chronic fatigue which is known to fit w/ reality. I look at the Mayellen Research Project survey results – Chronic fatigue is the foremost symptom.

This is profound of the case, and it does make perfect sense.

We now have critical data arriving.
We have our first NIR spectrum that I have been able to acquire from a VAX individual. Female 67 years. Stated to include the latest regimen of "VAX + booster shots"

At first glance, it appears to correlate reasonably well with the "normalized" profile that has evolved over previous pages.

We also now know something very important. Individual #5 from our Unvaxxed sample set had an extreme case of "COVID", almost lethal. Significant neuropathy issue remains. There also an incredibly important data point.

Now lets go to VAX spectrum #1.

Peaks

→ Norm	920 (2)	CH_2, ROH
New ←	1185 Very minor disturbance	CH_2, NH
	1365 Very minor disturbance	CH_3 Not a great match Stt?
→ Norm	1386 Desc. Inflection (2)	ArOH, CH_3
New ←	1433 Minor peak (1)	ROH, $CONH_2$, CH
→ Norm	1514 Peak (2)	RNH_2
New ←	1585 Minor Peak (1)	NO MATCH?
→ Norm	1645 Desc Inflection (2) (Pronounced in COVID case)	ArCH
	1700 Uncertain rise activity	

I get the same results on 3 spectra taken

There are 3 variations that are already interest with the #1 VAX sample:

NEW 1185 NH, alkanes

NEW 1433 ROH, $CONH_2$, CH

NEW 1585 NH (from CRC table) Secondary Amine

also

Likelihood of high correlation w/ COVID case

1645 Shap Desc Inflection - pronounced in Unvaxxed Sample #5 - COVID CASE

Aromatics or alkenes (vs Alkanes) - ArCH

alkenes contain a double bond

more reactive

Therefore in the VAX sample, we seem to have a greater likelihood of

1. Amines primary & secondary
2. Aromatics or alkenes

re proteins, reactive compounds, toxic compounds:

There seem to be enough difference here from the "average" unvaxxed profile that distinction may be possible as well as correlation to severe COVID presence.

The individual stated to have all COVID shots and boosters. The individual has prior military service w/ vaccines administered during term of service.

And now a return to the Conductivity ~~calculation~~.
It is also reasonable to presume that one punchout from dried blood on the filter ≅ 0.25 drop vs 0.20

There are .25 drop (.06 ml) = .015 ml / punchout
Therefore 6 punchouts = 6(.015 ml) = 0.09 ml (approx. 1½ drops)
Therefore our dilution level is $\frac{5\text{ ml} - .09\text{ ml}}{.09\text{ ml}}$
≅ 54.5
And our expected Conductivity of measured samples (1 unvaxxed & 1 vaxxed) are on the order of

54.5 (~70 uS/cm) = 3815 uS = 3.8 mS
≅ 4 mS

But blood norm Conductivity is established at 10-20 mS
And thus would place Conductivity @ ~ 1/3 to at most 1/2 of that which is expected.

This is fully coincident w/ widespread Chronic Fatigue.

The analyzer will continue but the process is partially destructive to the sample so it will be continued w/ caution depending upon sample availability.

Preliminary Conclusions thus far: Mar 22 2023

1. Foreign and toxic compound in the blood, especially aromatics and thiols, that have a long history of study w/ blood @ CE.

2. Likely discernible modification of blood under the presence of severe "COVID", including increased aromatic & thiol presence. Haemolytic destruction anticipated further w/ thiols. Toxicity expected to increase w/ aromatic presence.

3. Strong possibility that changes in blood of vaxxed individuals is determinable by NIR.

4. Initial conductivity studies suggest conductivity of blood may be lower across all sample types, vaxxed and unvaxxed. May well explain in part extensive documentation of fatigue (chronic) within the CE Magellan Research Project.

5. Anticipated that conductivity in the blood can be increased by external electromagnetic force & the point of lethality explored.

CArnicom

Next steps are:

1. Conductivity studies w/ my own blood to no limits. Concentration may be able to be increased, possibly even w/ fresh blood.

Very good results.

2. Visual examination of the blood – it's my turn again!

3. EIS work! many possibilities here.

4. OCP study

5. Rather profound findings already w/ only some preliminary examination.

6. Try to collect a known mass of blood on the scale.

Mar 23 2023

First thing that I would like to do is to see if I can collect enough blood to measure the mass.

My petri (mini) dish is ~~1.51gms~~ 1.51gms, no tare used.
1.51gms, 1.52, 1.52, 1.52, 1.52

~~I think that I should~~ I can get to 1.695gms
how water could added to 4mL = 5.52gms

Ok, I now have a total of 5.58gms
Conductivity = ~~0.10~~ 0.21 mS
Note this. * It is also of interest that there is a small clotted mass w/in the sample. This should be examined under the scope if possible. This should end up being a much better test of conductivity.

