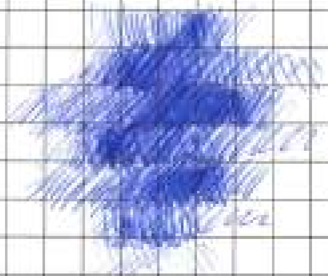
Project No.

TITLE Deconvolution of XS140128_1E1_7_3D.asc

Book No.

From Page No.

This is an attempt to deconvolute an old raster scan measured by Dr. Monika Dorwin and Phillipp Knapp, on 2014.01.28. This is an asymmetric raster scan, showing meander distortion:



PBS buffer + 1mM glucose

(target was a cell)

Monocyte

E = 650 mV vs. Ag/AgCl

measuring H_2O_2

The data is in the format:

0	,	0.00E+00	,	1.23E-12
1	,			
2	,			
3	,			
4	,			

number of measurement → 0, 1, 2, 3, 4

comma separator → the first comma

x-coordinate in (m)! → 0.00E+00

comma separator → the second comma

current in (A) → 1.23E-12

The data is not in chronological order!

[illegible]

This should be the correct one:

[illegible]

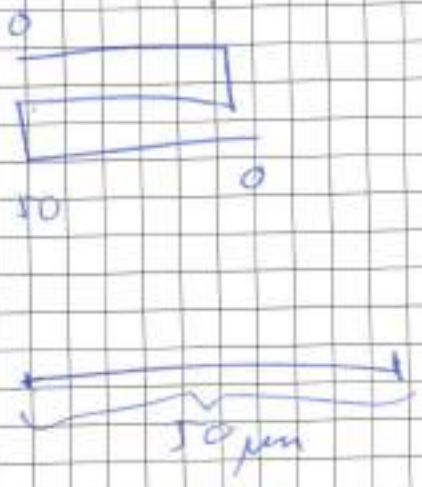
To Page No.

Witnessed and understood by me	Date	Invented by / Recorded by	Date
			2018.06.14.

HEKA

fix missing codes:

1 - 1001 ✓
1002 - 2002 ↔
2003 - 3003 ✓
3004 - 4004 ↔
4005 - 5005 ✓
5006 - 6006 ↔
6007 - 7007 ✓
7008 - 8008 ↔
8009 - 9009 ✓
~~9010 - 10010~~ ↔
9010 - 10016 ↔
10011 - 11011 ✓
11012 - 12012 ↔
12013 - 13013 ✓
13014 - 14014 ↔
14015 - 15015 ✓
15016 - 16016 ↔
16017 - 17017 ✓
17018 - 18018 ↔
18019 - 19019 ✓
19020 - 20020 ↔



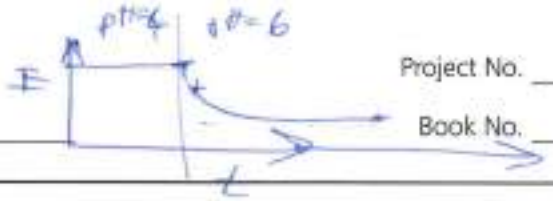
14012S_1_EL_11_3D.asc

1st
0
:
10

2nd
0
:
10

```
program deconvolution
implicit none

integer :: stat
real i, j, rc, e0, conv

rc=0.985

open(1,file='11.txt')
open(2,file='11_deconvoluted.txt')
read(1, *) i, j, e0
do
   read(1, *, iostat=stat) i, j, conv
   if (stat /= 0) exit
   write(2, *) i, j, ((conv - e0*rc)/(1-rc))
   e0=conv
end do
close(1)
close(2)

end program deconvolution
```

Python script is on page 77!



TITLE

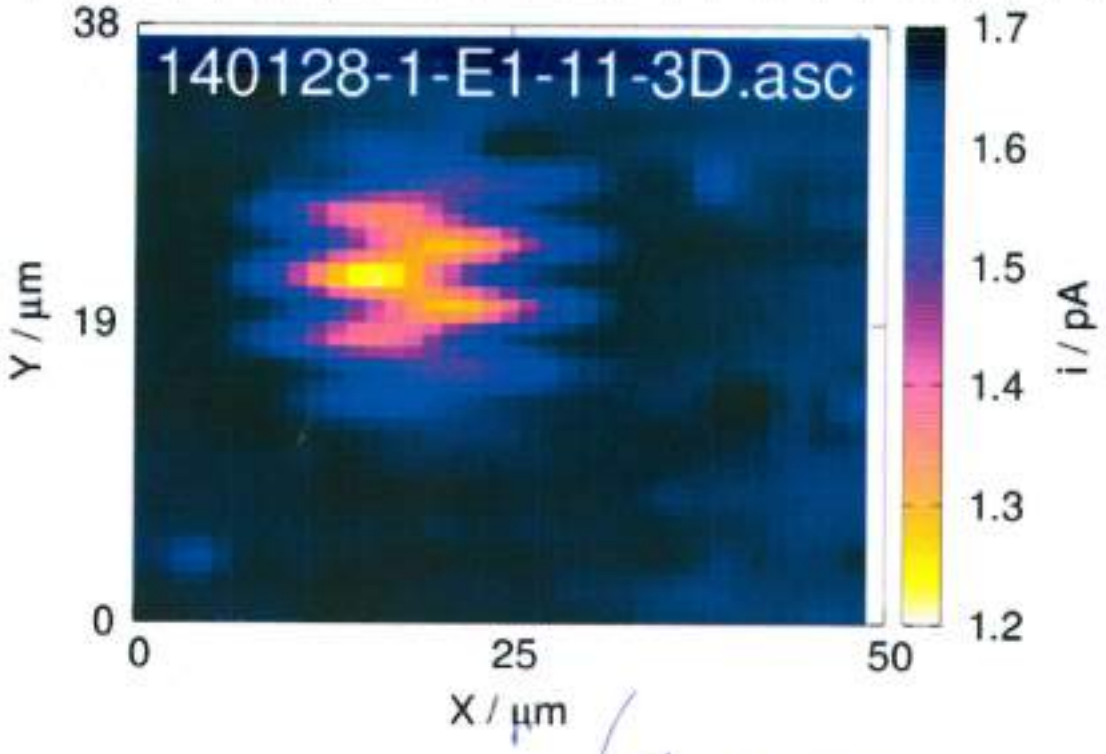
Project No.

Book No.

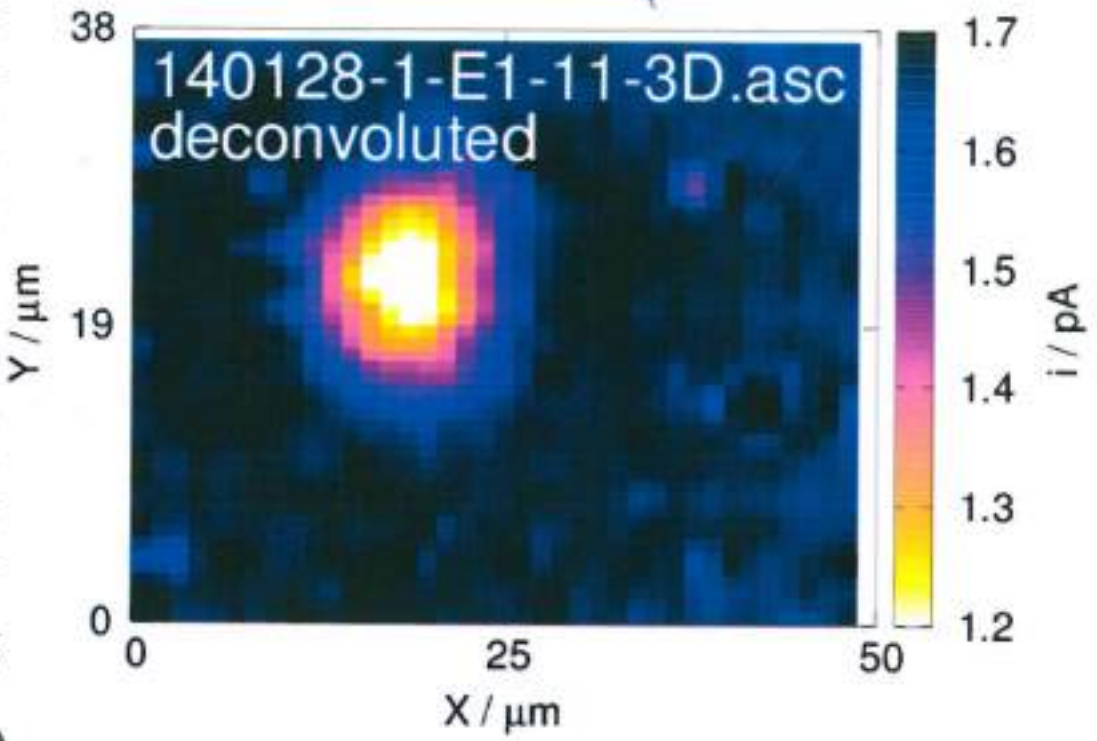
From Page No.

$$E_t = (E_0 - E_f)\, e^{\frac{t}{\tau_c}} + E_f$$

$$E_t = E_f + [E_0 - E_f] \cdot e^{\frac{t}{\tau_c}}$$



$\frac{t}{\tau} = 0.935$



Witness

HEKA

Project No. _____

TITLE (Nernst equation) _____

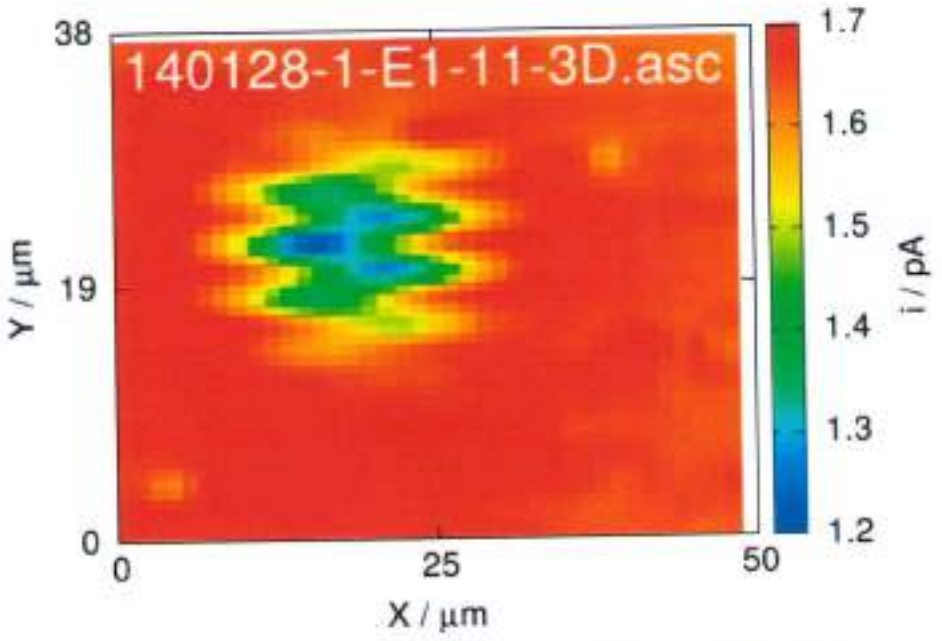
Book No. _____

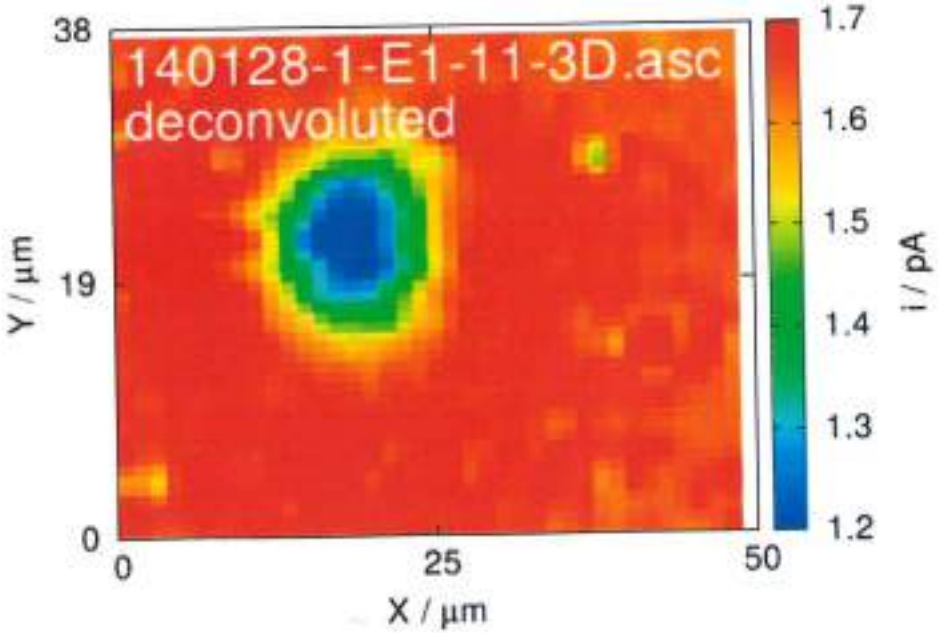
From Page No. _____

1, Nernst-equation

$E_p = \frac{RT}{zF} \ln \frac{[H^+]}{[H^+]} + E_{ref}$

(2)





(color scheme + set palette rainbow 22, 13, -31

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
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HEKA

$K_3[Fe(CN)_6]$

Project No. _____

TITLE _____

Book No. _____

From Page No. _____

Labseminar 2018

(Biophysics)

Monday at 11.00

Auditorium CIPMM

Presentation

January, 8th	-----	August, 6th	Dalia
January,15th	~~Markus~~	August, 13th	Girish
January, 22nd	~~Leticia~~	August, 20st	Diana
January, 29th	~~Katerina~~	August, 27th	Reinhard
February, 5th	~~Bin~~	September, 3rd	Janina
February, 12th	no seminar	September, 10th	Lea
February, 19th	~~Kim~~	September, 17th	Anni
February, 26th	~~Arne~~	September, 24th	Maylin
March, 5th	~~Renping~~	October, 1st	Lucas
March, 12th	~~Eva~~	October, 8th	Carsten
March, 19th	~~Mona~~	October, 15th	Nikolina
March, 26th	no seminar	October, 22nd	Monika
April, 9th	~~Monika~~	October, 29th	Michelle
April, 16th	general points	November, 5th	Phillip
April, 23rd	~~Maik~~	November, 12th	Adrian
April, 30th	no seminar	November, 19th	Julia
May, 7th		November, 26th	Sylvia
May, 14th	~~Jie Zhu~~	December, 3rd	Barbara N.
May, 28th	~~Ewa J.~~	December,10th	
June, 4th	~~Denise~~	December,17th	
June, 11th	~~Remy~~		
June, 18th	~~Vanessa~~		
June, 25.-Aug, 3.	no seminar		

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

HEKA

Project No. _____

TITLE 10 µm Pt disk electrode preparation

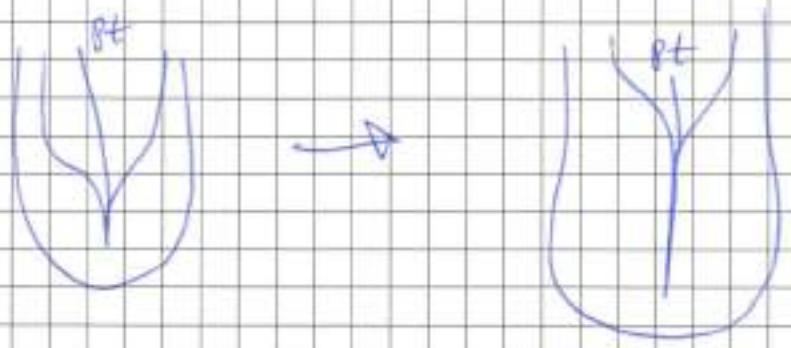
Book No. _____

From Page No. _____

I wanted to show Monika and Phillip how do we prepare the UMEs in vivo.

