

DNA – molekulaardiagnostikast kunstini

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Tallinn 2022

Huvitavaid fakte

- Inimese genoom on 3 miljardit bp
- Inimese genoomi trükkimiseks kuluks 50 aastat
- Inimeste genoom ühtib 99% ulatuses
- Inimese rakus oleva DNA kogupikkus on u 1,8 m => 0,09 μm
- Inimese genoom on 95% sarnane šimpansiga ja 50% banaaniga
- 1g DNA = 700 Tb andmeid
- Raku DNA kahjustub iga päev 1 000 – 1 000 000 korda

DNA rakendusala

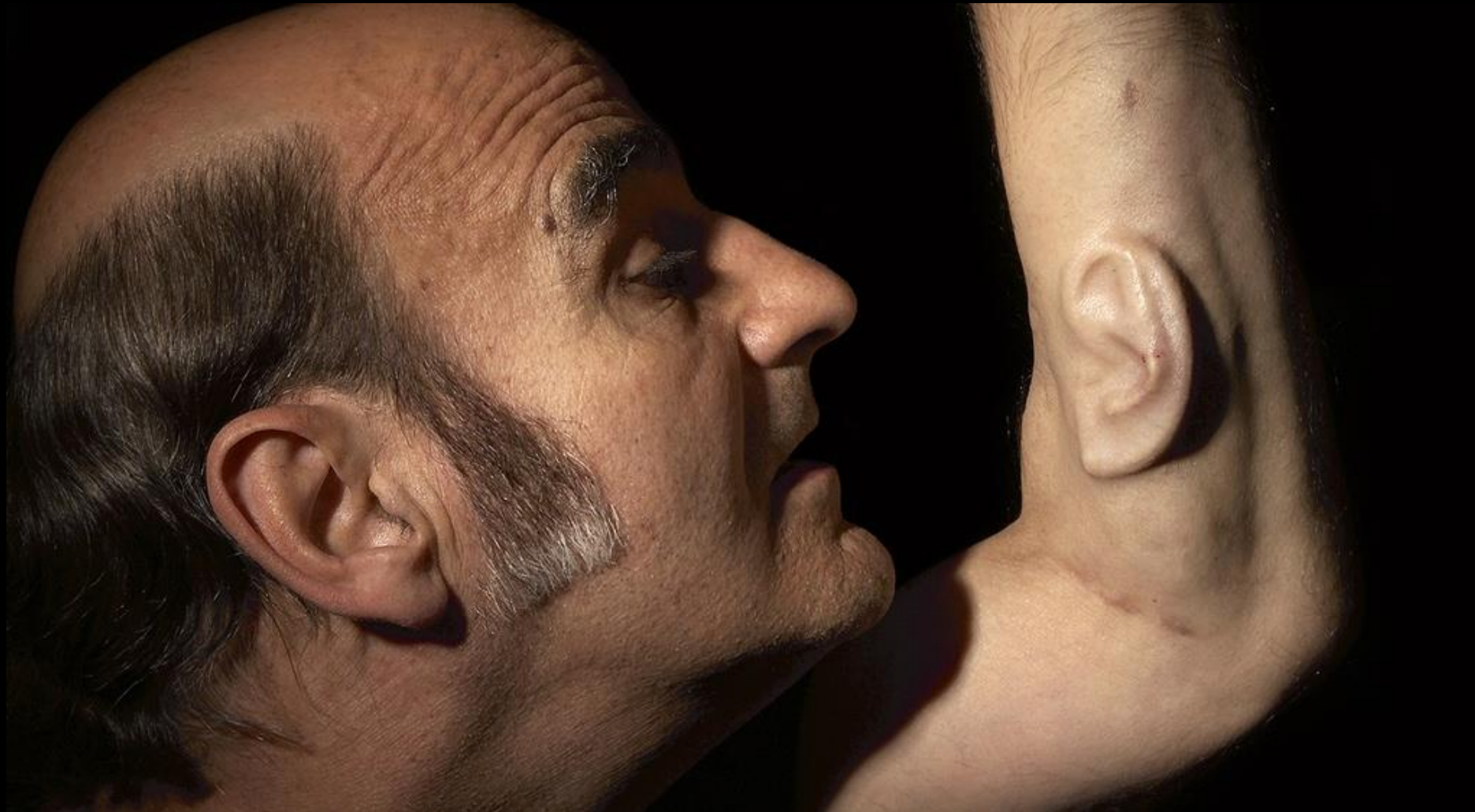
- Molekulaardiagnostika
- Geenitehnoloogia
- DNA profiilimine
- Desoksüribosüümid (katalüütiline DNA)
- Bioinformaatika
- DNA Nanotehnoloogia
- Evolutsiooni uurimine ja antropoloogia
- Kunst

