

SCRIPPS FLORIDA PROPOSAL: "ANGEL OF THE WEST (ANTIBODY)"

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Antibodies are truly magical molecules.

David S. Goodsell (Scripps Biochemist and Artist) [1]

1. IDEA

When I started thinking about a sculpture based on the antibody structure I discovered a fascinating visual analogy between the proportions of a human being as illustrated in Leonardo da Vinci's "Vitruvian Man", and the structure of an antibody. Fig. 1 shows both images superimposed. My proposed sculpture plays on the connection between Renaissance culture, symbolized by Leonardo's highly recognizable icon, and the antibody, the central molecule of the immune system.

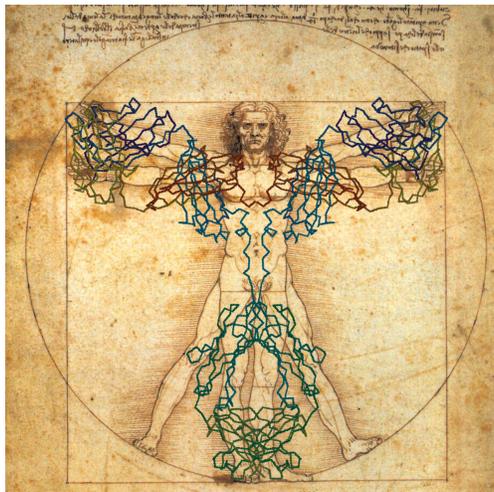


FIGURE 1. The backbone of a human antibody [2] (1994) superimposed on Leonardo's "Vitruvian Man" (1490). Note that both images are in the original aspect ratio. The antibody is a composite model built symmetrically from separately resolved fragments. Part of the hinge region and other details were theoretically modeled.

The scientific method is a culmination of the Western societies' approach to the world through logical reasoning. The second major era to develop this approach, after Greek Antiquity, was the Italian Renaissance. Our tremendous scientific and technological successes over the last centuries, for example in the art of healing, are a direct consequence of the application of the Western world view developed during these eras.

The discovery of the antibody structure, which was resolved to atomic resolution only in the last 25 years, lead to major advances in our understanding of the workings of the immune system. Today, there are a wealth of potent drugs and diagnostic tools based on the antibody. At the same time, antibodies are critical to basic research in the life sciences; their ability to bind to specific peptides makes them essentially our eyes to the world of protein biology. These properties, in combination with its remarkable shape, make the antibody molecule a potentially powerful symbol for the dramatic advances achieved in the life and health sciences.

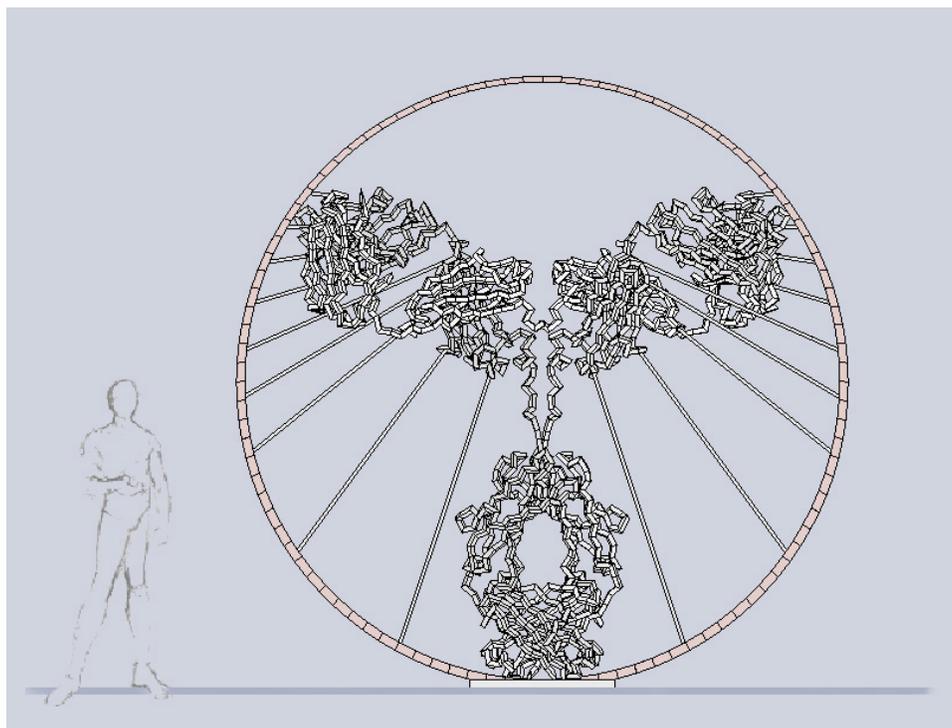


FIGURE 2. Front view of the proposed sculpture with a sketch of a 6' (1.83 m) tall person drawn to scale.

2. PROPOSAL

I propose to create a stainless steel sculpture consisting of a 9'8" (2.90 m) tall rendition of the antibody backbone structure in the style I developed over the last years [3, 4], surrounded and supported by a ring with an outside diameter of 12' (3.70 m) in the same proportions as the antibody and the circle around the man in Fig. 1.

The ring tapers from a width of 14.4 cm and a thickness of 7.2 cm on the bottom to half of that cross section at the top. The antibody structure will be attached to the ring with 3/4" (19 mm) round rods. The orientation of the rods is chosen such that they optically intersect at a common point corresponding to the center of the Vitruvian Man's head to subtly strengthen the connection with the proportions of the human body. The ring's outside will be covered with marble of a reddish tint. Marble, the Renaissance artist's preferred medium, will make a further metaphoric connection to the color of human flesh, and add a visually warmer element that contrasts with the modern look of shiny steel. Fig. 3 shows different views of the proposed sculpture. Please view the file "AntibodySculpture3D.html" on the enclosed CD for a moving three-dimensional image of the piece.