First, we sealed a d_o = 2 mm d_i = 1 mm borosilicate capillary at one end:

Then, I put in the l ≈ 1 cm d_i = 10 µm Pt wire, and seal it with a propane-butane burner:



Then, I pushed solder into the capillary, close to the Pt wire. After that I melted it in the same flame.

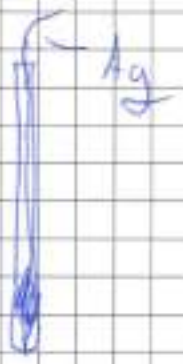
To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	2018.06.20.

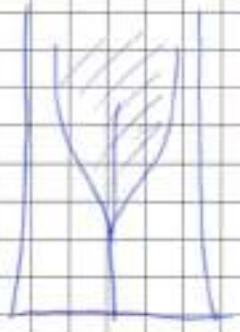
HEKA

From Page No. _____

Then, while the solder was still molten, I pushed in an 8 cm silver wire to provide electric connection to the protein-extract



Then, I ground the sealed end to expose the Pt-wire.



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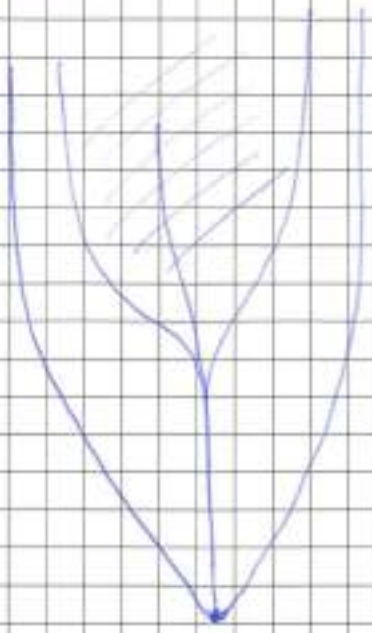
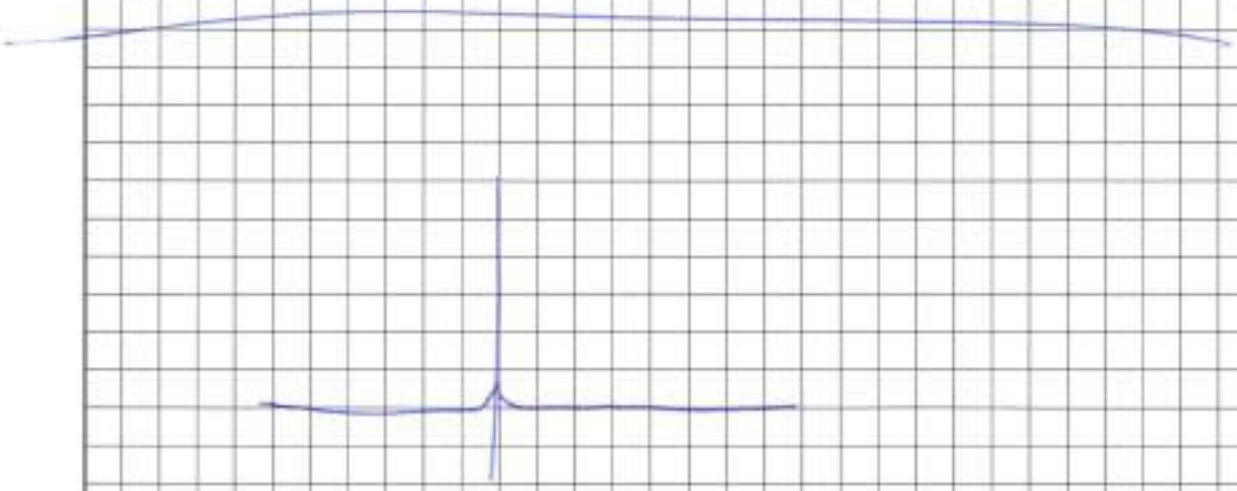
		Recorded by	

From Page No. _____

Then, I ground the bend:



Tested with CV in 2mM ferrocene / 100mM KCl.



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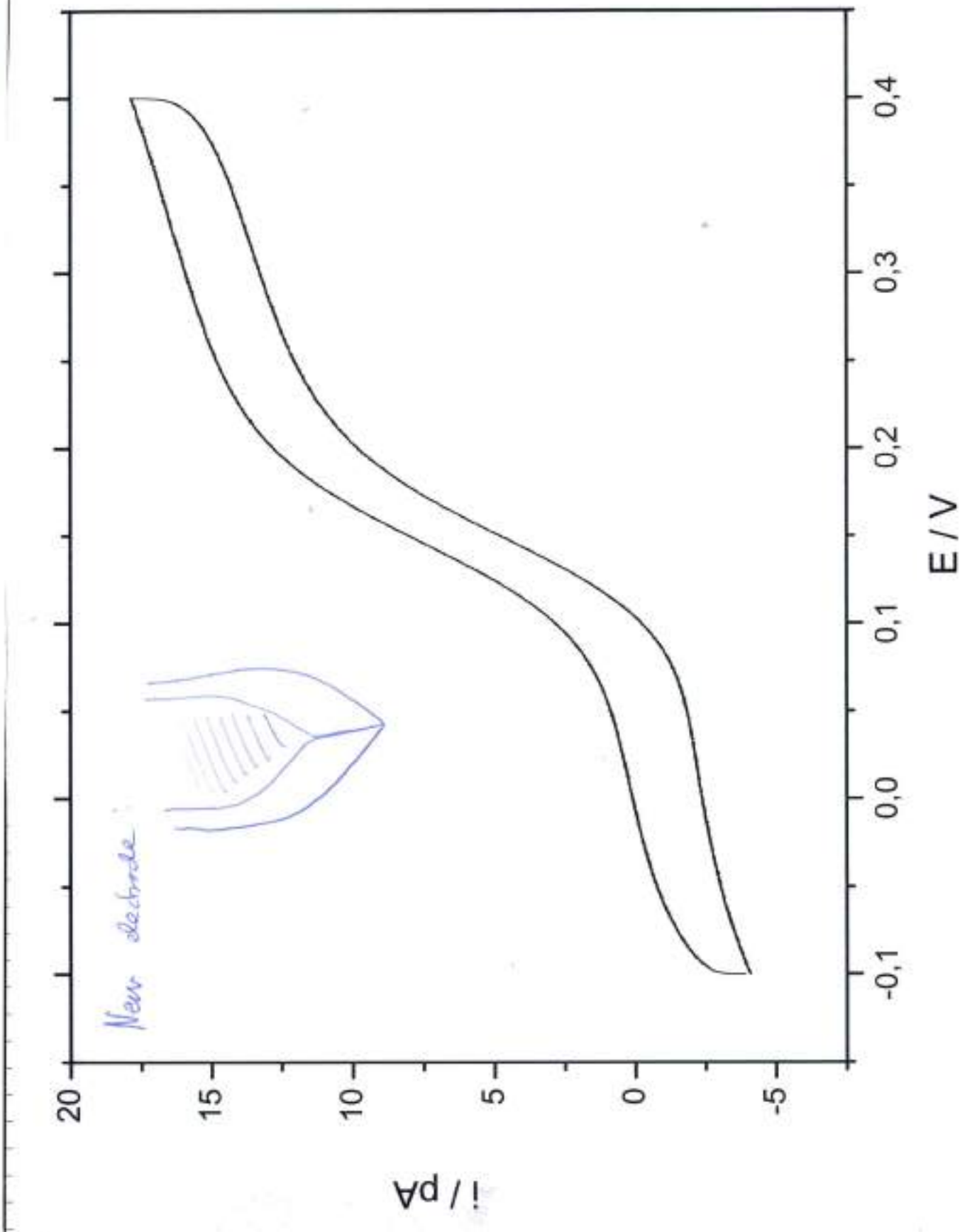
		Recorded by	

Project No. _____

TITLE _____ Book No. _____



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		Recorded by	

Project No. _____

TITLE H_2O_2 chronoamperometric calibration

Book No. _____

From Page No. _____

With the new electrode:

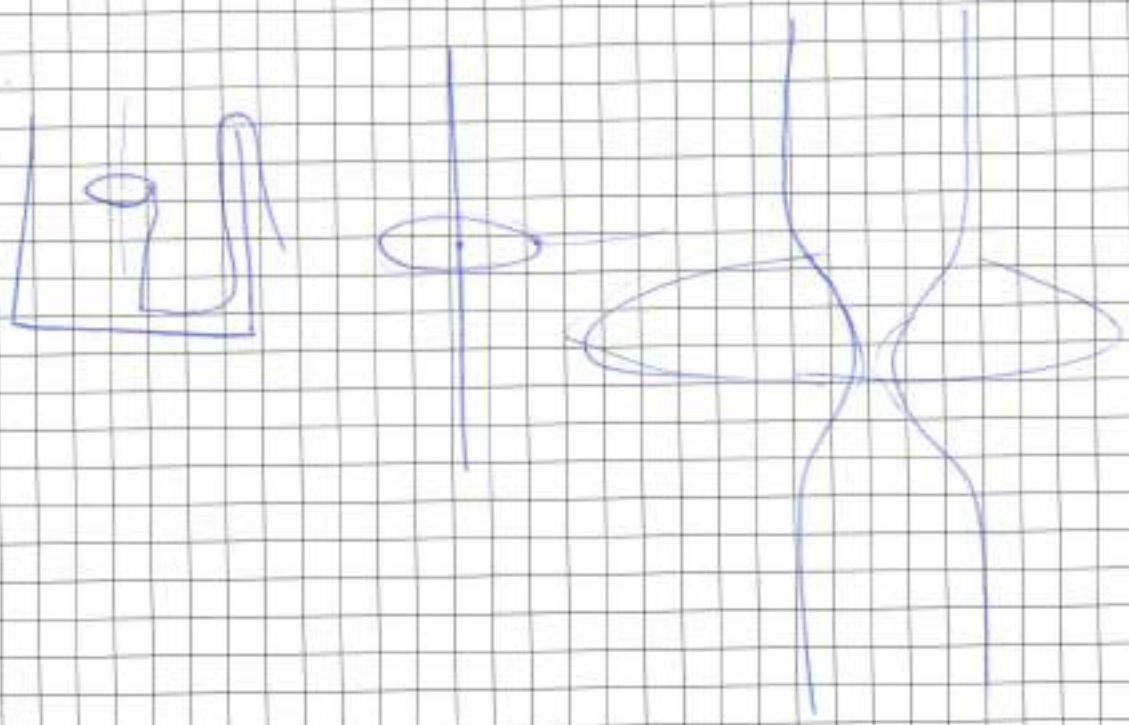
10-20 µl 1mM H_2O_2 stock

2 ml 100mM PBS

sucrose in H_2O_2 : 5 µl each addition

24.5°C

H_2O_2 stock solution prepared by Phillip

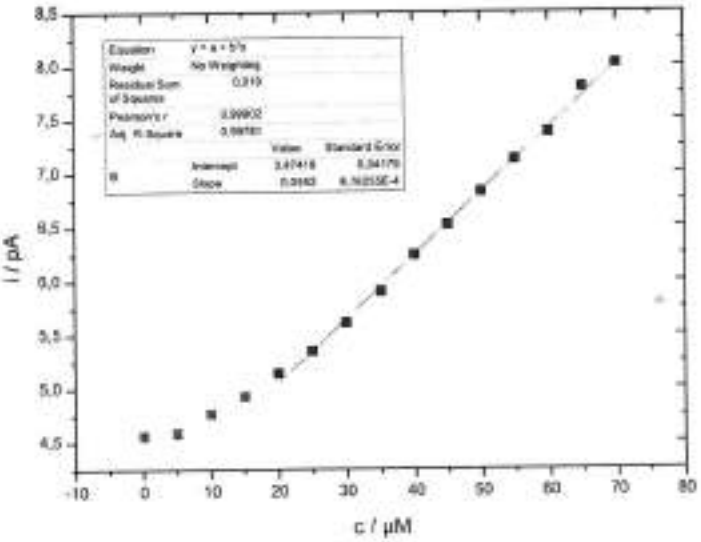


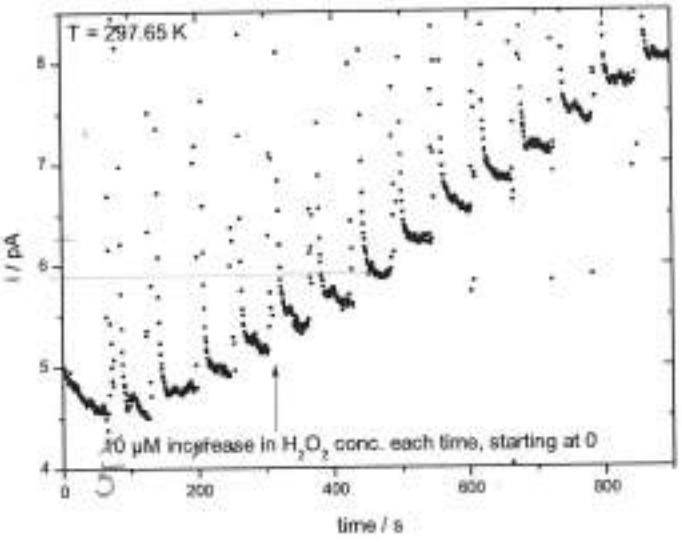
To Page No. _____

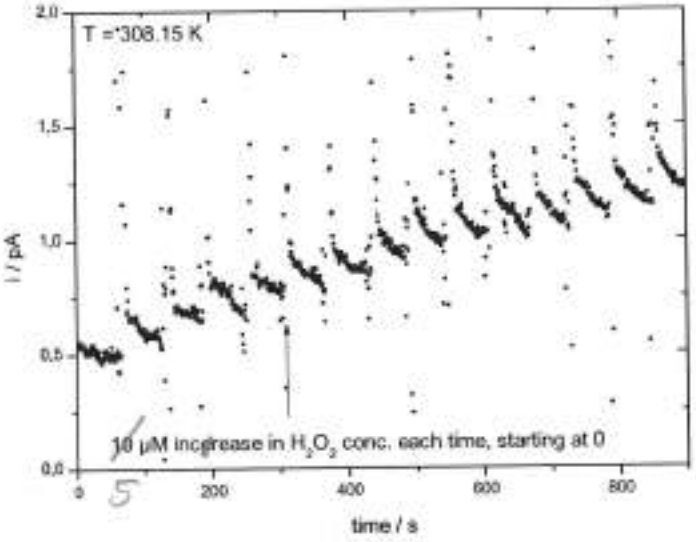
Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

