

## Artwork titles and descriptions

### Diagrams, illustrations, animations, and photographs

1. **Leonardo Da Vinci, *Vitruvian Man***. "The proportions of the human body according to [ancient Roman architect] Vitruvius." [https://en.wikipedia.org/wiki/Vitruvian\\_Man#/media/File:Da\\_Vinci\\_Vitruve\\_Luc\\_Viatour.jpg](https://en.wikipedia.org/wiki/Vitruvian_Man#/media/File:Da_Vinci_Vitruve_Luc_Viatour.jpg)
2. **Harvard/XVIVO, *The Inner Life of the Cell***. Animation illustrating mechanisms that allow a white blood cell to sense its surroundings and respond to an external stimulus. <https://www.youtube.com/watch?v=wJyUtb005Y>
3. **Rudolph Zallinger, *The March of Progress***. Classical image of human evolution from common ancestor with apes. [https://en.wikipedia.org/wiki/March\\_of\\_Progress](https://en.wikipedia.org/wiki/March_of_Progress)
4. **Leopold and Rudolf Blaschka, *The Ware Collection of Blaschka Glass Models of Plants***. Glass teaching models of plant families representing over 830 plant species, created from 1887 to 1936. [https://en.wikipedia.org/wiki/Glass\\_Flowers](https://en.wikipedia.org/wiki/Glass_Flowers)
5. **Andreas Vesalius, *On the Fabric of the Human Body***. Image of a dissected human body, published in 1543. [https://en.wikipedia.org/wiki/De\\_humani\\_corporis\\_fabrica](https://en.wikipedia.org/wiki/De_humani_corporis_fabrica)
6. **John Audubon, *Birds of America - Mourning Dove***. Printed illustrations of American birds, created between 1827 and 1838. [https://en.wikipedia.org/wiki/The\\_Birds\\_of\\_America](https://en.wikipedia.org/wiki/The_Birds_of_America)
7. **Charles Darwin, *Tree of Life sketch***. 1837 notebook sketch of a branching evolutionary tree. [https://en.wikipedia.org/wiki/Inception\\_of\\_Darwin%27s\\_theory](https://en.wikipedia.org/wiki/Inception_of_Darwin%27s_theory)
8. **Benoit Mandelbrot, *Mandelbrot set***. Zoom image of the Mandelbrot set of complex numbers, visualized on the real and imaginary axes. [https://en.wikipedia.org/wiki/Mandelbrot\\_set](https://en.wikipedia.org/wiki/Mandelbrot_set)
9. ***Proof Without Words - Sum of Odd Numbers Theorem***. Diagram showing that the sum of all positive odd numbers up to  $2n-1$  is the perfect square  $n^2$ . [https://en.wikipedia.org/wiki/Proof\\_without\\_words](https://en.wikipedia.org/wiki/Proof_without_words)
10. **Valerie O'Brien et al. [Untitled]**. Scanning electron microscopy image from a mouse model of a urinary tract infection. <http://www.faseb.org/Resources-for-the-Public/Scientific-Contests/BioArt/Past-Winners/2016-BioArt-Winners.aspx>
11. **NASA, Hubble Telescope, *Eagle Nebula - "Pillars of Creation"***. Composite, false-color image of clouds of interstellar gas and dust in the Eagle Nebula, which are creating new stars. [https://en.wikipedia.org/wiki/Pillars\\_of\\_Creation](https://en.wikipedia.org/wiki/Pillars_of_Creation)
12. **NASA, Kindra Thomas, *Total solar eclipse over Madras***. Composite image showing the progression of a total solar eclipse over Madras, Oregon on Monday, August 21, 2017. <https://www.nasa.gov/image-feature/total-solar-eclipse-over-madras-oregon>
13. **James Mhyre, *Double Helix***. Cherry, Maple, African Padauk, Peruvian Walnut, Leopard Wood, Wenge, and Zebrawood. Sculpture of DNA double helix in the lobby of the UW Foege Building, Seattle, WA.

