DIYbio

19 Feb 2009

NEWSLETTER

Homebrew Computer Club

Robert Reiling, Editor ☐ Post Office Box 626, Mountain View, CA 94042 ☐ **Joel Miller**, Staff Writer

Typesetting, graphics and editorial services donated by **Laurel Publications**, 17235 Laurel Rd., Los Gatos, CA 95030 (408) 353-3609

RANDOM DATA

By Robert Reiling

Computer clubs continue to form around the country...E. Brooner would like to have material to help him get started with the "Flathead Computer Society" in the Kalispell area. His Address is P.O. Box 236, Lakeside, Montana 59922.

Did you see the SOL terminal demonstrated by Bob Marsh at the Sept. 1st meeting? An excellent design that will interest hobbyists and commercial users alike. It's available from Processor Technology, 6200 Hollis St., Emeryville, CA 94608. Write them for prices and specifications.

The OSI Systems Journal has been sent to all OSI customers (free—at least for the time being). It's a bi-monthly magazine with plans to go monthly in the future. There are 28 pages in the first issue (August 1976, Vol. 1, No. 1) with a hardware feature covering the OSI 440 Video Graphics System and software, features concerning Tiny BASIC for the 6800 and a Graphics Editor for the 6502. It also includes OSI product and software catalog data. The BASIC is, of course, the 2K Tiny BASIC developed by Tom Pittman. Many of you have met Tom at the Homebrew computer Club meetings. The OSI Systems Journal is a good way to learn more about the OSI computer hardware and software along with helpful user information. The contact address is: The OSI Systems Journal, P.O. Box 134, Hiram, Ohio 44234.

KIM-1 users now have a newsletter. Eric Rehnke is producing the newsletter every 5-8 weeks, MOS Technology, Inc. helped get it started by sending copies to all known KIM owners. The user group, however, is independent of MOS Technology, Inc. The newsletter is devoted to KIM-1 support. Subscriptions are $5.00 for the next six issues. Contact "KIM-1 User Notes," c/o Eric C. Rehnke, Apt. 207, 7656 Broadview Rd., Parma, Ohio 44134.

The BAMUG club has a new contact address. It is BAMUG, c/o Timothy O'Hare, 1211 Santa Clara Ave., Alameda, CA 94501. Write Timothy for club information. I suggest you include a stamped, self-addressed envelope.

Beware of board snatchers! Glenn Ewing reports 11 boards were taken out of his IMSAI computer. The boards are: MPU, 4 RAM-4's, SIO-2, P10-4, PIC-8, PROM-4, IFM and FIB. Glenn suggests you consider providing good security for your computer and associated equipment. In his case the computer was in a locked office which was burglarized. In the event you have information on the above boards, write Lt. Glenn Ewing, Code 62EI, Naval Post Graduate School, Monterey, CA 93940.

For family and friends of people who always wanted to know about computers, but didn't want to ask them, four easy-going classes are available starting Oct. 19th on Tuesdays from 7 to 9 p.m. You can learn how computers work and what they can and can't do. You will also have some of the jargon deciphered, see what you can do with a computer, play some games and learn to program. The cost is $25. Contact the Community Computer Center, 1919 Menalto Ave., Menlo Park, CA 94025, phone (415) 325-4444.

A call for papers in personal computing has been issued by the 1977 National Computer Conference. The conference is scheduled for June 13-16, 1977. I have a few copies of the guidlines if you would like to submit a paper.

The First West Coast Computer Faire will be held April 16 and 17, 1977 at the San Francisco Civic Auditorium. This faire is shaping up rapidly. If you would like to lead a conference or participate in a conference session, please contact me. More information about the Faire is in the accompanying article.☐

THE FIRST WEST COAST COMPUTER FAIRE

A Call For Papers And Participation

The San Francisco Bay Area is finally going to have a major conference and exhibition exclusively concerned with personal and home computing—The First West Coast Computer Faire. And, it promises to be a massive one! It will take place in the largest convention facility in Northern California: The Civic Auditorium in San Francisco. It will be a two-and-a-half day affair, starting on Friday evening and running through Sunday evening, April 15-17.

It is being sponsored by a number of local and regional hobbyist clubs, educational organizations and professional groups. These include:

- The two largest amateur computer organizations in the United States—the Homebrew Computer Club and the Southern California Computer Society
- Both of the Bay Area chapters of the Association Of Computing Machinery—the San Francisco Chapter and the Golden Gate Chapter
- Stanford University's Electrical Engineering Department

DIYbio » Local Groups

http://diybio.org/local/

Google

as seen online!

search

DIYbio

Blog Home Local Groups Mailing List & Event Calendar Press Projects FriendFeed

Local Groups

There are DIYbioers all over the globe! See if there is a meetup near you on the map below. If there is not, add your location and your contact information to the map, so others can get in touch with you - just don't forget to update it once you start a regular meetup!

View a larger map, or to add yourself or your group to the map. You'll need to sign into your Google account in order to add a new point. It's a little unclear, so here's a screenshot of adding a new point

about us

DIYbio is an organization that aims to help make biology a worthwhile pursuit for citizen scientists, amateur biologists, and DIY biological engineers who value openness and safety. This will require mechanisms for amateurs to increase their knowledge and skills, access to a community of experts, the development of a code of ethics, responsible oversight, and leadership on issues that are unique to doing biology outside of traditional professional settings.

recent comments

Ana (Quo): Hola Fernando, Soy una redactora de la revista Quo y estoy ...

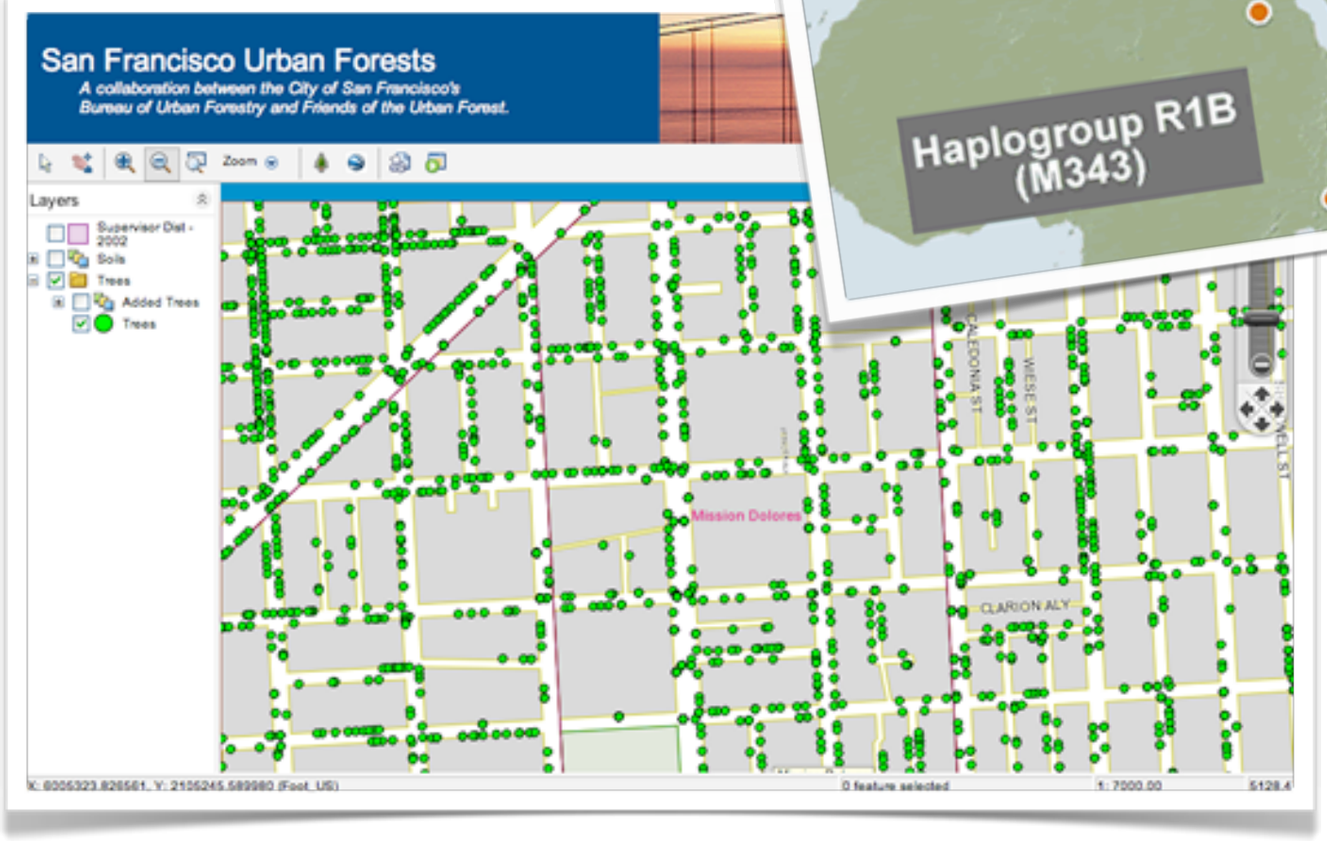
Nick See Weinberg: Would someone please add CodeCon to the DIYbio G-Cal? Thanks...