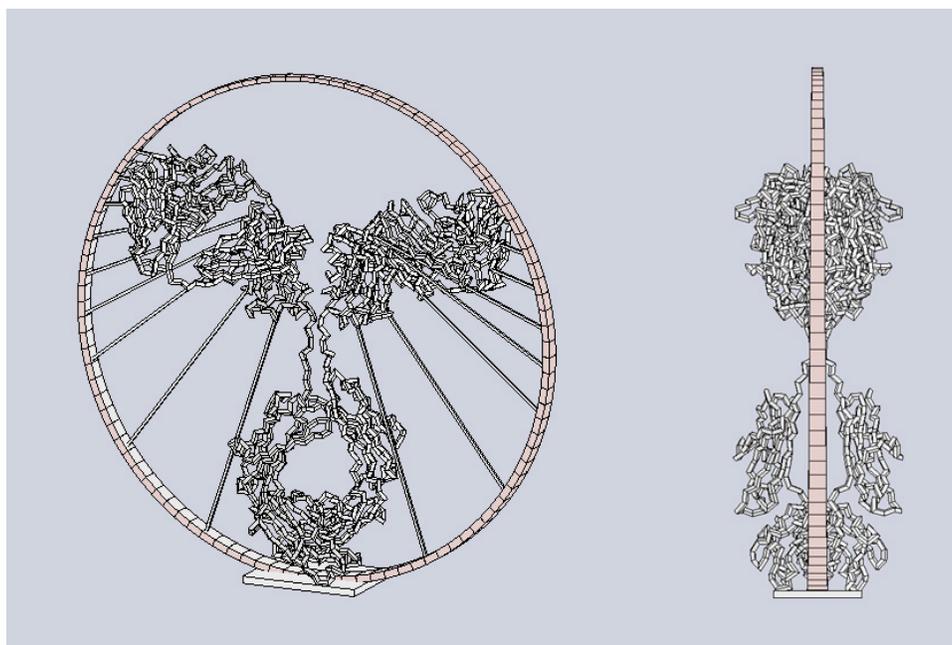


FIGURE 3. Images of the proposed sculpture. Pictured are a perspective view (left) and a side view (right).

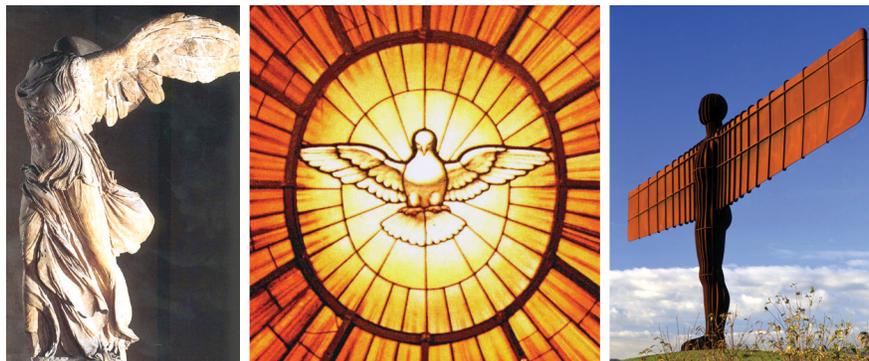


FIGURE 4. The image on the left shows the "Nike of Samothrace" (200 BC). In the middle is the 17th century "Holy Spirit" window in St. Peter's Basilica in Rome. The image on the right is Antony Gormley's gigantic "Angel of the North" (1998), with a wingspan of 175 foot (54 m) almost as long as the wings of a Jumbo jet.

When designing the piece I had images of angels in mind. Examples are the "Holy Spirit" in Rome's St. Peter's Basilica (Fig. 4, middle) and pre-Christian images of winged messengers, such as the Greek "Nike of Samothrace" (Fig. 4, left)¹.

I call the proposed piece "Angel of the West" for a number of reasons. The title references the monumental piece "Angel of the North" by British sculptor Antony Gormley (see Fig. 4, right). In my piece, "Angel" refers to modern medicine's almost miraculous promises of healing and "West" to the Western approach to healing. Most importantly, the title illustrates that antibodies are, in fact, an enormous army of tiny angels constantly protecting us from ill and disease.

3. SUMMARY

I believe the proposed sculpture, based on one of the most fascinating molecules of life, would be a beautiful addition to the Scripps Florida research campus. In addition to its aesthetic qualities, the piece is artistically relevant, offering a sensual experience of a world of vital importance to us, but invisible to the naked eye. The realization of the sculpture would give the antibody molecule the visual prominence it deserves and help reestablish the Renaissance notion that the natural sciences constitute an integral part of culture.

¹Interestingly, this famous image of the Goddess of Victory with her large wings and missing head and arms strongly resembles the shape of the antibody molecule.

REFERENCES

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- [2] Padlan, Eduardo A. Anatomy of the Antibody Molecule. *Mol. Immunol.* **31**, 169–217 (1994)
- [3] Voss-Andreae, J. Protein Sculptures: Life's Building Blocks Inspire Art. *Leonardo* **38** 1, 41–45 (2005)
- [4] Couzin, J. Blood and Steel. *Science* **309**, 2160 (2005)

Julian Voss-Andreae
2146 NE 10th Avenue
Portland, OR 97212
Home: +1 (503) 331 2309
Cell: +1 (503) 577 1979
Email: JulianVossAndreae@hotmail.com
Website: www.JulianVossAndreae.com