### Fine Art, BioArt

14. **Philip Beesley, *Epiphyte Chamber***. "Epiphyte Chamber is envisioned as an archipelago of interconnected halo-like masses that mimic human sensations through subtle, coordinated movements." [http://philipbeesleyarchitect.com/sculptures/1312\\_MMCA\\_Epiphyte-Chamber/](http://philipbeesleyarchitect.com/sculptures/1312_MMCA_Epiphyte-Chamber/)
15. **Paul Vanouse, *The America Project***. From the artist: "Visitors to the installation first encountered ... a spittoon in which their donated spit was collected... During the installation I extracted the DNA from what I hoped to be hundreds of spit samples—containing cheek cells and the cells' DNA—all mixed together. The DNA was not individuated nor retained: it was processed as a whole to make iconic DNA fingerprint images of power—such as a crown, warplanes and a flag—which were visible as video projections of the electrophoresis gels throughout the exhibition." <http://www.paulvanouse.com/ap/>
16. **Charles Vacanti, *Earmouse***. Laboratory mouse with an ear-shaped cartilage structure implanted under the skin of the mouse. From Wikipedia: "The photo of the mouse was passed around the internet, mainly via email, sometimes with little to no text accompanying it leading many people to speculate whether the photo was real. In the late 1990s, the picture prompted a wave of protests against genetic engineering—although in this specific experiment no genetic manipulation was performed." [https://en.wikipedia.org/wiki/Vacanti\\_mouse](https://en.wikipedia.org/wiki/Vacanti_mouse)
17. **Jasmine Temple et al., *Sunset at the End***. "Agar art" created by "printing" nanodroplets of media containing baker's yeast with pigment-encoding plasmids onto a large agar plate. <https://www.asm.org/index.php/public-outreach/agar-art>
18. **Klari Reis, *Underwater Pen Marks***. Layers of paint in petri dish. <https://www.wired.com/2013/09/one-lovely-petri-dish-painting-for-every-day-of-2013/>
19. **Christian Bok, *The Xenotext***. A poem encoded into DNA, expressed in "indestructible" extremophile bacteria as a protein. From the artist: "When translated into a gene and then integrated into the cell, my poem is going to constitute a set of instructions, all of which cause the organism to manufacture a viable, benign protein in response—a protein that, according to my original, chemical alphabet, is itself yet another text. I am, in effect, engineering a life-form so that it becomes not only a durable archive for storing a poem, but also an operant machine for writing a poem—one that can persist on the planet until the sun itself explodes...." <https://www.poetryfoundation.org/harriet/2011/04/the-xenotext-works>
20. **Edward Steichen, *Delphiniums***. An exhibition of "rare now American varieties developed through twenty-six years of cross-breeding and selection." <http://www.seniorwomen.com/news/index.php/a-moma-look-back-steichen-delphiniums>
21. **Eduardo Kac, *Genesis***. A biblical verse encoded in DNA using Morse code. The verse reads: "Let man have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moves upon the earth." Viewers can activate UV light that causes mutations, and the DNA sequence of the original and mutated verses are projected opposite each other in the installation. <http://www.ekac.org/geninfo.html>
22. **Paul Vanouse, *Deep Woods PCR***. From the artist: "To me, an encampment deep in the Canadian wilderness evoked a Romantic notion of exploration... My plan was to perform all phases of the 'high-tech' PCR process in the unlikely setting of the deep-woods encampment. I wanted to open up meanings of the PCR discovery/patent during the low-tech PCR experiment, a technologically anachronistic reenactment, in the heart of the national forest. The performance conflated scientific pioneer with its expedition counterpart and probed the idea of 'self-discovery' in its broadest sense." <http://www.paulvanouse.com/dwpcr.html>
23. **Anna Dumitriu, *Make Do and Mend***. From the artist: "'Make Do and Mend' references the 75th anniversary of the first use of penicillin in a human patient in 1941 and takes the form of an altered wartime women's suit marked with the British Board of Trade's utility logo CC41, which stands for 'Controlled Commodity 1941'. The holes and stains in the suit have been patched with silk stained

with pink colonies of *E. coli* bacteria, grown on dye-containing agar. The genomes of these bacteria have been edited using a technique called CRISPR, to remove an ampicillin antibiotic resistance gene and scarlessly patch the break using homologous recombination with a fragment of DNA encoding the WWII slogan "Make Do and Mend". Ampicillin is part of the penicillin group of antibiotics so with this artistic genomic edit, Dumitriu and Goldberg have used today's technology to return the organism to its pre-antibiotic era state, reflecting on how we might in future control and protect such biotechnological advances." <https://www.axisweb.org/p/annadumitriu/>

**24. Andre Brodyk, *Alzheimer's Portraits*.** "The transgenic bacteria that Brodyk created to paint these portraits included 'non-sense' regions of the human genome, or, in popular parlance, 'junk DNA.' He isolated a 158 base-pair fragment from the human gene for apolipoprotein E (APOE), a protein that helps to carry fat in the bloodstream. One form of this gene, APOE  $\epsilon$ 4, is associated with a marginal increase in the risk of developing late-onset Alzheimer's. Instead of using DNA that actually codes for the protein, however, Brodyk chose his fragment from one of the four segments that are regarded as junk, since they have not been ascribed a biological function." <p://www.multispecies-salon.org/life/>

**25. Patricia Piccinini, *The Naturalist*.** Made from silicone, resin, human hair. Figure: 26 x 34 x 27 cm. From the artist: "While I read widely and am fascinated by contemporary science, I am happy to remain very much a lay person. I think that gives me a certain independence. I don't have anything invested in any particular discipline, and nor do I have any illusions of omnipotence. To me the most spurious thing about some science is that scientists seem to be so definite - even when they are wrong. I marvel at so much of what I hear about, but at the same time I often find myself asking 'why' somebody might want to do it. I'm sure many scientists would wonder the same thing if hearing about what I do..." <http://www.patriciapiccinini.net/426/76>.