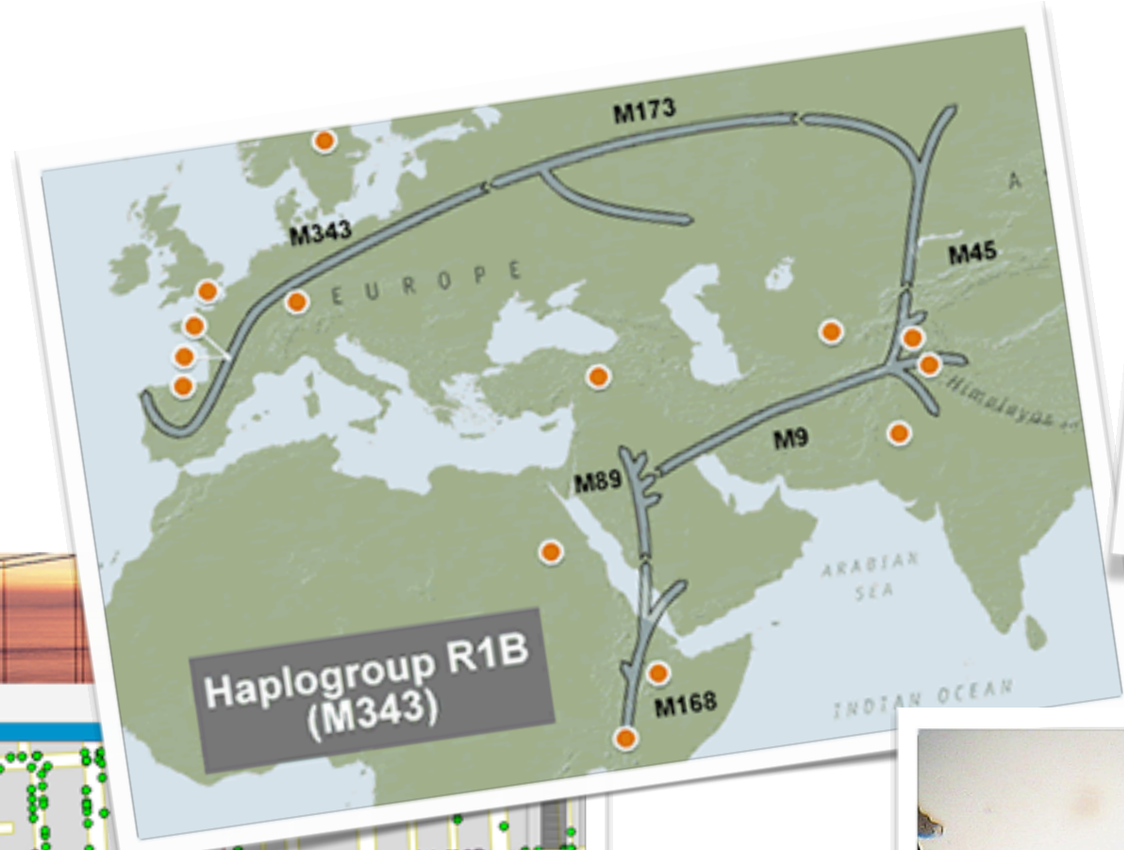
Charles Stone: Hey everyone!

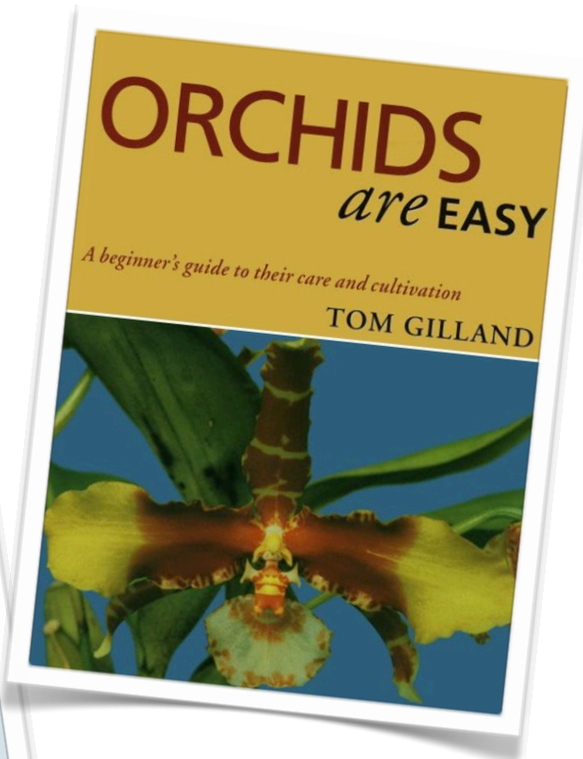
Transferring data from maps.google.com...

diybio is naturalism

macroscopic
to
microscopic







tardigrade

diybio is engineering

- graft a hybrid cranberry-apple tree

or

- add resveratrol production to yeast (healthier beer!)

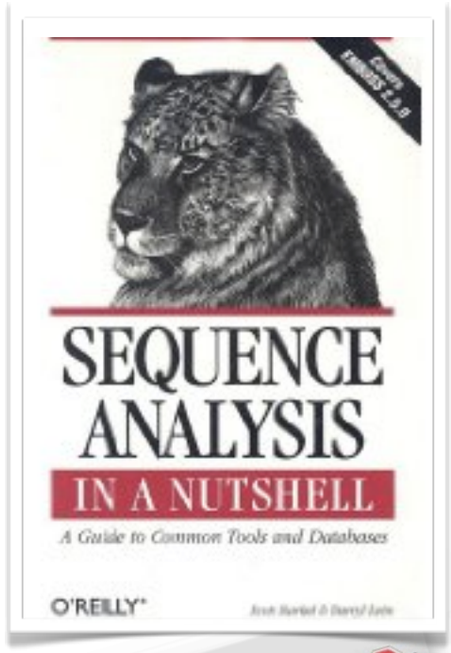
Ben Harris-Roxis / Flickr

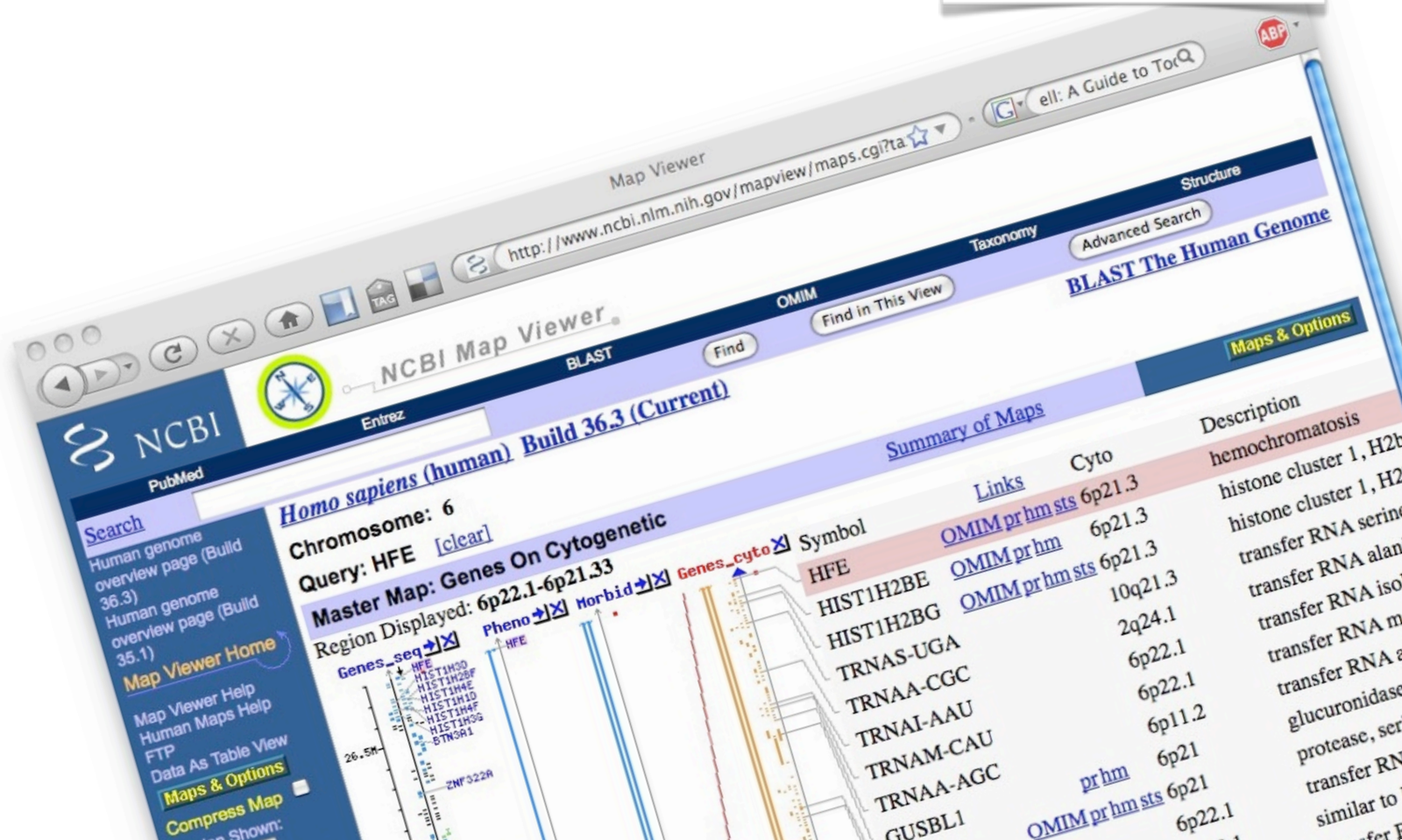
diybio is more

working on the SmartLab table, Dec 08

Alba, the fluorescent bunny (Eduardo Kac, 2000)

- hardware
- informatics
- art





Hacking is good.

but the word has a bad reputation.

