CI LABORATORY NOTES VOL XXIX

Our next question is, what can we meaningfully accomplish in remaining time before travel, also allowing for emails & recreation & planning & packing.

Possibilities include:

1. ACV work between VAX & UNVAX?
   - this could be very helpful and may answer further in stability and dynamics

2. Resonant freq work – EIS
   - 1. Concentration F(x)?
   - 2. Aging blood (?)
   - 3. Live or dried (?)

3. Bacterial DNA – overlap?

Mar 09 2023

Let's think about what can be helpful to shorten time remaining.

Know keys of statistical test & paper would be helpful now. A sample of 13 that shows a division of 10 & 3.
We do show a statistical difference there

$\bar{X}_1 = 8.7$ $\rho = 9.175E-5$ $\sigma_s = 1.43$

$\bar{X}_2 = 5.7$ $\sigma_s = .12$

It say the group of 3 has different characteristics need to know the "power" of a test - how good is the test when numbers are so small?

Difference between + test & Chi sq value?

Also ACV has promise of differentially samples for the.

Also may document few question exist.

Electrochemistry is your tool here.

Additional data coming in Dilution Factor: 55.6

Punches 6 punches 2 ml	Unvaxxed:	EC	$\hat{EC}$	AGE	
	#120	Ø.18	10.0 mS	72	UVAX
	121	Ø.18	10.0 mS	76	UVAX
	~~125~~ 122	~~Ø.15~~ 0.14	7.8 mS	74	UVAX
	~~124~~ 123	Ø.12	6.7 mS	NO AGE	UVAX
	~~125~~ 124	~~Ø.10~~ .12	~~5.6~~ mS 6.7mS	70	UVAX
	125	Ø.16	9.0 mS	70	UVAX

Figure out current mean. ~~100 $\bar{X}$ 4.02 101 $\bar{X}$ =~~

100: $\bar{X}$ = 9.35 101: $\bar{X}$ = 10.65 102: $\bar{X}$ = 9.35 103: $\bar{X}$ = 7.5

$\bar{X}$ = 8.7mS Exactly the same as the previous mean and σ_S. 7 UNVAX, 3 VAX

σ_S = 1.4mS

n = 10 -42% from expected mean of 15 mS.

Corrected

Dilution ratio is $\frac{2\text{ ml}}{6(.006\text{ ml})} = 55.6$

You could also consider $\frac{2\text{ ml} - 6(.006)}{(6).006} = 54.6$

No significant difference

VAX	No statistical difference between means	UNVAX
10.65		9.35
9.35		10.0
7.5		10.0
		7.8
		6.7
		6.7
		9.0
$\bar{X}$ = 9.2		$\bar{X}$ = 8.5
σ_S = 1.6 n = 3		σ_S = 1.4 n = 7

The conductivity session is heavily dominated by sample from senior citizens, 65 yrs +

Now Consider lastly the data set further.

3 additional usable samples lysates of more normal size

One sample has enough material for a 2 punch test
Two samples should have enough for a 3 punch test.

For the 2 punches will use 1 ml of H_2O.
The will equate to a 4 punch test w/ 2 ml.

	EC	$\hat{EC}$	Dilution Ratio	Age
Punches 2 1 ml	113 ~~.06~~ .01	58	1 ml / .006 ml = ~~166~~ 83 * 2	84
Punches 3 1 ml	112 ~~.09~~ .10	56	1 ml / (3 · .006) = 56	69
Punches 3 1 ml	#114 .07	58		68

Takeaways: Preliminary study in Senior Citizens set

1. Ion concentration of blood likely low
2. Methylation, lack of, may be an issue
3. Protein disruption, albumin is likely an issue
Autooxidation, previous energy studies

Some comment on the last set of 3 samples. The samples come from residents of subsidized housing. Also note senior citizens! It is also observed that the samples are generally more pale in color. A possibility to consider is that these individuals may not have convenient or feasible access to desired health care. They may also not have had as much access to health related information. Offered for consideration as the group is certainly known that the population tested earlier, the majority of whom do have access and take advantage of specialized health care, eg anti-aging clinics.

Majority unvaxxed
So now are data is: All participants are 65+ years

100	9.35 mS	120	10.0 mS	112	5.8 PCR
101	10.65 VAX	121	10.0	113	5.6 PCR
102	9.35 VAX	122	7.8	114	5.8
103	7.5 VAX	123	6.7		
		124	6.7		
		125	9.0		

~20% from lowest of these possibilities

$\bar{X} = 8.0$ mS
$\sigma_S = 1.8$ mS
$n = 13$

$\frac{8 - 15}{15} = -47\%$ from expected mean of 15 mS

t test 99.98% $U \neq 10$
100.00 $U \neq 15$

Unvax mean = 9.2 mS
$\sigma_{SX} = 1.6$ mS
$n = 3$

No statistical difference between Vax and Unvax.

These are the two main projects that I am able to accomplish up front:

1. NIR spectrometry
2. Blood Conductivity

The question in these two approaches was to determine if there is a discernible difference between vaxxed and unvaxxed blood samples.

The result w.r.t. NIR is: maybe? We have some shift phenomenon in NIR that may end up be important, especially in regard to methylation & protein alteration. More detailed work will now be required. It is also true that the NIR spectra are far more alike than different, as the severe Covid Cases clearly seem to be.

With respect to Conductivity we have two findings. Conductivity as a whole, among the general population, appears to be significantly low. There is, however, no discernible difference between the vaxxed and unvaxxed groups thus far. Everyone is acting here.

Ref - Previous energy study, Fe oxidation

Mar 11 2023

I have been able to acquire some important reference NIR data. Peaks are listed as:

1159	CH weak	overlapping data coverage
1449	OH Strng	
1802	CH weak	outside of range.
1923	C=O Strng	
2160	OH	

I have some serious NIR analysis to do. My plots capture data considerably above and beyond that of two separate reference plots. In addition, I appear to pick up the menstrual data available via the reference plots but they may exist with shifts, and there is also indicative of change.

There are likely discoveries to be made here, 5 different data sets to analyze:

1. Pre Card sample
2. Unvax
3. Vax
4. PCR test
5. Severe Card Event

Let's step through the peaks

Mar 12 2023

Now let's go to work examining the composite NIR plot
It appears that there is a wealth of information to be uncovered here.

We start by noting that between 900 - 1100 nm the front of our reflence

1. Nasiba, Bijora Agricultural University Dec 2019
   lists only 2 peaks of sugarcane
   1159 nm CH
   1449 nm OH

2. The second paper, Li, College of Physical Science and Technology, Guilin, China Dec 2020

1. 1452 nm OH
2. ~900 shown but does not describe it.

Then he goes on to say that the is due to water (1452)
and that it masks any other signals that may be present. He also does not seem to even discuss the peak @ ~900

In my experience there is a huge mistake to exclude any water in the sample, either NIR or mid NIR for the very same reason.

I would consider such spectra essentially useless. Nevertheless, the only information offered in between the two sources is:

1. ~900 no discussion
2. 1159 CH
3. 1449-1452 OH due to water, it destroys the spectrum.

These spectra, therefore extremely limited in any actual value. Li did devote a lot of attention to variation in water instead of just removing it. He also says that he results have no real value in determining changes in blood composition (they are due largely to the water issue).

The very first step that I take in any infrared analysis (NIR or mid IR) is how do I get rid of the water?

Let it be known that I am using dried blood as my primary form of sample and I have very responsive spectra as a result.

So on we go, with no real secondary reference available.

This spectrum will be accepted as a comparison reference
include:

We have (Strong = 3, mid = 2, weak = 1) (4 analyses also)

UNAX: AVG N=14

917 descend inflec. (2) CH (methyl CH_3) (915)

1064 peak (1) Alcohols as RCOH (1065) -OH & CH methyl combination

1225 descend inflection (3) CH Secondary or Tertiary Carbon
Aliphatic Hydrocarbons (1225)

1371 asc. inflec (3) CH_3 methyl CH associated w/
Aromatic $ArCH_3$, aromatic hydrocarbons (1379)

1413 peak (2) CH methylene $RC(CH_3)_3$ or $RCH(CH_3)_2$ (1411)
"CH_2 methylene (1415) Alkyl Alcohols (1415)

1522 peak (3) NH Amide NH or NH_2 - $CONH_2$ - Amide/Protein
(1520) NH secondary amine R-NH-R (1520)

1580 peak (2) Alcohol as RCOH (1580)
Alcohol (1583)

1629 desc. infl (2) CH Vinyl and Vinylidene
($CH_2=C(CH_3)-CH=CH_2$) (1630)

1681 peak (2) CH Aromatic (Ar CH) (1680)
Ketones (1678) Ketones (1682)

All measurements of blood conductivity remain perfectly consistent, and in all case they remain lower than expected. 10-20 mS are normal range leads to expected ∑ of 15 mS. Even if mean were @ 10 mS (currently 8.7 mS) the added leads to decrease of

$$\left(\frac{10\,mS - 15\,mS}{15\,mS}\right) = \underline{\underline{-33\%}}$$

If mean remains @ 8.7 mS $\frac{8.7 - 15}{15} = \underline{\underline{42\%}}$

We currently have 4 measurements of good reliability.

Now we can continue w/ a second calibration of the punch out method. We use the same blood sample and let us 8 punch outs in 2 ml H_2O.

—

Next is our punch out calibration. We can use the scale & keep up H_2O to 2 ml. I will use 6 punch outs of dried blood in 2 ml H_2O.

Our beaker weighs 83.32 gms → 85.32

Next we reconstitute the 6 punch outs for 15 min.

We therefore estimate that we have
6 punctures (.019 ml / puncture) = .114 ml
blood w/in 2 ml H_2O.
Our dilution level is therefore $\frac{2 - .114}{.114} = 16.54$

Even under the most lenient of circumstances & are getting a value that is 4 too low.
Our estimate of the volume of liquid blood of a puncture is way too high.
We can use our control to calculate
We measure 0.09 mS. Our control value measurement is 10.45 mS
Therefore $\left(\frac{2 \text{ ml} - X \text{ ml}}{X \text{ ml}}\right) .09 \text{ mS} = 10.45 \text{ mS}$

$\frac{2 - X}{X} = \frac{10.45}{.09} = 116.1$

$(2 - X) = 116.1(X)$
$2 = 116.1X + X$
$2 = X(116.1 + 1)$
$X = \frac{2}{116.1 + 1} = .017$ ml for 6 punctures

Therefore each puncture = .003 ml = 30 ul
not unreasonable

This is all reversed data w/ control

OK, we have some issues here.
First off, your estimate of .015 ml/punchout worked out quite well w/ your first Calibration test.
I will hold to this right now as our results achieved thus far are surprisingly consistent.

Second, we see that the multiplication factor of 88.4 on Mar 28 was simply too high by a factor of 2+. This became 4 punchouts were used in the most recent EC run, not two. The factor should actually have been $2\text{ml} - (4)(.015\text{ml})\left(\frac{5}{4}\right)$ / .06 ml
$= \frac{40.4}{32.3}$, not 88.4
The new leads to current data set of

101	3.8(1.13) = 4.3 mS	6 punchouts in 5 ml H_2O
102	3.2(1.13) = 3.62 mS	
103	3.2(1.13) = 3.62 mS	
103	.07 (40.4) = 2.83	
102	.11 (40.4) = 4.44	4 punchouts in 2 ml H_2O
101	.12 (40.4) = 4.85	
100	.10 (40.4) = 4.04 mS	
100	.18 (22?) = 4.00 mS	6 punchouts in 2 ml

4 punches 2 ml
6 punches 2 ml

X = 4.0 mS
σ_S = 0.1 mS

Which is surprisingly consistent, and also very very low.

What is necessary however, is to continue to calibrate fresh blood conductivity against the pierce out method. Even if our value were off by a factor of two they would still be quite low.

Therefore we are to calibrate once again.

Use both 4 pouches & 6 pouches in 2 ml H_2O
We have already two measurement in place for sample 100.

.10 mS (40.4) = 4.04 mS

~~.09~~ .12 ~~mS~~

.12

In the ~~.09~~ mS measurement: .12 2.5 mS

2 ml / .09 = 6(.015 ml) = 21.2 & 21.2(~~.09~~ mS) = ~~1.91 mS~~

Which just seems too low so this is being repeated.
Actually since there is no liquid actually added we should use .18 = 4.0

2 ml / .09 ml = 22.2 22.2(.12) = ~~2.7 mS~~

Next we look @ VAX N=5

Same 914 same descending inflection (2)

1064 not detectable

1187 peak (1) Methyl (1194)

1359 peak (2) Methyl

1432 peak (2) Aromatic Amine, NH primary aromatic amines (1432)

1516 peak (3) NH bonded from polyamide II, polyamide II (1515)

Same 1581 peak (2) Alcohols as RCOH (1580)

1650 Desc inflection (3) Nitro CH_3 as CH_3NO_2, CH Methyl

We therefore note change with respect to:

1. Essentially all peaks and inflections except for 917 & 1580 nm. These indicate change in alcohols, aliphatic hydrocarbons, methyls, Aromatics, Amides & amine (protein), Vinyl, Polyamides & Nitro structure.