HEKA

From Page No. _____







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Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

Project No. _____

TITLE Zeiss Werbung

Book No. _____

From Page No. _____

140514_1.dat

① - 6 EX-1 ; maybe EX_3

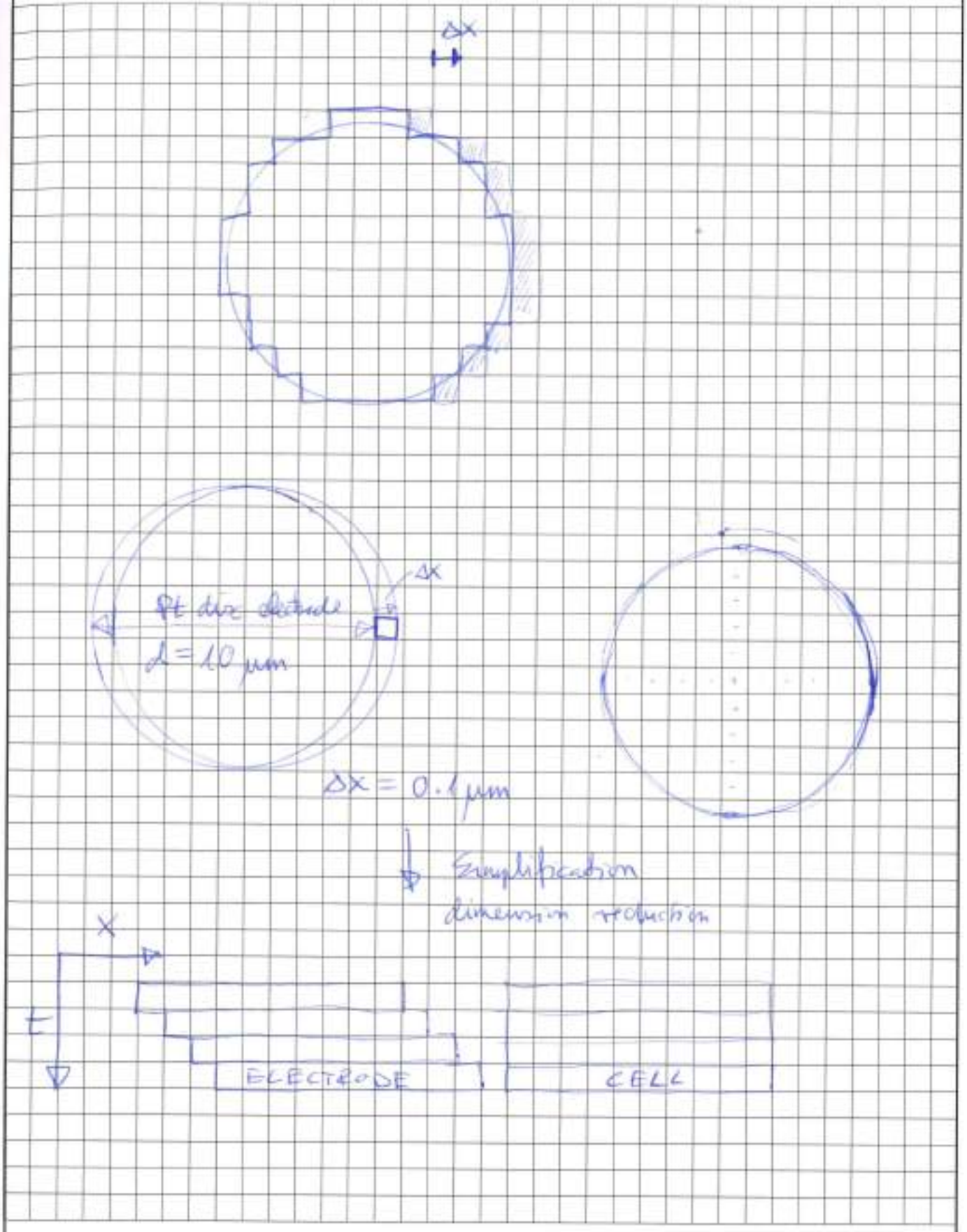
beads

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

HEKA

From Page No. _____



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		Recorded by	

EI-7

47 µm X 45 µm

2 µm/s

µ step : 2 µm

26 recordings

X 0-45 (46 rows)

Y:

lines in the hole: 13026

$\frac{13026}{501} = 26$

50 step 47 µm X 47 µm

Witnessed and understood by me	Date	Invented by	Date
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TITLE _____ Book No. _____

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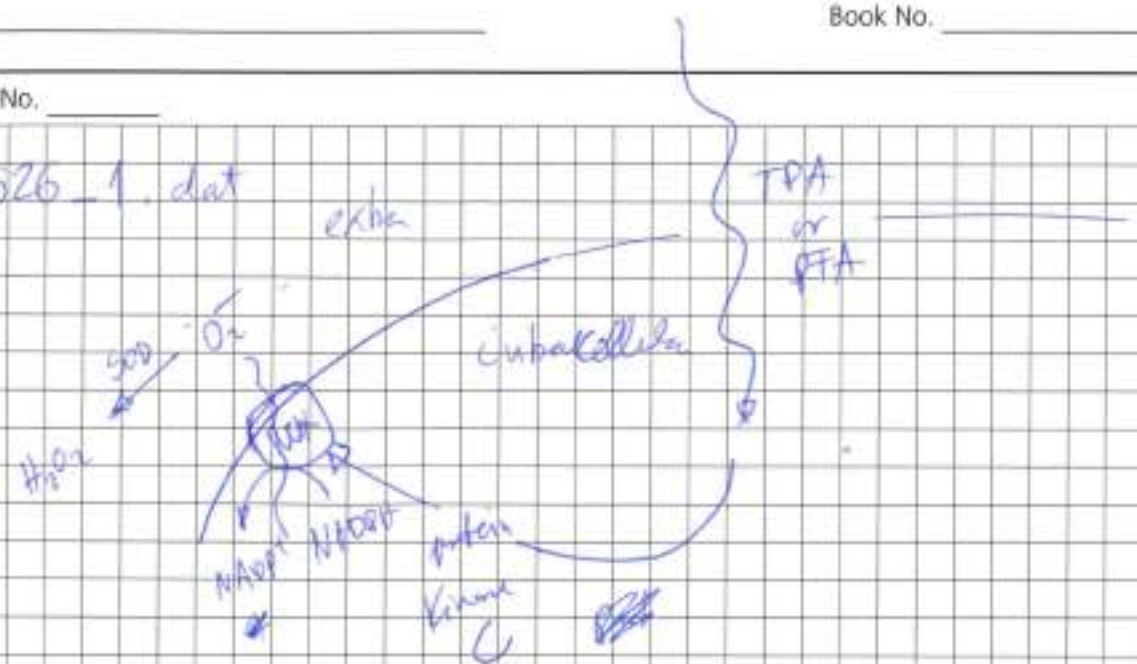
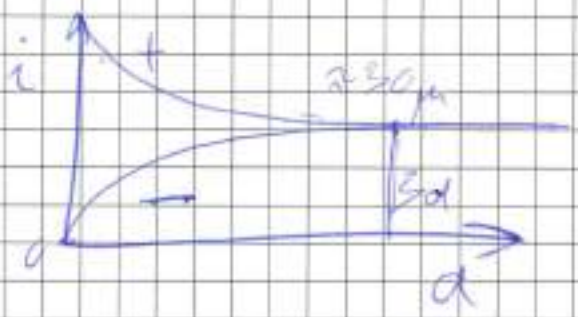
M1

18626_1.dat





cell attached to UMF and dragged along another during the scan

F1_11_4

0,1 mM TPA
+ 5 µl to 2 ml

1 µM TPA for the cells
in DMSO

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Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

HEKA

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TITLE _____ Book No. _____

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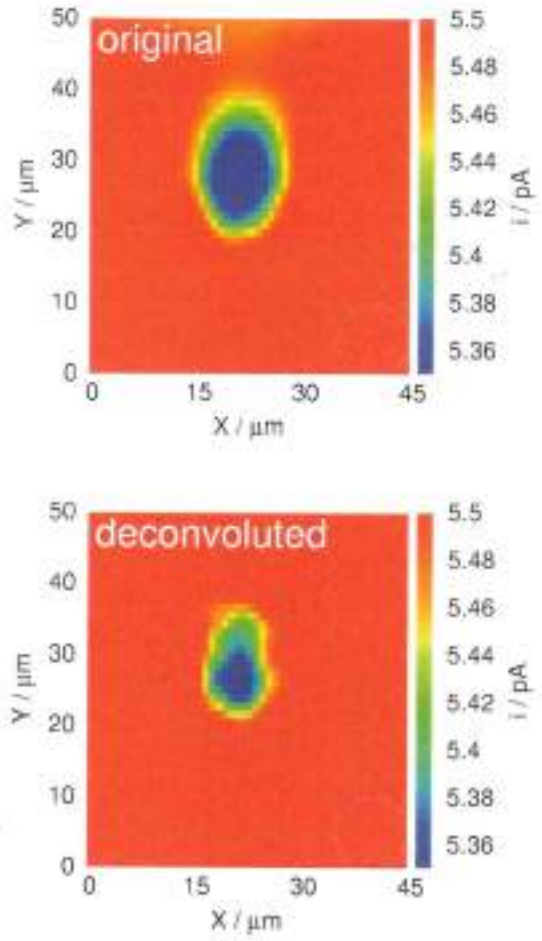


Figure 1

Witnessed and understood by me | Date | Invented | Recorded

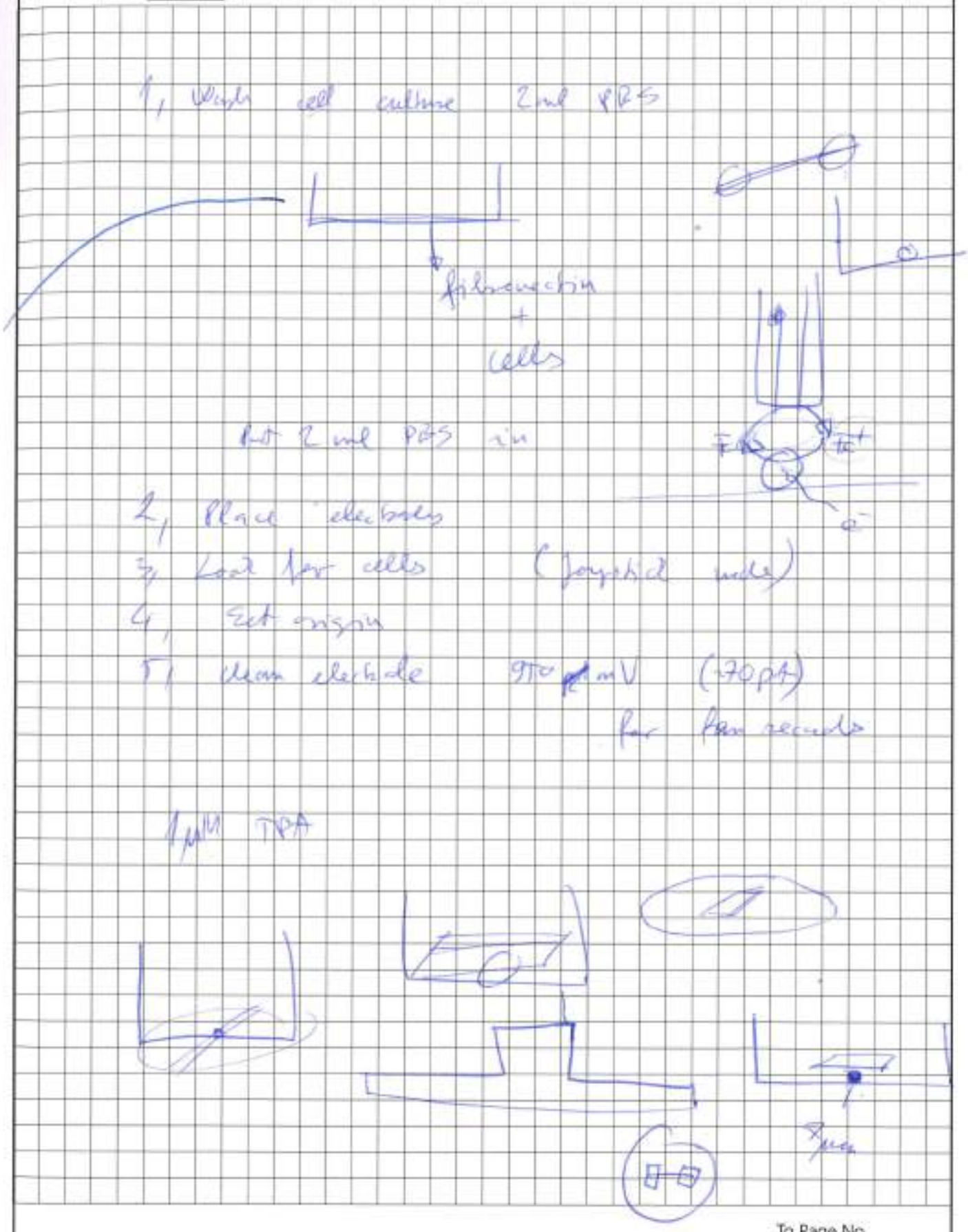
HEKA

Project No. _____

TITLE 180627 Neur cell experiment

Book No. _____

From Page No. _____



To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

TITLE Pt-target wire measurements for spectral deconvolution

Project No.

Book No.

From Page No.

3: meander
4: fast conv 10 µm/s 200 mV 5 mV/pt

50 µm X 50 µm

1 µm X 1 µm step size

51 X 51 pxl 0 – 50

5: 5 µm/s

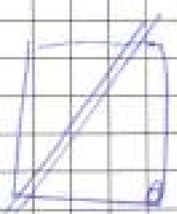
meander

6: best set for Pt electrode

5 µm/s

51 X 51

7. zoom better Δz = 5 µm



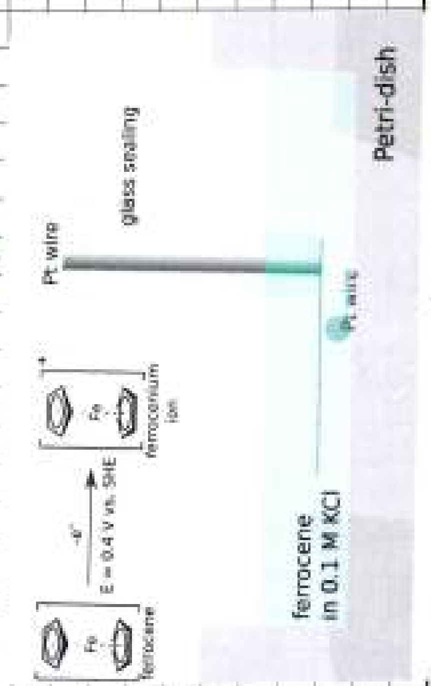
start photo: 007

8:

Ø 25 µm Pt

electrode focus: 5.18 µm start: 010
wire edge foc.: -3.82 µm stop: 011

Results: page 55



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HEKA

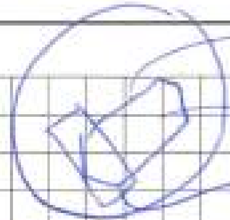
Project No.