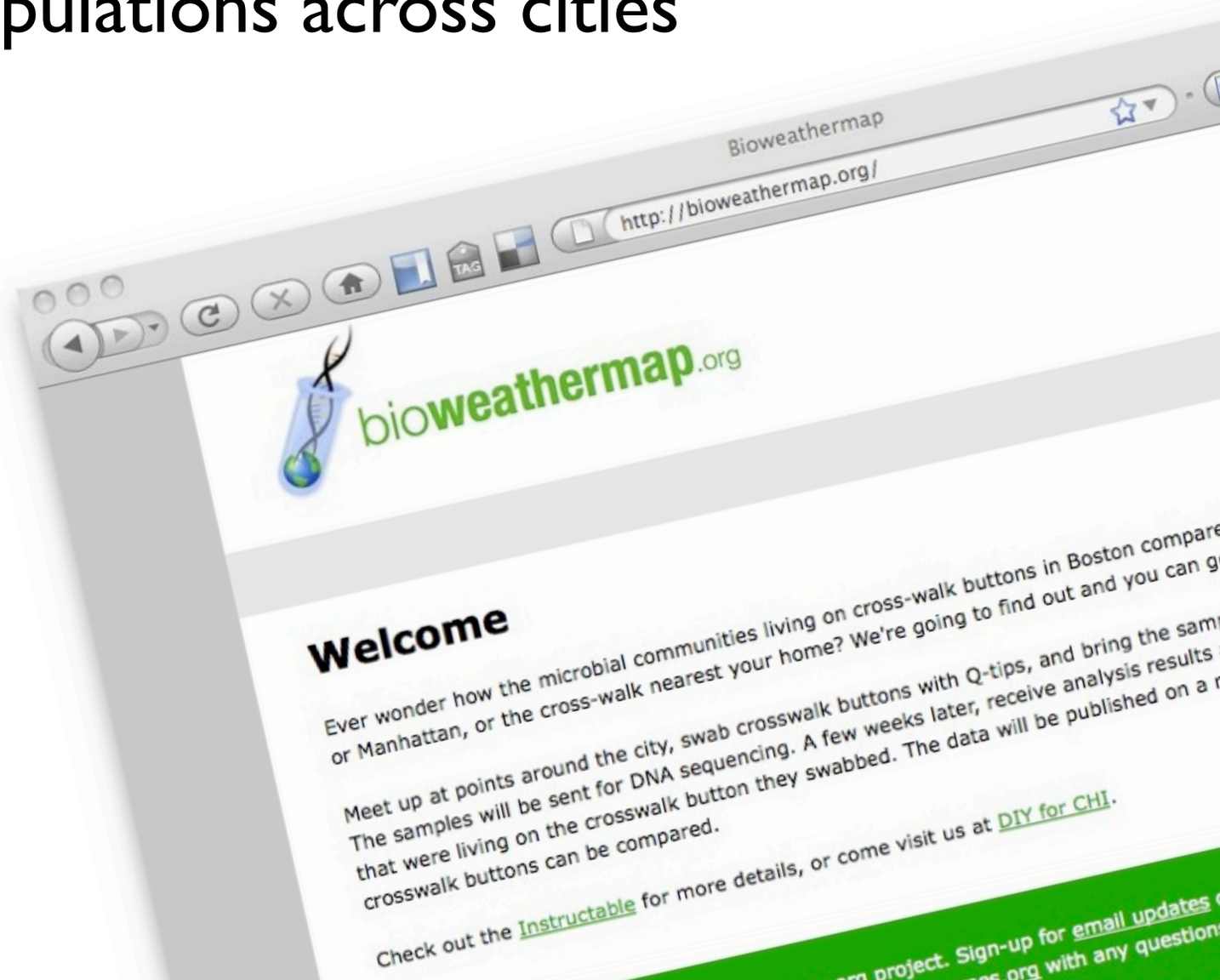
...and now some projects:

5-min dna extraction in a shot glass

just add:
saliva + soap + salt +
160 proof rum

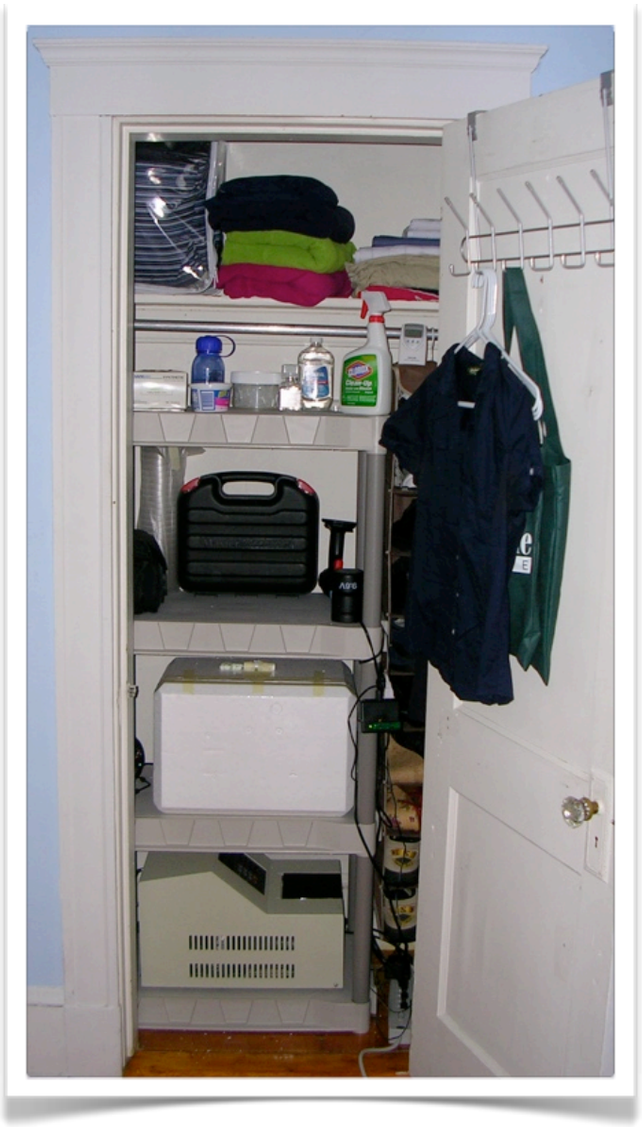
bioweathermaps

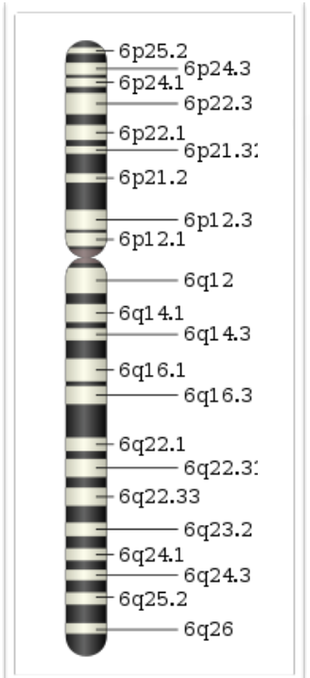
flashmob + science =
distributing tracking of bacterial populations across cities



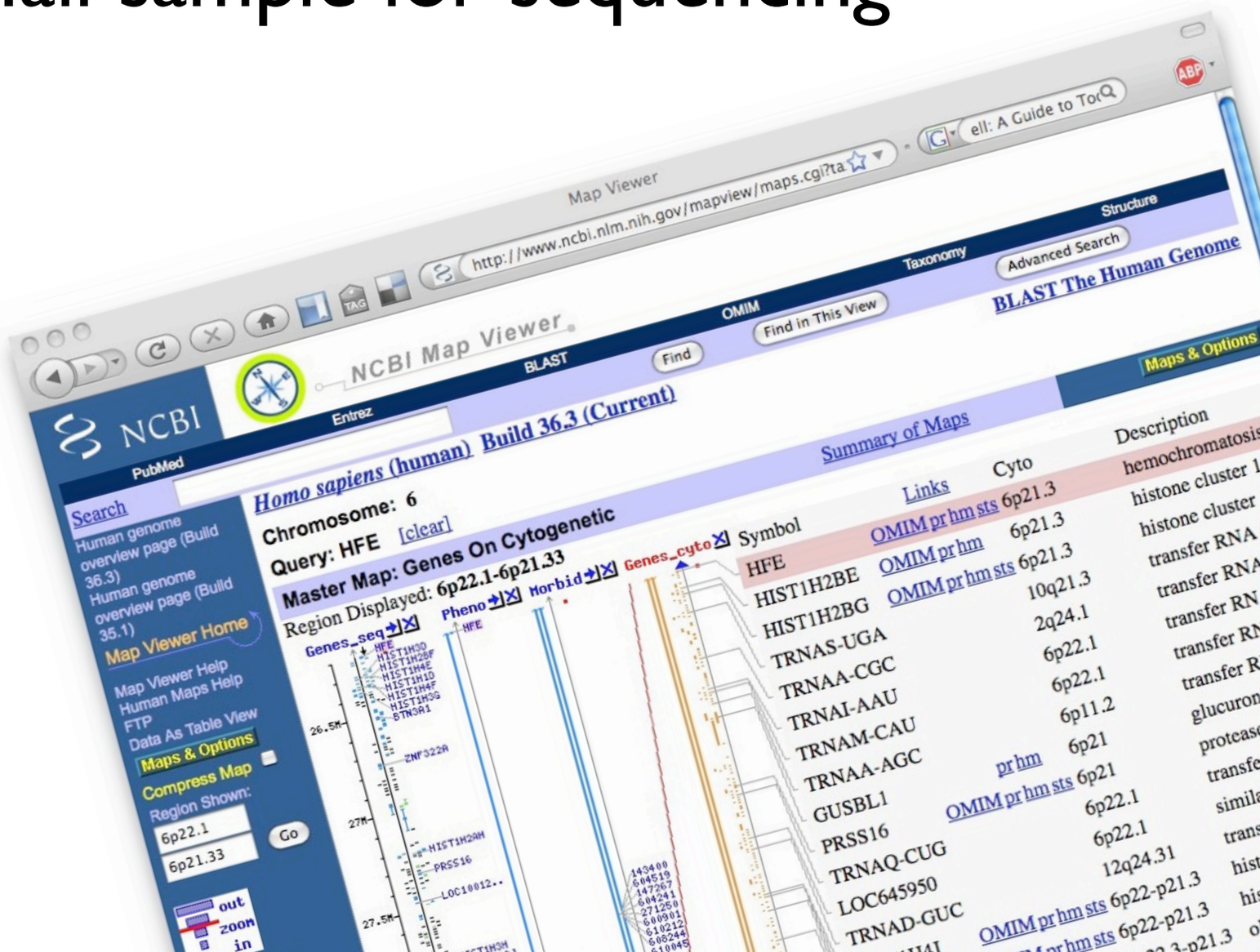
self-genotyping

Is Kay a carrier of hemochromotosis on her 6th chromosome?