Next, let's look @ the ~3 YR OLD dried blood sample, Pre Covid era. Realize that the Pre Covid sample is not to be regarded as representing "normal" or improved health, it is only to be regarded as a Pre-Covid event or sample.

* 907 CH_3 Methyl (908) Shifted (3)

917 Not detected

1048 peak(1) R-C-OH Alkly Alcohol (1047)

1138 peak(1) Ar CH (1142)

1179 peak(2) (Y'=0, zero crossing) Alkene is closest

C=CH match @ 1170) but Galaxy Scientific Chart shows Methyl CH_3 group dominant here.

Therefore great confusion here, Methyl and/or Alkenes are both candidates here.

Inorganics Possible Here

1248 CRC book shows no entry. Galaxy PDF shows CH Ether Peak(1) Tertiary Amides in 2011 CRC book.

1290 Peak(2) CRC shows no entry Galaxy shows no entry. SH does show up in CRC previous edition 2011 table.

SH

1401 OH Methanol (1408) peak (3) (Y' Zero Crossing)

1520 Amide/Protein Peak(3) 1520 (Y' Zero Crossing) A major dominant peak here.

Major Peak Here

1570 Peak(1) Amide/Protein

Observation: When an inflection point is observed, see if it is a portion of tailing a peak, however subtle it may be.

Comments on Pre Covid sample,
Recall that the Pre Covid sample is not to be regarded as a "Norm", only as a pre covid event for comparison purposes.

What we do see is change. The spectrum is to be regarded as differing from both VAX and UNVAX post Covid analysis. The suggests that blood has been or may be in a continuous state of change across periods involving several years. This is not inconsistent w/ health improvement or degradation, as well as hypothesis presented such as in the paper "Transformation of a Species" in 2019.

Blood changes appear to be both complex and dynamic w/ time as a variable as well as health and "vaccine" influences.

Next we have the severe covid event spectrum.

Correspondence

All samples 912 Peak (2) Y' Zero Crossing CH_3 Methyl (915)

939 Peak (1) Y' zero Crossing Methylene (930)
outside normal error range but
w/in range of Galaxy Scientific CH_2

996 Peak (2) OH Primary Alcohol $-CH_2-OH$ (996)

Pre-Covid 1046 Peak (2) Y' Zero Crossing RCOH Alkyl Alcohols
(Note in Pre Covid Sample)

1096 Peak (3) Y' Zero Crossing Alcohols as RCOH (1065)
Alcohols broad banded. OH & CH_3 methyl combination
Galaxy indicates CH_2, and both CH & CH_3
also possible. Strong indication of RCOH in all
cases.

New 1160 C=O Peak (1) (1160) Carbonyl Group
Reactive band.

Unvax 1238 Peak (1) CH Secondary or Tertiary Carbon. (1225)
Galaxy indicates CH Strong probability.
CRC Previous edition also indicates possible alkanes.
Alkane most likely

SH 1279 Peak (1) No CRC 2012 entry. No Galaxy
Entry. SH in CRC 2011. Inorganic suspected

VAX 1434 Desc. Inflection (2) NH Aromatic Amine (1430)
$R-C=O-NH_2$

New 1489 Peak(1) Aromatic Amine or Amide or Polymeric alcohol (1486-1496, multiple entries)

UNVAX -Shifts 1527 Alkyne R-C-C≡C-H (reactive bond) or Peak(1) vs Peak(3) Amide/Protein or Secondary Amine: Peak(1)

UNVAX 1624 CH Vinyl Peak(2) (1624-1630)

VAX 1650 CH_3NO_2 (1654) Peak(3) - Methyl, Nitro

---

pre Covid PCR Samples - Points of Note

1407 OH Methanol Peak(2) (1408)

UNVAX SEVERE COVID 1632 CH Vinyl

Next question: What type of NIR data do you have regarding the electrical transformation of blood in Paper #4 of the altered blood series

April 14 2023

I think the best way to go about the question is to get a fresh sample of the foam precipitate protein formed from page #5 and collect a full NIR analysis of it and then compare w/ your recent analysis.

I am going back to the notes of Apr 23, 2022 almost exactly from one year ago. I am utilizing the method of Chronopotentiometry, almost the simplest method possible.

I have set the current @ -3 mA.
t interval = 0.1 sec for 2000 sec = 32 min
The working voltage is ~ -3V

$E = \frac{I}{R}$ $\quad R = \frac{E}{I} = \frac{\sim 3V}{3E-3A}$ $\quad R \cong 1000\ \Omega$

We can indeed see precipitate being formed on the red electrode (working electrode) within 10 minutes.

The goal is to get a usable sample of foam precipitate on a coffee filter & thereby and collect a NIR spectrum & compare w/ dried blood samples.

Ready in 50 ml is now 6.45 mS. Not bad.

$\frac{6.45 - 7.06}{7.06} = -8.6\%$ Not bad

Ready in 100 ml is now 3.71

$\frac{3.71 - 3.56}{3.56} = +4.2\%$

$\bar{X} = -2.2\%$ This is close enough & an acceptable Calibration. No further meter adjustment is required.

Now let's Calibrate punch outs to liquid blood.
Assume we use 4 punch outs per 2 ml H_2O
This should equate & approx $4(.019\ ml) =$
.076 ml in 2 ml H_2O
Assume density of blood $\cong$ density of H_2O
This means it is safe to use .076 gms of fresh blood in 2 ml.

Previously we were able to Capture .175 gms, so lets attempt to Capture ~ .15 gms into the 3 ml electrochemical vial and then bring up solution to 2 ml.

Our vial weighs 83.29 gms. We are therefore gets ~ 83.44 gms

83.87
~~83.91~~ gms w/ 19 drops H_2O

.037 ml/drop ⇒ 19(.037 ml drop) = 0.703 ml
= .703 gms.

83.27 gms
+ .703 gms
83.97 gms

but it should weigh 83.87
Therefore we have 0.10 gms for blood.

We have now increased vial from 83.27 gms to 85.27 gms. (~0.10 ml)
Thus mean we have ~0.10 gms liquid blood dissolved in 2 ml H_2O.
Now measure Conductivity
We measure 0.55 mS.
Our dilution ratio is $\frac{2\text{ ml} - 0.10\text{ ml}}{0.10\text{ ml}} = 19$
This leads to a conductivity estimate of pure fetal whole blood of the sample to be
19(.55) = 10.45 mS
Which is very much in line w/ expectations.
We have a range of 6.2 to 10.6 mS from previous analysis. The previous measurement on the same sample was 8.84 mS.

Ok, we now have extremely consistent results w/ sample 100, and I have done the three items. Now let's Calibrate with fresh blood.

We are using 6 punchouts which are currently equate to $6(.015\ ml) = .09\ ml = 90\ ul$
This is difficult to capture but let's get what we get.

Ok, Good news. I got 90 ul of blood + place into 2 ml H_2O. I now have a good control. I measure ~~0.12~~ 0.42 mS
Now we measured 0.18 mS under identical Control Conditions. We now know that our Control factor is $\frac{0.42}{0.18} = 2.33$

Excellent. We know that our recorded value
1. need to be increased by a factor of 2.33 which make perfect sense.
2. We now also know that a punchout Contains ~ $\frac{.015\ ml}{2.33} = .006\ ml$ / per punchout $= 6\ ul$

The is now excellent control.

Our measured values are now therefore

VAX	101	4.3 mS (2.33)	=	10.0	6 punchouts
VAX	102	3.62 "	=	8.4	5 mL
VAX	103	3.62 "	=	8.4	
	103	2.83 "	=	6.6	
	102	4.44 "	=	10.3	4 punchouts
	101	4.85 "	=	11.3	2 mL
VNVAX	100	4.04 "	=	9.4	6 punchouts
VNVAX	100	4.00 "	=	9.3	2 mL

$\bar{x} = 9.2$ mS

$\sigma_s = 1.4$ mS

~~15~~ $\frac{9.2 - 15}{15} = -39\%$

Ok, we now have a method in place to estimate blood conductivity w/ reasonable reliability w/ a calibrated EC meter and calibrated blood samples. Great.

The fact that we get the same general results w/ different concentrations lends credence to the method. Fresh blood under a control vacuum is critical

If you have plenty of sample available for comparison 6 punches in 2 mL, otherwise 4 or 2

Apr 07 2023

The VIS spectrometer does seem to be out of commission until the battery arrives.
I will proceed w/ NIR, there high priority data and now we have two more samples.
Recall that I have located a ~3yr old dry blood sample,

NIR File Formats:

ADDITIONAL STATUS

01_FEMALE_67_032223_VAX-01_XXX...

&

01_MALE_70_032123_XXX...

↑ Subject No. ↑ Sex ↑ Age ↑ Date

Let's start and plan the NIR collection. Let's start w/ FE samples first.

OK, we now have additional VAX scans in place.
Let's carry on w/ the "AD" samples.
Recall also we have a 3yr old stored untouched unvaxxed dried sample available

OK, Now we have a wealth of NIR to work with.
Let's add 3 yr old stored unvaxxed samples

We now have a very significant data set available. ~~N=19~~ total Essentially N=22 now

Unvaxxed n=14
Vaxxed n=5
PCR TEST n=2
~3 YR OLD SAMPLE N=1

We are going to need a more sophisticated manner of analyzing the data now

We see that DPLOT is very effective @ viewing a single plot.
D PLOT can append, & combine multiple plots. These are also good.
D PLOT can also average all the curves, these are good.

Apr 08 2023

We have good NIR work in place now.
Our next most crucial information is on Conductivity
of an increased sample size.

Let's go to work on it.
You need to generalize the punch out - Concentration
- dilution relationship.

We originally made the assumption that a single punch
of dried blood is ~ equivalent to .015 ml of liquid blood.
We then calibrated the conductivity result to a known
fresh blood concentration and found it to be
quite close. The correction factor is (5/4). Page
Notes are in Vol 28 lab notes on Mar 23.
We also calibrated our eyedropper @ 1 drop = .037ml/drop
(2ml = 54 drops) (1ml = 27 drops).

This means that our best estimate of punch out equivalence
to liquid blood is .015 $\left(\frac{5}{4}\right)$ = 0.019 ml/punch.

We could calibrate the conductivity w/ fresh blood
again.

Notice that we have also determined a Calibration for the EC meter w/ the use of NaCl.

I think our next step is to perform a check on our estimate of equivalence of dried blood to liquid.

Let's start by Calibrating the EC meter again.
Regression @ 67°C
$uS = 1.594(mg/liter) + 48.4$

Assume we put 0.22 gms NaCl in ~~50~~ 100 ml = 2.2 gms/liter
= 2200 mg/liter $\Rightarrow$ uS = 3555 uS = 3.56 mS
C

.22 gms NaCl in 100 ml = 50 ml
$\frac{.22 \text{ gms}}{50 \text{ ml}} = \frac{X}{1000 \text{ ml}}$

X = 4.4 gms = 4400 mg liter $\Rightarrow$ uS = 7062 uS = 7.06 mS

50 ml beaker measures 33.59 gms now add to 50 ml H_2O
33.59 + .22 gms = 33.81 gms

100 ml beaker weighs 52.51 gms now add to 100 ml H_2O
52.51 gms + 0.22 = 52.79 gms

These rectangles increasing on an order of 15° and ~ 1½ hrs of 3mA current in defibrinated blood. This means that the conductivity of blood is decreasing. This corresponds to density of Conductivity in actual blood sample conductivity measurements.

Foam precipitate now readily visible after ~ 1½ hrs.

I have now completed some very important steps.

1. Using Chronopotentiometry, Conductivity decrease of blood has been corroborated, the time of the introduction of current.

2. Production of foam and COB filament layer via electrochemistry (Chronopotentiometry) has been replicated and confirmed.

3. The lower layer (settled) is visibly the more productive layer containing massive mass of COB and some mature filaments as well.

4. What I have done that will be very important is that I have now isolated the lower layer CCB (prenatal) layer for subsequent NIR analyses. This is going to be very important for comparison purposes.

5. I have documented the lower layer (CCB and filament) with the microscope.

6. I have documented the gross separation between the foot foam and lower layer by Kantera.

Now we wait for our sample to dry and conduct the NIR analyses.

You have also refined some microscopy techniques:

1. Focus for highest power: back all the way down, zoom at above previous objective and start moving the stage slowly up while adjusting the light level. You may also encounter a false layer.

2. If you rotate the camera 90° clockwise so that USB cable outlet is positioned at left, the stage controls will be in alignment with viewing orientation. Very helpful.

April 15 2023

Two major topics immediately @ bay:

1. Energy studies (historical) Vol 3 p 179 2011
   Vol 10 p 13 +/- 2015
2. COB Isolation NIR

Apr 19 2023

We are in some mega new territory now. A very important spectrum has now available and this is the largely isolated CBB layer at the bottom of the vial subjected to Chirascan spectrometry The plot has potential very significant implications.

938 peak (3) Methylene (930)

956 peak (2) Alkyl Alcohol (962)

981 peak (1) OH Water (979) this is possible as extensive drying of sample was not done.

1031 descending inflection (3) (1029) OH/C-O
Polyfunctional alkyl alcohols
Ethers and esters also containing alcohols.

2011 CRC Alkenes

1103 descending inflection (3) Nothing organic listed. Look for 2012
adjunct to peak.