TITLE Image of broken microscope slide cover

Book No.

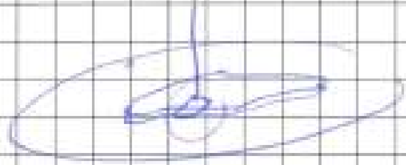
From Page No.

2mM ferrocene in ?



E1_2 — 50x50 µm µm 10 µm/s meander

— 1µm x 1µm



E1_3 fast comb

E1_4 fast comb 5 µm/s

start picture: 004

E1_5 meander 50 µm/s

E1_6 meander 100 µm/s

	m.	f.c
~~0.5~~		
2 1	15 ✓	16 ✓
5	13 ✓	4 17 ✓
10	2 19 ✓	3 18 ✓
50	5 20	
100	6	

E1_13: finish: 7, 6

E1_17: finish: 8

E1_32: finish 13

5 µm/s

101x101

1µm x 1µm res.

E1_33: finish 14

201 ~~101~~x101

1x1

To Page No.

Witnessed and understood by me | Date 180628 | Invented by | Recorded by | Date

Project No. _____

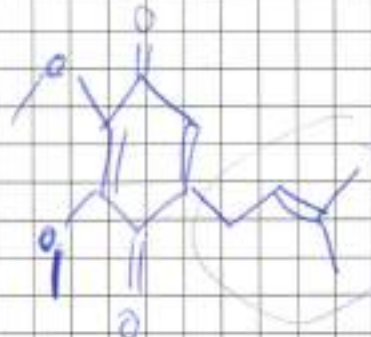
TITLE Vidulin's presentation #2

Book No. _____

From Page No. _____

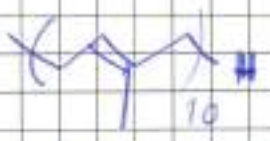
Ca^{2+} affinity of decylubiquinone in organic solvents

(Valentin Mirceski (SWV)
Lovric was his supervisor)



Coenzyme Q_1

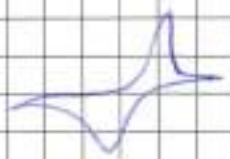
decylubiquinone



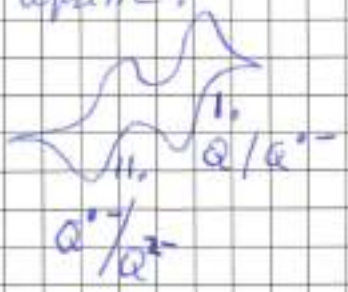
Coenzyme Q_{10}

aprotic solvent → non-proton donating solvent

protic solvent:



aprotic:



= mixture: SVW + SWV
= activity instead of conc.
(temp.)

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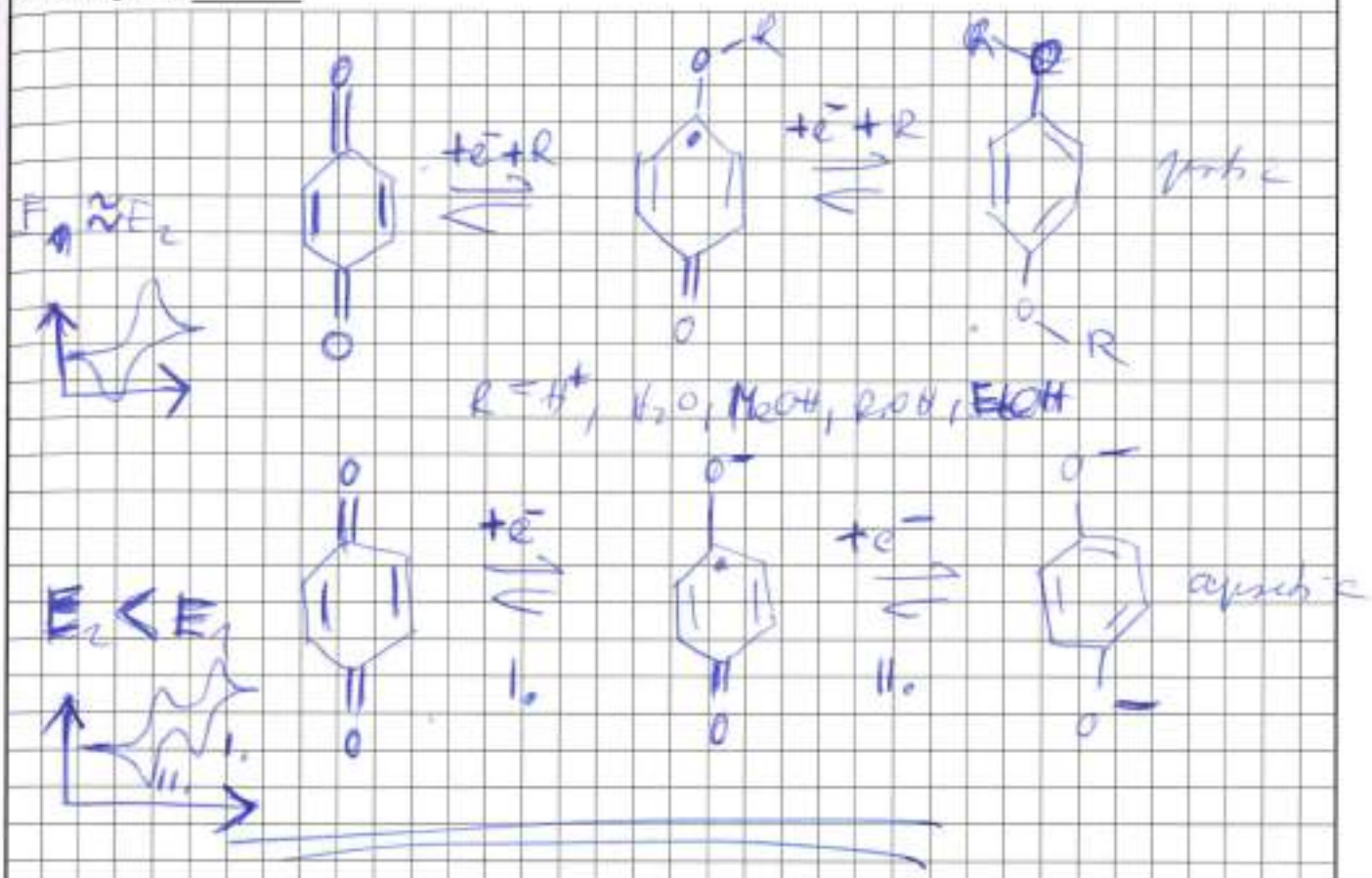

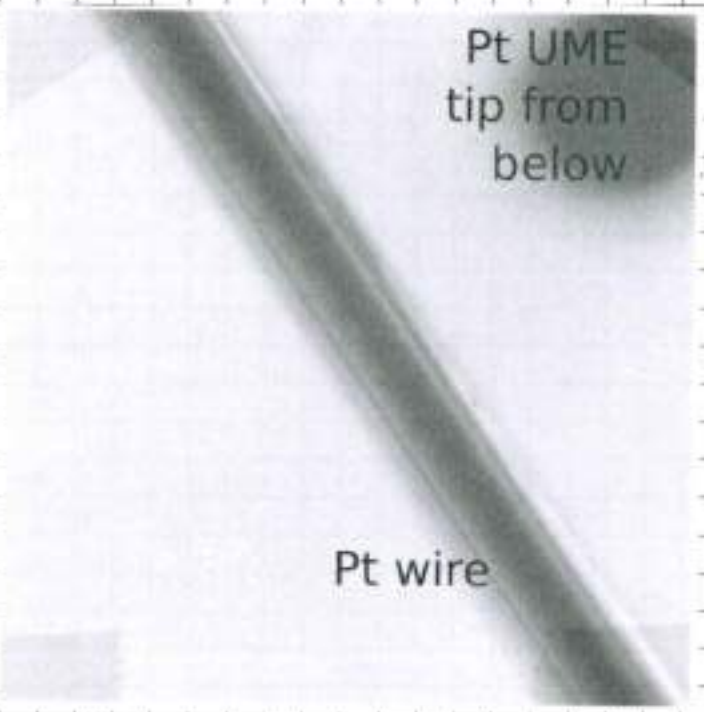

referred to on page 19

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

Project No. _____

TITLE _____ Book No. _____

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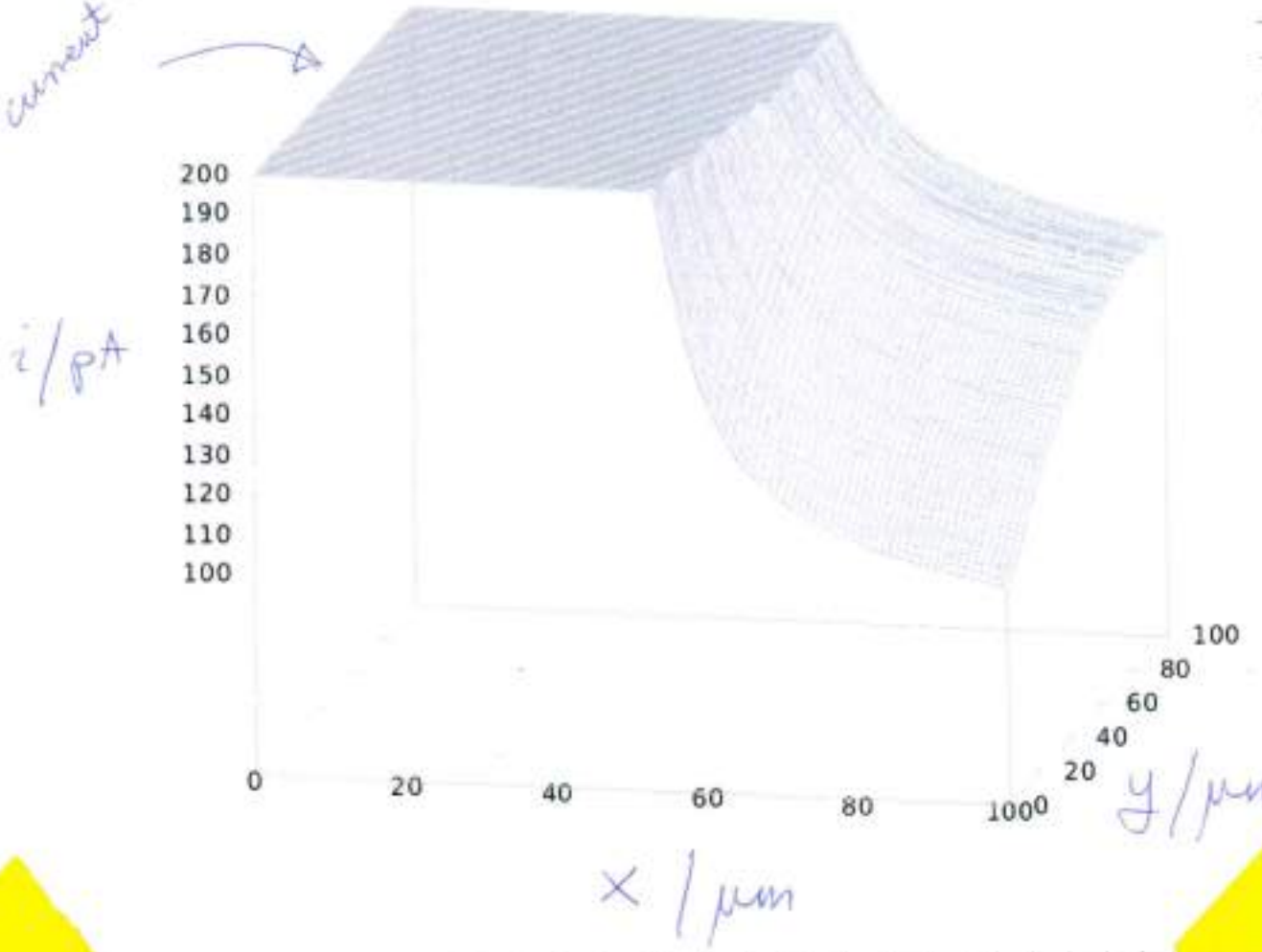
current is out of range !

'32_xyz_separated_lines.txt'



All of the scans from 180628 are clipped at ~200 pA !

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

HEKA

Project No. _____

TITLE Soda-lime glass pulling

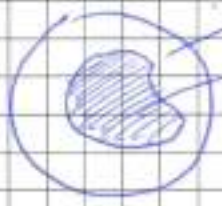
Book No. _____

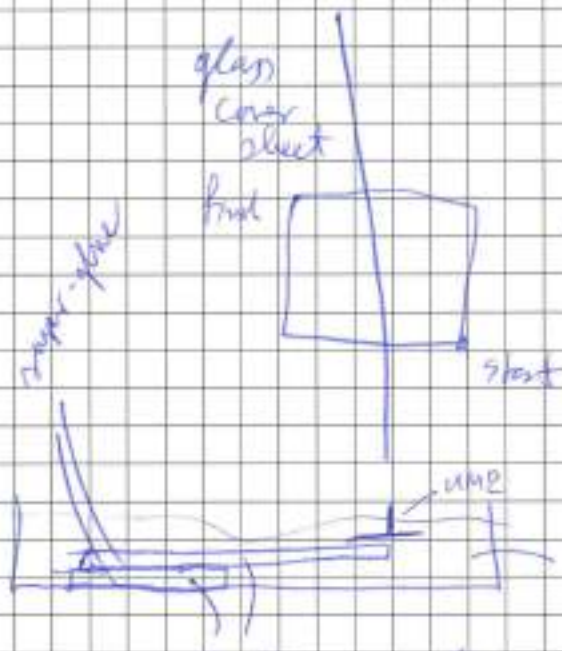
From Page No. _____

Sutter Instrument P-1000

Program 88

180704 Scanning with electrode #8 prepared yesterday





101 points X 101 points

100 µm x 100 µm

~~10 µs~~ 5 µm/s

fast comb scanning algorithm

2 mM ferrocene in 0.1 M KCl

E = 300 mV vs. Ag/AgCl ground

h = 100 µm glass cover sheets

gain: 20 mV/pA

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Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

Continued on next page

Project No. _____

TITLE _____ Book No. _____

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Continued from previous page

- 130704L_F1_1 limits: cell 130704_003.TIF

101 x 101
100 x 100

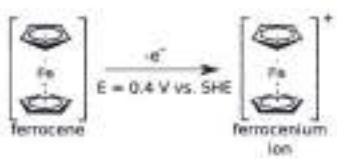
5 µm/s
fast cont

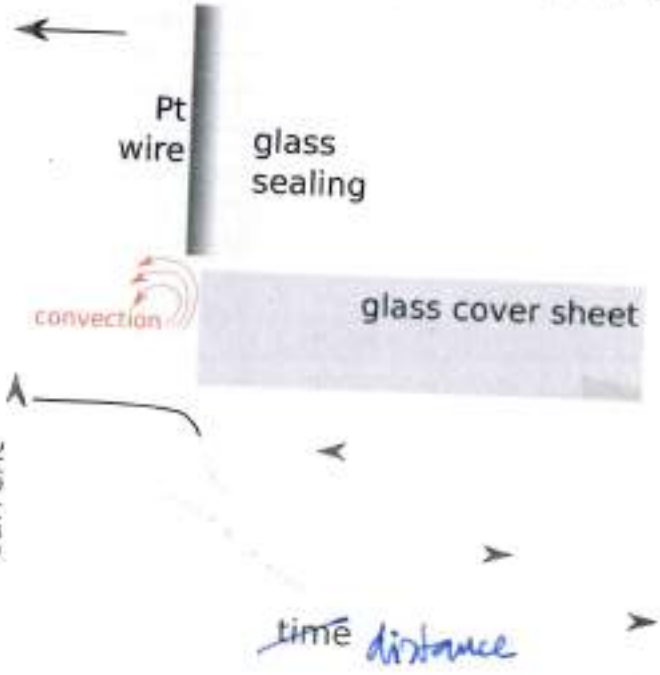
- 13070406_F1_2

10 µm/s meander

speed	algorithm: fast cont	meander
5	1	
10		2
20		
50		3
100		4

Results on page 54.