Our blood mass collected is 1.695gms − 1.52gms = .175gms
We have added distilled water to a total of 5.58gms.
Therefore the water we ~~be~~ have added is
5.58gm − 1.52gms − 0.175gm = 3.885gms = 3.885mL
Our dilution ratio is therefore
is ~~3.88mL +~~ 3.885gms + .175gms = 23.2
.175gms
Since density of blood ≅ density of H_2O we can exchange between gms + mL.

This means that our conductivity of pure blood is estimated to be on the order of

$$0.21\,mS\,(23.2) = 4.872\,mS$$ (dilution factor) vs expected 10-20 mS.

This is very much in line with the previous estimate, surprisingly so.
The first estimate, based upon an extremely limited sample was ~ 4 mS.
Now we have ~ 5 mS.

We now establish two tests, the second of a quite reasonable protocol, both of which establish the conductivity of blood (with a fairly "normalized" NIR spectrum as being a minimum of 1/2 of the expected value.

=

This is thereby potentially highly significant.

I have a very successful testing process for conductivity now w/ a sample size of ~ 0.2 mL

If I can ever receive sample size of 1-2 mL I would be in very good shape.

This was a very reliable test. I was able to cut the detection ratio in half. This method implies that our previous method for dried blood sample seems to be reasonably good.

If your blood sample evaporates to some degree you can reconstitute w/ a closely measured addition of water.

Conductivity of "typical" blood in these experiments to be @ ~ 1/2 to 1/3 of the expected value.

Assessment, the number of free ions in blood is reduced. Most likely is because these ions have been bound into compounds (eg foreign proteins)

Some very favorable news. I have now been able to collect two additional samples from "vaxxed" individuals. This makes a very big difference in balancing out my study.

Mar 23 2023

Two additional "vax" sample now to assess.

#2 VAX is Female 58 2 VAX SHOTS RECEIVED.

917 peak (2)
1395 peak (1)
1520 peak (2)
1585 peak (1)
1650 desc. inflection
Rising @ 1700

#3 Vax Male 68 2 VAX SHOTS RECEIVED

905 peak (2)
1386 asc inflection
1435 asc inflection, peak (1)
1510 peak (2)
1585 minor peak (1)

Correspondence on Vax

	#1	#2		#3
NORM	920	917		905
NORM	1386	1395		1386
NORM	1514	1520		1510
NEW	1585	1585	NH secondary amine	1585
ALSO UNVAX	1645 COVID CASE	1650	ArCH	
NEW	1435		ROH, $CONH_2$, CH	1435

Primary and secondary amines are commonly employed to produce colours, rubber, synthetic fibers, resins and medicines.

It is definitely helpful to have the additional info coming in. The general assessment is that

1. "VAXXED" individuals appear to present w/ unique functional group presence eg

Proline found in collagen.
Collagen is a natural hydrogel.

1. Amine (?protein) groups NH, NH_2 ??

2. ArCH

Amino acids require NH_2
There are indeed "secondary amino acids" Proline

2. There appears to be a commonality of appearance between vaxxed and severe COVID cases (unvaxxed) and the additional presence of ArCH.

3. A distinction in the nature of blood w/ between VAXXED & UNVAXXED individuals appears to be making itself known and identifiable through NIR functional group analysis.

Thus far, ~~ss~~ significant reduced conductivity is appearing in all individuals, vaxxed or unvaxxed.

Now let's proceed to conductivity study of the two additional VAX samples. The viability and accuracy of the punch out method (concentration control) has been established via a liquid blood control test. 5 ml distilled water and 6 punch outs will be used as before to estimate conductivity.

Conductivity Logo

$\hat{EC}$	No	Status	Punchouts	Age	Sex	Time min	H_2O ml	EC uS	$\hat{EC}$ mS
	100 n=1	UNVAX	6	70	M	30	5ml	80uS	5.1
	101	VAX	6	67	F	30	5ml	60uS	3.8
	102	VAX	6	58	F	30	5ml	50uS	3.2
	103	VAX	6	68	M	30	5ml	50uS	3.2
	100 n=2							60uS	3.8

This work is by irony & statistics. The general population shows a likelihood of having low blood conductivity. This would be in accordance w/ general chronic fatigue.

Our conductivity estimate is $\frac{5ml}{.09ml} = 55.5$ dilution factor

$\hat{EC} = \frac{(55.5)}{1000} \cdot EC = \quad mS$

Control w/ liquid trial provides for $\hat{EC} = \hat{EC}\left(\frac{5}{4.4}\right) = 1.14\hat{EC}$

$\hat{EC} = \frac{63.3 \cdot EC}{1000}$ in mS

You can run a t test on a single value sample, not paired. With respect to conductivity that test passes already @ a high probability level that $\bar{x} \cong 3.82$ mS Call it 4.0. Extraordinarily low w/ very even 10mS as the reference value.

We now have enough data to see certain patterns in place.

1. A "~~now~~ normalized" NIR plot of blood can be established @ least by certain major absorbance peaks.

2. Anomalies do occur with an "unvaxxed" data set; @ the point the anomaly corresponds w/ severe COVID event, close to lethal.

3. Discernible variations within the NIR spectra of VAXXED individuals does appear to exist; these seem to be centered on the presence of NH, possible NH_2 and ArCH

4. There appears to be level of coincidence between a unvaxxed severe COVID event and the VAXXED samples with respect to the NIR spectra of both.