1119 Adjunct peak visible (1) Nothing organic listed 2012

Look @ inorganics also Notice CRC 2011

C=C also N-H possible? 2011 CRC

1167 peak (2) Alkene (1170) .HC≡CH
Alkenes, polyenes (highly reactive bonds)

1232 peak (2) (1225) CH secondary or tertiary carbon, Aliphatic hydrocarbon

1314 peak (2) Nothing organic listed (SH (1308) CRC 2011)
Notice potential inorganics on 2011 CRC edition
Center of SH band:
0.7 cm out at 3 = 250nm. (1250 – 1500nm)
and width of band is 0.8 cm
Center of band = 1250 + 58 = 1308 nm
There clearly a candidate.
Width of band 0.8 cm / x = 3 / 250nm x = 67nm
Therefore our SH band is listed to be at center of
~1308m ± 33nm, or 1275nm ± 134nm

1400 peak (2) Methyl associated w/ branched aliphatic $RC(CH_3)_3$ or $RCH(CH_3)_2$ (1396)
Methanol (1408)

1521 peak (2) NH Amide NH or NH_2
Amide/protein (1520) or NH for secondary amine R-NH-R (1520)

1572 NH Amide Amide/Protein (1570)
or NH Polyamide (1570) peak (1)

1631 peak (3) CH Vinylidene (1631)
Now we have a very broad peak spaning to ~1661
which strongly suggests a span of both
Vinylidene, Vinyl groups and numerous (1631–1637)
methyl groups including
Methyl, methyl Nitro (CH_3NO_2) (1654)
Methyl, brominated CH_3Br (1655)
Methyl Iodine CH_3I (1660)
Methyl Chlorinated CH_3Cl (1661)

1666 descending inflection (3)
Methyl $ROHCH_2$ (1664)
CH Aromatic CH-Aryl (1671)

We have quite a handful here and it can
* with good justification be attributed strongly
and primarily w/ the existence of the CDR.

The spectrum acquisition is a major
achievement.

Apr 29 2023

We now have a respectable NIR library of blood spectra as a reference. This is valuable.

We also have the spectrum of an isolated CDB layer (separated w/ electrical current). Highly valuable.

We have the spectrum of secreted fluid from the right ear known to be tied into CDB symptoms over a ~5 yr period. Also highly valuable.

The importance of the combined spectra alone will become increasingly apparent over time.

Before we proceed further, there is another important spectra to acquire, and that is of the skin flake that result from the damage to the skin from the secreted fluid.

We now have these spectra available, ie the affected skin flake in the ear / neck region and the lower leg.

We also have reference spectra available of both ear/neck and lower leg live skin.

I now begin to tally up and collate the differing NIR spectra data.

Let's just collect the additional data on the skin flakes, ear and leg, the ear known to potentially if not exclusively be the result of the secreted fluid from the ear.

I see we need the secretion data even prior to that.

Removal of Dead Enhances Detection Ability

NIR Analysis: Secreted fluid from ear

901 nm peak (3): Methyl CH_3 (908)

CDB match 930 peak (2) Methylene CH_2 (930)

979 peak (2) (979) OH from Water

Identical match to CDB layer analysis CRC 2011 required

1103 ascending inflection (2) No listing CRC 2012
However, as in CDB layer NIR 2011 CRC shows
Alkenes CRC 2011
but even more important we have the adjunct
peak @:

1117 which shows up as alkenes CRC 2011
and possible N-H CRC 2011 peak (1)

CDB match 1174 Alkene (1170) peak (2) .HC=CH.

1205 peak (3) OH from water (1200)

1256 descending inflection, no adjunct peak
visible, no listing 2012 CRC.
Note possibility of SH w/in band as noted
for CDB layer CRC 2011.

1296 descending inflection. Identical comments to 1256 deflection. SH / Alkene appears most likely

1416 peak(3) Methylene (CH_2) (1415)
OH Alcohol (Alkyl alcohol) (1415)
OH from Butanol - Alkyl Alcohol (1416)
CH Aromatic (1417)

COB match 1516 peak(3) Extremely high absorbance haze (1515)
Polyamide
~~Amide~~ (1520)

The inflection points are most likely associated with an adjacent successive peak, often weak & difficult to detect.

COB match 1571 peak(2) NH Amide (1570) Amide/protein
Polyamide (1570)

COB match 1601 peak(2) Polyamide (1598)

1630 peak(2) Vinylidene, Vinyl (1630, 1631)

1657 peak(2) Methyl, Methyl Nitro, Methyl Brominated (1654-1655)

1682 peak(2) CH Methyl (1682) CH Aromatic (1685)

We therefore see that we have an extremely clear match between

1. The CDB direct extraction from the blood

and

2. The secreted fluid from the ear (5 year event, most likely induced by external energy protocols).

* Vinyl, methyl, alcohol, polyamide, sulfur, alkenes, aromatics, proteins are the target candidates.

* The is the essence of the blood research that he take place in the spring of 2023.

* Much is now known as to the harmful compounds w/in the CDB.

Subtracting the trend from the NIR plot as well as derivative analysis if needed are useful NIR analysis tools.

A graphical analysis does not make the case as strongly as the structural analysis does. There may be far too many variable involved here between the point of inception of CO2 existence and metabolic product w/in or secreted from the body. However the structural analysis of the absorbance peaks make a very strong case.

I think that we need to tally the analyses side by side.

CDB		SECRETION
		901
938	Methyl ⟷ Methylene	930
956 Alkyl Alcohol		
981	OH from ⟷ Water	979
1031 (deflection)		
1103	CRC 2011 ⟷ Alkenes	1103
1119	CRC 2011 ⟷ Alkenes	1117
1167	CRC 2011 ⟷ Alkenes	1174
		1205
1238 CH hydrocarbon		
		1256 SH 1296 SH CRC (2011)
1314 SH (CRC 2011)	← = →	
1400 Methyl	← - →	1416 methylene Alcohol, CH Aromatic
1521	Polyamide ⟷	1516
1572	amide, Polyamide ⟷ Vinyl, Vinylidene	1571
BROAD PEAK	methyl, Methyl Nitro ⟷ methyl Bromoalkyl	1601 1630
1666	CH Aromatic	1657 1682

I will also visually inspect the sample.

After 30 min, the foam precip is now legumacy & he visible on the surface. I will ~~estimate~~ that about 2 hrs will be required & produce sufficient sample. Electrodes become visibly active @ ~30 min.

30 min segments: n = 1, 2, 3

I notice that the voltage is decreasing over time. Voltage decreased from ~3.5V to -2.8V over the first 30 min period. I is fixed. Therefore from $E = \frac{I}{R}$ the means that the resistance is increasing. This does mean that the conductivity is decreasing as a result of applying the current. This actually makes sense. What appl occurs when you apply current to a salt solution? What are the products?

You should probably photograph your vial this time.

Electrolysis does cause the decomposition of the substances.

Voltage settles in 3 ~ 2 hr 2 ~ -2.9V.

The expected result of electrolysing NaCl in H_2O is

$$2NaCl + 2H_2O \xrightarrow{\text{electrolysis}} 2NaOH + H_2 + Cl_2$$

The reaction is a lot more interesting and involved than it might seem to be. The result says that the pH of the result should increase. That would be interesting & test as well.

Eventually the work electrode becomes so congested w/ material production that it separates from the electrode and rises to the surface.

Side note: of importance to come — Plasmids are DNA molecules that are separated from the chromosome.

Approximate change in resistance

Initial Voltage: $\sim -3.25V$ $\quad I = -3mA$

Recent Voltage (1 3/4 hrs) $\sim -2.75V$

$$\frac{-2.75 - (-3.25)}{-3.25} \cong -15\%$$

Voltage decreasing w/ constant I means resistance is increasing. $E = \frac{I}{R}$

What we see here is a level of congruence between

Toxins emphasis

1. Methyl & methylene
2. Alkenes (highly reactive) based upon CKC 2011
3. Likely SH bonds based upon CKC 2011
4. Polyamide, Amide, Vinyl, Vinylidene, Protein Methyl, Methyl Nitro, Methyl Brominated
   CH aromatic (possible)
   alcohols (possible)

1516 - 1682 looks to be an important & active region

All are important leads to discovery

The above is in addition to

1. Conductivity of blood
2. Nerve ion oxidation

Energy

3. Toxicity Studies

Apr 29 2023 (cont).

Let us call the most recent work of NIR on blood, CDB layer, secretion as "First Derivation."

Let's look @ the information in a different sequence and I also want to explore more deeply:

1. Trend removal
2. Mean removal
3. Inflection points vs adjunct peaks, also in combination with Hexane 192.

Since the CDB layer is driving most of the results then far, let us start w that analyses first. Then let us proceed onto the blood layer, secretion, and the skin layer afterwards. Capable use of plotting software (ie DPlot) is invaluable here.

First w/ CDB layer, we see that trend removal also does accomplish mean removal.

Next desirable step is to normalize.

Next, let's look @ influence and relationships between: inflection points and adjunct peaks.

2nd Generation CDB Layer NIR Analysis 8 7 pages.

Trend Removed & Normalized CDB Layer - 2nd Gen Analysis

accepted. 911 nm peak(2) Methyl CH_3 (908) Methyl Aliphatic CH_3 (915)

938 peak(2) Methylene CH_2 (930) Methylene, aliphatic (939)

956 peak(2) OH Alkyl alcohol (962)

accepted w/ weights. ~~982~~ 981 peak(1) 981 OH from water (919) Consistent w/ drying level of sample

1008 peak(0.5) OH from tertiary alcohols (1006) -C-OH

Let's look @ 918 & 1008 more deeply w/ derivative analysis
Zero Crossing @ 956 for y' is evident.
What we see is that the derivative analysis on these points is not so obvious but a zoom window is much more evident. 982 is a peak.
1008 is a peak but so small as to only rate 0.5 vs 1.
But the method does work.

Now compare the w/ 1st gen analyses. In general quite consistent. 911 methyl not recorded and no 1008 recorded. 2nd gen analysis will be accepted as most reliable w/ understanding that associated weights will be important in the final probability ranking.

Carrying on:

ArCH is accepted.

1120 peak(0.5) No direct listing in CRC 2012.
Closest is ArCH @ 1142 & 1143 nm
But notice alkanes listed in CRC 2011 C=C
and also consistent w/ previous CDB analysis
of Apr 19. Our support is that the
inflection pt triggers a search for an
adjacent peak (remains justified as shown
occurs in the Apr 19 analysis) leading to
the same result. A "zoom" analysis here.

Now let's look @ the ArCH issue w/ the
Galaxy NIR chart to determine range
of that functional group!

The use of mint helps. CRC 2012 shows
ArCH (extends) clearly to 1143 nm. However
Galaxy shows the ArCH range to be from
~ 1075 nm to ~ 1100 nm.

This means that ArCH band is even wider
than that shown in Galaxy reference and
that there is no problem in (unclearly) 1120
within the ArCH range. It also says
that we have no requirement to use

the CRC 2011 inorganic reference @ the point. This means that ArCH can now clearly be justified with inclusion, esp. w/ respect to the associated weighting factors given. This also shows that there can be differences between Inorganic reference and that the CRC peak shown do not address the range functional group range issue satisfactorily to satisfaction. Therefore in case of doubt about an this implementation of CRC 2012 w/ Galaxy reference can be very helpful and clarifying.

Continuing:

accepted alkenes, polyenes.

1171 peak(2) also y' analyses. Alkene, polyenes

X=1172 CRC 2012 (1170) $\cdot HC=CH\cdot$

Notice our joint analyses identified peaks 1167. The give a average value of 1172 vs CRC 2012 of 1170.

Alkenes are highly reactive bonds.

Lets also look @ Galaxy

Galaxy does not give the level of detail on by chocarbons.

1233 Aliphatic hydrocarbon (1225) CRC 2012
Note that Galaxy clearly shows aliphatic CH
from ~1170 to 1260 nm. peak(1)

SH // CRC 2011

1255 No CRC 2012 listing. CRC 2011 SH (1) peak(1)
We see that this once again raises the
spectra of the CRC 2011 SH range
from ~1250 - 1500 nm w/ a center estimate
of 1308 nm. Accept SH w/ a weight of 1.

SH // CRC 2011

1326 A broad peak. From ~1317 to 1340 peak(3)
CRC 2012 has no listing. We also see that
Galaxy has no listing. The result once again
directs us to the inorganic SH information
as in the CRC 2011 Chart. A very good fit
w/ the center of the band estimated @ ~1308.
SH most definitely accepted here.

Valuable structural info here

1397 CH Methylene Peak(2) (1395)
Aliphatic Hydrocarbon
CH_3 Methyl ~~RCH~~ $RC(CH_3)_3$ (1396)
or $RCH(CH_3)_2$ Peak(2)

Apr 30 2023

It appears to me that an inflection point should be regarded foremost as a signal for an adjunct peak, however weak that peak may be. In the absence of a peak, you will need to make your best analysis of what that inflection point is likely synonymous to.

Signal only: 1440 Descending Inflection. Look for adjunct peak.