Project No. _____

TITLE Antirrag microelectrode tests

Book No. _____

From Page No. _____

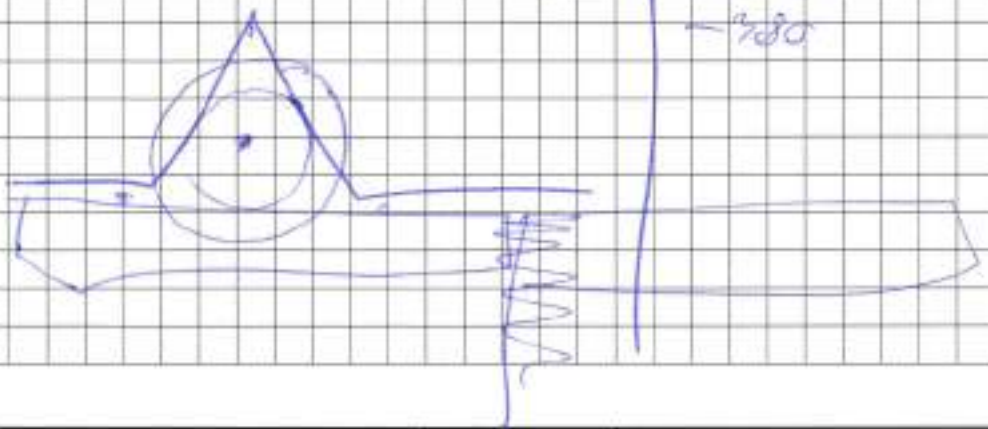
Hanna instruments pH meter pH 211
Microprocessor pH meter

E/mV pH	4 (citrate)	7 (phosphate)
	-200	-330 mV

80mV / 3
26 mV / pH

Buffers were kindly provided by Katerina.

pH	Hanna E/mV	EL Bofan E/mV
4	-210	
7	-330	-368
4	-377	
4	-260	117 / 3
		39 mV / pH
4	-262	
	-380	



To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

Project No. _____

TITLE Writing a script to fix the meander algorithm

Book No. _____

From Page No. _____

Problem :

X	Y	Z	
0	0		1st line
1	0		
2	0		
3	0		
4	0		
0	1		2nd line
1	1		
2	1		
3	1		
4	1		

The direction should be reversed for the even numbered lines, like this :

X	Y	Z
0	0	
1	0	
2	0	
3	0	
4	0	
4	1	
3	1	
2	1	
1	1	
0	1	

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	180709

HEKA

From Page No. _____

fc2m.sh „Fast code to meander"

inputs: 1/ # of ~~points~~ points in a line (x)

example from the left: x=5

2/ # of lines (y)

example from the left: y=2

usage: fc2m -x 5 -y 2 -f test.txt
-o test_0.txt

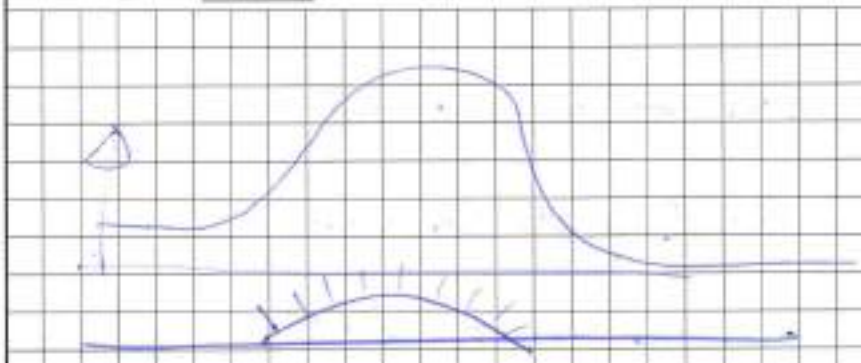
bash argument: getopts

```
while getopts u:d:p:f: option
do
case "${option}"
in
u) USER=${OPTARG};;
d) DATE=${OPTARG};;
:
esac
done
```

finished script on next page!

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

From Page No. _____



```
#!/bin/bash

POSITIONAL=()
while [[ $# -gt 0 ]]
do
key="$1"

case $key in
    -x|--x)
    x="$2"
    shift # past argument
    shift # past value
    ;;
    -y|--y)
    y="$2"
    shift # past argument
    shift # past value
    ;;
    -if|--inputfile)
    inputfile="$2"
    shift # past argument
    shift # past value
    ;;
    -of|--outputfile)
    outputfile="$2"
    shift # past argument
    shift # past value
    ;;
    *)    # unknown option
    POSITIONAL+=("$1") # save it in an array for later
    shift # past argument
    ;;
esac
done
set -- "${POSITIONAL[@]}" # restore positional parameters

#old version done with sed, not complete
#cp /dev/null $outputfile
#for i in $(seq 0 2 $y); do
# sed -n "$((i*x+1)),$((i*x+x)) p" "$inputfile" >> "$outputfile"
# sed -n "$(((i+1)*x+1)),$(((i+1)*x+x)) p" "$inputfile" | tac >> "$outputfile"
#done

#with awk
cp /dev/null $outputfile
for i in $(seq 0 2 $y); do
 awk -v line="$i" 'NR>=$((i*x+1)) && NR<=$((i*x+x))'{print $2*1000000, line, $3*1000000000000}'
$inputfile >> $outputfile
 awk -v line="$i" 'NR>=$(((i+1)*x+1)) && NR<=$(((i+1)*x+x))'{print $2*1000000, line+1,
$3*1000000000000}' "$inputfile" | tac >> "$outputfile"
done
```

To Page No. _____

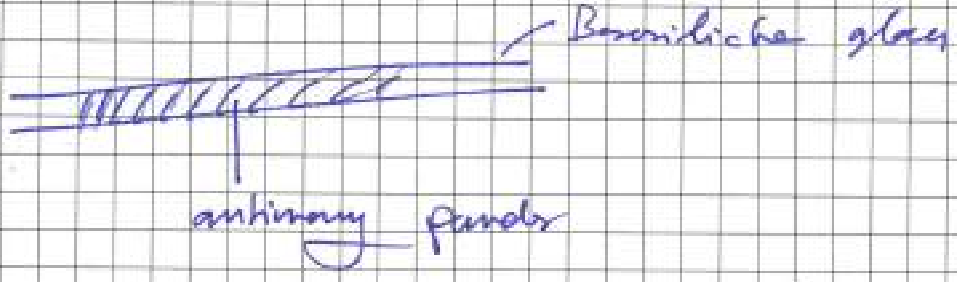
Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

Project No.

TITLE Trying out a new technique to fabricate Sb microelectrodes

Book No.

From Page No.



P-1000 horizontal puller

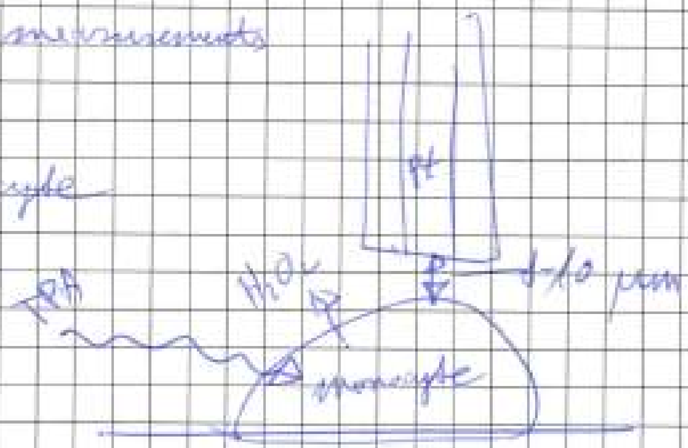
180710 | H_2O_2 measurements

above monocyte

E=650 mV

50 µm/50 µm

2 µm/2 µm



180710_1.dat

1. [illegible] : fast curl 5 µm/s

2. [illegible] mode 10 µm/s

plate switched

To Page No.

Witnessed and understood by me	Date	Invented by	Date
	180709	Recorded by	

HEKA

Project No. _____

TITLE Testing antimony microelectrodes prepared yesterday

Book No. _____

From Page No. _____

	E@ pH=7 PBS (mV)
1	—
2	-409.16
3	-394
4	-378
5	-360
6	-350
7	-350
8	-350
9	-358
10	-357

9/10

62 pixel = 10 μm (40X)

cell	bulk
-415	-413
-416	-413

17th bulk
24 cell
25 bulk

+E.coli.

21 bulk
35 cell (macrophage)
⋮
41 4:30
52 6:30

-430mV → -696mV

300μl
1N NaOH

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
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HEKA

Project No. _____

TITLE Attempting to image yeast cell CO2 output

Book No. _____

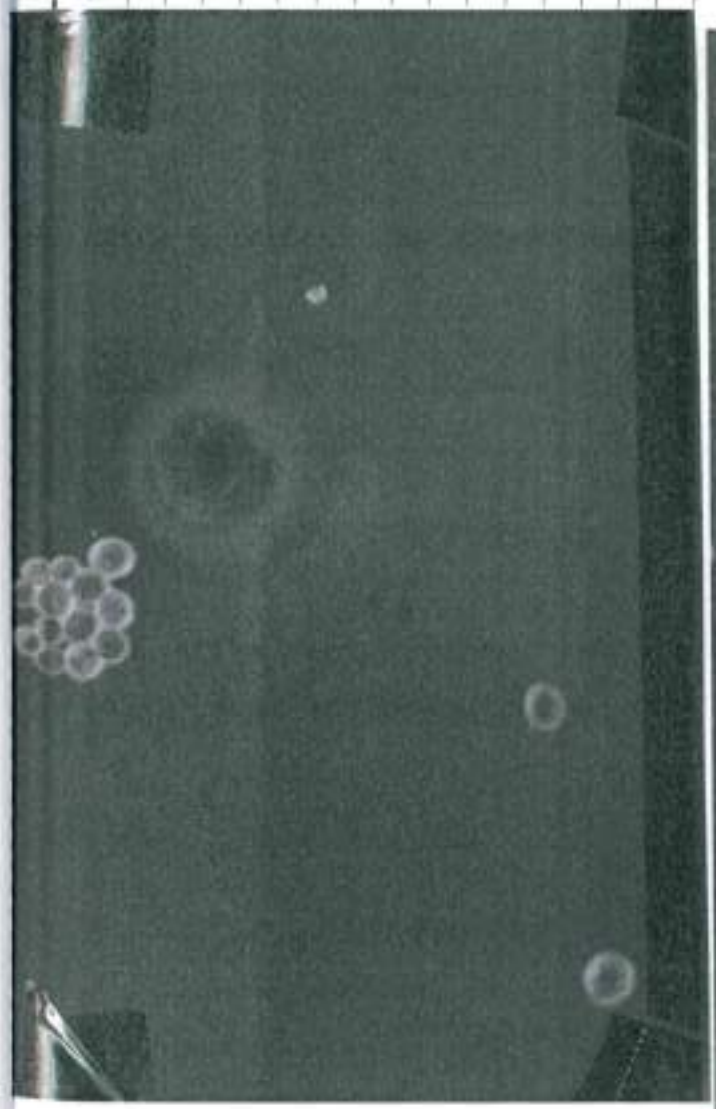
From Page No. _____

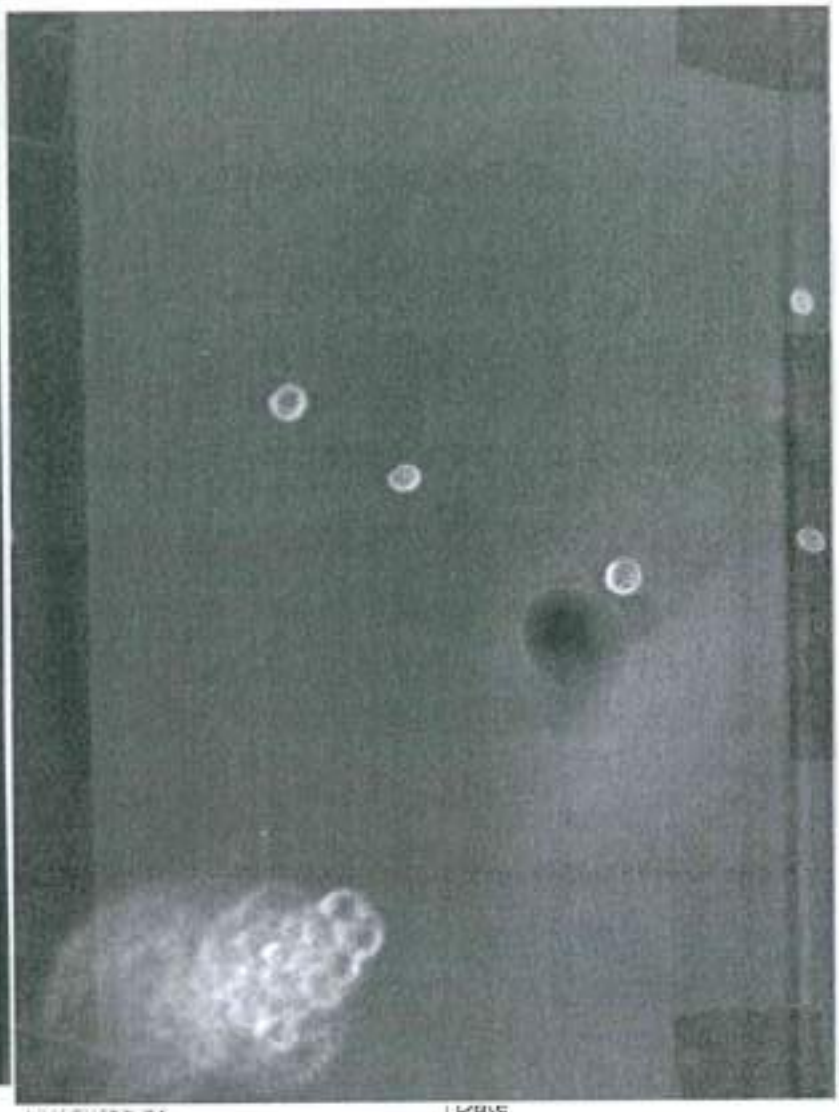
Broth: 2g glucose in 100 ml dw.

Yeast: „Oma's Ur-Hefe Universal" from Edeka

I could not observe any pH change above the yeast cells.

(pH electrode #7 broke.)