5. Conductivity of blood of the general population appears to be significantly lower than expected.

Mar 24 2023

An excellent microscopy session today. First time that I have looked @ blood in ~1½ years. It looks surprisingly favorable. A photograph has been recorded and it can serve as a reference for the NIR spectrum and conductivity tests that are active. CDB (commensal presence) seem to remain external to the cells and are relatively few in number. Quite favorable. Static day smear easily achieved the theme, dramatically different from the year and a day ago.

—

Am setting up for electrochemistry work. The interest is going to be in Electrical Impedance Spectroscopy (EIS) of blood. Vax & unVax comparison will take place.

—

There is certainly interesting work. The ability to interpret impedance here as well as how to set reasonable boundaries on the input impulses is important here. I am improving quickly. The sample is an arbitrary concentration of blood for clarity and development purposes.

The system response we see that for is in that
1. Impedance is close to zero near ≥ 200 Hz
2. Impedance approaches a max as the frequency decreases and approaches 0.

I seem to have some workable parameters:

	Updated set:
Edc = 0.4V.	Scan type fixed
Fixed scan	Edc = 0 The set looks
Eac 0.1V	Eac = 0.1 quite stable.
n freq = 50	Freq type scan
Freq type scan	n freq = 50
Max freq 200 Hz	max freq = 200 Hz
Min freq 1 Hz.	min freq = 1.0 Hz

It certainly looks as though no DC component is required, that makes sense for EIS.

One of the first consistent observations is that the lower the frequency the higher the impedance is. Conversely the higher the frequency is, the lower the impedance is.

$$> f \Leftrightarrow < Z$$
$$< f \Leftrightarrow > Z$$

Here is a question: Is there any way that a blood sample might have a resonant frequency? At this point, it does not appear to be the case however, it is one very worthy and intriguing question.

At this point, I do not see any unique identifying features ascertainable from the EIS plot. Data is limited so the experimentation will continue.

In EIS, we see we have a recommendation of having 10 data pts per decade. Let's deal with this. I am up to getting more data collection beyond the 1-1200 Hz range thus far.

I believe that I have found a resonant point in the "blood circuit". Sample is #100 - n=2. The method is to identify the point where the Nyquist Plot crosses the y' axis, ie where there is no impedance, only resistance. This is occurring @ ~1082 Hz.

It is not easy to find. All parameters have to be set just right. I found it with:

Eac = .05
n = 60 (80/dec which is high but needed)
Max freq 3800 Hz
Min freq 700 Hz

And most importantly, the system is very sensitive to current levels. It looks like only 10 uA can be used.
The resistance is 2472 Ω.

$I = \frac{E}{R}$ ~~R=E~~ $E = I \cdot R$ = 10E

Idc = .2092 uA   Edc = 7.915E-7 V

dC $R = \frac{E}{I} = \frac{7.915E\text{-}7\ V}{.2092E\text{-}6\ Amps} = 3.8\ \Omega$

The is quite interesting.

I do think that I have located a resonant part of the circuit @ a frequency of ~1100Hz.
It makes sense - there is no capacitance or inductance here.

The tabular data will eventually be very valuable to interpret.
Our data configuration Sample #100 n=2 is

Edc = 0
Eac = .05V
Freq type = Scan
n freq = 60 (80/dec)
Max freq 3800 Hz
Min freq 700 Hz

Current = 10UA only! as for.

I am learning how to control the plot more.
If you set the current @ 10UA for example, then you adjust Eac to smooth out the plot.

OK, some very amazing work is going on here.
I've learned to determine the resonant frequency of a "blood circuit".
I have two vials of the same blood of a individual.

The resonant freq of the first sample was determined @ ~ 1082 Hz

The resonant freq of the second sample was determined @ 1134 Hz.

The consistency here is quite amazing considering the process that is involved.

Some aspects of finding the freq are:

1. Set the current @ a fixed value.
2. You will need to find at least generally where the impedance is close to 0 Ω (cross the Y axis w/ pure resistance)
3. Now you need to plateau on that point.
4. You adjust the Vdc to match the current level (eg ~100 A) to start finding a smaller circle. This is critical.
5. Now you start adjusting the waveform frequency until you center the plot on the 0 axis cross. You keep narrowing it down.
6. You can then read the good resistance of the circuit and then match that to the resonant frequency in the tabulated data.

impedance

Even though both sample shows a somewhat different curve @ low frequency the resonant frequency of both samples came out almost identical.

Now we need to look @ a VOX sample and see what type of resonant frequency we get.

The may eventually have therapeutic value also. They has great potential.

At very least it may establish consistency of a sample type. We can construct an equivalent circuit w/ the appropriate C and L.

Mar 25 2023

I am continuing the "resonant freq frequency" investigation of the blood samples. The positive sample gave a resonant freq of ~ 1100 Hz w/ R ≅ 250 Ω
was from an unvaxxed sample(s). Vials # 100 & 100 n=2.
Two independent samples produced an essentially identical result. Current flow was 10 UA (very low).