**26. Tim Knowles, *Tree Drawings*.** "A series of drawings produced using drawing implements attached to the tips of tree branches, the wind's effects on the tree, recorded on paper. Like signatures each drawing reveals the different qualities and characteristics of each tree." <http://www.timknowles.co.uk/Work/TreeDrawings/CircularWeepingWillow/tabid/266/Default.aspx>.

**27. Diana Scherer, *Exercises in Rootsystem Domestication*.** From the artist: "In my work I explore the relationship man has with his natural environment and his desire to control nature. For the past few years my fascination has mainly been focused on the dynamics of belowground plant parts. I've been captivated by the root system, with its hidden, underground processes; it is considered to be the brain of the plant by plant neurobiologists. Charles Darwin was the first to watch the behaviour of plant roots. In his book *The Power of Movements of Plants*, he describes how roots do not passively grow down, but move and observe. A root navigates, knows what's up and down, observes gravity and localizes moisture and chemicals. Darwin discovered that plants are a lot more intelligent, than everybody thought. For contemporary botanists, this buried matter is still a wondrous land. There is a global investigation to discover this hidden world. I also want to explore it and apply the 'intelligence' of plants in my work." <http://dianascherer.nl>

**28. Lisa Nilsson, *Tissue Series - shoulder*.** Cross sections of human anatomy recreated using quilling. From the artist: "These pieces are made of Japanese mulberry paper and the gilded edges of old books. They are constructed by a technique of rolling and shaping narrow strips of paper called quilling or paper filigree... I find quilling exquisitely satisfying for rendering the densely squished and lovely internal landscape of the human body in cross section." <http://lisnilssonart.com/section/282102-Tissue-Series.html>

**29. Peter Saville & Harold Craft, *Unknown Pleasures album art*.** Cover art from the English band Joy Division's 1979 album *Unknown Pleasures*, shows stacked radio signals from a pulsar based on a figure in the 1977 edition of the *Cambridge Encyclopaedia of Astronomy*. From the *Encyclopaedia*: "Successive pulses from the first pulsar discovered, CP 1919, are here superimposed vertically. The pulses occur every 1.337 seconds. They are caused by rapidly spinning neutron star." <https://blogs.scientificamerican.com/sa-visual/pop-culture-pulsar-origin-story-of-joy-division-s-unknown-pleasures-album-cover-video/>

## Comics

**30. Beatrice the Biologist, *A Date With Your Microbiome*.** Comic drawn by former high-school biology teacher Katie McKissick. <http://www.beatricebiologist.com/2017/02/a-date-with-your-microbiome/>

**31. Beatrice the Biologist, *Gene Silencing*.** Comic drawn by former high-school biology teacher Katie McKissick. <http://www.beatricebiologist.com/2016/06/gene-silencing/>

**32. Maki Naro, *The Antibody*.** Comic strip about the immune system. <https://makinaro.myportfolio.com/the-antibody>

**33. Rosemary Mosco, *Bird sounds*.** Comic strip with mnemonics for remembering different bird calls. <http://infinitespider.com/wp-content/uploads/2014/01/bird-pneumonic-sounds.jpg>

**34. xkcd, *Up-Goer Five*.** Comic strip explaining how rockets work using only the 1000 most common words in the English language. <https://xkcd.com/1133/>

## Infographics

**35. Mason Currey / Info We Trust, *Daily Rituals: How Artists Work*.** Infographic of the daily routines of famous novelists, poets, playwrights, painters, philosophers, scientists, and mathematicians. <http://infowetrust.com/daily-rituals/>

**36. xkcd, *Tall Infographics*.** Webcomic by former NASA engineer Randall Munroe. <https://xkcd.com/1273/>

**37. Edward Minard, *Russian Campaign of 1812*.** Early infographic summarizing Napoleon's troop losses during the Russian campaign of 1812. Translated from text: "The numbers of men present are represented by the widths of the colored zones at a rate of one millimeter for every ten thousand men; they are further written across the zones. The red designates the men who enter Russia, the black those who leave it." [https://en.wikipedia.org/wiki/Charles\\_Joseph\\_Minard](https://en.wikipedia.org/wiki/Charles_Joseph_Minard)

**38. Eleanor Lutz, *Living with Fire*.** Different species of plants possessing different adaptations to wildfires were recreated using paper, and then filmed after being lit on fire. <http://tabletopwhale.com/2017/03/01/living-with-fire.html>

**39. Tami Tolpa, *Grow your own*.** Infographic highlighting technologies to manufacture brain parts, from Scientific American Magazine January 2017. [www.tolpa.com/infographics](http://www.tolpa.com/infographics)

**40. Jennifer Fairman, *Snip vs. Shred*.** Infographic that contrasts CRISPR-Cas9 with its cousin Cas-3. [www.fairmanstudios.com](http://www.fairmanstudios.com)