Recorded by

Date

180713

Project No. _____

TITLE Scanning oxygen above the human monocytes

Book No. _____

From Page No. _____

180716_01

E1 - ?

incomplete

Monocytes 6 days old

100µm X 100µm area

101 x 101 points

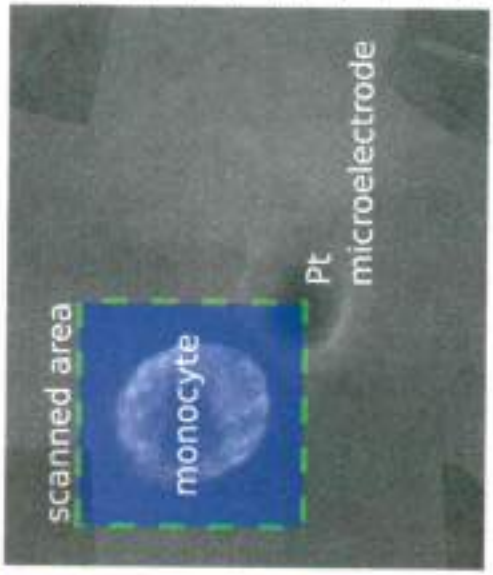
↓

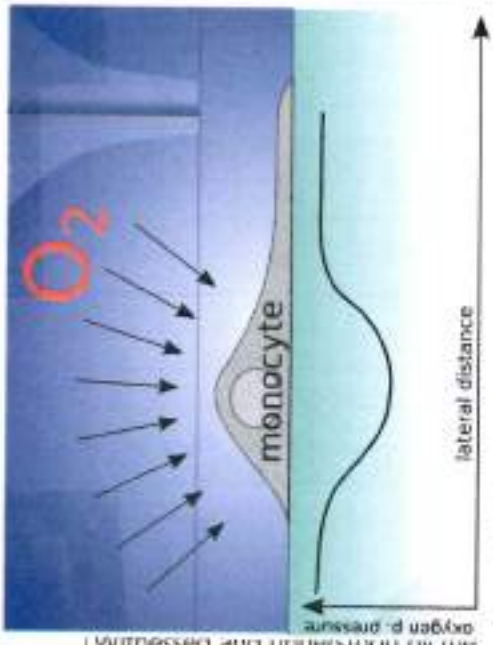
1µm x 1µm step size

10µm/s scanning speed

meander algorithm

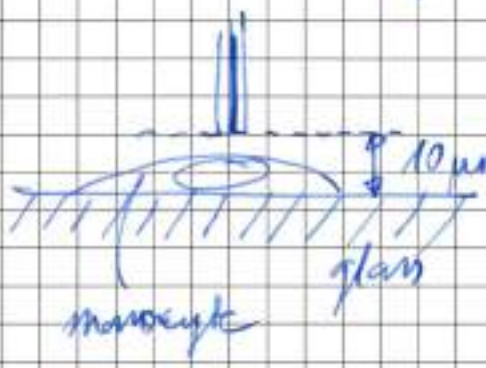
electrode #8





E = -700mV vs. quasi-reference (chlorinated silver wire)

medium + electrolyte: PBS + 10mM glucose



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Date	Invented by	Date
180716	Recorded by	

HEKA

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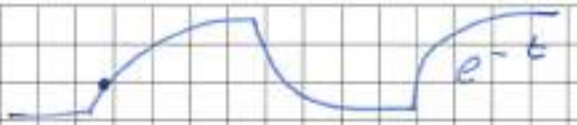
E1 - 3 40 µm / 40 µm

41 x 41

5 µm/s meander incomplete



start: 3 (Cell18276_003.TIF)
finish: 4

E1 - 4 40 µm X 40 µm incomplete

41 x 41

1 µm/s fast cont

E1 - 5 40 µm x 40 µm h = 3.15 µm

41 x 41

10 µm/s meander

E2 - 1 60 µm x 60 µm

61 x 61

0.5 µm/s fast cont

---

new cell

z = -26.71 µm

E2 - 8 x y

40 x 40

801 x 41

fast cont

5 µm/s

E2 - 9

40 x 40

401 x 41

meander

10 µm/s

E2 - 10

20 µm/s meand

Only 401, because it's 10 times faster

E2 - 11

50 µm/s

meand

E2 - 12

0.5 µm/s

fast cont

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
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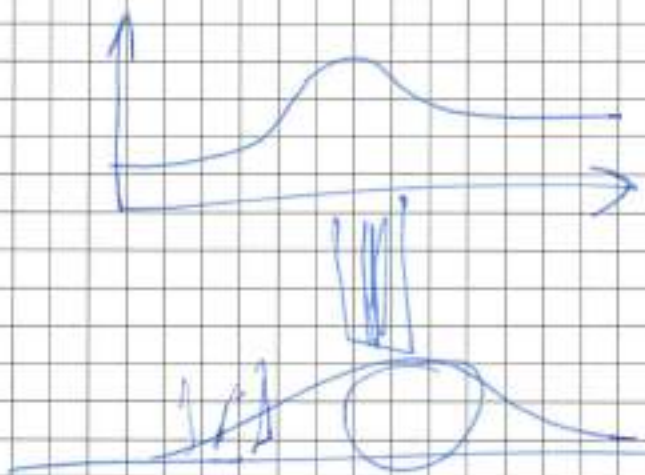
r/µm/s	fast comb	meander
1	~~(E2-13)~~	
5	E2-8	
10		E2-9
20		E2-10
50		E2-11

+ step response? →

cell dead: E2-15



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Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

+20µl of 100mM H_2O_2

$V_{total} = 2$ ml

$20 \cdot 10^{-6}\,dm^3 \cdot 0.1 \frac{mol}{dm^3}$

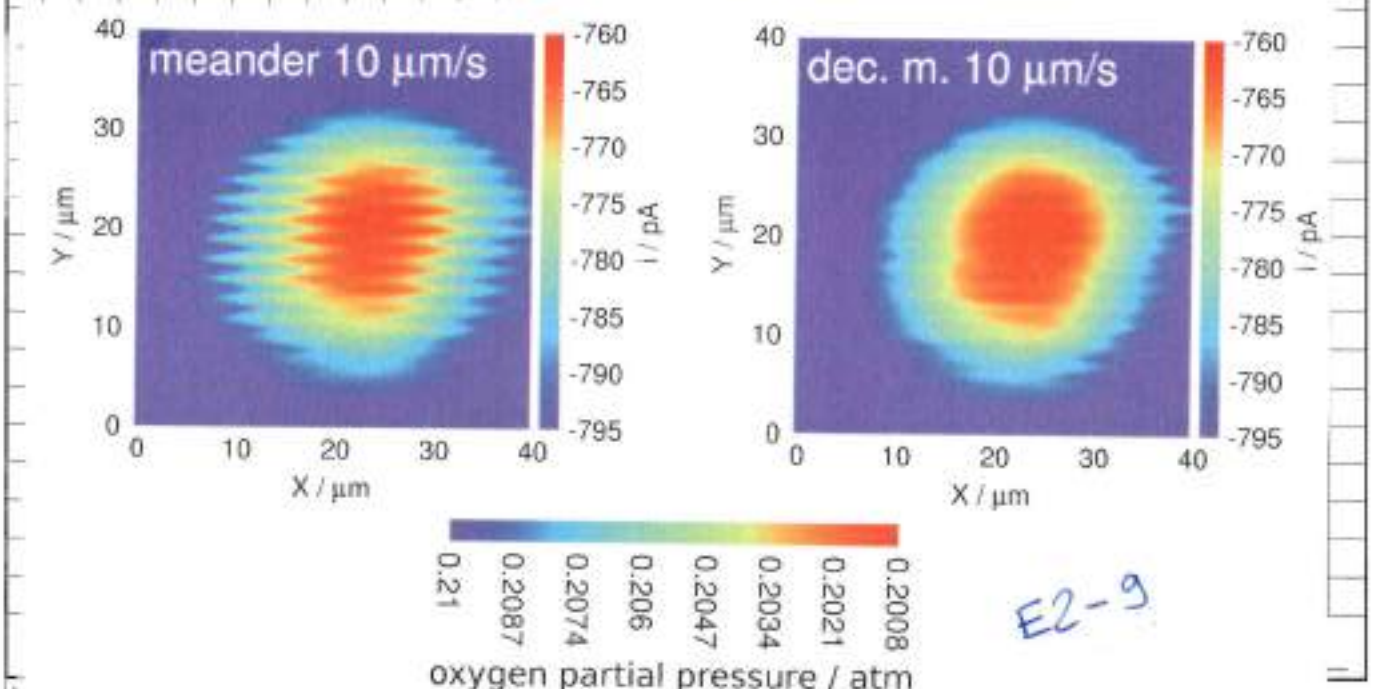
$2 \cdot 10^{-5}\,dm^3$

$2 \cdot 10^{-6}$ mol

2 µmol in $0.002\,dm^3$

$c = \frac{0.000002\ mol}{0.002\,dm^3}$

$c = 1$ mM H_2O_2



E2-9

recorded by

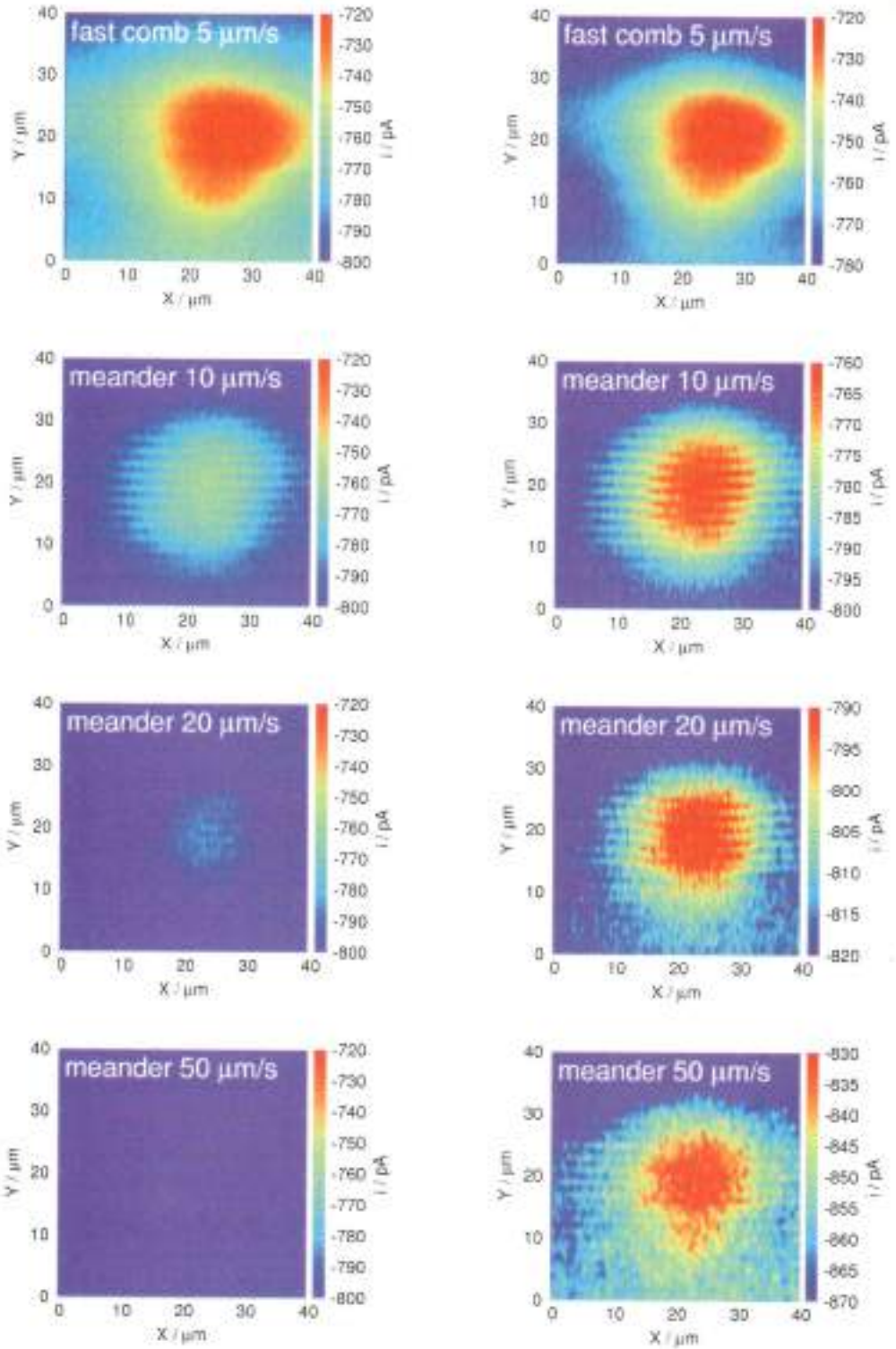


Figure 1: Oxygen reduction current above a human monocyte at h = 10 µm relative to the glass bottom of the Petri–dish. Working electrode: d = 10 µm Pt UME, RG ≈ 2.5, E = -700 mV vs. Ag/AgCl quasi–refenc electrode. Medium/electrolyte: PBS + 10 mM glucose. Date: 2018.07.16. Left column: fixed scale -800 pA to -720 pA. Right column: autoscale.