Peak identified: 1455 Weak Adjunct peak (17)

	Weights $\frac{1}{\Delta+1}$
Carbonyl C=O (1450) ketones & aldehydes	1/6 = .17
OH Polymeric (Polymeric Alcohol) (1450)	1/6 = .17
Si-O from Silicone (1452)	1/4 = .25
NH Aromatic Amine (1452.5)	−1/3.5 = .28
OH from Water (1453)	−1/3 = .33
NH Aromatic Amine 1459.5	−1/4.5 = .22

Aromatic Amine has two acceptable entries, therefore weight = 0.28 + .22 = 0.50 Therefore tally Ranking is:

RANK:

1. Aromatic Amine ($\bar{x}$ = 1456)
2. OH from Water (1453)
3. Si-O from Silicone (1452)
4. Polymeric alcohol (1450)
5. Carbonyl Groups (1450)

1516 Peak (2) Broad peak Polyamide accepted as most probable
. NH or NH_2 (1520) Amide / protein
NH secondary amide as R-NH-R (1520)
Polyamide (1515)

From a derivative analysis, the slope is decreasing @ the most rapid rate @ 1516 nm
(The indicate most probable peak location)
Zoom analysis also agree w/ acceptance of 1516 nm

1572 Peak (1)
Differential and zoom analysis also supports/accepts 1572 nm.
, NH Amide Amide/Protein (1570)
NH bonded - Polyamide (1570)

Lastly we have very broad absorption from ~1630 to 1664
Notice the separation of the activity from the 1572 peak is now much more distinct.

The appears to consist of two main peaks that are joined. Very high absorbance (relative) @ carry here.

1629 ... C-H Vinyl & Vinylidene C-H as Peak (3)

$CH_2 = C(CH_3) - CH = CH_2$ (1630)

C-H Vinylidene C-H, associated w/ $(CH_2 = C<)$ (1631)

Also note that 10 Vinyl groups range from 1621 to 1637. A perfect match in general w/ no real competition.

wgts $\frac{1}{\Delta+1}$:

(1) 1661 Peak (3) C-H Methyl, CH_3I Iodine (1661) 1

(1) C-H Methyl Chlorinated 1

Note also we have broad relative high absorption (3) from ~ 1654 to 1671

The includes:

(4) CH Methyl Nitro CH_3NO_2 (1654) 1/1 = .14

(3) CH Methyl Bromine CH_3Br (1655) 1/6 = .17

(2) CH Methyl $ROHCH_3$ (1664) 1/4 = .25

(3) CH Aromatic (1671) 1/6 = .17

Ranked therefore:

Strong dominance w/ Methyl Methyl Halogens

End of Analysis

We are now in a position to tally our results. We can use weighty factors of $\frac{1}{\Delta+1}$ as deemed. W = 0.5, 1, 2 3 with product of $\frac{1}{\Delta+1}$ rule

If only band ranges are available (eg Galaxy) one weighty is in thirds across the bar from the center. The method has been used for years w/ mid IR analyses.

I have now established probabilities of various functional groups which I will look at in various combinations. We will sum the weights for each group to get a sense of relative ranking.

Number entries

1st Group is Methyl (8 at 9 31 entries)

$\Sigma = 3+3+1+.75+.50+.43+.46+.38$

8(9.52) = 76.2 $= 9.52$

3(6.43) = 19.3 Methyl Halogen: $3+3+.43 = 6.43$

4(2.89) = 11.6 Methylene : $2+0.22 = 2.22 + .67 = 2.89$

$2.89 + 0.11 = 3.00$

2(2.50) = 5.0 Vinyl $1.50 + 1.00 = 2.50$

No. Entries

3 2^5 Aromatic: .50 + .27 + .05 = .82

4 2^6 Amides/Polyamide; 1.00 + .33 = 1.33
+.40 + .33 = 2.06

2 1^5 Protein .40 + .33 = .73

5 12^3 NH 1.00 + .40 + .40 + .33 + .33 = 2.46

4 5^5 Alcohol .75 + .29 + .17 + .17 = 1.38

2 0^4 SH .16 + .06 = .22

1 0^7 Alkenes .67
1 Polyenes

1 0^2 Si-O .25

1 0^2 Carbonyl .11

Revised to include number of occurrences

Ranked	
Methyl	9.52
Methyl Halogen	6.43
Methylene	3.00
Vinyl	2.50
NH	2.46
Polyamides	2.06
Alcohols	1.38
Aromatics	.82
Alkenes, Polyenes	.67
Si-O	.25
SH	.22
Carbonyl	.17

CDB Composition - NIR

We see that only summing the weights we miss a part of the picture. Repeat entries have much greater influence than sole entries.

Revised Ranking

		Rank
Methyl	76.2	1
Methyl Halogen	19.3	2
NH	12.3	3
Methylene	11.6	4
Amides/Polyamides	8.2	5
Alcohol	5.5	6
Vinyl	5.2	7
Aromatics	2.5	8
Protein	1.5	9
Alkenes, Polyenes	0.7	10
SH	0.4	11
Si-O	0.2	
Carbonyl	0.2	

The latter two can be disregarded @ this point and ignore OH from water

All functional groups up to and including SH are to be regarded w/ the greatest of importance.

11 fundamental source of damage to health from the COB have been identified.

The work is based upon spreadsheet analyses.

Polymers should also be considered in all cases, eg poly vinyl alcohol
poly amides
etc
poly aromatics

May 01 2023

Now let's start tallying up the inorganic constituents available from two separate studies:

1. from the Environmental Filament ICMP test (2017 paper)

28.5	1. Aluminum	8. Magnesium	90.5	← *
4.3	2. Barium	9. Manganese	36.0	
* → 73.8	3. Calcium	10. Nickel	2.0	
5.5	4. Chromium	11. Potassium	13.9	
2.8	5. Copper	12. Titanium	14.3	
* → 513.9	6. Iron	13. Vanadium	1.2	
1.0	7. Lead	14. Zinc	7.2	

The Concentration / Reporting Limit Ratio is listed

The obvious starting and focal points here will be Fe, Mg, Ca. — Mn, Al would be next.

Precedent of iron disruption and electrolyte (ion) (ie, conductivity) is already deeply established.

Next, look seriously at Paper #4 of the six part series and see what you find.

1. Halogens (Cl, Fl, Br, I)
2. Oxidizer (H_2O_2)
3. Electrolytes and ions:
   Na, Ca, Mg
   Fe, Al, Mn
4. Nitrogen and Sulfur Compounds

Perfect Coincidence Continues. The evidence and state of affairs is quite clear @ this point.

We have congruence at a very high level between:

1. NIR methods
2. ICMP high level laboratory methods
3. Electrochemical Analysis

(and all previous CI research history...)

A progressive next step is to attempt to develop some building block molecular structural models of formation of compounds within the blood.

May 08 2023

Two NIR spectra deserve to be taken:

1. 2nd ear secretion (small sample available)
2. Skin behind ear appears to be affected by secretion. Comparing spectra between right ear (affected) and left ear (unaffected) could be helpful, irrespective of dominant H_2O influence.

—

I now have two separate ear secretion NIR spectra. They demonstrate very significant correlation. Their plots will be of much interest to analyze.

They are close enough in form that we may be able to average the two samples and then compare that spectrum w/ the CD3 layer spectrum.

We have 2 samples, 5 spectra averaged taken

The next data point we have is

1. NIR of the second secretion from the ear on Apr 24 (already being compared), however we have photographs of the skin for that event of both ear and leg. Let's get those pictures in the same folder as the Apr 24 spectra.

These photos are on the phone and they are not possible to transmit now as the net connection available. As we are to note that the photos involve the leg and ear below to Apr 24 event.

The photographs of the left and right ear comparison below to the May 04 secretion event.
I will have to transmit and organize them later.

What we have now therefore is

1. NIR no trend - two normalized CDB spectra
2. Secretion (2 samples) from ear, no trend, normalized.

3. We have "normal" skin NIR spectrum of leg and ear, heavily influenced by water content. Let's still may be helpful.

There are two additional NIR Categories now desired.

1. NIR of skin directly on the affected May 02 secretion event (cheek right ear) and the unaffected left ear on the same subject.

2. Skin flake collected separately from the damaged ear and leg sections. The ear is directly affected from secretion and the leg appeared to be irritated via ultrasound, Vit B, Iodine, etc enhancement. Ear likely affected by the same adherence that produced a visible secretion w/ a directly associated skin result. Both were photographed.

Ok, we now have an excellent delta plot of an area of skin affected by the Ear secretion event of May 02 2023

There is an especially important specimen as it will tell us what is likely affecting the skin.

The reference is an adjacent area of "normal" appearing skin.

It also shows an extremely sharp drop in absorbance at 1450 (1453) which is clearly due to lack of water in the skin region. We also have many peaks to analyze here. The well probably be one of our most useful plots as we have subtracted "normal skin" from affected skin.

The plot is even more valuable than a plot that can be made from the skin flakes themselves (also which have been collected) because it largely removes the influence of skin itself.

Very important points ahead as to form comparisons between

1. The affected skin "dft delta" plot NIR
2. The eccrine fluid NIR
3. The CDB extraction layer NIR

The latest agenda stated is especially important. It may well give us a sense of what might be different chemically between the CDB by itself vs what is being produced and on ~~what is being~~ the occasion is excreted or secreted from the body (skin).

Also, note the lack of asorbance in the water region is especially important here. It shows that the water is being removed from the skin by the secretion. A leading candidate for the cause would be the existence of an alcohol within the secretion.

The skin flake samples are less important now that when originally collected. The "delta" plot is the most valuable now; it is what the body can eject.

This is a very significant achievement today.

We now have an NIR plot that likely will be revealing of the CDB upon the skin

Three important NIR plots now exist for Comparison:

1. CDB stand alone and isolated
2. Two separate secretions from the skin that dramatically damage and impact the skin (ie, classic "Morgellons" photos
3. The influence of the secretion upon the skin (and undoubtedly internally as well).

In theory, it should also be possible to conduct an electrochemical analysis of the secreted samples.

Blood Conductivity is on the table ahead.
Blood NIR Comparison are on the table.
Clot sample available?

May 09 2023

I am getting set up for the next investigation

I have created a plot that contains 3 data sets.

1. VAX N=~~15~~ 5 Dried Blood
2. UNVAX N=15 Dried Blood
3. COB Isolate/transform Dried.

We need to think about what the objective here is. Recall that the COB Isolate represents a lateral transformation of blood into a COB layer. The Imaging Charge in the spectra alone shows that it certainly no longer is blood in any conventional sense. It is completely and totally transformed blood so you really do not expect to maintain much if any correspondence with the blood.

So some preliminary questions will come to mind:

1. What functional groups, if any overlap between COB and the 2 blood layers. ?

2. What kind of reference NIR plot do we have?
So far it's been a huge disappointment as most sources used fresh blood which is dominated by water.

3. What differences, if any, exist between VAX and UNVAX blood?

4. Later we want to compare the COB isolate to the severe COVID event dried blood. Save that for later.

The first reference paper is limited in value but has:

			Literature (vague as heck)
CRC			
	C=O	1923 OUT OF RANGE	1800–2000
OH Wale	O–H	1449 (CRC–1453)	1300–1500 = 2 PAGES CRC WORTHLESS
	OH	2160 OUT OF RANGE	2000–~~2250~~ 2200
C=O	C–H	1159 (CRC 1160)	1100–1300 0.5 PAGES CRC WORTHLESS
	C–H	1802 OUT OF RANGE	1600–1800

The first paper on Research Gate is essentially worthless. It tells us mostly nothing. Date 2019

Our plots are going to reveal a lot more than the Research Gate paper which are basically

dominated by water.

We see signs of two peaks in the second Research Gate paper, not identified. (data 2020)
They occur @ approximately:

0.25 cm (300nm) = 19.5 + 900nm ≅ 920 nm
3.85 cm ± ~15

3.5 cm (300nm) = 273nm + 900nm ≅ 1173 nm
3.85 cm ± ~~20~~ 15

The means we can accept assignments in the region are most likely present in the visited reference spectra. But there is not at all certain because the "reference" has been lost * now for 20+ years.
From CRC, we see
915 = CH_3 Methyl - aliphatic hydrocarbons
930 = CH_2 methylene

In our data, we do indeed see a peak (2) at ~917nm in both VAX and UNVAX samples.

However, we see additional peaks @ ~940 - 945 in both VAX and UNVAX.

CDB

Our data measured @ w/ CRC

911 Methyl CH_3

938 Methylene CH_2

952 Alcohol Alkyl Alcohol

981 OH from water

The mean that we anticipate the reference spectra to accept Methyl @ ~ 915 - 920 but that our measured VAX & UNVAX spectra show increased if not the emergence of unanticipated methylene groups as well as alcohol influence is also a consideration.

The may be our first investigative study of the potential influence of the CDB upon blood. Noted we do have relative high absorbance in the general region and absorbance here is a mere peak on the reference plot. Also stronger signal in VAX vs UNVAX.

The reference @ 1170 will also raise its own questions

CRC

1160 C=O Carbonyl

1170 C=H alkene

1194-1195 CH_3 Methyl

Carbonyl + Methyl Can be accepted. Alkene not @ this point.

However, we do have alkenes in the CDB
as a dynamic signal @ 1172 nm.