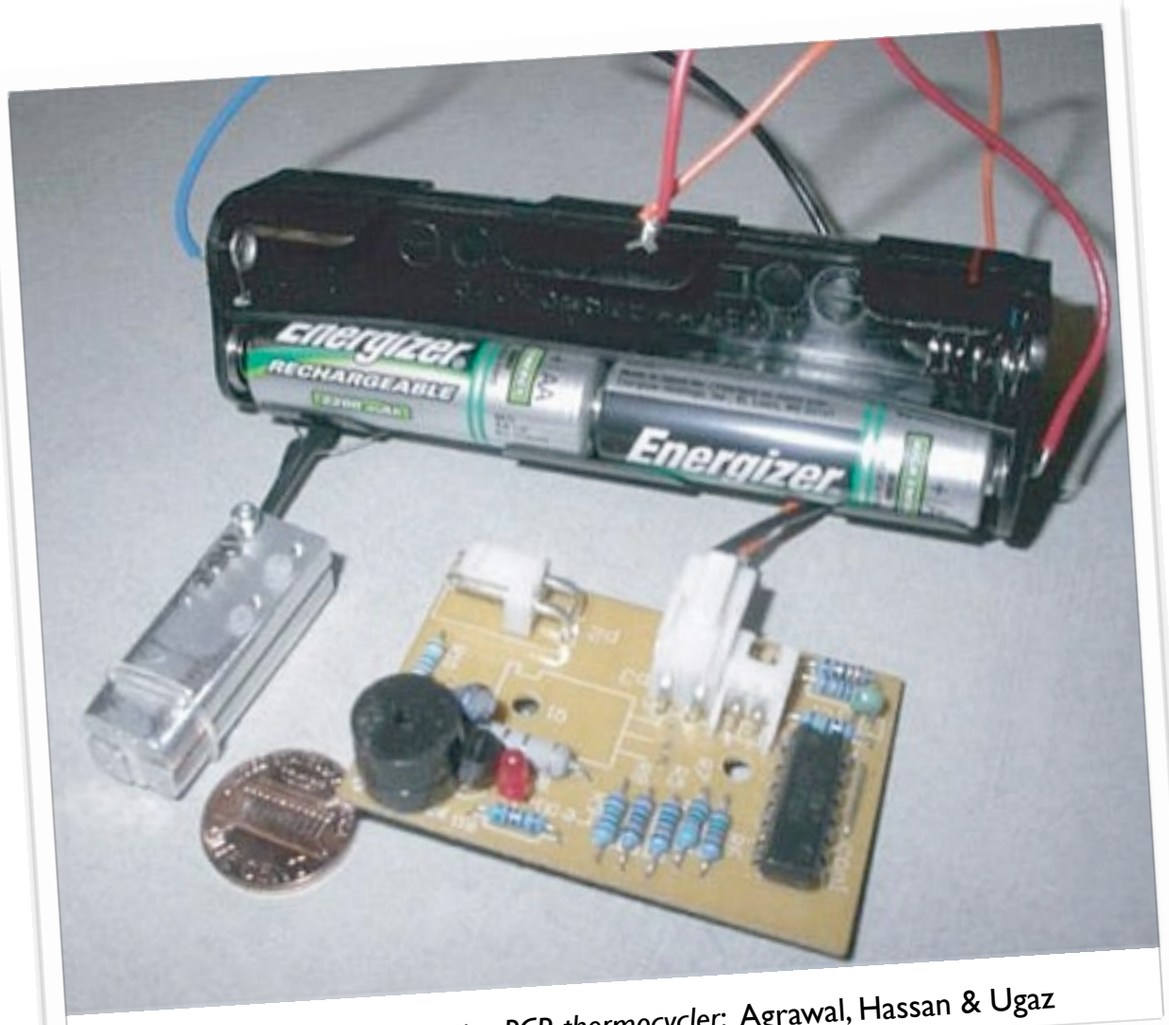


1. Allele-specific PCR at home
2. Mail sample for sequencing

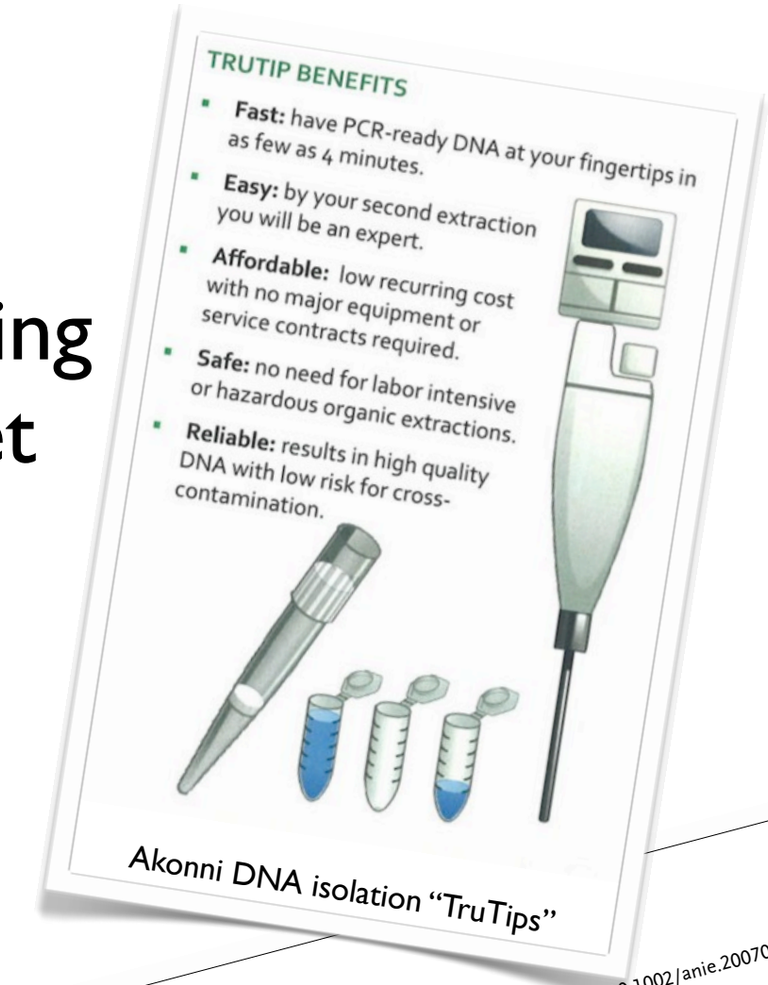


Pocket PCR

Jim Head, Nitin Agrawal and others are bringing the convective PCR thermocycler to market



A pocket-sized convective PCR thermocycler; Agrawal, Hassan & Ugaz



Akonni DNA isolation "TruTips"

DOI: 10.1002/anie.200700306

Communications

VIP **Microreactors**

A Pocket-Sized Convective PCR Thermocycler**

*Nitin Agrawal, Yassin A. Hassan, and Victor M. Ugaz**

The ability to make technologies for rapid diagnosis of infectious disease broadly available in a portable, low-cost format would mark a revolutionary step forward in global public health.[1,2] A critical challenge to these efforts is that a large segment of the population that is most in need of these advances resides in locations that offer limited or nonexistent laboratory infrastructure.[3,4] At the same time, many diagnostic assays rely on the polymerase chain reaction (PCR), which requires thermocycling instruments that are relatively slow and consume considerable electrical power to perform repeated heating and cooling steps.[5] Herein, we introduce an innovative thermocycling system that harnesses natural convection phenomena to amplify DNA rapidly by the PCR in a greatly simplified format. A key element of this design is an architecture that allows the entire thermocycling process to be actuated pseudo-isothermally by simply maintaining a single heater at a constant temperature, thereby enabling a pocket-sized battery-powered device to be constructed at a cost US$10. These devices are straightforward to operate, and uniquely address a

Despite these advances, the timescales required to perform a typical reaction generally remain on the order of hours—a rate much slower than would be expected on the basis of kinetics alone. This is because conventional thermocycling instruments typically employ a hot-plate design consisting of a metal block whose high heat capacity, combined with relatively low thermal conductivity of the plastic tubes or multiwell plates used to contain the reagents, severely limits achievable heating and cooling rates. Consequently, a majority of time and electrical power consumed is expended regulating the temperature of the instrument's structural components rather than driving the reaction.

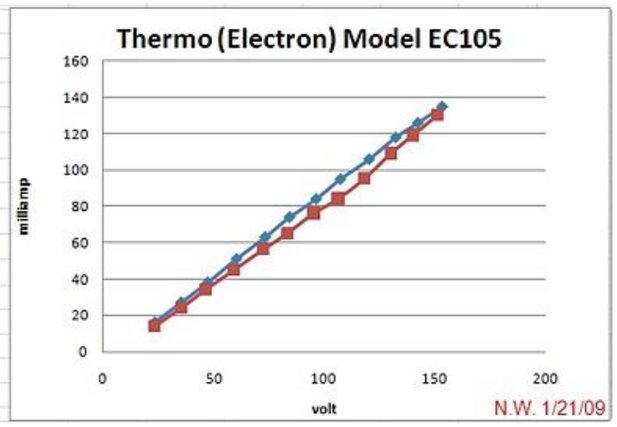
Buoyancy-driven natural convection phenomena provide an attractive way to overcome these limitations. By applying a static temperature gradient across an appropriately designed reactor geometry (e.g., a cylindrical cavity or closed loop), continuous circulatory flow can be initiated that rapidly and passively transport PCR reagents through temperature zones associated with each stage of the reaction.[8–11] This arrangement is highly advantageous because the need for time-consuming heating and cooling is eliminated, which greatly simplifies instrument design. Furthermore, rapid thermal cycling is achievable since reagents quickly attain local thermal equilibrium as they travel through the temperature gradient. The development of convective PCR has been advanced beyond the

Gel Box 2.0

for sorting dna by size

the best commercial boxes cost > $1200.
build an open source alternative for ~$100

1x TAE		1x TAE + 1.2% Gel	
V	mA	V	mA
23	16	23	14
35	27	35	24
47	38	46	34
60	51	59	45
73	63	72	56
84	74	83	65
96	84	95	76
107	95	106	84
120	106	118	95
132	118	130	109
142	126	140	119
153	135	151	130