Next I study a VAXXED sample. Vial # 101.
On first run, the resonant freq seemed in no way, by even close to the results from vial # 100 above.

Further investigation appear to have tested the limits of my electrochemical equipment.
The equipment has a max freq generation of 50KHz.

The closest I can come to the determination of a resonant frequency is on the order of 45-50KHz. It appears to be radically different from the unvaxxed sample.

In addition, the associated resistance of the sample is very ~~low~~ on the order of 4K-7KΩ but the current required is on the order of 10mA to get any kind of signal. I can steady the plot & get it successfully. The behavior of the system is oscillatory near to Nyquist plot origin, although the Resistance is in positive territory.

The sample, in terms of electrical behavior, appears to be radically different from unwaxed sample tested previously.

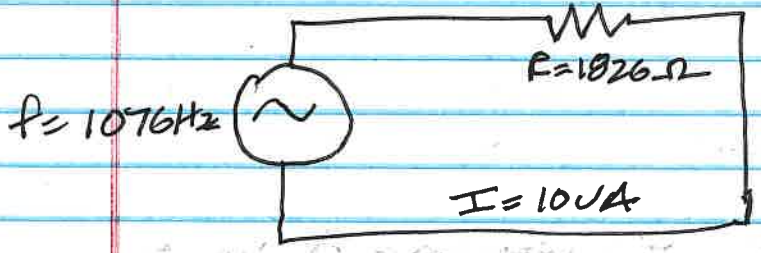
More to follow.

Mar 26 2023

I made an error w/ the "resonant frequency" investigation on Vial #101. Only the electrodes were disconnected.

Let's repeat. (I notice that once again an extensive filament network has formed at the bottom of the vial. The blood has indeed been transformed through the application of low level AC current).

I now get a very similar result w/ Vial #101
Very smooth plot.
freq = 1076 Hz Resistance = 1826 Ω
Current = 10 uA



Our resonant value are now:

UNVAX	1082	
UNVAX	1134	X = 1097 Hz
VAX	1076	

They are amazingly close. What we also know w/ Vial #101 is that the blood transformation to the filament network has already taken place.

One thing we will watch for any difference at the beginning of a sample analysis as more samples become available and the result after the transformation to a filament network has taken place.

Our settings currently are:

1. Fixed scan
2. Edc = Ø
3. Eac = .009V
4. Frequency type = scan
5. n frequencies = 76 (182/dec)
6. Max freq 1800
7. Min freq = 700

A very smooth plot w/ zero crossing reading visible w/ current sample.

Vial # 102. VAX. I definitely have the zone of zero crossing windowed in properly this far. Smooth plot.

Results. f = 1001 Hz R = 3211 Ω I = 10 uA
This is showing a different to some extent. Note this is now accomplished immediately w/ the electrical signal introduced quickly and briefly @ the beginning of the msmt period and results are quickly and smoothly obtained

Now for Vial # 103

Once again, very clear and rapid results on the first pass.

freq = 1088 Hz R = 3000 Ω I = 10 μA

		$\bar{X}$=1076	$\bar{X}$=2445	
		σ_s = 50 Hz	σ_s = 60 Ω	
Vial	Status	freq	R	I
100	UNVAX	1082 Hz	2472	10 μA
100 n=2	UNVAX	1134	1718	10 μA
101	VAX	1076	1826	10 μA
102	VAX	1001	3211	10 μA
103	VAX	1088	3000	10 μA

I do not see anything that distinguishes VAX from UNVAX. What I do see is that a resonant frequency of quite high consistency does exist.

$\bar{X}$ = 1076 Hz
σ_s = 50 Hz

It now the question is what if you divert the X freq into blood? What happens?

Next is, how does, if at all, the frequency change w/ concentration

Mar 26 2023

Initial work has now been done with three different methods to analyze blood.

1. NIR near infrared spectrometry
2. Blood Conductivity
3. Determining the "resonant frequency" of a blood sample.

Samples are minimal in number and unbalanced between VAX & UNVAX, but I am learning what I can.

1. NIR now holds the greatest promise of the 3 methods to distinguish between vaxxed & unvaxxed samples.
2. Blood Conductivity needs more samples & has any prospect of distinguishing between groups. Chaotic low conductivity as a whole is, however, rarely seen as an issue.
3. Resonant frequency does not show distinction between groups but discovery and determination holds implications of important discoveries to come in the future.

The next most important thing I can do, which most certainly destroy the VAX samples, is to try and collect enough blood samples to continue the conductivity study. Later I hope to have more sample materials to work with.

Let's look @ our sample here.

We are only going to be able to get 2 punches from the majority of the samples (uvoxxed) available. Due to a serious hindrance we were only 6.

Sample #5 one of the most important to be set, has so little / material that it will be almost useless
so our method will need to be to collect 2 punches in 2ml of H_2O vs 6 punches in 5 ml of water /. This is feasible and gives us 5 more samples to work with.