Notice that we do have a signal in the VAX (~1178)
sample here (weak but identifiable)
and appear to be slightly stronger in the VAX sample

Here is our second point of observation.
alkenes, polyenes ~~are~~ may be known.
Are they expected in blood? I suspect
not but we will search for it.

"Polyenes can impede many membrane
proteins and other proteins specifically
by binding to the SH group."
ScienceDirect.com

It is not yet found that polyenes are
stated to exist in blood. ~~Polystyrene~~
Polyenes form the basis of many antifungal
medicines.

May 13 2023

Continuing on w/ the NIR analysis / comparison between the CDB isolate and the VAX/UNVAX spectrum

Our last observation center on the overlap occurring in the 1176-1179 nm region. Definite peak here in the CDB isolate, discernible peak does exist in the VAX sample (N=5) There actually is a slight, and I do mean slight, but visible change in the UNVAX under room conditions, but it is ever so slightly discernible. The means that we do have overlap of the 1179-1181 region of CDB vs both VAX & UNVAX blood, but that the VAX has a stronger signal here.

The most closely associated w/ the alkenes (1170) CRC Δ=9
Next closest is the methyl group @ 1194-1195. CRC Δ=15

They are the alkenes - polyenes are the more probable target, but both are important & significant.

Alkenes are reactive bonds.
Polyenes bind to the SH group.
Polyenes impede many membrane proteins.

"Polyene" antibiotics target the plasma membrane" pnas.org.

Red blood cells positively do have a plasma membrane, They are potentially very symmetrical, ie

the polyene – red blood cell – plasma membrane – CDB interaction.

Our next point of interest is in the 1217 - 1228 nm region of blood. But in the case the ABSENCE of absorbance is the question. CDB shows a peak @ 1232.

The region is aliphatic hydrocarbons (1225 nm nm) CRC Also termed as the secondary or tertiary Carbon.

One of our problems here is that we really do not know what "reference blood" even means anymore

A pertinent question is how much of both methyl group groups or alkene / polyene ~~are~~, if any, are expected

to be within "reference blood" as we have no such thing available any more. What we can say, however, is that the CDB we anticipated to, at the very least, cause an elevated, most likely significantly, elevated impact upon the blood with respect to loss of these functional groups.

The "reference spectra show no discernible impact from hydrocarbon @ ~ 1217 - 1228 nm. Our blood samples, both vax & unvax do not show the either.

However, the CDB does have a significant contribution here. We can say that this structural aspect of the CDB is not visible, w.r.t. the NIR analysis, a noticeable impact upon either the vax or unvax blood samples.

Our next point of interest is the 1255 nm point. This can be regarded as in conjunction with the 1315 - 1336 nm region. In both cases, these shown stay to be the SH group (inorganic) and this was established with the use of the CRC 2011 NIR Version.

The SH aspect seems to have been messed with in the 2012 version.

So we have a case here where the COB show a strong signal for SH. The blood shows at best a very weak signal in the reg and best a hint of existence in velocity.

But we must now also recall a previous statement w.r.t. polyenes:

"Polyenes can impede many membrane proteins and other proteins specifically by binding to the SH group".

And therefore, what we now have is:

⑥ Vinylidene
⑦ Halogens & methyl Nitro Carbolates

* ① The polyene – red blood cell – plasma membrane – COB – SH interaction
* ② Polymeric alcohol (see subsequent **)
along with
③ methyl group interference/disruption
* ④ & methylene (see next *)

are at the top of the list of potential pharm mechanisms

* ⑤ Amide – Protein – Polyamide (Twice-repeats)

1375 - 1379 is our next point of interest. Here we have ascending deflections in both VAX & UNVAX blood.

We have learned that inflections are best regarded as a signal of a subsequent peak, however weak.

Here is what we do see, and a zoom in helps to clarify the picture.

The CDB shows a peak @ ~ 1402. The VAX blood shows a weak peak in the same region. The UNVAX blood shows an ascending inflection @ the same point.
We clearly seem to have some level of influence and activity taking place here.

In our CDB spreadsheet, we have 1397 for both methyl groups (specifically $RC(CH_3)_3$ ~ $RCH(CH_3)_2$ ~ or methylene, either a hit @ 1397 nm.

We must now additionally regard a methyl group (ester type) as affecting the blood as potentially methylene now as well.

Although we saw a region to the near functional group in the "reference" blood spectrum it was not @ the location, it was in the 915-930 nm region.

Since there is a clear COO contribution in our plot @ ~ 1402 and in our notes and spreadsheet we deliberately note measurement of methyl @ 911 nm & Methylene @ 938 nm

* The case for influence of both methyl and methylene influence upon the blood is fully justified

Next, we have very broad peaks occurring

~1442 VAX
$\bar{X}$=1454 ~1466 UNVAX } subject to greater error of determination, weak, broad peaks
1451 CDB Analysis - Polymeric alcohol.

We therefore must conclude that we very likely
** have a polymeric alcohol influence
upon the blood

—

Our next point of interest is @ ~1520
measured in the CDB.
This corresponds to both Polyamide
and Amide ~ Protein.

* We have an absolute match here @ ~1520
in both vax and unvax blood.

* We have the same result @ 1572
Polyamide - Amide - Protein

* Same w/ Vinylidene ~1628

May 15 2022

Photo of current status of CEC has been taken. It looks quite clean. However, an enigma ahead of us - there is the same blood that transforms likely to CDB - filament forming under the application of electrical current. Also a significant case history in place w/ significant skin eruptions in place over the last 1-2 months @ the sites of chronic pain for many years (5-10).

1. Ear (right)
2. Feet, especially left foot w/ apparent clot visible and varicose vein symptoms
3. Upper chest, neck area, right shoulder.

Causative factors likely include

1. Ultrasound protocols used
2. Balm - steady use
   1. methyl salicylate
   2. Tea Tree Oil
   3. menthol crystals
   4. Creosote bush.
3. Significant increase in Vit B complex intake.

The next step is to repeat the conductivity test on blood, hopefully w/ more concentrated samples.

Repeat the Calibration of Apr 08 2023

0.22 gms NaCl in 50 ml dist H_2O $\tilde{\Leftrightarrow}$ 7.06 mS.

0.22 gms NaCl in 100 ml dist H_2O $\tilde{\Leftrightarrow}$ 3.56 mS.

Mass of 100 ml beaker = 52.59 gms
Mass of 50 ml beaker = 33.61 gms 33.61 + .22 = 33.83 gms
~~33+.83 F~~ 33.83 + 50 ml (gms) = 83.83 gms 3K

Initial reading is 6° mS. raise it to 7.0
OK. We have it @ 6.9 mS. set

52.59 + 50 ml = 102.59 gms + 50 ml H_2O
And we read 3° mS. Excellent results

We accept EC meter as calibrated.

Next we work on more concentrated blood samples.

For some reason my EC dropped its value to 0. Battery?

I have an alternative meter and it does read 3.5 mS.

Yes, it is a power issue. We were at the end of the Calibration range. Not expected. Now that we have sufficient power to the meter again, we measure 4.4 mS. I will drop it to 3.6 mS and rely on the second meter as a backup check only and as NOT Calibrated. It was sufficient to diagnose the power problem.
Done. It is always required when the Calibration is @ the end of the range. Now we are Calibrated in mid range of the meter. All looks good.

Lesson: sufficient power to the EC meter is important & Verify
Both meter now read @ 3.6 mS.

Now let's calibrate our eyedropper again, this time using the scale.

5 ml beaker = 6.23 gms
+ 50 drops 8.03 gms

8.03 gms
− 6.23 gms
= 1.80 gms

$\frac{1.80 \text{ gms}}{50 \text{ drops}} = \frac{x}{1 \text{ drop}}$ x = .036 gms = .036 ml

So 1 drop = .036 ml. This is very close to that determined before. So 1 ml = 28 drops

Now, the weight of our blood measuring vial system is ~~31.89~~ 31.86 gms. Density of blood ≅ Density of H_2O. If we were to use 0.1 ml (100 ul) in 2 ml H_2O this would be a factor of 20. Let's try to get 0.2 ml of blood in a sample.

This sample flowed freely from the syringe.

31.86 + 0.2 gms = 32.06 gms expected.
Sample 1 M. Vog 74 yr old
Up to 32.41 gms + water to 33.92 gms

Measure ~~2.88~~ 2.93 mS.

32.41 gms
− 31.86
0.61 ml

and 33.92
− 32.45
1.47 ml

So our dilution ratio is $\frac{1.47}{0.61} = 2.41$

Pure blood = 7.06 mS

The values are astoundingly close to those that have been measured previously under high deletion ratios. Thus at a low deletion ratio and we get the same general result.

To save the sample:
1-74 Container = 2.60 gms.
Storage sample filled = 4.51 gms
Dilute blood storage = 4.51 gm - 2.60 gms = 1.91 gms (ml)

Good work.
Sample # 2 70 yr old unvax female —
Vial assembly = 32.26 gms
add ~ 0.6 ml = 32.86 gms ~~alternate~~.
and ~ 1.5 ml H_2O = 34.36 gms ~~alternate~~.

32.83 w/ blood (highly Coagulated.
34.34 gms total w/ H_2O
Shook vial thoroughly to attempt to dissolve any coagulation.
Measure 1.81 ms

Weight 32.83 − 32.26 = 0.57 gm (ml = 1.57 gms (ml)
34.34 − 32.83

Dilution ratio = $\frac{1.51}{0.57}$ = 2.65
2.65 (1.81 ms) = 4.80 ms

The sample shows signs of ~~coagulation~~

Sample #2 Glass container = 2.54 gms
w/ blood added = 4.59 gms
Δ = 2.02 gms of 1.51 water
0.57 blood

—

Sample #3 50 yrs female no vax

Vial assembly = ~~32.59~~ gms (H_2O in wood clip)
32.46 + 0.6 ≈ ~~34~~ 32.96 w/ blood
33 + 1.5 H_2O = 34.5 total estimate gms

32.97 w/ blood — 34.50 w/ H_2O
32.47 — 32.97
= 0.50 blood gm (ml) = 1.53 ml H_2O — $\frac{1.53}{.50} = 3.06$

The sample flows very freely in syringe.

Measure ~~2.18~~ 2.20 mS ($\frac{1.53}{0.50}$ dilution ratio) = ~~6.69~~ 6.73 mS

~~Sample~~
Container wt. = 2.54 gms
w/ blood added = 4.56 gms
Δ = 2.02 gms (ml) of 3.06 to 1 H_2O to blood

Sample # 4 male ~~or~~ max 51 yrs old

Vial Assembly = 32.62 gms

+0.6 ≅ 33.22 ~~Laboratory~~ w/blood

+1.5 ≅ 34.72 w/ H_2O

Sample # A Conference 2.55 gms
w/ dilute blood 4.56

33.22

~~33.42~~ w/blood

34.82 w/ H_2O

2.39 mS

Δ = 2.01 gms (ml)
of 2.67 to 1

~~33.42~~ ~~32~~ 33.22 34.82

~~33.~~ − 32.62 − 33.22

− 0.69 mS/ml 1.60 ml H_2O

$\frac{1.60}{0.6} = 2.67 (2.39\,mS) = 6.38\,mS$

In our results as therefore

		Delta Ratio
1	7.06 mS	2.41
2	4.80 mS	2.65
3	6.13 mS	3.06
4	6.38	2.67
	$\bar{X} = 6.2$ mS	$\bar{X} = 2.70$
	$\sigma_S = 1.0$ mS	$\sigma_S = 0.27$

Additional Conductivity Study

to clearly the results are ever as poor as the earlier test depicted.

Our previous paper concluded an 8 mS average $N=13$ dilution factor $\cong 55$

$\sigma_S = 1.8$ mS t test $\neq$ 10 mS 99.98%

15 mS 100.00

Now we have

$n=4$ $\bar{X} = 6.2$ mS

Dilution factor = 2.7 $\sigma_S = 1.0$ mS

As we weight by inverse dilution factor

$$\frac{\left(\frac{4}{4}\right)(6.2\text{ mS}) + \frac{13}{55}(8\text{ mS})}{\frac{4}{4} + \frac{13}{55}} = \bar{X} = 6.55\text{ mS}$$

0.24

$= -35\%$ for low end

$= 56\%$ for mid range

by me estimated is $\frac{4}{4}(1.0\text{ mS}) + \left(\frac{13}{55}\right)1.8\text{ mS} = 1.15\text{ mS}$

1.24

σ_S

Total $N = 17$ Vax & Un Vax

No Statistical difference between Vax & Unvax.

May 15 2023

There is good reason to suspect that the coagulation level in the blood is directly related to the conductivity

$$\text{Conductivity} \propto \frac{1}{\text{Coagulation level}} \quad ??$$

—

Additional projects:

1. Case history:
    1. Ear secretion NIR analysis
    2. Ear skin NIR analysis w/ controls
    3. Photo of skin
    4. Photo of blood

2. Resonance study w/ 4 delete blood samples

3. Functional group investigation

4. Structural model development.

5. Difference plot vax vs unvax?

May 16 2023

Mar 24-27 2023 I did some work with EIS spectroscopy and I would like to record that. I have worked out parameters that deliver a smooth plot:

Scan type: Fixed
Edc 0 V
Eac 0.1 V
Frequency Type Scan
n frequencies 50 (= 21.3/dec)
Max freq 200 Hz
Min freq 0.1 Hz

Now we see that an objective is to find the zero crossing - this means no impedance in the circuit which implies a resonant frequency. We adjust parameters until that point is found.