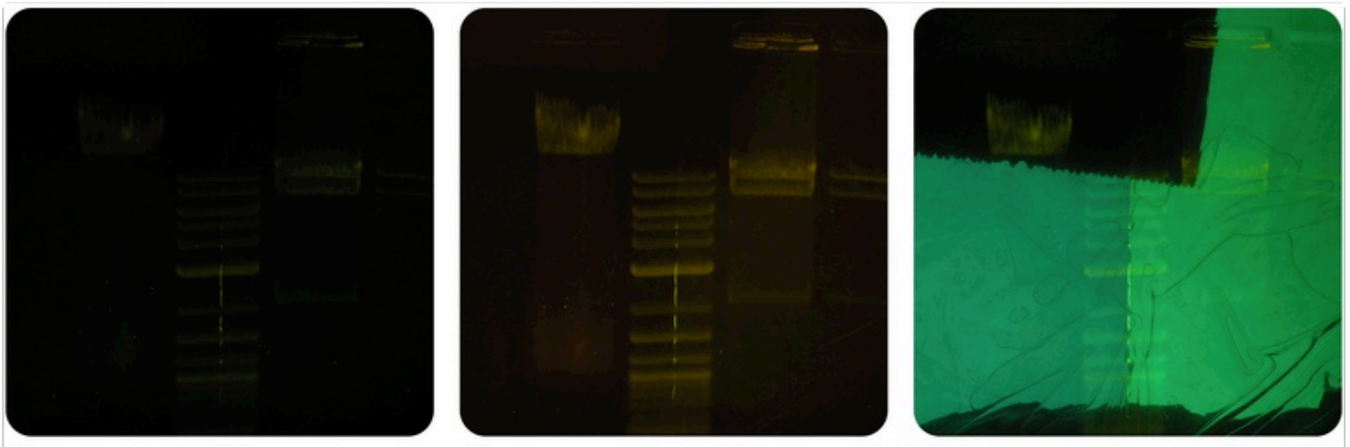
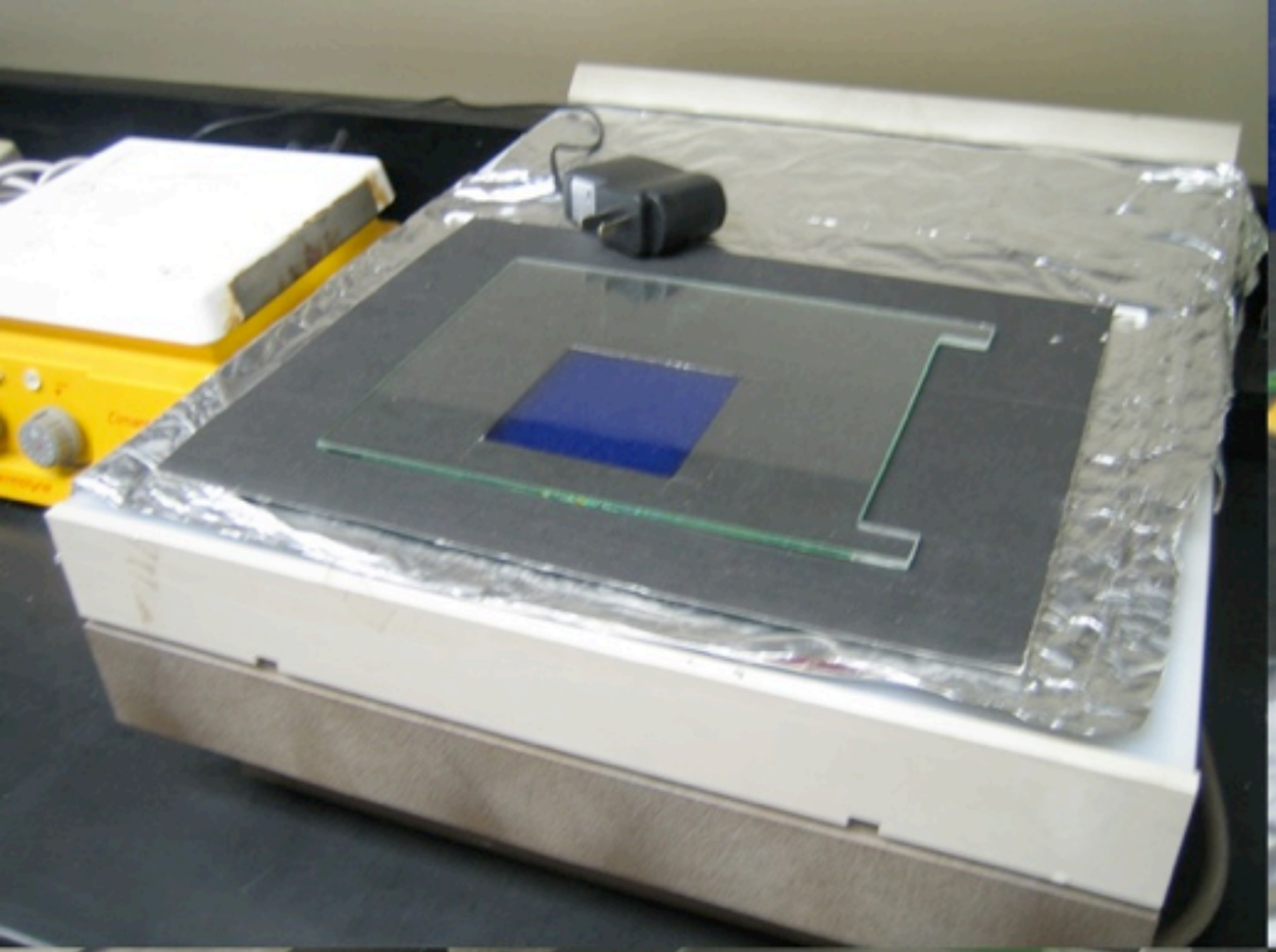