Calibrate eyedropper:
50 drops
+ 50
+ 9 drops
$\Sigma = 109 = 4$ ml $\quad \frac{109 \text{ drops}}{4 \text{ ml}} = \frac{1}{x}$

$x = .037$ ml per drop
so 2 ml = 54 drops H_2O per sample.

Each vial will therefore get 54 drops of distilled water and 2 punchouts of dried blood.

Each punch out is equivalent to ~ .015 ml of liquid blood.

NOTE: all measured ~~val~~ EC values on the page to be increased by 13% to accommodate calibration

15 min

~~Shaker~~ Mixing tube ~~2-3~~ 3-4 times during session is beneficial.
Our dilution level will be: 2 ml ≈ 66.7
(2 punchouts) .030 ml

Our conductivity value read will therefore be multiplied by a factor of

$$(66.7)\left(\frac{5\,mS - \text{liquid control run}}{4\,mS - \text{punch out avg}}\right) = \hat{EC}_{mS} = 88.4 \cdot EC_{sample}$$

Let's set up vials. The work will destroy our sample for further NIR work but the spectra have been recorded. 15 min sample will be sufficient to stabilize

(NOTE)

Vial #	Sample (each in unvoxxed)			EC Previous	$\hat{EC}$	
	1	Male	70 03/21		4.5 mS	5[1]
~~#104~~	2	♀	42 03/08	.06	5.3 mS	6[0]
	3	♀	62 03/08	~~.06~~ .07	~~5.3~~ mS 6.2	7[0]
	4	♀	72 03/08	.07	6.2	7[0]
	5	♀	48 03/07	.05 (could be .04)	4.4 – 3.5 $\bar{x}$ = 4.0	5[0]
	6	♀	42 03/08	.06	5.3 mS	6[0]
101				VAX	3.8	4[3]
102				VAX	3.2	3[6]
103				VAX	3.2	3[6]

Now something truly advantageous I have found is that the conductivity meter will efficiently fit w/in the electrochemical vial (test tube). This is a major improvement w/ the use of a limited sample.

#5 sample is of special interest. It is of minimal size so it presents special challenge. I am trying to err on the side of producing more than required samples as NIR work prompts special interest in it.

t test $p = 1.43E-3 = .00143$

$= .14\%$ $\tilde{=}$ 99.0% that groups are different

Combined mean = ~~4.7mS~~ 5.3mS $\sigma_S = 1.1$mS $n=9$

Means: Univax ~~5.5 mS~~ VAX ~~3.4mS~~

~~5.4~~ 6.0 mS 3.8 mS

These values now increased by the 13% to accomodate calibration.

No significant effect whatsoever but now we had confidence in the meter calibration.

Conductivity Repeat:

~~VAX(2) 0.68 03/23 .05 (88.4) = 4.4mS~~

Mar 21 2023

I am now learning to control the resonant frequency of blood coagulation across a wider freq range.

I have a fresh high dilute blood sample.
Range 1-200 Hz open range I (Asc)
200-1000 Hz 100 uA smooth (Asc)
10 uA Elastic
Already plot 1 mA rough but reasonably stable
1000-3000 Hz (Asc) Water for n frequency
1 mA rough but Coherent 100 uA rough, Coherent 10 uA Elastic
@ @ 0.100 V. Set to .009 more stable
also approach zero crossing
Change the current magnitude from 100 uA to 10 uA
changed the direction of the plot.
You can see you are getting closer to the zero point.

I can see the resonant freq is ~ 900 Hz.
So our resonance for at: 881.9 Hz = 888 Hz
Ω = 4612 Ω I = 10 uA
Edc = .006 V
n = 40 Range = 1200-800 Hz.

OK, I have learned some more on the run.
1. Arbitrary Concentration. I suspect more concentrated than the punch nt sample.
2. Resonant freq is positively identifiable and repeatable.
3. I stepped from 1 Hz to 4000 Hz until the window of zero crossing occurred.

Go adjust the current (single level current on the window we isolated) and the voltage until the plot stabilizes. It is quite possible to stabilize the plot w/ a suitable variation of parameters.

The frequency in this case is lower than the earlier threshold, so the suggests that the frequency may be a function of concentration. This is what will be tested next.

Notice that not only the freq changed but resistance also.
Relevant freq is lower, resistance is higher.

What does this mean in terms of circuit analysis and behavior?

Therefore our mean of 4.7mS
should be increased by ~ 1.28(4.7) = 6.0 mS

Therefore still no significant difference in the conclusion. Still working 10-20mS
We are still bringing down more than 50% from a mean of 15mS

$\frac{6.0}{15\text{mS}}$ = 40% so 50% reduction remains a conservative estimate.

Mar 20 2023

We do indeed have a calibration issue w/ the EC meter. It was really too low.
Calibration value is now @ 12.50 vs observed 12.88.
I will test also w/ NaCl solutions

25°C = 77°F
I am sorta at closer. 20°C = 68° 25°C = 77
Temp ~ 68°. Factor for 25°C = 0.894
.894(12.88 Calibration Solution @ 25°C) = 11.46
Our value may have been too ~~high~~ low by a factor of
~ 11.5/9 ≈ 1.28%

We work Continuum to be reasonable
& now have a chart of conductivity for NaCl @ 25°C
Molar wgt of NaCl ~ 58.4 gms / mole

A concentration of .075 moles / liter ≈ 5003 μS = 5 mS @ 25°C
.075(58.4) = 4.38 gms / 1000 gms H_2O

50 ml H_2O ≈ .05 .05(4.30 gms) = 0.22 gms.