Does resonance depend upon Concentration?

Ok, we have a result for Sample #1.

Hz/~~Impedance~~	~~Freq~~	Resistance
13140 ~~13110~~	~~Hz~~ Positive	122.5 Ω
12990 13610	~~Hz~~ Negative	122.5 Ω

Estimated zero crossing in the region ~~13690~~ 13065 Hz with a resistance of ~ 122.~~25~~.5 Ω (Quite low!)

The reason for the case. In the region the impedance is on the level of 1 Ω or less. The current @ the point is on the order of 808 ~~80~~ uA and the voltage is on the order of 1.06V

Now with previous Odlitzka ratio of ~ 55 & 1 we had a resonant freq of ~ 1100 Hz

Now our Odlitzka ratio is on the order of 2.70 and we have a resonant freq of ~~13690~~ 13065 Hz.

Out of curiosity $\frac{55}{2.7} = 20.4$

$1100/(20.4) \approx 22440$ vs ~~13690~~ 13065

The suggest that the Odlitzka ratio may be a factor but that it is not linear.

You can test dilution ratios and see how the resonant frequency changes.

Your settings for determining the crossover point were

max 14K Hz
min 12K Hz
n = 20 10
Eac = 0.1V
Current @ 1 mA
Scan Fixed

Let's dilute by a factor of 3.
Container mass = 2.66 gms
w/blood = 4.33
Δ = 1.64 gms (ml)
3(1.64) = 4.92 + 4.92 + 2.66 = 7.58 gm

Have now diluted by a ratio of 3 to 1.
Our original dilution ratio was 2.41
Our dilution ratio is now 3(2.41) = 7.23
Now read resonant freq again. We anticipate it to be lower.

Ok, we seem to have steady results.
Zero Crossing is between 12200 Hz & 11900 Hz. $\bar{X}$ = 12050 Hz

Not actually a whole lot different

Now let's dilute by a factor of 3 again

Beaker mass = 20.55 gms
w/ blood (7.23 dilution ratio) = 25.39 gms
Δ = 4.84 gms
3(4.84 gms) = 14.52 gms
14.52 gms + 20.55 gms = 35.07 gms (mL)
Dilution ratio = 3(7.23) = 21.69

It look to me like you need to keep X
of $\frac{X}{dec}$ = n as long ≤ 100 or so.

Crossover pt is 11360 Hz $\overline{X}$ = 11300 Hz
11240 Hz

Again only a modest change. We now have

Dilution Ratio	Resonant Freq Hz
2.70	13065
7.23	12050
21.69	11300

We will make another dilution - However, regression shows a power regression doesn't

Resonant freq $\approx 13938\ Hz \cdot (\text{Dilution Ratio})^{-.0694}$

$r^2 = .991$

$MSE = 1.00E-4$

And $1^{-.0694} = 1$. So the suggest a harmonic freq of 13938 Hz or ~ 14K Hz.

Log regression gives essentially the same result (13839 Hz) as $\ln(x) = 1$. $r^2 = .986$ so power is a bit better.

Let's dilute again.

We can now, however, predict the frequency:

$21.69(3) = 65.07$ Resonance $\approx 10431\ Hz$

We have 14.52 gms of dilute blood at dilution ratio 21.69

Divide by 3 we need $3(14.52\text{gms}(\text{ml}) = 43.56$ gms total add

$\Delta = 43.56 - 14.52 = 29.04$ gms additional

Beaker now = 20.55 gms

$20.55\text{gms} + 29.04\text{gms} = 49.59$ gms total

Our dilution ratio is now $21.69(3) = 65.07$

I would say we have it, and that we have a method.

Tried the crossing point @ the high dilution ratio does seem more difficult but I do have a target identified.

Crossover point ~~obtained at~~ 10500 Hz
r = ~~66.670~~ Ω 10220 Hz
9988 9756 Hz
X = ~~10400~~ Hz
Amazingly close to the predicted and ~~estimated~~ value of 10431 Hz.

Where the resonant freq appear to follow a power law, or logarithmic, either way seems to be in line. Our data now is

Dilution Ratio	Resonant freq:
2.10	13065
7.23	12050
21.69	11300
65.01	~~10400~~ 9988

Power regression: Resonance = ~~13956~~ 14230.3 · Dilution Ratio ^ ~~-.0702~~ -.0818
r^2 = ~~.996~~ .983
Mse = ~~5.12E-5~~ 3.19E-4

Log regression: Resonance = ~~13799.5~~ 13997.3 - ~~819.9~~ 937.6 · ln(Dilution Ratio)
r^2 = ~~0.994~~ .990
Mse = ~~12000~~ 263227

Both methods seem satisfactory but the power regression gives slightly better results.

Now what the means is that

1. Given a series of dilute blood samples, even though to be derived from a single sample, the resonant freq of that sample can be determined w/ Electrical impedance Spectroscopy.

2. The resonant freq as a function of the dilution ratio follow a power regression, or alternatively a logarithmic regression

If you have an adequate blood sample you do not need to do any of this. If you do not have enough, a 3 point regression would seem to be adequate to make a decent estimate of the resonant frequency.

Now sample #1 had a ~~Cod~~ Conductivity measurement of 7.06 mS 74 yr old
no vax

Now there is much interest in sample #2
70 yr female w/ atony Coagulation

Lets run a 3 way resonant freq trials

In theory, a 2 point regression will at least give an estimate. Let us see how this proceeds.

Vial w/out lid mass 2.55 gms
Sample #2 contains 4.49 gms
Δ = 4.49 - 2.55 gms = 1.94 gms (ml) of blood @ a dilution ratio of 2.65
Estimated Conductivity 13 kHz but wonder if different (lower?) due to coagulation and Conductivity measurements

OK, we have a decent graph. It was difficult to settle down but we do have a decent graph.

Crossover point: 15330 Hz R = 206 Ω
14980 Hz I_{ac} = 478 uA
$\bar{X}$ = 15155 Hz V = 1.06V AC

One they intersect here is that our current flow is about ½ of the sample #1 and Resistance is close to ½

Sample #	Conductivity	Iac	Dilution Ratio
1	7.06mS	808 uA	2.41
2	4.80mS	478 uA	2.65

$\frac{4.80}{7.06} = 0.68$ $\frac{122\Omega}{206\Omega} = 0.59$

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

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

Ohms $R = \frac{E}{I}$ $E = I \cdot R$ $I = \frac{E}{R}$ $P =$ I·

NO!

$V = I \cdot V$ or $P = I \cdot V$ and $V = IR$ so $P = I^2 R$ NO!

$P = IV$ so on sample 1: $P = 808 E\text{-}6 \text{ uA} \cdot 1.06V = .86 mW \cdot (.707) = .60 mW$

Sample 2 $P = 478 E\text{-}6 A \cdot 1.06V = .51 mW (.707) = 0.36 mW$

$\frac{.36}{.60} = 60\%$

Need to UW! Aqua UA!

Now here are a couple of interpretations:

Looking @ power delivery of the blood, I make an estimate that Sample #2 is delivery about 60% of the energy level of Sample #1.
Sample No 1 74 years old
Sample No 2 70 years old

The older person should have more energy available than the younger person. The younger person is coagulated.

In addition, since frequency is an expression of energy, the delta max power to the blood circuit of sample #2, Coagulated, it requires a higher frequency, i.e., higher energy than Sample #1. A higher required frequency for the blood is not desirable, it means it requires more energy.

Ok, let's continue, dilute sample #2, establish a blood resonant frequency, and then extrapolate to frequency of undiluted blood for that individual.

Sample #2. We have 1.94 gms (mls) of blood @ a dilution ratio of 2.65.
Vial mass = 2.55 gms
Now we want dilution factor of 3. $3(2.65) = 7.95$
$3(1.94\text{gms})(\text{ml}) \approx 5.82\text{gms}$
$5.82\text{gms} + 2.55\text{gms} = 8.37\text{gms}$. Bring vial up to this

Here we go. We have a first estimate. It would like to explore the concavity of the graph However, first crossover estimate is
11630 Hz $\bar{x} = 11365$ Hz
11100 Hz

Dilution Factor	Resonant Freq
2.65	15155 Hz
7.95	11365 Hz
	11695

1st Estimate Resonant Freq $\approx$ 19072 · Dilution Ratio -0.236
Resonant freq of undiluted blood is 19072
vs 13957 Hz.
Hypothesis: Energy level of individual #2 (age 70) is ~70% of that of individual #1 (age 74).

The theory developing (logical also) is that a higher frequency is required to deliver more power to the blood of an ill person than a person in better health.

i.e, the Relevant freq of the blood is a measure of the ~~the~~ general health of an individual.

—

#1 Next is two fold. I would like to see if I can improve the parameter for sample #2 for 3 fold dilution trial.

#2 2. ~~Do~~ Go for next dilution ratio.

General theory: Both conductivity (ease of accessibility) and the resonant frequency of blood can be used to assess the general health of an individual.

Ok, I have rejected the second data point.
A very good graph. Range is 10.9K to 12K.

You have learned to keep N division from 10-20.
and X/dec ≤ 100 if possible (200 may be ok)
Our Crossover point is 11760 Hz
11630 Hz

X = 11695 Hz
Then is a better data point.

Ok, to solidify the graph and process, we delete by a factor of 3 again.

Incidentally, Conductivity measurements give the same result as the resonant frequency approach. (~70% ratio between sample 1 & 2)

We now know enough to predict the frequency for the next dilution. 3(7.95) = 23.85
19072 Hz · 23.85 − 0.236 = 9022 Hz

Wt. Mass of vial w/ blood = 8.36 gms
(Incidentally, a major clot is present).

Empty vial = 2.55 gms

$\Delta = 8.36 - 2.55 = 5.81$ gms (ml) of blood

$3(5.81 \text{ gms (ml)}) = 17.43$ gms of blood are needed.

Vial is now 20.55 gms.
We have already 5.81. Should combine to
20.55 + 5.81 = 26.36 gms Ok.
But we need a total of 17.43 gms
17.43 − 5.81 = 11.62 gms (ml) of H_2O
need to be added.

Check on this:
Vial = 20.55
+5.81 = 26.36 gms
3(5.81) = 17.43
20.55 + 17.43 = 37.98 should be total mass Ok

Dilution Ratio will be 3(7.95) = 23.85
w/ expected resonance of ~ 9022 Hz

Let's see how we do.

First crossover between 10710 – 10460
11360 – 10990

Decent graph here * 10220 – 10000
$\bar{x}$ = 10110 Hz @ dilution of 23.85

Our data set + theory

Dilution Ratio	Resonant Frequency (Hz)
2.65	15155
7.95	11695
23.85	10110

Hz –

Resonant freq $\approx$ 17795.7 · Dilution Ratio$^{-.1042}$
r^2 = .974

so end results result f_0 = 18K vs 14K

The work is highly interdependent also quite demanding to accomplish. Conductivity is obviously an easier method that gave same general result.

However a big question – Can the resonant frequency be used to benefit health? There is other max power in the blood is elevated

May 16 2023

There are some very interesting questions and relationships going on. In a sense, I suppose what is occurring in the onset of viewing blood from an electrical engineering perspective. In the case, we are addressing the rotation of blood that has been modified, both chemically as well as likely electromagnetically.

Three factor are coming to the fore that are:

1. Conductivity
2. "Resonance"
3. Power transmission

[There is in addition to the chemical analysis which is taking place (primarily NIR and electrochemistry) which is substantial.]

I think it is quite plausible that some functional relationships can be developed between these three factors.

It is quite ask to what end.

I think that deviation from the norm of blood will be more easily assessed and defined w/ more knowledge. Combing body of energy study along w/ chemical makeup may also be fruitful down the road.

We have now some data available on two samples analyzed in depth thus far.

Sample	Conductivity (1)	f_o (2)	Iac (Resonance)	R	AC Power $P=I^2R$ (3)	Ax^{-b} f_o(dilution)
					Diluted	
1	7.06mS	13956kHz (DF 2.70)	808UA	122Ω	57uW	A= 14230 b= -.0818
2	4.80mS	17795 kHz (DF 2.65)	478UA	206Ω	33 uW	A= 17795 b= .1842

Notice also in $f_o = f(\text{dilution})$ that magnitude of f_o and the decay rate are both potentially significant factors.