Image: Norman Wang - http://bit.ly/GelBox2-transilluminator_image

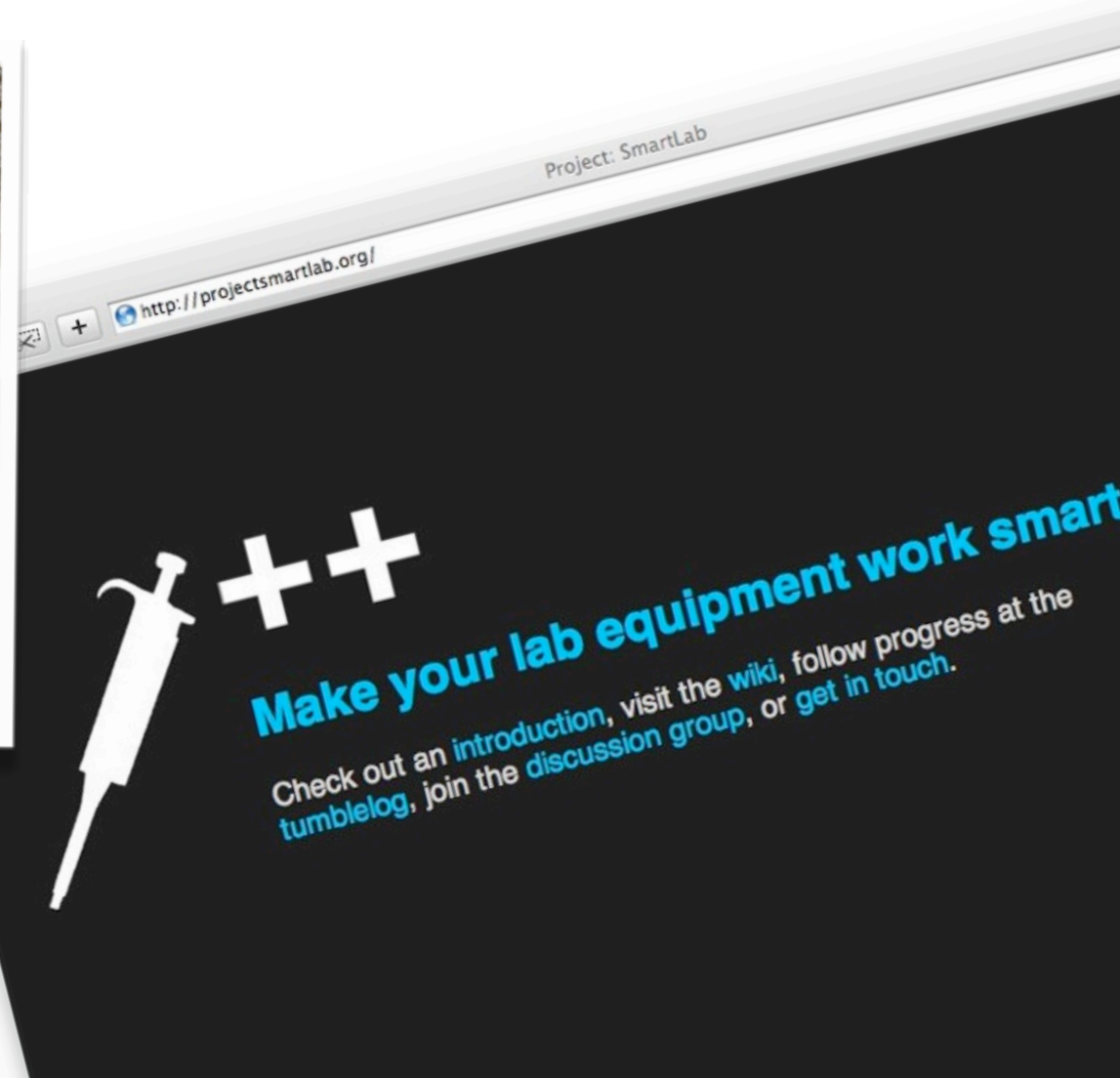


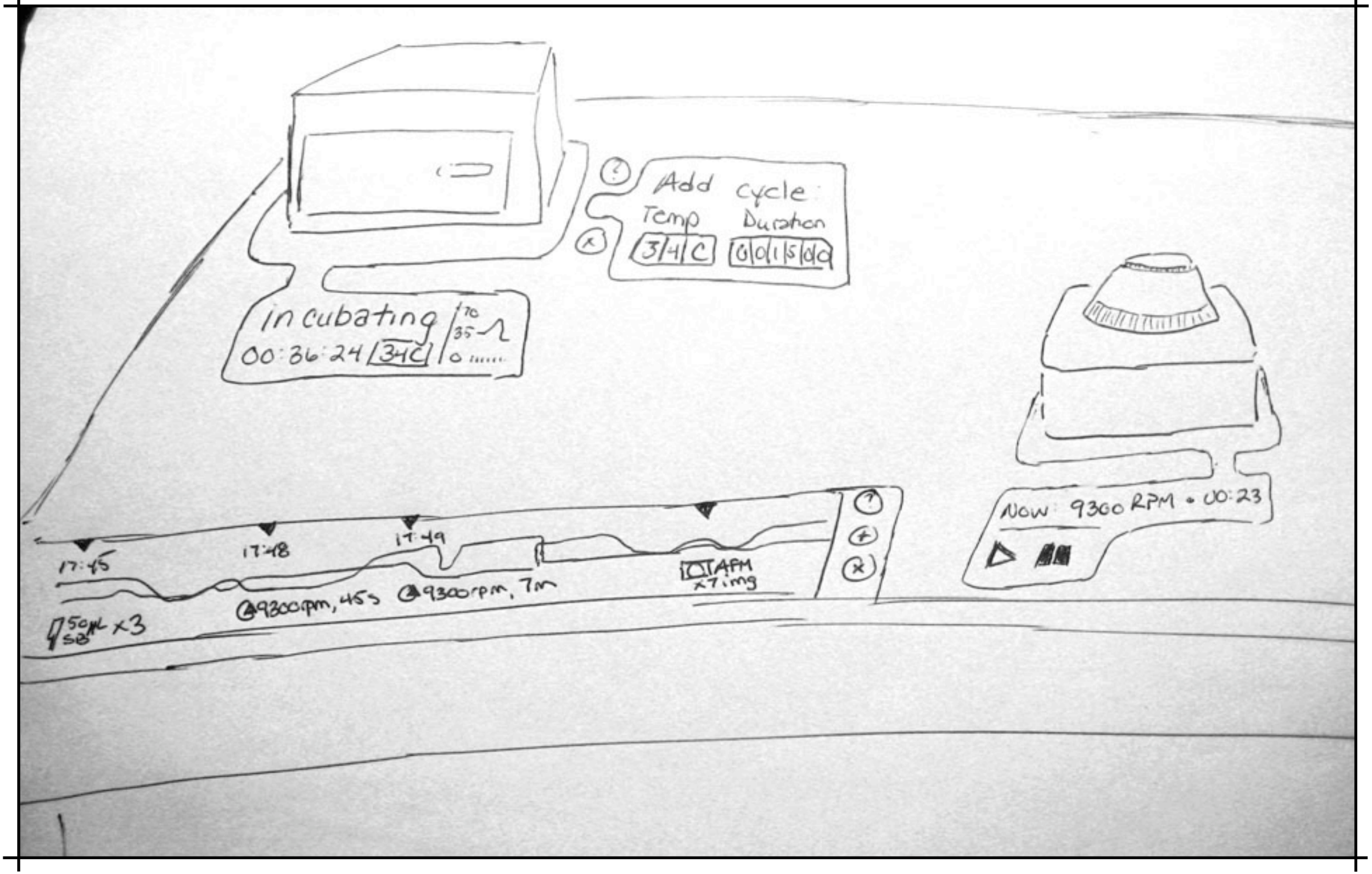

Kodak
Kodak
Wratten Gelatin Filter
3 in (7.6 cm) square
KEEP IN COOL DRY PLACE

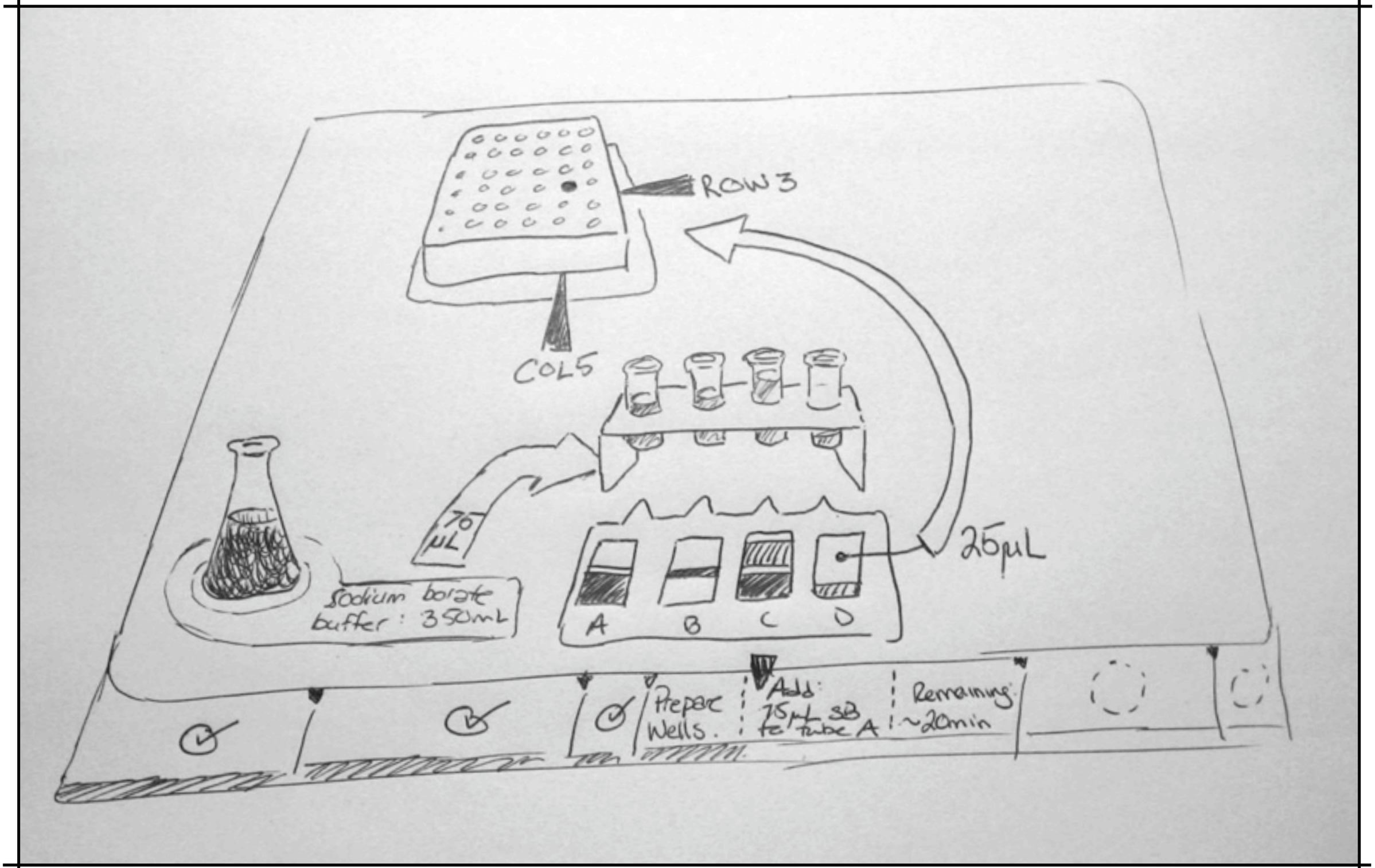
SmartLab

Multitouch LabBench

an augmented reality platform for recording + doing benchwork



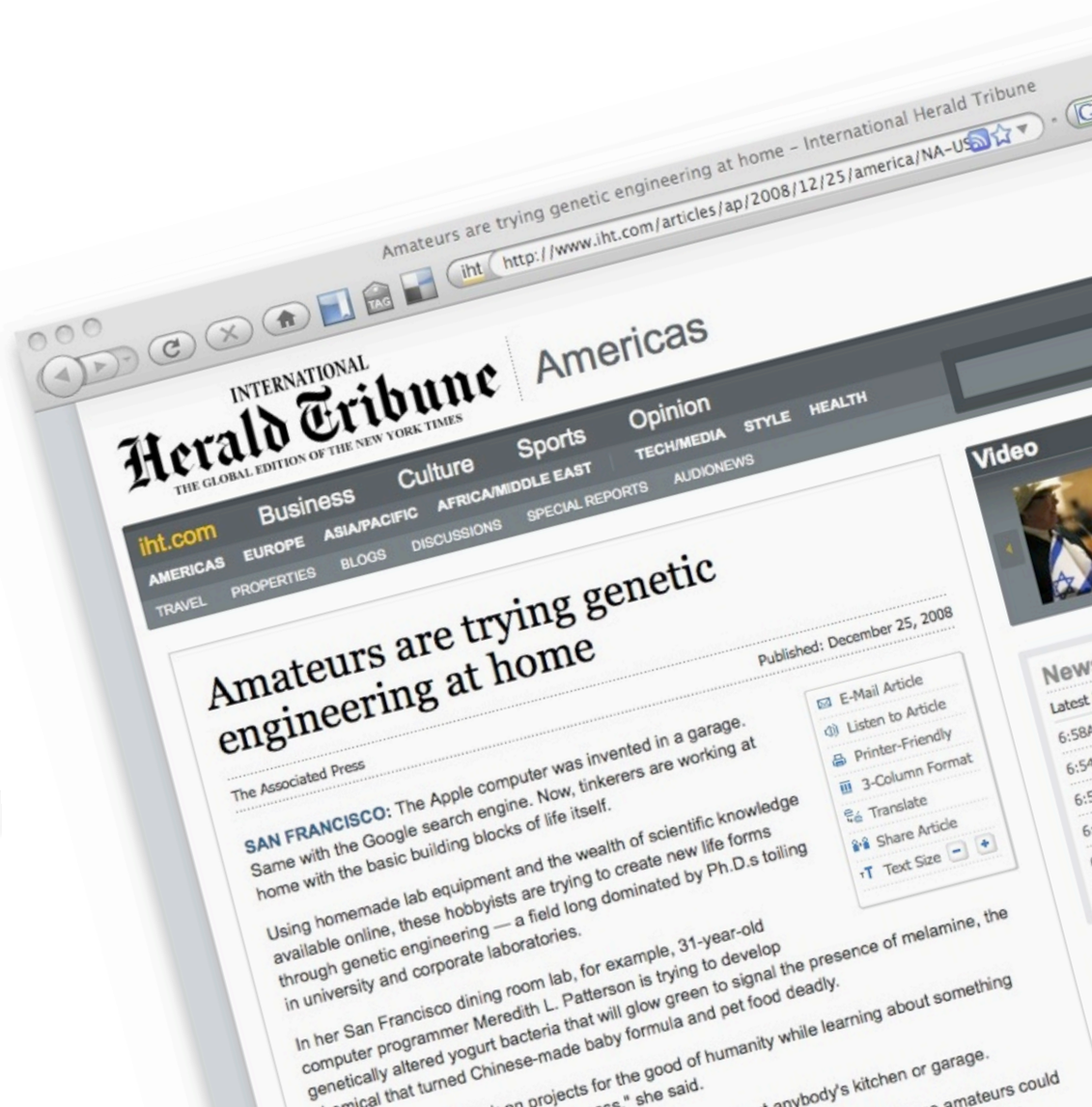

Add cycle
Temp
Duration
34C
00:15:00
incubating
00:36:24
34C
17:45
17:48
17:49
50µL x3
@9300rpm, 45s
@9300rpm, 7m
AFM
x7 img
NOW 9300 RPM • 00:23


