DNA Art on the Cheap : the guide (v4.1)

Thank you for your interest in making homemade DNA art. Perhaps you've been inspired by dna 11 (www.dna11.com) or the thread on MetaFilter that started this all (http://ask.metafilter.com/mefi/32637). Either way, you want to get some sort of visual presentation of the features that make your genome unique. There are many outfits now offering this service to the masses, and until June 2008 I was able to offer a crude, do-it-yourself version to interested parties. However, because of changing circumstances, **I am unable to provide this service any longer**.

For those who have access to molecular biology laboratory facilities, I'll keep the scientific information here in this document so that you can try your own hand at DNA art. It's pretty straightforward.

DNA Extraction:

- The most convenient method of collecting DNA for this project is by using a pre-assembled DNA collection kit. **I highly recommend ordering an OraGene kit from http://www.dnagenotek.com/** (either the disc or vial form is fine). This is the most reliable method of getting DNA. The kit comes with a purification solution and a protocol that yields high quality DNA in less than an hour. DNAGenotek will often not sell kits in less than bulk quantities, so this may not be a practical option.
- If you can't get hold of an Oragene kit, you can use mouthwash – use 15 – 20 mL of Scope (other mouthwashes may work too). Use the following procedure:
    - Swish it in your mouth for no less than a minute, and spit it into a 50mL centrifuge tube. Make sure you haven't eaten for an hour prior to swishing for best results.
    - Centrifuge the mouthwash at 2000 x g for 10 minutes.
    - Decant the mouthwash, and resuspend the pelleted cells in 500uL of lysis buffer (0.1 M Tris, pH 8; 5 uM EDTA, pH 8; 0.2 M NaCl; 0.1% SDS) supplemented with 100ug proteinase K.
    - Transfer to 1.5mL tube and incubate at 62 degrees for 2-3 hours, with optional shaking at 700-800 RPM.
    - Add 94 uL 8M potassium acetate, vortex briefly, and freeze at -20 C for >15 minutes.

- Spin in microcentrifuge at highest speed for 10 minutes.
- Remove supernatant with wide-bore pipette tip and transfer to new 1.5 mL tube.
- Add 1mL 100% EtOH and invert tubes several times.
- Spin at highest speed for 2-5 minutes. Remove ethanol, add 500 uL 70% EtOH, and spin again for 1 minute.
- Remove ethanol and air-dry for 10-15 minutes.
- Resuspend in 100uL nuclease-free water.

PCR:

- Pick a set of well-designed 20-22nt oligonucleotides (~50 GC%, no self-complementarity). Some primers will give better, more polymorphic results than others. This can only be determined empirically. If you want to avoid further expense, just use primers that you already have and see how well they work.

- In each 10uL reaction, use 100 ng genomic DNA, 1uM of **one** primer, and 1M betaine, along with the standard buffer, dNTPs and polymerase.

- Perform PCR under the following conditions:
    - 95, 5 minutes
    - 35 cycles of:
        - 95, 30 sec
        - Ramp to 70 deg. at normal rate, then to 37 at 5-10% normal ramp rate.
        - 37, 1 min
        - Ramp to 60 at 5-10% normal rate, then to 72.
        - 72, 2 min.
    - 72, 10 min

- Load 5 uL of PCR products on a 1% gel.

I'm available to answer any questions about the procedure if necessary. You can email me at ed.weiss –at—rogers.com.

<u>Please don't ask me for primer sequences; I don't have them, and I wouldn't be able to provide them even if I did.</u>