~~Some initial regressions~~

$f_o \cong -1698.7(mS) + 25949 Hz$ $r^2 = 1$

$mS = -5.89E-4 f_o + 15.3$ $r^2 = 1$

See power function estimate on next page

However, we can already determine that the relation is not linear. W.r.t. #2, $\frac{4.8}{17795} = 2.70E-4$

and $\frac{7.06}{13956} = 5.06E-4$ and $\frac{5.06}{2.70} = 1.87 \cong 2$

So our equations are of the form

$y_1 = f(x_1)$

$y_2 = f(x_2)$

$\frac{y_1}{x_1} \cong 1.87$ or $\frac{y_1 x_2}{x_1 y_2} \cong 1.87$

$\frac{y_2}{x_2}$

$y_1 x_2 \cong 1.87 x_1 y_2$

$y_1 = a x_1^b$

$y_2 = a x_2^b$

$y_1 = \frac{1.87 x_1 y_2}{x_2}$

$y_2 = \frac{y_1 x_2}{1.87 x_1}$

assuming a power relationship

unknowns are a & b

$y_1 = 1.87\left(\frac{7.06}{4.80}\right)(17795) =$

$y_1 = 48944.4$

$y_2 = \frac{13956}{1.87(7.06)}(4.80) = 5074.1$

no

$48944.4 = a(7.06)^b$

$5074.1 = a(4.80)^b$

$\log \frac{a}{b} = \log a - \log b$

$9.646 = \frac{(7.06)^b}{(4.80)^b}$

$\ln(9.646) = b \ln(7.06) - b \ln(4.80)$

$2.266 = b \cdot 1.954 - b \cdot 1.569$

see next page

$\frac{a^b}{c^b} = d$

$\ln(a^b) - \ln(c^b) = \ln d$

$\ln(a^b) - \ln(c^b) = 2.266$

$\frac{a^b}{c^b} = 9.646$

$b \cong 5.82$ by trial & error

$a = 0.550$

$f_0 \cong 0.55 \, ns^{5.82}$??

Nope, but still should be on right track

Power function $f_o = a \cdot mS^{-b}$

I have x & y reversed. Actually it is

$\frac{x_1}{y_1} = 1.81$ or $\frac{x_1}{y_1}\frac{y_2}{x_2} = 1.81$ or $y_1 = \frac{x_1 y_2}{1.81 x_2}$

$\frac{x_2}{y_2}$

$13956 = a(7.06)^b$

$11795 = a(4.80)^b$

$0.784 = \frac{7.06^b}{4.80^b}$ $\quad b \cong -.64$

$a \cong$ ~~48562~~ 48650

So $f_o \cong 48650\, mS^{-.64}$

$b\ln(7.06) - b(\ln 4.80) =$ ~~1.4~~ $-.243$

$1.954b - 1.569b = -.243$

$b(1.954 - 1.569) = -.243$ $\quad b = -.631$ OK

$a = 47881$

So $f_o \cong 47881(mS)^{-.631}$ Very good

$(mS)^{-.631} = \frac{f_o}{47881}$

$-.631 \ln(mS) = \ln(f_o) - 10.776$

$\ln(mS) = \frac{\ln(f_o) - 10.776}{-.631}$

$mS = e^{\left[\frac{\ln(f_o) - 10.776}{-.631}\right]}$

$\left(e^{\frac{\ln(x) - a}{b}}\right)$

additional data sets will allow for regression

The goal is to develop a relationship between f_0 and mS, ie the resonant frequency and conductivity.

The means we can already make some estimate of the resonant frequencies of our conductivity measurements

$f_0 \approx 47801 (mS)^{-.631}$

Sample	Conductivity (mS)	f_0
1	meas 7.06	13950 Hz
2	meas 4.80	17795 Hz
3	meas 6.73	estimate/4376 Hz
4	meas 6.38	estimate 14870 Hz

Now the reason this should work rather well is that the conductivity values have already factored in the dilution saturation. Our resonant frequencies show that they are not linear. The interpretation here is that high conductivities will be favorable, but high frequency will be less favorable since they imply that high power be needed to maximize the blood pressure.

Power relations vs mS can likely be viewed in the same way —

Realize however, that your power estimates are based upon a ~~3x~~ diluted solution. (variable dilution levels).

There might be a ~~Case~~ that the power delivered is directly proportional to the dilution factor

May 17 2023

A couple of immediate important projects going on. First off, a complex project seeking relationships between Conductivity, resonant frequency, and power delivery of blood.

Second will be skin Chemical NIR analysis. Ear, neck, chest, leg - CDB Comparison.

We have recently reinforced our conductivity studies w/ results in complete agreement to/ previous results.

—

An interesting combination of measured data and models is taking place on our Conductivity - resonance - power ("CRP") study.

1. All conductivity values are measured values.
2. Our resonance values for Samples 1 & 2 are by direct measurement and then redirected into a regression model for each sample individually.
3. An analytic solution for 2 equations, two unknowns is easy a power model $y = Ax^b$

is used to estimate resonance values for samples 3 & 4. Determining the resonant frequency needed to undiluted blood take a great deal of effort. We already know we can extract 0.6 ml of live blood from samples available, if I can extract 1.2 ml it will save a great deal of time and effort.

However, in the interim, a point of interest is that a regression developed from the current data available, combined in both a measured sense and (majority) and modeled sense (minority), is essentially flawless. We are left to a model of f_o (resonant freq) = A · Conductivity^{b} (mS) leading to

$$mS = 2.6484E7 \cdot f_o^{-1.5862} \qquad r^2 = .999995 \;!!!$$

$$Mse = 2.00E-7$$

$$* \quad f_o = 47835.6 \cdot mS^{-.6304} \qquad r^2 = .999995$$

$$Mse = 7.96E-8$$

Conductivity is relatively easy to measure. Resonant frequency is far more difficult and advanced requiring EIS spectroscopy & any complication that results from diluted blood.

I think we should try to acquire direct resonance and power data (ie, Iac & Δf) from the live blood samples. Then we will have measured data for all samples. So for samples 1 & 2 are solid info but they do not include power info directly so ideally we use a 1 ml sample of each into a vial, less if possible. Note that pure blood will be subject to coagulation - this is not good and it make a strong case for using the existing dilute sample and regressing to Iac and Power.

Let's try to see how power behaves for Samples 1 & 2 as a function of dilution.

Actually coagulation of live blood presents serious problems and I cannot afford the risk of having any live blood samples degraded or destroyed. Dilute blood actually has its advantages.

f_o (Hz)	Sample #	Dilution Ratio	Iac (uA)	R (Ω)	uW I^2R Pwr	File Name
13065	1	2.70	808uA	122.5Ω	80	12-14K 1415
12050		7.23	341	297.5	35	11-12K 1720(2)
11300		21.69	282	354	28	11-12K 1720(1)
9988 adjusted		65.07	164	618	17	9-11K 1820

Ok. We have good data for sample #1.
We see with the mini adjustment on. f_o for 65.07 dilution that the regression has slightly changed. It is still a close call between power and log regression but it will mention power regression as it is a simpler form and seems to hold valid across all relationships thus far.
We now have for Sample 1: $f_o \cong 14230.3\,Hz \cdot \text{DilutionRatio}^{-.0818}$
$r^2 = .983$ $Mse = 3.19E-4$

Now lets Compute Power levels: Done.
From these we can now determine a relationship between frequency and power
Our best model here is logarithmic
$f_o \cong 4718.7 + 1952.0 \cdot \ln(\text{Power}_{uW})$ $r^2 = 0.95$
Hz

$\text{Power}_{uW} \cong 0.1226\, e^{4.848E-4 \cdot f_o}$

There is already an important finding in two respects.

Indeed the best model Resonant freq (f_0) as a function of the dielectric constant may indeed be logarithmic or power. We shall need to see.

However, more importantly, we see that the power required to achieve a higher resonant frequency (which is characterized by lower conductivity) is exponential in nature, thus is very hard to achieve.

This says that a small change in conductivity has a so much larger change in energy level requirements for the blood to perform at its optimum. This is a very important finding.

The fields we are actually engaged in now are biophysics.

Next, let's learn what we can from Sample #2.

fo	Sample#	Dilution Ratio	Iac(uA)	R(Ω)	Pwr (uW)	File Name
15155	2	2.65	478	205	47	13-16K 1900
11695		7.95	248	402	25	
10110		23.85	142	710	14	10-12 2100

Ok let's compute fo, power relationship here:

$Power_{uW} \cong 1.483 e^{2.307E-4 \cdot fo}$ $r^2 \cong .965$ Mse = .025

$fo_{Hz} \cong -1223.0 + 4185.1 \ln(Power_{uW})$ $r^2 \cong .965$

Now, we can use these relationships to estimate the power levels of the Undiluted blood.
For Sample #1, we have fo estimated @ 14230 Hz for undiluted blood. ($fo \cong 14230.3 \cdot Dilution^{-.0818}$)
We also have $Power \cong .1226 e^{4.848E-4 \cdot fo}$)
Therefore our power estimate (relative) for undiluted blood is 121.5 uW

For sample #2, we have fo estimate @ 11795 Hz for undiluted blood. ($fo \cong 11795.7 \cdot Dilution^{-.1842}$)
We also have $Power \cong 1.483 e^{2.307E-4 \cdot fo}$)
Therefore our power estimate of undiluted blood is 90uW
$\cong -26\%$ power reduction.

The results are significant.

Now the questions for my own validity of relations and relationships can we draw?

Sample	(Meas) Conductivity (mS)	meas (dilute) model (undilute) f_o (H_2)	meas (dilute) model (undilute) (uW) Power
1	7.06 mS	14230 (meas + regression)	121.5
2	4.80 mS	17795 (meas + regression)	90
3	6.73 mS	14631 (model only)	116
4	6.38 mS	15090 (model only)	111

1. f_o (H_2) regression model from Samples 1 & 2 $f_o = 44160 \cdot mS^{-.5794}$ model, therefore f_o for Samples 3 & 4.

2. We can now therefore develop a comprehensive model for mS ⇄ f_o

$f_{o\,(H_2)} = 44157.4 \cdot mS^{-.5794}$ $r^2 = .9999999$

Notice same as above, internally consistent.

A linear relationship is also good here, $r^2 = .996$

$f_o = 25465.4\ mS - 1606.6$

The linear relationship is one alternative.

~~It is simple and plausible. It shows that a may freq achievable is expected~~ The power regression seems more logical and feasible as $mS \to \emptyset$.
The linear model will be less logical.

3. Power(uW) regression model for Sample 82 is ~~uW = 13.94~~
Now, we have seen that power related to freq is exponential, at least w.r.t. to dilution.
Dilution is an expression of concentration (density) and Conductivity is also a direct expression of concentration. It will be logical to adopt an exponential regression therefore.

$$uW = 47.58\, e^{.1328 \cdot mS}$$

Next we can now develop a comprehensive model for $uW = f(mS)$

$$uW = 47.67\, e^{0.1324 \cdot mS} \qquad r^2 = .999$$

And now we have the following

Undiluted Blood Final Summary of the Work.

power function: $f_0(H_2) \cong 44157.4 \cdot mS^{-0.5794}$

exponential function: $Power(uW) \cong 47.67 e^{0.1324 \cdot mS}$

direct measurement: Conductivity in mS (A direct measurement)

Note:

(1) A higher resonant frequency mean the conductivity is lower. The interpretation of this is that it takes more energy (freq is directly related to energy $E=h\nu$) to deliver maximum power in blood that is less conductive than it requires for blood that is more conductive. Resonance occurs when max power is delivered to the load.

(2) Power shows likely to be exponentially related to Conductivity. The more conductive the blood is (within ~~limits~~ normal ranges) the more power that can be delivered through the blood.

(3) Each person would have their own resonant frequency for their blood.

4. The impact of delivery a resonant frequency to the blood from an external source is unknown. Special concern exists for introducing any additional electromagnetic energy to the blood based upon transformation results/ CCB presence that has been established.

—

What has been done here is to create a biophysics model, of sorts, that is based upon blood conductivity measurements.

The model can now be used to explore the "normal" range of blood and then comparison can now be made in terms of expected "resonance" and power delivery within the blood.

Most importantly, given that "normal" blood has a range of 10-20mS, what is the expected power transmission within it.

Assume mS = 15mS Power = 347 uW

8mS Power = 137.5 = 25% from 10mS.

Assumed ref. * 10mS Power = 179uW

4.8 Power = 90 = -50% from 10mS

May 18 2023 – Projects ahead

(1) It may be more academic than practical, but it would be of interest to see if mid level conducting blood reading also lead to an intermediate resonance value as well

(2) You have quite a lot of skin based NIR work that can be done:
1. Secretion
2. Skin plate vs control of some kind? Maybe paper exposure is better
3. Ear damaged skin vs control
4. Chest/Neck skin vs control
5. Current leg status vs control (post event)

(3) You could create a set of vax & unvax paper samples and then run ACV on them.

(4) Diff plot study on vax vs unvax sample

(5) Study functional groups of arite
– Structural proposals

May 20, 2023

Let us look @ an intermediate Conductivity blood sample and see if it conforms to the model that has been developed for both resonance as well as power capability.

Use sample #4, Conductivity ≅ 6.38 mS
Resonance is predicted @ 15090 & Power @ 111 uW Undiluted. Our sample is diluted, however, May require a 2pt measurement.