100 ml ≈ 0.44 gms
Beaker wt ~~20.55~~ gms + .22 ⇒ ~~20.77~~ gms
20.53 gms + .22 = 20.75 gms

~~We measure 8.73 mS~~
We measure 5.14 mS in 100 ml H_2O.
~~This should be a direct read.~~

Repeat: Beaker mass = 52.57 gms

52.57 + .22 gms @ 25C = 52.79 gms
for 50 ml H_2O

We measure 7.60 mS. @ 68°F
~~w/ temp correction.~~
We should measure 5.0 mS @ 77°F
∴ 5.0 (.89) = 4.45

But we measure $\frac{7.60}{4.45}$ = ~~1.70~~ 1.71

This is 71% too high.
~~If 7.60~~ 7.60 (.71) =
Ok, err on Conservative side.
$\frac{7.60}{50}$ = 1.52 = 50% too high.
By Cat. Calibration we were 28% too low,
(−28% + ~~50~~ 50%) /2 = +11%
Therefore if we reduce our ~~50~~ current value by 11% we will eventually split the difference of the two calibration procedures.

.11 (7.60) = .84 7.60 − .84 = 6.76

We will adjust our meter to 6.76 in our NaCl Calibration solution.

The value actually make sense as we have an @ the extreme end of the potentiometer w/ the first Cole Calibration method. The adjustments will have us needed closer to the central range of the potentiometer adjustment.

So for now it seem reasonable to dissolve 0.22 gms in 50 ml distilled H_2O and read 6.76 on our meter.

I think we have a decent calibration now.

This means that I will now reduce our previously adjusted mean by 11%.

Therefore 6° ms (.11) = .66 ms @ 6° − .66 ms = 5.34 ms

We originally had a mean of 4.7 ms
We now have a mean of 5.3 ms
The range our measured values were on the order of ~13% too low.

Therefore all previously measured values will be increased by 13%. This has no real impact upon the results.

I am also learning to mix the sample more thoroughly 3-4 times during the 15 min period.

* = Calibrated EC Meter

Most Current Conductivity Run
15 min stabilization period

No.	VAX	Sex	Age	
101	3.8 (1.13) = 4.3	F	67	This set had 6 punchouts in 5 ml
102	3.2 (1.13) = 3.62	F	58	
103	3.2 (1.13) = 3.62	M	68	
* VAX 103	.07 ms (88.4) = 6.2			Now we have 4 punchouts in 2 ml
* VAX 102	.11 ms (88.4) = 9.7			$\bar{X} = 8$ ms
* VAX 101	.12 ms (88.4) = 10.6			$\frac{4}{2} = 2$ $\frac{4 \cdot 5}{6} = \frac{20}{12}$
* 100	UNVAX 0.10 (88.4) = 8.84			$\frac{6}{5} = 1.67$ greater Concentration w/ ½ of sample

Our total data set is now:

UNVAX	VAX
5.1	4.3
6.0	3.6
7.0	3.6
7.0	6.2
5.0	9.7
6.0	10.6
8.8	
$\bar{X} = 6.4$	$\bar{X} = 6.3$
$\sigma_s = 1.3$	$\sigma_s = 3.1$

$\Sigma \bar{X} = 6.4$ $\quad n = 9$

$\sigma_s = 2.2$

Mar 29 2023

Electrical impedance spectroscopy remains and exists as a very interesting prospect for discovery.

1. What are different forms or patterns that a Nyquist plot can take?
2. Is the form I am seeing unusual in any respect?
3. Does the "resonant frequency", ie, resistive AC current circuit depend upon concentration?
4. Vax or Unvax a factor?
5. It seems difficult to get a smooth plot over a wide freq range but not a narrower one.
6. Recall that it is plasmarg, but not necessarily AC focus.

also:

Ya have analyzed a Unvax sample in detail w/ both NIR and AC voltammetry. How about a VAX sample w/ AC voltammetry? (ya do have NIR on VAX).

—

Is there any more info that can be extracted from conductivity testing of your limited samples? Calibration trial again? Two solution concentrations this time?

More exact conductivity info on NaCl would be helpful.

I now have a second table of NaCl conductivity. It looks to be more specific.

Use $\frac{0.22\text{gms}}{50\text{ml}} = \frac{x}{1000\text{ml}}$ $x = 4.40\ \frac{\text{gms}}{\text{L}}$

$= 4400\text{ mg}$.

On table we have

4000 mg = 7500 uS

5060 mg = 9240 uS

$0.4(9240+7500) = 696$ or $7500+696 = 8196$ uS

$= 8.2$ mS @ 25°C

and $.89(8.2) = 7.3$ mS @ 20°C

Our meter has previously been set to read 6.8 mS. This is quite close so our meter is in decent shape now I.