ROW 3
COL 5
70 µL
25µL
Sodium borate buffer : 350mL
A
B
C
D
Prepare Wells.
Add 75µL SB to tube A
Remaining ~20min

working on the SmartLab table, Dec 08

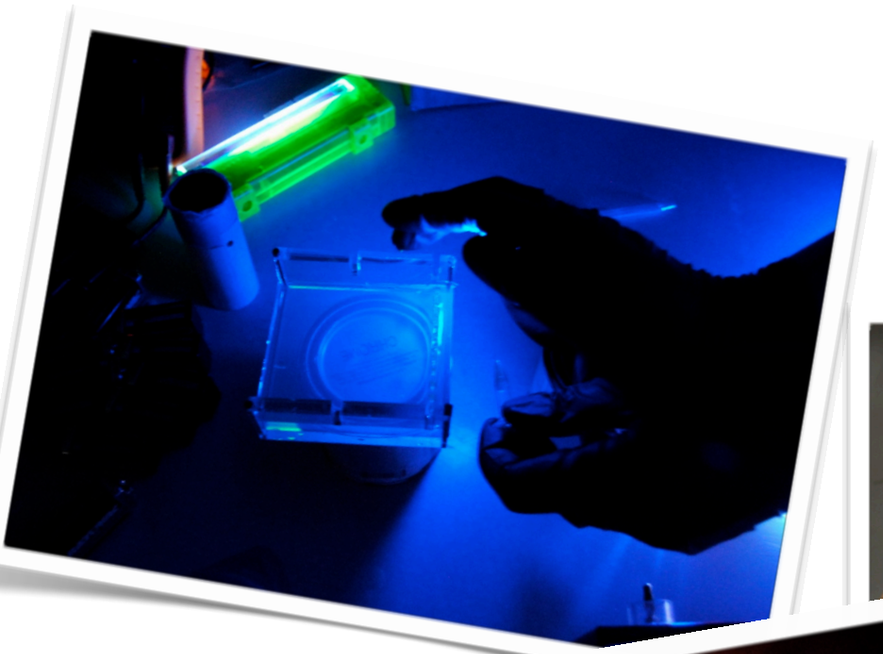
GloGurt & Melaminometer

lactobacillus “hello world” +
biosensing melamine



diy-iGEM

Willoughby & Baltic wetlab (02144)

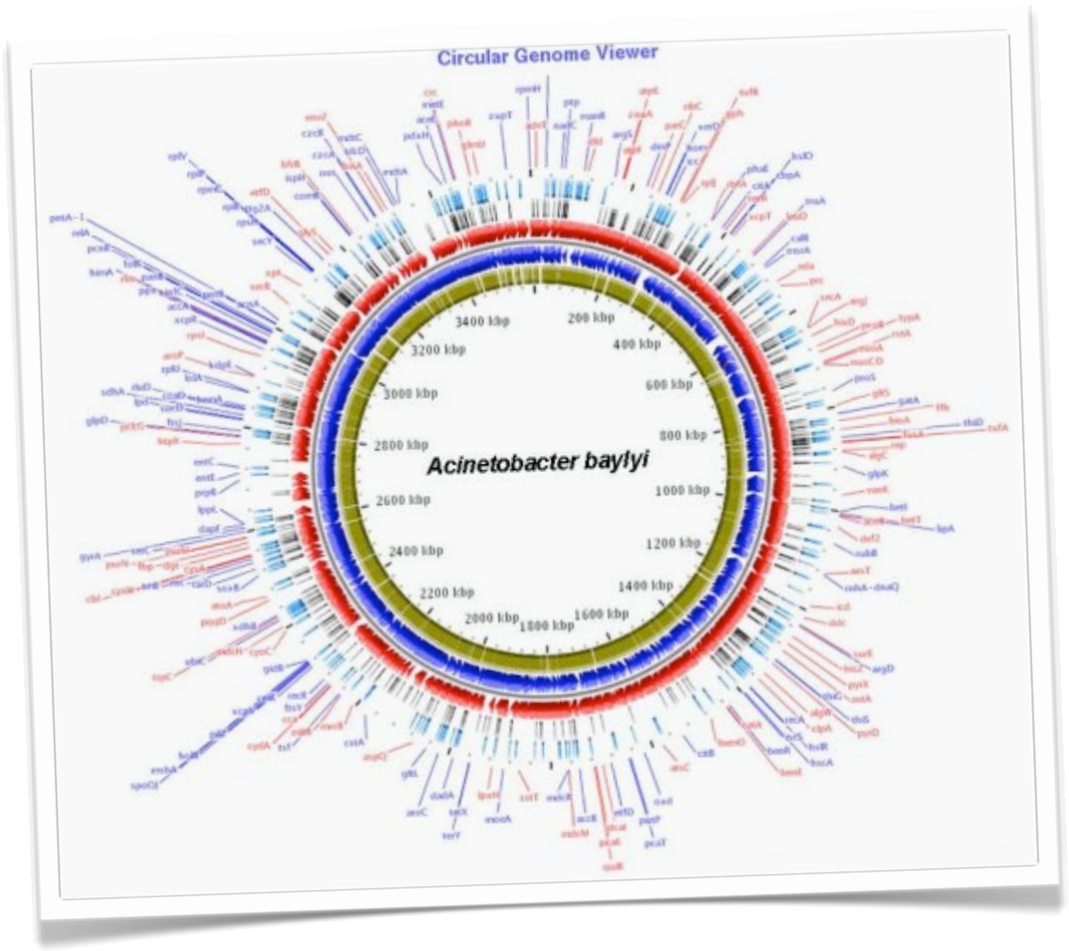


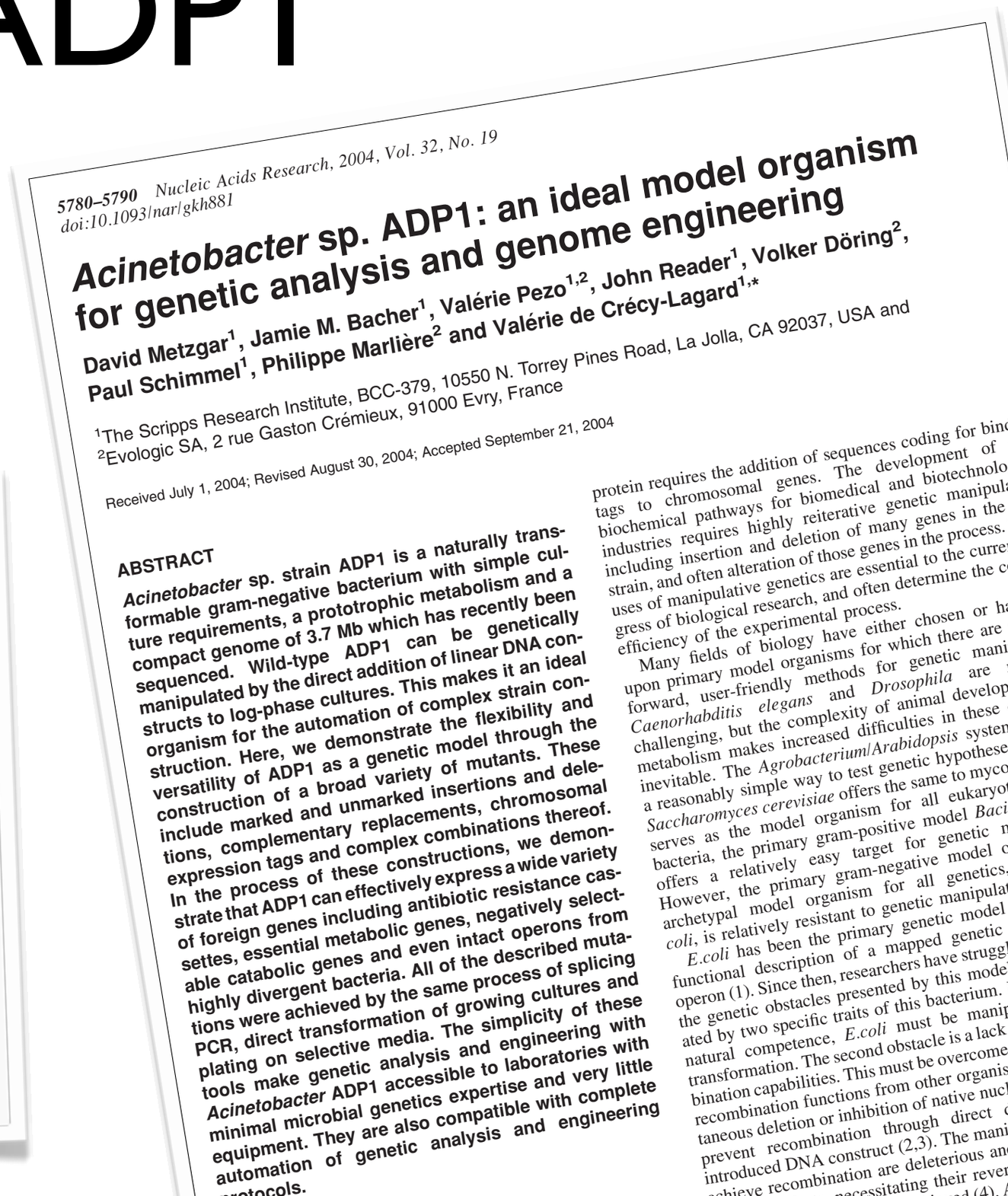
we have lab!

working with better model organisms
for diy work (ADP1)

Acinetobacter Baylyi ADP1

- gram-negative
- genome sequenced
- naturally competent!