The resonance value of dilute blood is quite high ~20K even for dilute blood. The only variable known here is that the blood has been sitting for several days now and you must account for the creation additional deterioration in the sample. The is much higher than sample 2. The sample is dilute, Dilution Ratio = 3.06

mS

Conductivity is on the order of 189 uA & R ≅ 120 Ω
Power ≅ 74 uW.

mS				
7.06	In Sample #1: Dilution 2.70	Pwr ≅ 80 uA	Power ≅ 121.5	
4.80	#2	2.65	47	90
6.38	#4		74	

Est Estimate Power
$\frac{(6.30 - 7.06)}{7.06 - 4.80} = -.30$
$.30(80\text{uA} - 47\text{uA}) = -10\text{uA}$
Leads to 70uA vs ~~74~~ 74 uA

Here is what we see from the data. Resonant freq does not match the model expectation in any fashion. The resonant freq shows up as likely guide light and not with any expected interpolation. This suggests that the Resonant freq may be unique to the sample in other respects, and not modeled simply w/ conductivity. This could be useful down the road when more is tested and understood but @ this time no obvious relationship appears to exist with conductivity, even with the power models assumed

---

However, the power level is within expected range. This could be helpful as power is a completely separate measurement from conductivity and yet is showing signs of correlation w/ conductivity. This would actually seem sensible, logical and plausible, recall however, that final Power estimates are made with undiluted blood, thereby a 2 point measurement @ a minimum is required.

This suggests that the work is still worthwhile to pursue.

Recall also, that power measurements ARE taken @ a point of resonance even for the diluted samples, which mean that resonance is actually still required and determined for Power, ie whole blood.

It remain plausible that we do have a correlation between

1. Conductivity measurements
2. Power delivered at the point of blood resonance.

What is the purpose of this? To not provide a specific method by assessing or characterizing the performance of blood with respect to energy transport.

Whether these data remain viable.

And the question and project down the road is to ask if dilute blood, like lysed diluted blood can be used to establish a smooth EIS profile, and whether or not dyspnea for vax/unvax.

Left a new container w/ Sample # 4
Power / Resonant measurement
Current dilution ratio is 2.65
Vial mass = 2.55 gms
Mass w/ blood = 4.28 gms Δ = 1.73 gms
Dilution ratio of 3. 3(1.73 gms) = 5.19 gms
2.55 gms + 5.19 gms = 7.74 gms
Bring mass to 7.74 gms and dilution ratio is 3(2.65) = 7.95

Initial result: Crossover 7055 Hz $\bar{x}$ = 6890
6726 Hz

Iac = 448 μA R = 225 Ω
Power @ Resonance = 45 μW

We now have two data points for power and resonance

Sample 4

Dilution Ratio	Resonant Freq	Pwr
2.65	~20K	74 μW
7.95	6890	45 μW

Determine Pwr Curve: Pwr = 115.0 dilution ratio $^{-.453}$
Ideal Power ≈ 115 μW

Now we have 3 data points for the empirical curve

Sample #	Dilution Ratio	mS	Pwr$_0$	~~Conductivity~~
1	None	1.06	121.5	~~1.06~~
2	None	4.80	90	4.
MODELED 3*	None	6.73*	118*	~~MODELED~~
4	None	6.38	1150W	

Notice how close the determined power level for Sample #4 is from measurements is extraordinary close to that which has been modeled as 118 W.

Now we form a ~~median~~ derived power-conductivity regression model w/ 3 samples vs the two previous.

$$Pwr_0 = 25.92 \cdot Conductivity(mS)^{0.7960} \qquad r^2 = .983$$

$$MSe = 3.51E-4$$

This should now be a very respectable model and be value to determine relative loss and gain of power capability w.r.t. conductivity measurement alone

$Power_0 = 25.92 mS^{,1960}$

Now let's look @ calculated relative power loss of the four undiluted blood samples.
(n=3 to 1 original dilution)
(undiluted)

Sample	mS_0	$Power_0$	Pwr Loss % from 10G	Pwr Loss % from 10mS	Pwr Loss % from 15mS
1	1.06	121.5	0%	-25%	-46%
2	4.80	90	-26%	-44%	-60%
3	6.73	118	-3%	-27%	-47%
4	6.38	115	-5%	-29%	-49%
Theoretical Low	10mS	162	+33%	0%	-28%
Theoretical Mean	15mS	224	+84%	+38%	0%
Weighted Current Mean n=17	6.55mS	116	-4.5%	-28%	-48%
Highest Value Measured n=17	10.65mS	170	+40%	+5%	-24%
Lowest Value Meas N=17	4.80	90	-26%	-44%	-60%

Power relationship to be determined by EIS & Resonance

We see now that we want to create a graph that shows these relationships.

Conductivity vs Power

1. Normal range (10 - 20 mS)
2. Measured range (4.80 - 10.65 mS)
3. Full range (e.g. 3 - 25 mS)

What we are actually after here is a graph that shows the power efficiency of blood as a function of conductivity as referenced to the expected mean of 15 mS. Deviation above and below this would be less optimum (assumed).

Ok, we have a very depictive graph in place. It easily shows the skew in expected power inefficiency in measured blood samples. Excellent portrayal.

The has made the entire process (difficult and extended) worthwhile.

Tailor the legends and axes and you have a meaningful plot.

You can now, if you wish, entertain idea of whether you can obtain a smooth EIS plot over an extended range, assuming that the deletion of the sample is a factor.

It is an irony here that dilute blood is actually more reliable to conduct the measurements that have been taken. Thus because it minimizes the effects of coagulation is clearly evident.

Regression over reasonable range allow for determination of intercept, which will then correspond to undiluted blood.

Guess what? I actually have on the control pt. Power is 0 when conductivity is 0.

Revised:

Sample	$m S_o$	ΩPur_o
1	7.06	121.5
2	4.80	90
4	*6.38	115
Control Pt	0	0

Now, we can actually run the data thru a linear model just fine.

$\text{Power}_{uW} = 17.6 \cdot mS + 1.5 \quad r^2 = 0.996$

There is now the adequate and large data set to eventually 0 uW @ 0 mS.

In reverse, $mS = .0567\,uW - .065 \quad r^2 = .996$

Solve for $mS = 0$

$.0567\,uW = .065 \Rightarrow uW = 1.15 \Leftarrow 0\,mS$

Power @ 15 mS is 265.5 uW vs 224 previously

Assume max power achieved @ 15 mS = 265.5 uW.

So now we have another control pt.

Sample	mS	Pwr_0
1	7.06	121.5
2	4.80	90
4	6.38	115
Control	0	0
Control	15	265.5
3	6.73	

$\text{Pwr}_0 (uW) = 17.6\,mS + 1.4 \quad r^2 = 0.999$

We have a very decent graph.
Now what I would do next, to adopt a more conservative view, is to adopt a mean value of power for the range of 10-20 mS, instead of the peak value @ 15 mS. This will be a much more conservative approach.

(by area) RG

The mean value occurs approximately @ -22% power loss.
The occurs @ a conductivity of ~ 11 mS & ~ 18 mS
Power @ 11 mS ≅ 195 uW instead of 265.5 uW. This will be much more conservative and realistic.

—

This requires that we recalibrate the control pot in our regression to 195 uW instead of 265.5 ???

—

There is an alternate approach to consider. Let's flatten out the peak @ 15 mS. It is not unreasonable to assume a modest loss of power efficiency at the range ends of 10 & 20 mS. A value of 5% loss would not

seem unreasonable. 5% of 265.5 uW = 13.275
265.5 − 13.275 = 252 uW
Therefore set 2 additional control pts for the regression
10mS 252 uW
20mS 252 uW
Now we have:

Sample	mS	uW	
1	7.06	121.5	
2	4.80	90	
4	6.38	115	
Control	0	0	
Control	15	~~265~~ 240	5%
Control	10	~~252~~ 220	5%
Control	20	~~252~~ 220	5%

The best regression here is a cubic.
uW = ~~−.0914mS³ + 1.854mS² + 11.966mS − 2.187~~
−.067mS³ + 1.16mS² + 14.93mS − 229 r^2 = ~~0.957~~
The curve peaks @ 290 so we need to lower peak Control by ~25 uW. r^2 = .96

The shape looks decent but still problem
1. The peak is @ 16mS vs 15mS.
2. 20mS has ~13% ~~error~~, 10mS has ~25%
These are way too high.

I have tailored a polynomial that appears reasonable and flattens out the 10-20 mS range as much as possible while still accomodating the measured data.

$uW = 3.054E{-}3\,mS^3 - 1.053\,mS^2 + 29.29\,mS + 1.97$

peak = 214.11 $\quad r^2 = .735$

Ok I have a model that look quite good now

It is also a conservative model with the reduced peak power from 265 uW to 214 uW. It is symmetrical by power losses at range ends of ~ 10%

It is also based upon measured data.

May 22 2023

Am Continuing w/ ECIS of blood. First question is my result depend upon concentration

I have a very smooth Bode plot w/ f = 1 to 15K Hz w/ Eac of .003 V. 2 peaks visible One peak @ ~ 5750 Hz, other @ ~ 2 Hz Plane

Ok, next we need to see if result depend upon Concentration.

Vial is ~~2.589 gms~~ 2.59 gms 2.60 gms
w/ H_2O = 7.89 gms Δ = 5.29 gms H_2O

In the case our blood initial Concentration will be unknown but the well still meet dilution need. Call it Concentration 1. Rich red color

The Bode plot of my sample, arbitrary Concentration looks highly similar to that of the highly dilute first sample #1 investigation
We had the same double peak @ $f_{0.10}$ = 3.641 Hz & 3.859 Hz
Also @ $f_{0.10}$ = 0.2957 This is plane, not impedance.

Now dilute by a factor of 5

2.59 gms vial ⇒ 4.14 gms. Δ = 1.55 gms
need 7.75 gms (1.55)(5)
+ 2.59 gms vial
10.34 gms
We have 10.41 gms, 10.41 − 2.59 = 7.82
7.82/1.55 = 5.045 Current dilution factor.

Paused Color

We have same general form.
Peaks in phase of 3.641 & 3.859 $\log_{10}$ Hz
but peak of .2957 is no longer reached.
It remains monotonic only increasing.

The way that we have same general form of the Bode plot w.r.t. dilution, but not exactly the same. Double peak has slightly higher phase magnitude and primary peak near 1 Hz is not reached w/ the dilute sample.

Now dilute again

Vial 2.54 gms → 4.17 gms Δ = 1.63 gms
Divide by 5 ⇒ 5(1.63 gms) = 8.15 gms + 2.54 gms = 10.69 gms
Done. Extremely fast solution.
Total deletion factor here is 25.

Same general response. Double peak increases magnitude w/ higher deletion factor and peak near 1 Hz is not achieved, even less so. There is a very delicate solution.

—

I am now interested in exploring further the double peak region as it seems to be very responsive to deletion.

The portion of the graph smoothed out by a higher AC voltage is used in the region, ie 1K–15K Hz.
E.G. 0.15 V AC instead of .003 V AC
The system seems less responsive to the higher voltage, but the lower voltage may be an experimental convergence. What we do see even in the smooth graph is a decrease in the phase in the vicinity of the plot.

What I see is that likely a convergence wire is active @ the high frequency however the general pattern of decrease in phase at the upper freq range remains in place across both .003 and .015 AC Voltage

---

We now should be at a point to make a preliminary investigation of VAX vs UNVAX sample.

The idea is to ~~combine~~ separate punch diluted sample from both VAX and UNVAX. Conduct EIS and see if any difference is noted.

Keep track of no. of punches
Since we have 5 VAX sample available we will use 5 single punch max for each group. Therefore

1. VAX: 5 individuals, one punch each
2. UNVAX: 5 individuals, one punch each
3. 3 YR OLD blood sample, one individual, 5 punches.

This will keep the concentration level relatively uniform across the three sets.

Next, let's decide how much distilled water to add to each vial. I will suggest 2 ml.
Leave punche in for 15 min minimum to start test.

Vial 3 (3 yr. old sample) mass = 2.589gms +2
Vial 2 VAX
Vial 1 UnVax

VIAL 1: UNVAX

N frequencies = 43 Min 1Hz Max 15kHz Vac = .003V

Unvax is recorded first. All punche remain in vial

I see I can use the dilution vials as suitable electrochemical cells. No transfer needed.

The second set has Vac = 0.15V

It converge very smoothly and quickly @ 0.15V.
We saw the dirty peak as well.

3 runs @ .003V
3 runs @ .015V

Next is the ~~HP3478A~~ VAX set.
Vac = .003V 3 runs.
.15V 3 runs

. Now focusing on the 1-10 Hz range because of signal C ~ 4Hz.

& Can see now that the "dec" can be increased as long as the curve continues plot smoothly. I have increased dec to 52 & allow more data points as the signal is studied more closely.

After 3 hr + of headache trying to get the exported data from PSTrace read into DPLOT & have done it. It was a headache.
It apparently has to do with opening the file w/ Notepad and saving it in either
UNICODE 8
and/or ANSI.
Then depending on a formatting error.

However, with the data that has been imported, DPLOT will not:

1. Remove trend
2. Make equal intervals
3. Smooth the data, all of what I need to do.

So DPlot has serious problems here
OK, I managed to get the trend removed by reversing the X axis from -11 to -1
& managed to get equal intervals by setting to .01
OK, I have managed to smooth with a window of 10-20.
I also can get polynomial fits now
Now I can set differences. Set the lag properly

I have very visible spike @ 2.9 Hz, 3.75 Hz & 5.7 Hz
I can later export DPlot as CSV and then compare.

Differentiation really shows the spike.
To fix scaling errors on axes, use amplitude limits

On to the next volume, ..