Biokunst

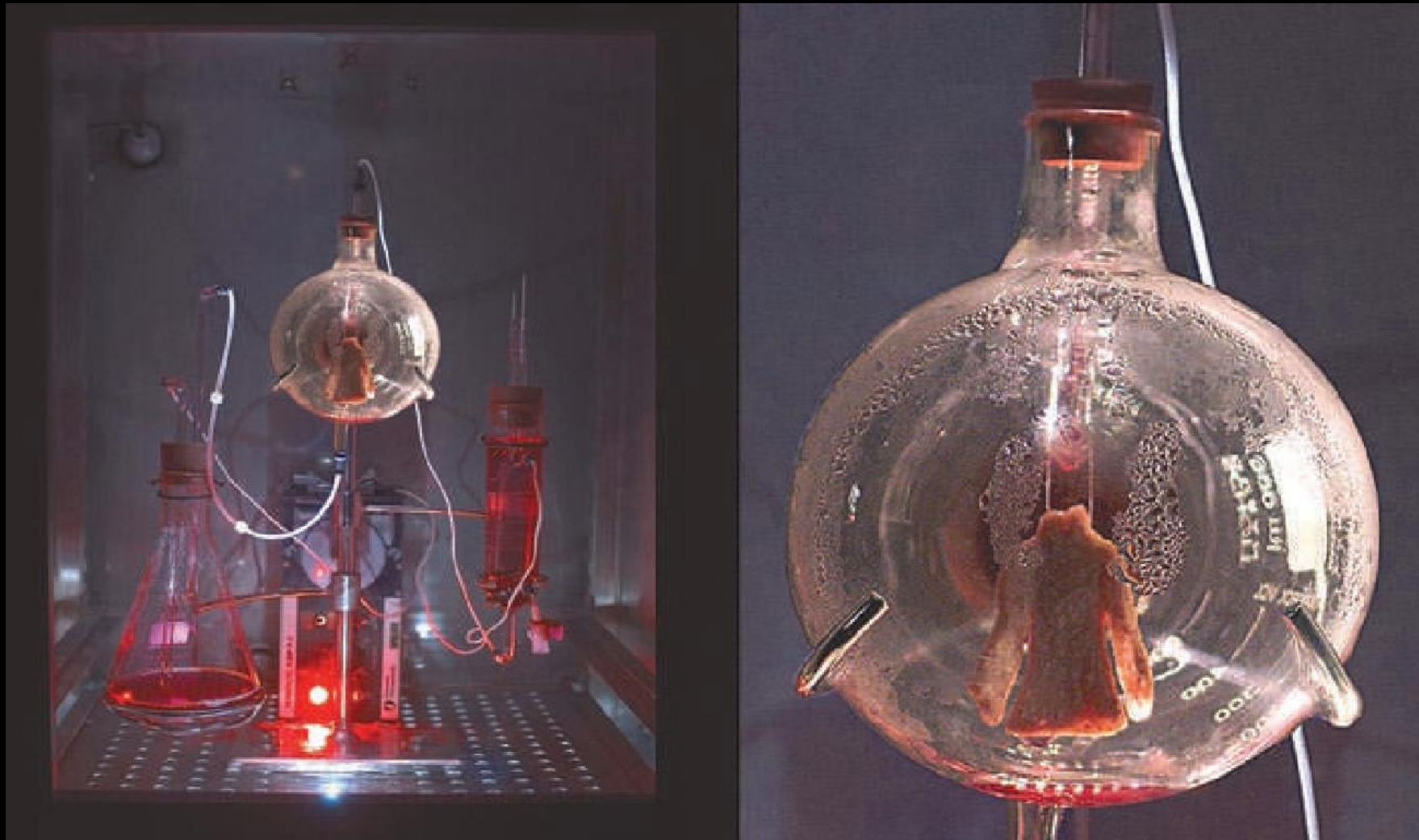
Biokunstis ristuvad traditsiooniline kunst ja bioteadused

- Organismide manipuleerimine
- Hübriidid
- Poolelavad objektid
- DNA-kunst

Organismide manipuleerimine



Poolelavad objektid





Regenerative Reliquary | Amy Karle | 2016

DNA-põhine kunst

Heather Dewey-Hagborg *"Stranger visions"*

- Geneetiline materjal avalikest kohtadest
- DNA eraldamine
- Märgistamine
- PCR
- Sekveneerimine



Tunnused

- Sugu: SRY
- Päritolu
- Nahavärvus: SLC24A5
- Silmavärvus: OCA2, HERC2, EYCL1, EYCL2 ja EYCL3
- Näo pikkus: FGFR2
- Nina: PAX3, PRDM16, C5orf50, COL17A1
- Silmadevaheline kaugus: TP63

Portrait and samples from New York: Sample 2

Collected 1/6/13 12:15pm

1381 Myrtle ave. Brooklyn, NY

MtDNA Haplogroup: H2a2a1 (Eastern European)

SRY Gene: present

Gender: Male

rs12913832: AA

Eye Color: Brown

rs4648379: CC

Typical nose size

rs6548238: CC

Typical odds for obesity



Portrait and samples from New York: Sample 6

Collected 1/6/13 12:25pm

Wilson ave. and Stanhope St. Brooklyn, NY

MtDNA Haplogroup: D1 (Native American, South American)