5780–5790 *Nucleic Acids Research*, 2004, Vol. 32, No. 19
doi:10.1093/nar/gkh881

Acinetobacter sp. ADP1: an ideal model organism for genetic analysis and genome engineering

David Metzgar[1], Jamie M. Bacher[1], Valérie Pezo[1,2], John Reader[1], Volker Döring[2], Paul Schimmel[1], Philippe Marlière[2] and Valérie de Crécy-Lagard[1,*]

[1]The Scripps Research Institute, BCC-379, 10550 N. Torrey Pines Road, La Jolla, CA 92037, USA and
[2]Evologic SA, 2 rue Gaston Crémieux, 91000 Evry, France

Received July 1, 2004; Revised August 30, 2004; Accepted September 21, 2004

ABSTRACT

Acinetobacter **sp. strain ADP1 is a naturally transformable gram-negative bacterium with simple culture requirements, a prototrophic metabolism and a compact genome of 3.7 Mb which has recently been sequenced. Wild-type ADP1 can be genetically manipulated by the direct addition of linear DNA constructs to log-phase cultures. This makes it an ideal organism for the automation of complex strain construction. Here, we demonstrate the flexibility and versatility of ADP1 as a genetic model through the construction of a broad variety of mutants. These include marked and unmarked insertions and deletions, complementary replacements, chromosomal expression tags and complex combinations thereof. In the process of these constructions, we demonstrate that ADP1 can effectively express a wide variety of foreign genes including antibiotic resistance cassettes, essential metabolic genes, negatively selectable catabolic genes and even intact operons from highly divergent bacteria. All of the described mutations were achieved by the same process of splicing by overlap extension (SOE) PCR, direct transformation of growing cultures and plating on selective media. The simplicity of these tools make genetic analysis and engineering with *Acinetobacter* ADP1 accessible to laboratories with minimal microbial genetics expertise and very little equipment. They are also compatible with complete automation of genetic analysis and engineering protocols.**

protein requires the addition of sequences coding for binding tags to chromosomal genes. The development of new biochemical pathways for biomedical and biotechnological industries requires highly reiterative genetic manipulation, including insertion and deletion of many genes in the same strain, and often alteration of those genes in the process. These uses of manipulative genetics are essential to the current progress of biological research, and often determine the cost and efficiency of the experimental process.

Many fields of biology have either chosen or happened upon primary model organisms for which there are straightforward, user-friendly methods for genetic manipulation. *Caenorhabditis elegans* and *Drosophila* are relatively challenging, but the complexity of animal development and metabolism makes increased difficulties in these organisms inevitable. The *Agrobacterium*/*Arabidopsis* system provides a reasonably simple way to test genetic hypotheses in plants. *Saccharomyces cerevisiae* offers the same to mycologists, and serves as the model organism for all eukaryotes. Among bacteria, the primary gram-positive model *Bacillus subtilus* offers a relatively easy target for genetic manipulation. However, the primary gram-negative model organism, the archetypal model organism for all genetics, *Escherichia coli*, is relatively resistant to genetic manipulation.

E.coli has been the primary genetic model since the first functional description of a mapped genetic locus, the lac operon (1). Since then, researchers have struggled to overcome the genetic obstacles presented by this model, obstacles created by two specific traits of this bacterium. Due to a lack of natural competence, *E.coli* must be manipulated to allow transformation. The second obstacle is a lack of natural recombination capabilities. This must be overcome by the addition of recombination functions from other organisms and the simultaneous deletion or inhibition of native nuclease activities to prevent recombination through direct destruction of introduced DNA construct (2,3). The manipulations needed to achieve recombination are deleterious and have considerable epistatic effects, necessitating their reversal after the desired steps have been achieved (4). All of these steps are subject to unpredictable fai

...th descriptive

iGEM

- Resveratrol Beer
- Bacterial Photography
- oderant synthesis (banana!)
- arsenic & lead biosensors
- H. pylori vaccine

Team Registration ends March 31 ($500)

Jamboree is Oct 31

Regulatory

- Prohibition is not the answer
- terrorists can get PhDs (or go to flightschool)
- "5th column" of experts is good
- community currently values openness & transparency
- besides cambridge, unsure about laws

- regulatory bodies exist in other hobbies:
  - model rocketry, ham radio, ultralight flying, scuba diving

Safety

“

Dear DIY bio people,
Do you think people might be receptive to some measure of absolute prohibition, along the lines of:

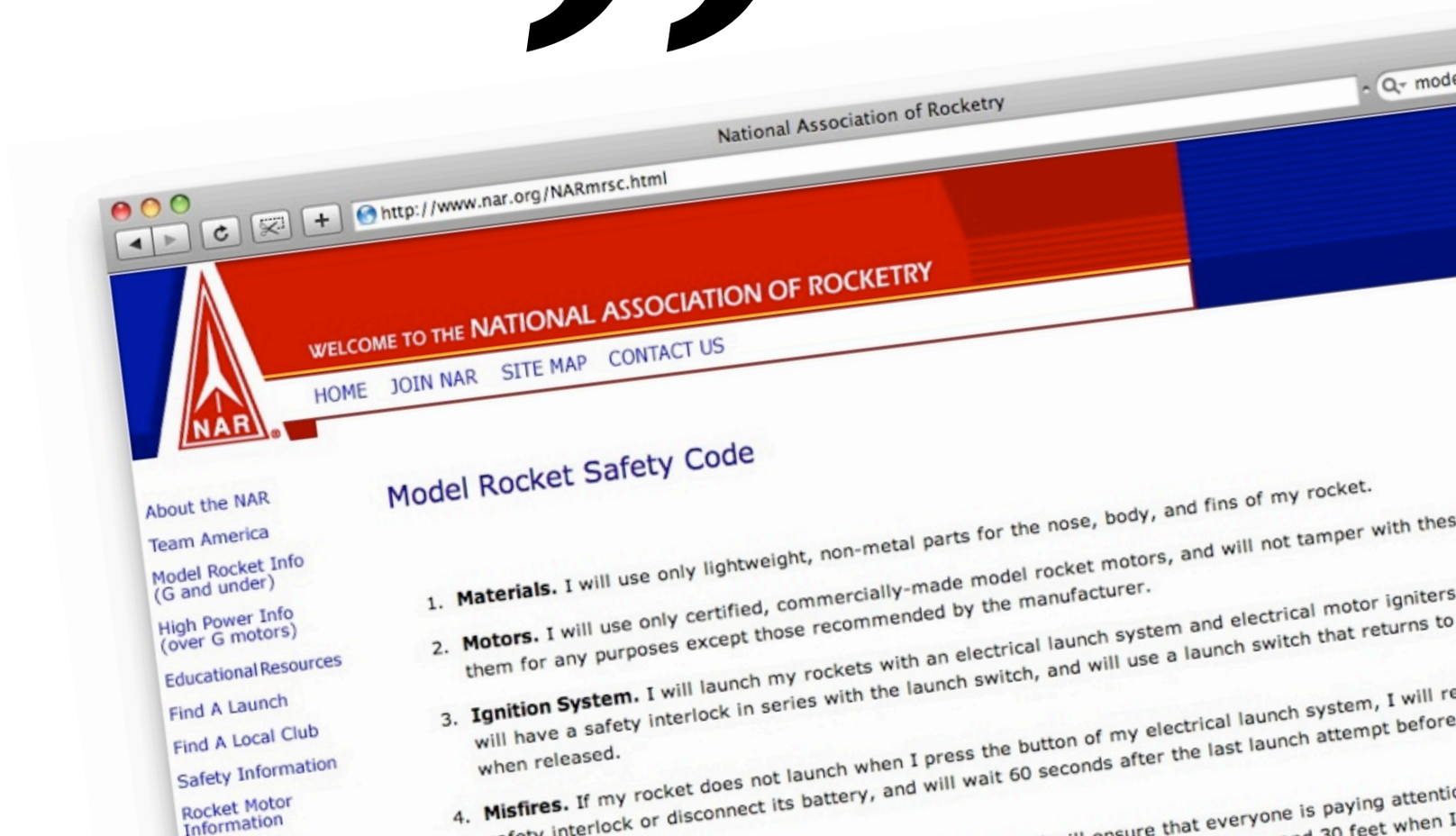
"Thou shalt not design, nor build, nor isolate, nor modify, nor grow, nor release any self replicating organism, with the intent of causing harm?"

”

-Roger Brent

diybio creed:

Safe as an undergrad lab
or better:
safe enough to eat



future

5 year goals

100 diy-GEM teams

Distributed “open-source science” biofuel project

three points

Scope: bigger than biohacking

making the world better:

gel box, melaminometer

SB as platform for garage biotech

(1 year 100k prod development cycle instead of 10 year 100m)

diybio as seed

join us at diybio.org