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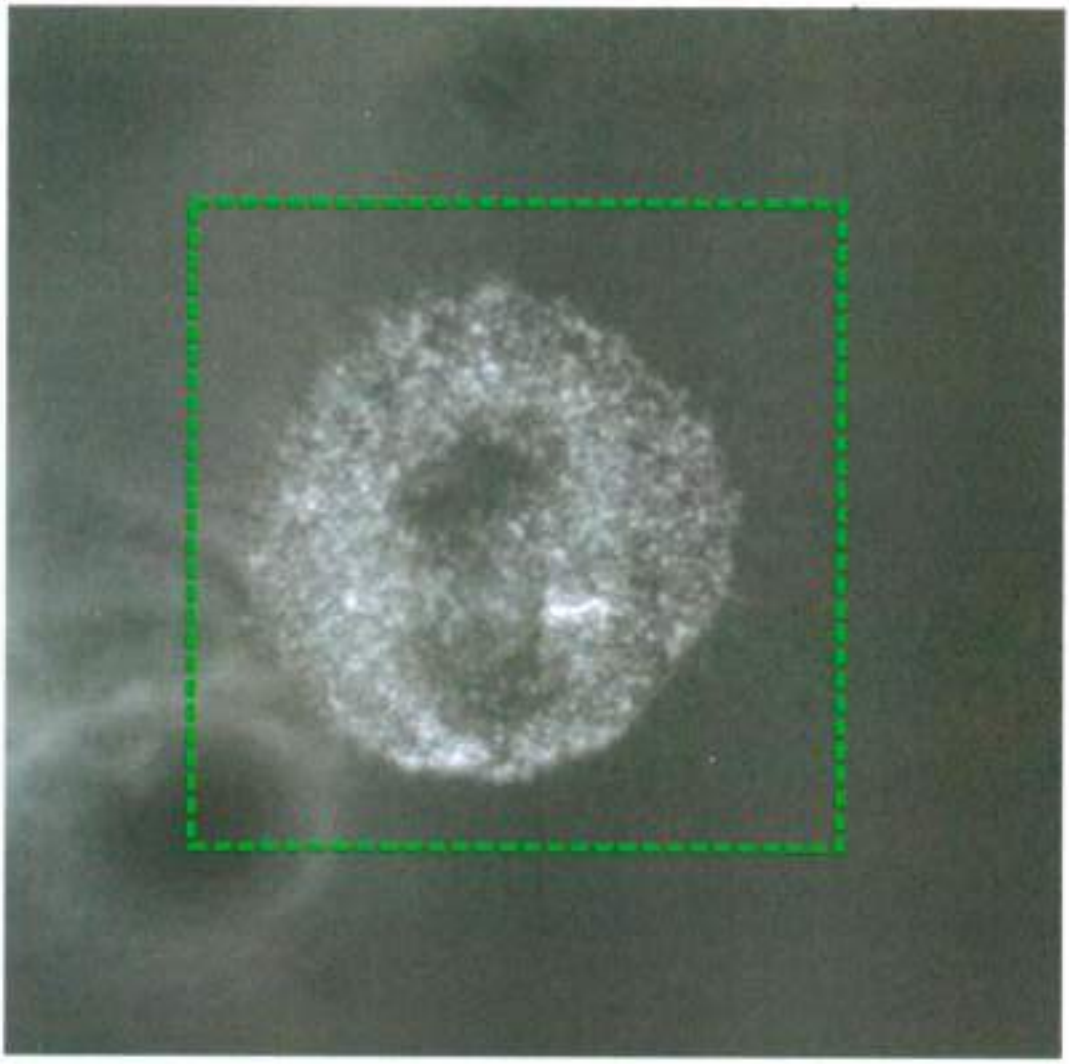

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1/ Scale pH = 6 6.5 7 7.5 8 buffers (PBS)

adjusted with 1N HCl and 1N NaOH

real pH 6.06 6.57 7.06 7.5 8.03 ~~8.42~~ 8.42

measured with Hanna pH 211

pH	E/mV
6.06	-293.1
6.57	-318
7.06	-344
7.5	-364
8.03	-388
8.42	-403

Sb #3

v. Mehrlum

Ag/AgCl/3M KCl ref. electrode

with HEKA patch-clamp EPC 10 USB

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HEKA

pH	E (mV) vs Ag/AgCl quasi-ref (chlorinated silver wire)
6.06	-315
6.57	-336
7.06	-358
7.5	-377
8.03	-397
8.42	-415

The slope is similar to that of V measured against an Ag/AgCl/3M KCl Ketolum ref. electrode.
The potentials are shifted by about -20mV, as a consequence of the shift in the potential at the reference half-cell.
The minor difference in acetate buffers doesn't seem to effect the response notically.

Witnessed and understood by me	Date	Invented by	Date
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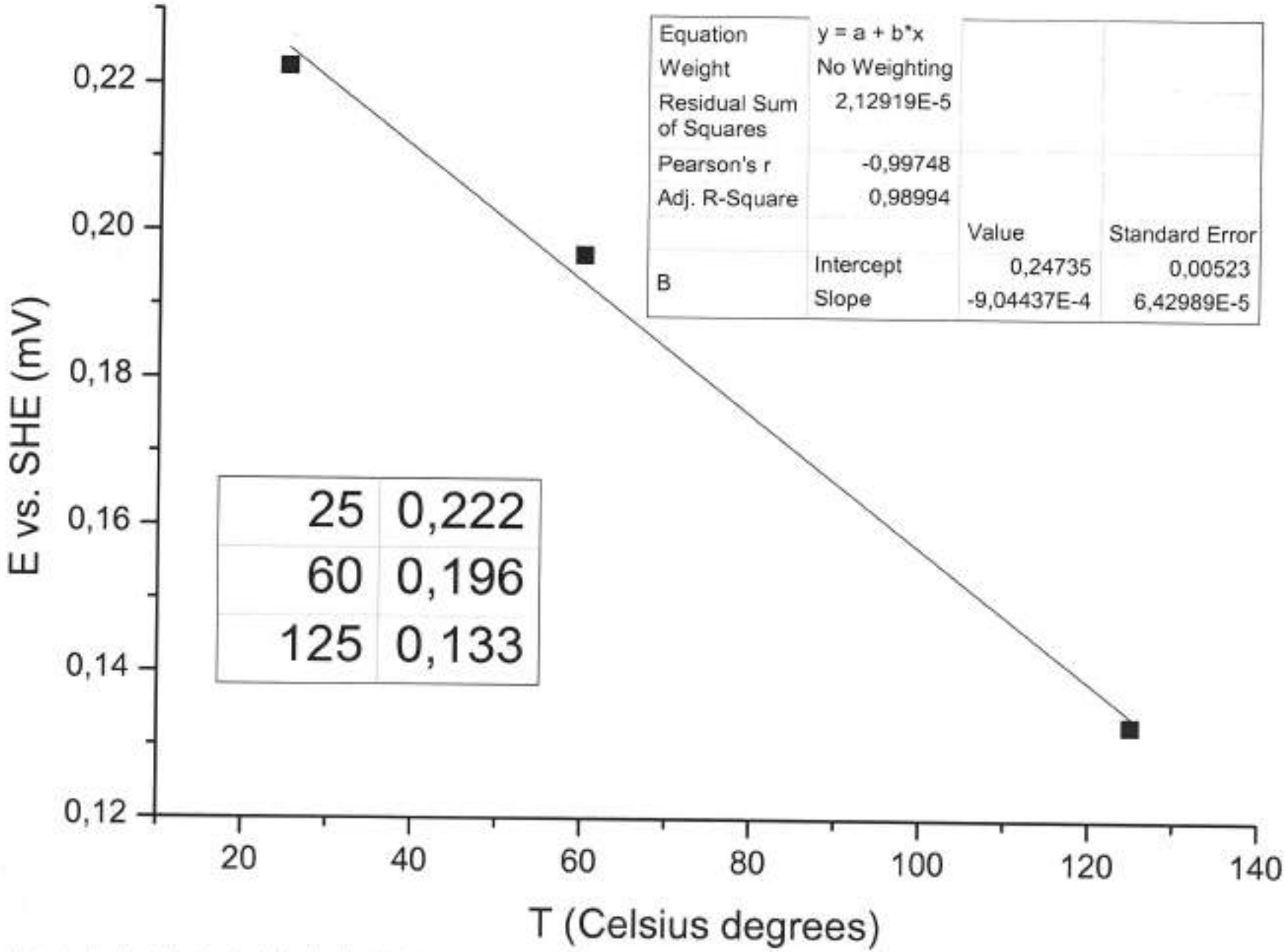
HEKA

Witnessed and understood by me | Date

Invented by | Recorded by | Date



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Project No.

Book No.

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TITLE _____ Book No. _____

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Project No. _____

TITLE Investigating the noise problem

Book No. _____

From Page No. _____

The noise in chronoamperometric measurements increases as temperature increases

2ml PBS
E = 650mV
Pt WE # 8

t = 36.8°C
noise ≈ 3.48pA − 3.53pA ≈ 305fA

1:22:30 thermostat off

t / °C	≈ noise
~~36.8~~	~~305 fA~~
32.8	270 fA
31.3	200 fA
30.0	~~50 fA~~) ≈ 110 fA
28.0	130 fA
27.0	110 fA
26.0	90 fA
23.0	60

Arrhenius-equation
$k = A e^{\frac{-E_a}{RT}}$

(1:51:00 + ice ≈ 18°C
1:54:00 + ice

16°C | ~~58 fA~~

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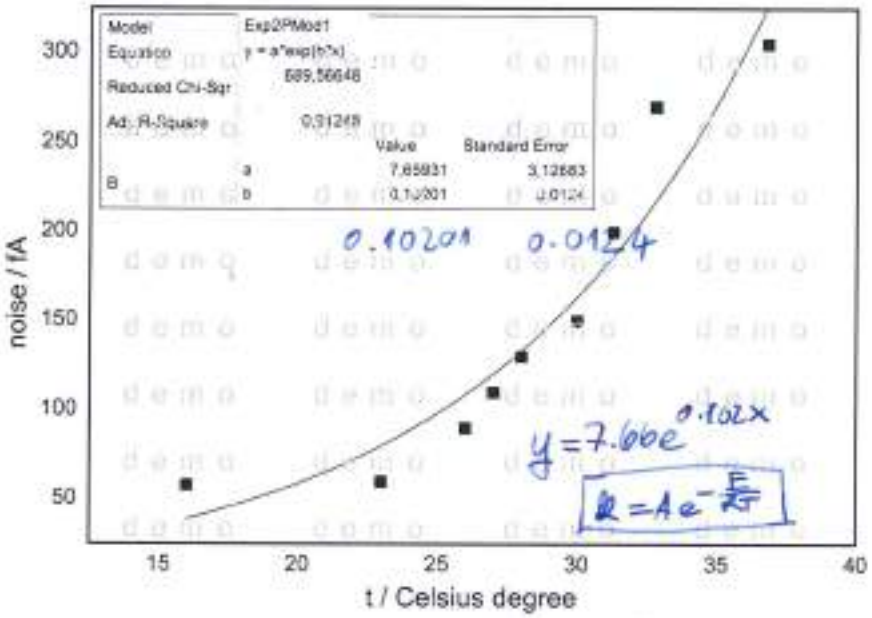
Witnessed and understood by me	Date	Invented by	Date
	180719	Recorded by	

HEKA



The observed noise might be caused by the increased reaction rate. It appears that the magnitude of the noise follows the Arrhenius law.

$$k = A e^{-\frac{\Delta E}{RT}}$$

Note on 2018.08.07:
The signal is not increasing with temp. as much, because the rate limiting step is not the electrode reaction, it's transport limited.

Witnessed and understood by me	Date	Invented by		Date
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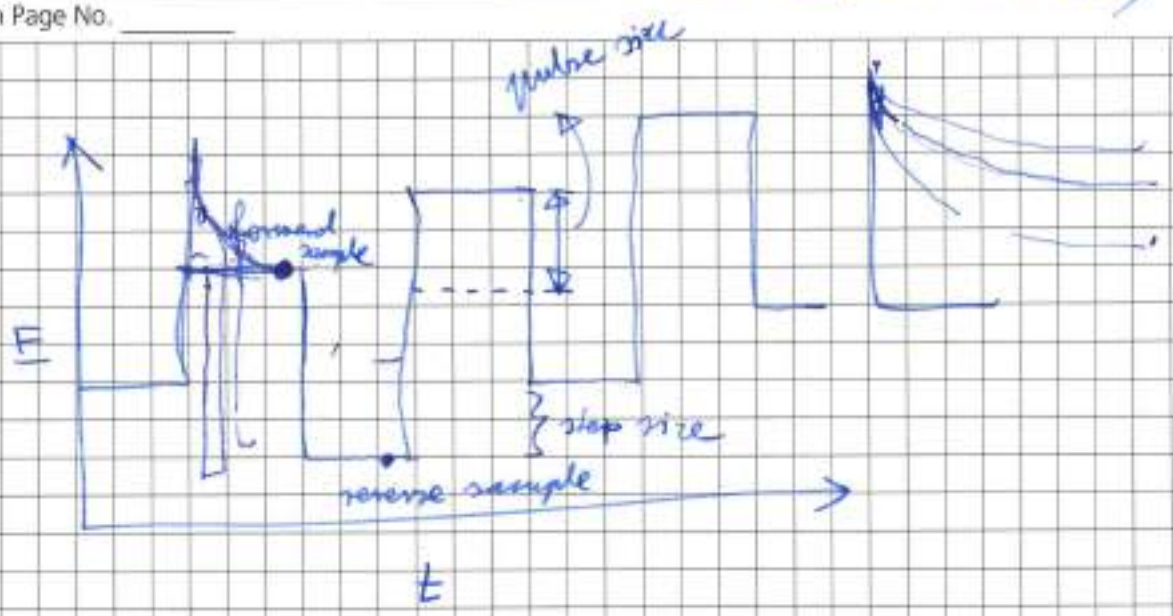
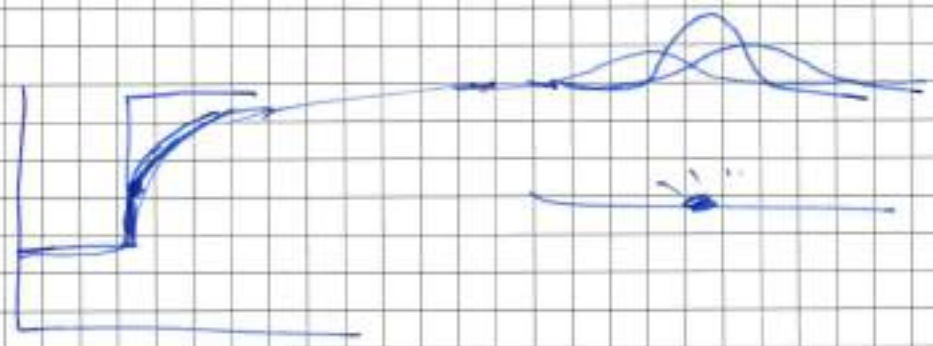
Project No. _____

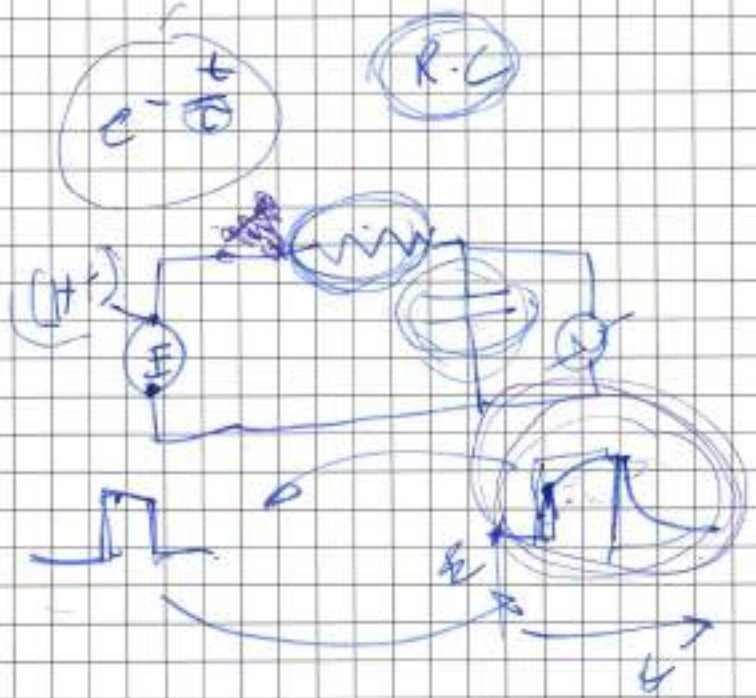
TITLE Square wave voltammetry (Discussion with Valentin)

Book No. _____

From Page No. _____







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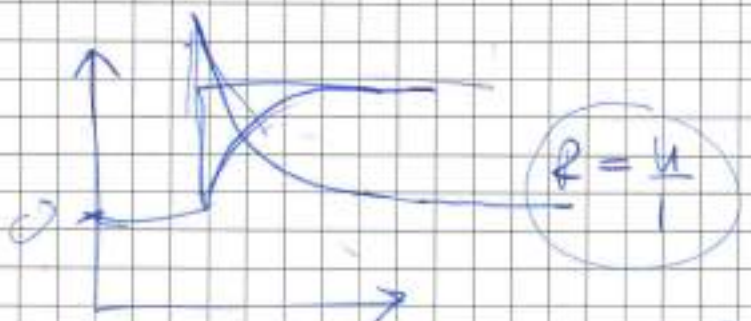
		Recorded by	

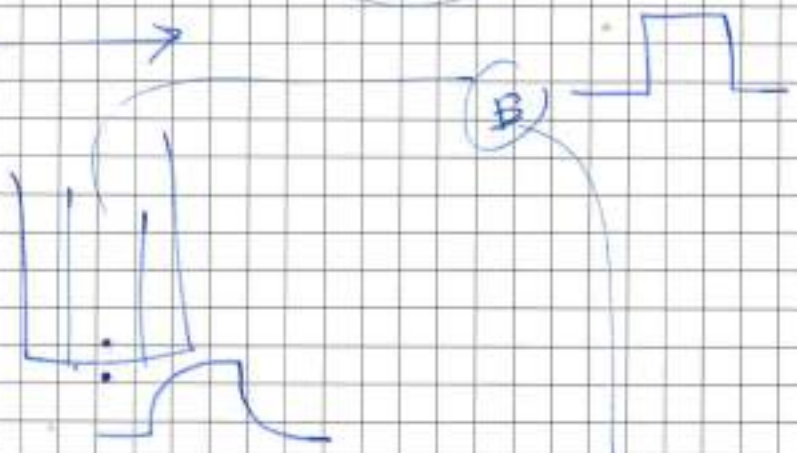
HEK

Project No. _____

TITLE _____ Book No. _____

From Page No. _____ Discussion with Valentin





$i_t = Ae^{-\frac{t}{\tau}} + \frac{1}{\sqrt{t}} + b$

$\frac{1}{\sqrt{t}}$

$\frac{V}{J} = \frac{1}{\sqrt{x}}$

$x = \left(\frac{1}{J}\right)^2$

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
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Project No. _____

TITLE Platinum etching in aqua regia

Book No. _____

From Page No. _____

Aqua regia: 1:3 (mole ratio) mixture of HNO_3 cc. and HCl cc.