For future, we make a menu modification:

At 20°C (67°F) we will now dissolve 0.22 gms NaCl in 50 ml Distilled H_2O and set the meter to 7.3 mS.

If we were to dilute the solution to 100 ml we have

$\frac{.22\text{mg}}{100\ \cancel{50}\text{ml}} = \frac{x}{1000\text{ml}}$ $x = \cancel{4.40}\ 2.20$ gms / 1000 ml

2000 mg/L = 3830 uS $.2(5760-3830) = 386$ uS

3000 mg/L = 5760 uS $3830+386 = 4216$ uS $= 4.2$ mS

$.89(4.2) = 3.7$ mS

$r^2 \geq .999$

NaCl Conductivity Regression $uS = f(mg/liter)$

We can see that it is not exactly a linear relationship as we have seen
Lets form our own regression then @ 25°C

Actually graph does look rather linear
Actually it is perfectly linear.

~~$uS = 0.85 (mg/liter) + 1.32E-5$~~ ~~$r^2 =$~~ + @ 25°C
— @ 20°C

So ~~$uS = (.89)(.85)(mg/liter)$~~
~~$uS = .7565\ mg/liter$~~

$n = 47$

~~$uS = 1.1765 (mg/liter)$~~
Ok, not quite linear, but close.

linear $uS = 1.791 (mg/liter) + 54.4$ $r^2 = .999$ @ 25°C

power $uS = 2.1756 (mg/liter)^{0.9846}$ $r^2 = .9998$

Linear form is more than satisfactory

S. @ 20°C

Use this $uS = (0.89)(1.791)(mg/liter) + 54.4$

X $uS = 1.594 (mg/liter) + 48.4$ @ 20°C (67°)

This is fine

Use this now, any concentration now available.

Reverse Regression

Concentration regression vs uS $r^2 = .999$

Now we can also create the inverse of the regression

25°C $mg/liter = 0.558(uS) - 29.6$ $r^2 = .999$

~~20°C $(mg/liter) = 0.497(uS) - 26.3$ $r^2 = .999$~~

Just use the 25°C formula to start

20°C $(mg/liter) = .625(uS) - 33.1$ @ 20°C

Now we can look at concentration in terms of equivalent to dissolved NaCl.

So if our blood samples measure on the order of 8mS = 8000uS, then our calculated mg/liter is $.625(8000uS) - 33.1 = 4966$ mg $\cong$ 5gms/liter

And we can now see that is a very significant measurable amount of salt. And the normal range is on the order of 10gms equivalent NaCl per liter.

Now to calibrate

If we put 0.22 gms in 50 ml, then this = 4.40 gms/l

0.22 in 100ml H_2O = 2.20 gms/l

20°C uS = 7.06 mS $\frac{.22 gms}{50 ml}$

20°C uS = 3.56 mS $\frac{.22 gms}{100 ml}$

Notice we had set the meter @ 6.8mS so we are right on track with our most recent calibration. Good. This means your most recent measurements will be the most reliable.

No.	VAX n=3	UNIVAX n=1
103	6.2mS	100 8.8 mS
102	9.7 mS	
101	10.6 mS	
	$\bar{X}$ = 8.7mS	$\bar{X}$ = 8.8 mS

No significant difference yet but all values are below normal!

April 04 2023

Blood samples should arrive today.

One question, beyond concentration level, is whether the resonant frequency might be different between fresh (or at least relatively fresh) blood and blood that has been subjected to low AC current (i.e., EIS only) or ~10uA and INCUBATED for 24 hrs + @ room temperature.

—

The samples have arrived. Let's inspect their quality.

1. Noticy sandy particles, graphene sheets

One sample set is superb and will allow for considerable testing.

The other sample is minimal and I will need to choose my tests very carefully.

Let's think about some of our questions and efficient testing procedures, depends upon sample amount.

2 NIR testing on the samples at lowest non destructive test method. Thus is almost certain to be first.

3. Possible test scenarios
   1. NIR
   2. Conductivity
   3. Resonant frequency - EIS
      a) concentration
      b) "pure" blood
      c) incubated blood
   4. AC Voltametry - elemental analysis
   5. Vaxxed vs Unvaxxed vs PCR
   6. Normal sample, albumin sample
   7. Microscopy of incubation, vaxxed vs unvax
   8. VIS spectroscopy?
      Notice that 2 of 3 vax VIS are much lighter color
   9. Calibration of conductivity meter
   10. Notice the pure blood sample incubated @ room temperature.
   11. Do you have the USB scope? - Apparently not.

MD
1. Sample quality
2. Receipt of samples
3. New Biology paper - food
4. Graphene link
5. Incubated blood

Apr 05 2023

I am starting w/ the fecal blood petri dish filament culture.