SRY Gene: present

Gender: Male

rs12913832: AA

Eye Color: Brown

rs4648379: CC

Typical nose size

rs6548238: CC

Typical odds for obesity



Portrait and samples from New York: Sample 4

1/6/13 12:20pm

Myrtle ave. and Himrod St. Brooklyn, NY

MtDNA Haplogroup: T2b (European)

SRY Gene: absent

Gender: Female

rs12913832: AA

Likely Eye Color: Brown

rs4648379: CT

Slightly smaller nose size

rs6548238: TT

Slightly lower odds for obesity



Manu Sporny

<https://github.com/msporny/dna>

Maternal Haplogroup: M6a (Asian, likely Indian)

Earwax: Wet

Malaria Resistance: None

Eye Color: 56% chance brown eyes, 37% chance of green eyes

Crypts: Typical

Iris Furrows: Typical

Pigmentation Rings: Typical

Hair Color: 5x Decreased odds of blonde hair

Hair Wave: Curlier

Baldness: Typical

Weight: Typical

Skin Color: Typical

Freckling: Typical





Kurt Andersoni portree (foto: Julia Lowrie Henderson, montaaz: Stefan Sierhej)



Heather Dewey-Hagborg | Stranger Visions

Parabon Nanolabs SNAPSHOT

DNA SNAPSHOT



Sex: Male ♂

Skin: Dark / Dark Olive

Eyes: Brown / Black

Hair: Brown / Black

Freckles: None

Ancestry: 92% West African
8% NW European



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<http://Parabon-NanoLabs.com/Snapshot>

Snapshot Prediction Results Composite Profile



#CMPD-CA-97-06559-Snapshot
PNL Document #17D20024 - 72U21S0P2A



Actual Photo

Predicted (■) & Excluded (⊗) Phenotypes



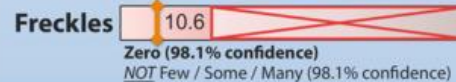
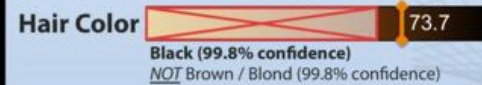
Sex: Male ♂

Age: Unknown
(Composite shown at age 25)



Body Mass: Unknown
(Composite shown at BMI 22, Normal)

Ancestry: Latino



Snapshot Prediction Results Composite Profile



#APD-NM-08-169900-Snapshot
PNL Document #17G26L12 - G5DGR8T1



Actual Photo

Predicted (■) & Excluded (⊗) Phenotypes



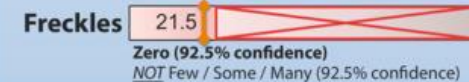
Sex: Male ♂

Age: Unknown
(Composite shown at age 25)



Body Mass: Unknown
(Composite shown at BMI 22, Normal)

Ancestry: Admixed
European and Native
American



Hong Kong „Face of Litter“



Probleemid

- Ei ole täpsed
- Geenide aheldatus
- Pole võimalik määrata:
 - Kaalu
 - Vanust
 - Keskkonnamõju

Kasutatud materjalid

- <http://www.smithsonianmag.com/science-nature/creepy-or-cool-portraits-derived-from-the-dna-in-hair-and-gum-found-in-public-places-50266864/?no-ist=>
- <http://www.thisiscolossal.com/2013/05/stranger-visions-dna-collected-from-found-objects-synthesized-to-create-3d-printed-portraits/>
- <http://www.scientificamerican.com/article/researchers-identify-huma/>
- <http://www.gnXP.com/blog/2008/09/genes-and-facial-features.php>
- <http://www.livescience.com/23188-face-shaping-genes-identified.html>
- <http://www.plosgenetics.org/article/info:doi/10.1371/journal.pgen.1002932>
- <http://www.nature.com/scitable/topicpage/genetic-mechanisms-of-sex-determination-314>
- <http://www.nature.com/nrm/journal/v10/n7/pdf/nrm2699.pdf>
- <https://thenewinquiry.com/sci-fi-crime-drama-with-a-strong-black-lead/>
- [Heather Dewey-Hagborg | Stranger Visions \(deweyhagborg.com\)](http://www.deweyhagborg.com)
- [Making Portraits Out of DNA | Studio 360 | WNYC](http://www.wnyc.org)
- [Industry Views: How the \(Mobile\) Web Will Affect Payments \(cspdailynews.com\)](http://www.cspdailynews.com)
- [The Face of Litter | Ecozine](http://www.ecozine.com)
- [Parabon® Snapshot® DNA Analysis Service - Powered by Parabon NanoLabs \(parabon-nanolabs.com\)](http://www.parabon-nanolabs.com)
- [Victimless Leather – The Tissue Culture & Art Project \(tcaproject.net\)](http://www.tcaproject.net)
- [Regenerative Reliquary - Amy Karle](http://www.amykarle.com)

Täna!