HCl
HCl
HCl

$HO-N^{+}(=O)-O^{-}$

(Merck) $[HNO_3] = 6.66 \frac{mol}{dm^3}$ (not cc.) this was a very old solution

$[HCl] = 11.65 \frac{mol}{dm^3}$, 37%. (cc)

2 ml HNO_3 ad.
3 ml HCl ad.

$t \approx 100°C$

etch start: 13:00
finish: 13:40

10 µm Pt wire was etched down to ~2.5 µm

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Witnessed and understood by me	Date 130724	Invented by	Date
		Recorded by	

HEK

Project No. _____

TITLE _____ Book No. _____

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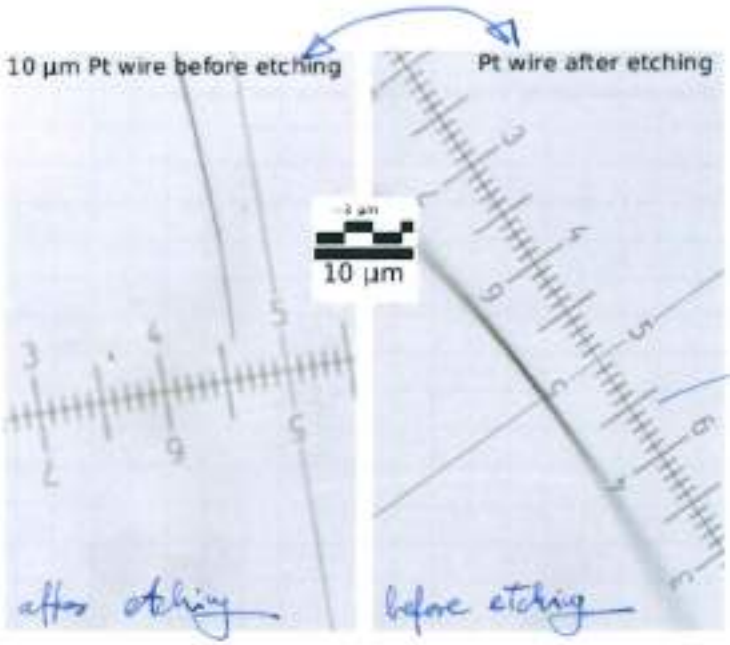


One notch here is 10 µm

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

Project No. _____

TITLE Planning the presentation

Book No. _____

From Page No. _____

1, introduction → what is SECM
2, previous work → potentiometry
3, SECM Conferences Vienna
4, question: „Can it be done for amperometric SECM?"
5, YES: page 3. ← amperometric cell, feedback ...
6, I've started a rigorous study
   a, glass sheet
   b, Pt wire

→ deconvolution worked surprisingly well!

7, cells: H_2O_2 sink
~~H_2O_2 source~~
O_2 sink ✓
→ 2 cells

8, spatial deconvolution
   DST
   ⋮

9, thank you ← photos from PEIs

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
	130726	Recorded by	

HEKA

180731

Project No. O_2 mapping

TITLE Additional measurements

Book No.

From Page No.

1/ O_2 reduction above glass sheet / bulk

2/ O_2 change response

3/ very slow scan (O_2 reduction) for spatial deconvolution (slowest possible)

0.1 µm/s ?

- with circular Pt electrode 10µm
- electrolyte: PBS + 10mM glucose (same as for monocytes)

— ∅ —

speed µm/s \ algorithm	meander	fast comb	
1		12	
2			
5			
10	E2-4	E2-3	~~0.1 µm/sample~~
20	E2-5	E2-6	1 µm/sample
50	E2-~~8~~&7	E2-9	1 µm/sample
100	E2-11	E2-10	data not shown correctly by software

optical and electrochemical images are horizontally mirrors of each other

To Page No.

Witnessed and understood by me | Date | Invented by | Recorded by | Date

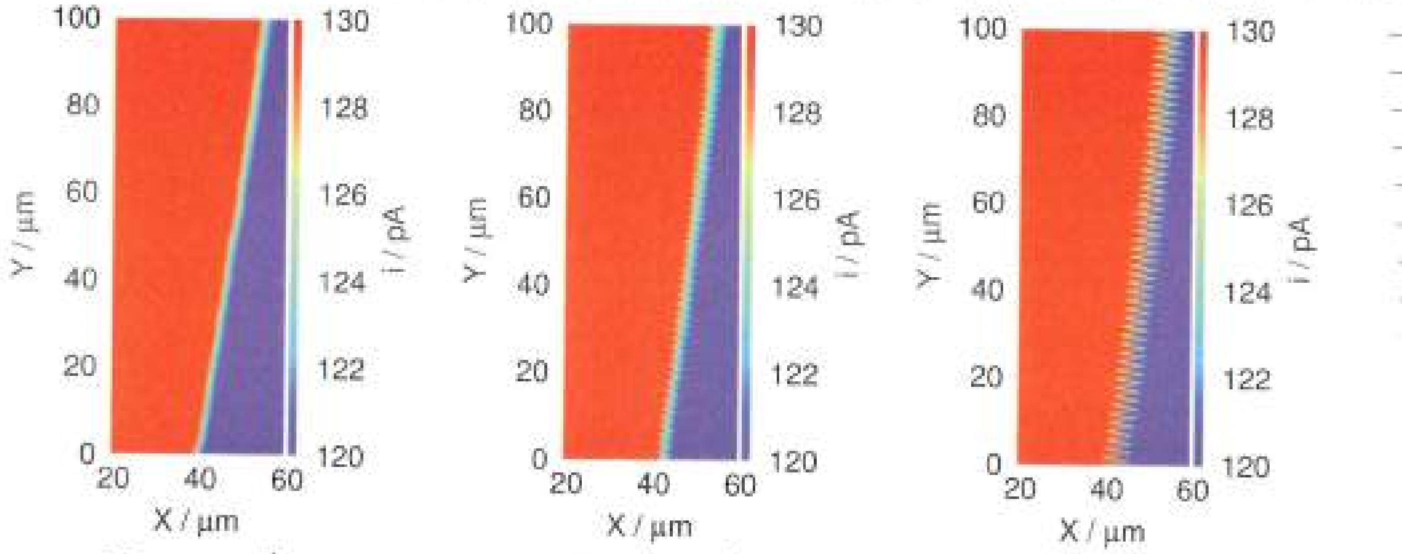
TIF: 3

E2-13 is for spatial deconvolution!

Project No. ______

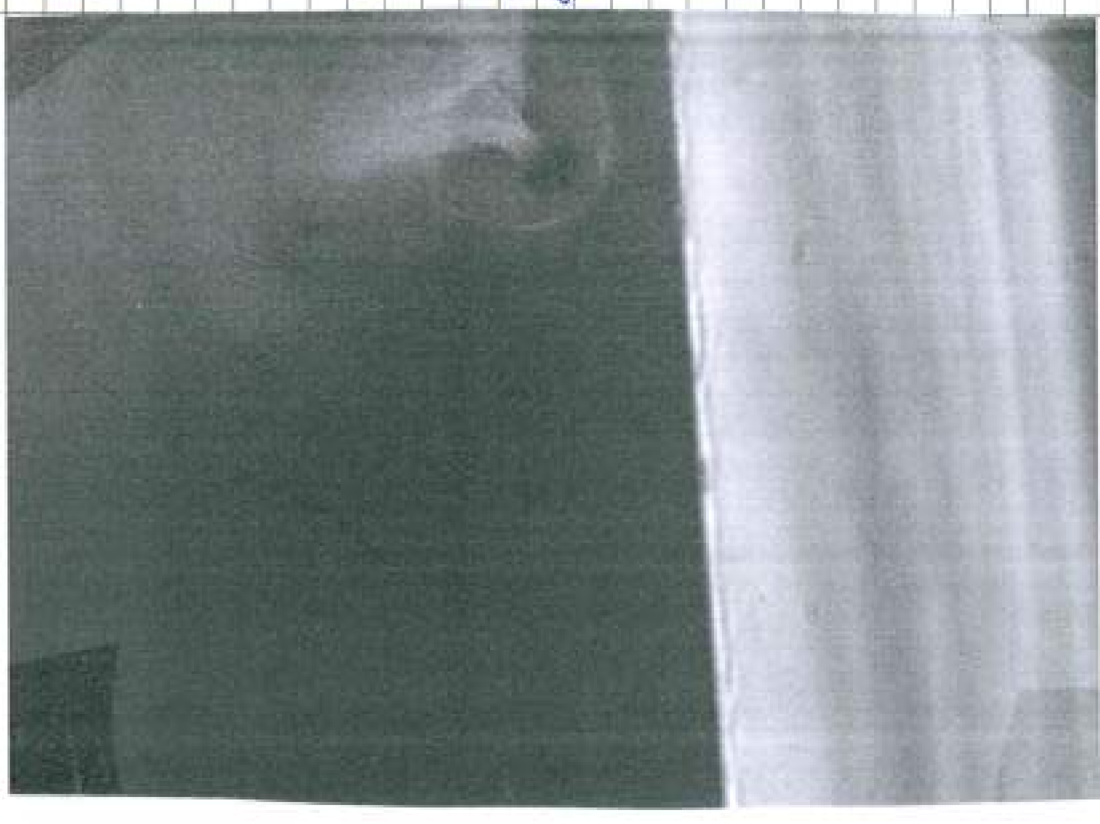
TITLE ______ Book No. ______

From Page No. ______



5 µm/s 10 µm/s 10 µm/s deconvoluted

Referred to from page 24.



Optical image is mirrored horizontally because it's taken with the inverse microscope of the HEKA

e No. ______

Witr

Project No. _____

TITLE _____ Book No. _____

From Page No. _____

Referred to on page 18.

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

Project No. _____

TITLE Deconvolution of already slow image

Book No. _____

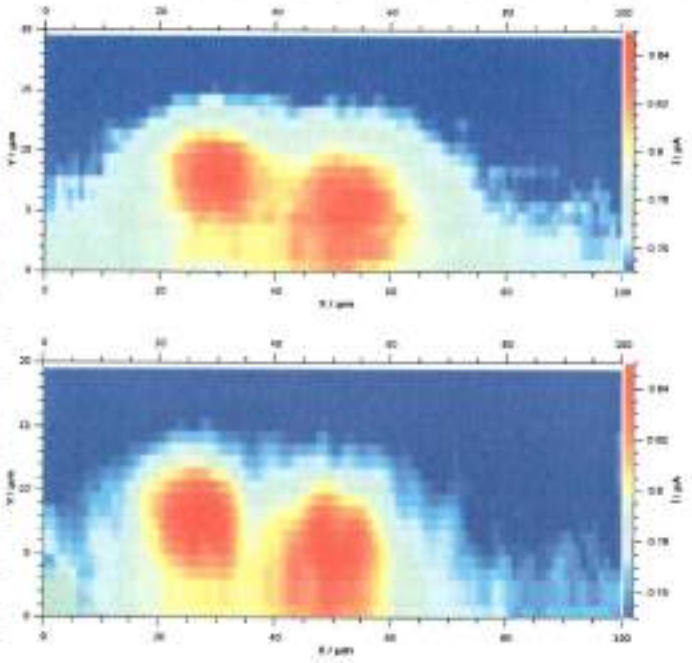
From Page No. _____

Targets: 2 monocytes stimulated with TPA

↓

Extracellular H_2O_2 conc. increases.

scan rate: 2 µm/s



From: 2014. april 1.

There isn't much improvement. The image was already pretty good.

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Witnessed and understood by me	Date	Invented by	Date
Notes written in 2+13.08.07.		Recorded by	

HEKA

From Page No. _____

```
#!/usr/bin/env python

'''
Deconvolution of distorted SECM images.
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Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston,
MA 02110-1301, USA.


 Here is a first attempt at porting the deconvolution algorithm
 from FORTRAN to python. The gaussian filter is not yet implemented
 in the program. Right now I do it with the plotting software (gnuplot),
 but it would be better if the python program did it. Also, I haven't
 done the command line argument interpreter yet, so the file name must
 be changed in the code every time. A GUI would be nice, and a live plot
 of the convoluted and deconvoluted image. For that, the XYZ data needs
 to be converted to a matrix.

'''

import numpy as np
import subprocess

conv_img = np.loadtxt("9_41_meandered.txt")
deconv_img = np.copy(conv_img)
e0 = np.float32(conv_img[0][2])
for n in range(0, conv_img.shape[0]):
        deconv_img[n][2] = np.float32((conv_img[n][2]-e0*0.68)/(1-0.68))
        e0 = np.float32(conv_img[n][2])

np.savetxt('9_41_meandered_deconvoluted.txt', deconv_img, delimiter=" ")

#proc = subprocess.Popen(['gnuplot','-p'],
#                        shell=True,
#                        stdin=subprocess.PIPE,
#                        )
#proc.stdin.write('set xrange [0:10]; set yrange [-2:2]\n')
#proc.stdin.write('plot sin(x)\n')
#proc.stdin.write('quit\n') #close the gnuplot window
```

The deconvolution algorithm in Python.
I've written it on 2018.07.02.

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Witnessed and understood by me	Date	Invented by	Date
		Recorded by	