1. Phone image ~~1500X~~ 5X
2. 001 as 10X objective
3. 002 as 40X
4. 004-006 40X

OK, let's run some Calibration slides
Each Division = .01 mm = 10 UM

~~10x objective:~~ 10X
~~Each large division in length~~ Total segment = 1 mm w/100 divisions

1 mm ~~10 ...~~ = ~~...~~ 1E-3 m
16 cm 16E-2 m

Magnification = Measured segment / known segment = 16E-2 m / 1E-3 m = 160X

4X " " " = 64X
10X objective w/ Camera = 160X
40X " " " = 640X
100X " " " = 1600X

Ok, now we have them in place and written on the scope there.

Now let's learn focus protocol.

1. 10x (=160x) is ~ 0.75 cm from stage

2. Snap 40x into place. Sufficient fine play exists. Increase exposure. Raise stage. Play may be run out and it is still OK to use the fine focus. You can increase play in main wheel play courtesy to move stage and closer with fine focus and then backy down the main stage w/ the large wheel. until approx focus

For now you can barely see another 5 turns beyond focus point UPWARDS with the fine focus, and then drop the main wheel back down. The look a bout right, about 5 turns.

Battery or light was dead. Play in now.

We see that 4 turns of fine focus down is enough to let the 100x objective to clear the stage just ONLY w/out A SLIDE COVER

I know now that the stage did not have enough free motion to focus properly @ 1600x. The stage does have to have a fair amount left to focus w/ the 100x objective @ 1600x

I have adjusted. Extreme caution will be required to not break the slide

The microscope adjustment is very important because the COB cannot be seen to be dividing en masse, however full magnification is required to be able to capture it.

OK, I have captured division and combinment within filaments.

We find that the stage must be lowered considerably, beyond the fine tuning range, in order to accomodate the 100x objective. It is required to raise the stage slowly and carefully to the point of focus. The 100x is the only operation that is standardized yet.

Apr 06 2023

There are a lot of projects outlined. Keep in mind, however, that a primary objective is to determine if there is an identifiable difference between VAx & NonVAx blood.

1. Conductivity
2. Resonance freq? EIS Profile
3. Chemical signature — NIR, VIS? ACVoltametry

Sample preservation is also an extreme priority. Another objective, therefore, is to maximize the information that can be obtained from the sample set, for long as it is non-destructive & the sample and does not sacrifice the accomplishment of the primary objectives within a prompt time frame.

Even considering our previous "pencil" samples we can consider

1. Even visible light spectroscopy - NIR usually better though
2. Microscopy of filament growth
3. AC Voltammetry

Our four "pencil" tubes are almost dispensable @ this point so we can test what additional information we might gain.

1. Microscopy?
2. VIS spectroscopy?
3. EIS exploration?
4. ACV exploration?

Conductivity & NIR are mandatory to be applied to a broader sample set

Intensity, but may not be critical

Critical

As a recollection, our most recent work with the four "punch" tubes was about conductivity of

#100	101, 102, 103
UNVAX	VAX

w/no clear discernible difference in the means although all values are considerably lower than expected.

In addition, work was done with calibration of the conductivity meter via NaCl known solutions as well as a regression determination for concentration.

Let's gather residual information from the four tubes. Microscopy first...

~~Concentr~~

#100 UNVAX defunct filament-CDB network. Photographed.

101 VAX Minimal but present filament-CDB network. Photographed.

102 VAX "

103 VAX " but CDB dominated. Division and alignment highly visible

Ok, the assessment on the situation is that all samples, vax & unvax demonstrate the existence of the CDB/and/or filament network even within highly diluted incubated blood.

Some more advanced filament network
Some with more factual CDB networks

Apr 06 2023 (cont)

Since there is no loss, I can continue to seek out any additional info from the four "punch out" samples. I have already learned that

1. No significant conductivity difference exists (yet)
2. All samples, VAX and UNVAX, show the development of the COB filament network under incubation conditions only, no applied energy required.

There is valuable info for a drop of blood (at most) in a 2 ml dilute sample.

I think VIS spectroscopy should at least be explored to set the stage for possible future work.

Notice how the samples are yellow now vs red.
Could that not indicate oxidized iron?
2 samples (both VAX) are very light in color.
2 samples (1 VAX, 1 UNVAX) are darker in color

Notice that the UNVAX sample

1. Presented a fairly "normal looking" dried blood smear
2. BUT AND presents the most extensive filament development within the dilute blood set by pin prick out.
3. Is darker in color.

Indeed ferric iron hydroxide is yellow. VIS spec could be a tool.

Also I have found an unused coffee filter w/ numerous blood samples (dried) on it. The samples are estimated at ~ 3 years old so it could become a valuable reference to see or look for changes in blood stains that time.

Dissolved ferrous iron is kinetically oxidized to ferric iron by oxygen.
This means to me that I would expect blood to turn yellow in water over time.

Status: The portable visible light spectrometer is out of commission. It appears to be the case because of a dead rechargeable battery. 3.7V, an unusual voltage. 2700 mAH.

So I have been able to order a spare battery @ ~$30. Now I need to see what will be required to recover it.

So no VIS spectrometer for the time being.

So now we decide where to go next

NIR & Conductivity probe are my essential tools right now. EIS & AC voltammetry come afterwards.

MIR spectroscopy & Resonance pursuits.