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COLLAGEN SCULPTURE

WORKING TITLE "SYNERGY"

I propose to create a sculpture for the *Center for Integrative Proteomics Research* based on the structure of the collagen molecule. Collagen, the most abundant protein in the human body, consists of three protein spirals that wind around each other, thereby creating a tight meta-spiral that is one of our body's key structural elements.

The sculpture will consist of stainless steel and glass for maximum durability and low maintenance. I will miter-cut 80 ft (24 m) of 10" x 10" (25 x 25 mm^2) square tubing to recreate the geometry of the protein backbone. I am basing my design on the collagen II structure[1,2]. The three strands will consist of 17, 18, and 19 mitered-cut parts (peptide units) featuring 207 windows (including three at the end of each strand). The three strands are joined by eight connectors that correspond to the hydrogen bonds in the molecule (one bond per tripeptide, arranged in a left-handed spiral). Each connector will made from approx. 4" (10 cm) pieces of 3/4" (19 mm) diameter round rod.

Each mitered-cut piece (corresponding to one peptide unit) will have approx. 7" (18 cm) wide cut-outs on each of its four faces in which windows of artisanal colored glass will be set. A typical window is approx. 14" (18 cm) long. The glass will be laminated onto clear glass to make very sturdy, 3/8" thick panels. Those will be water-jet cut to shape and set flush into the steel using architectural adhesive/sealant. Each of the 207 pieces of glass will rest on a laser-cut bracket, welded into the cutouts in the square tubing.

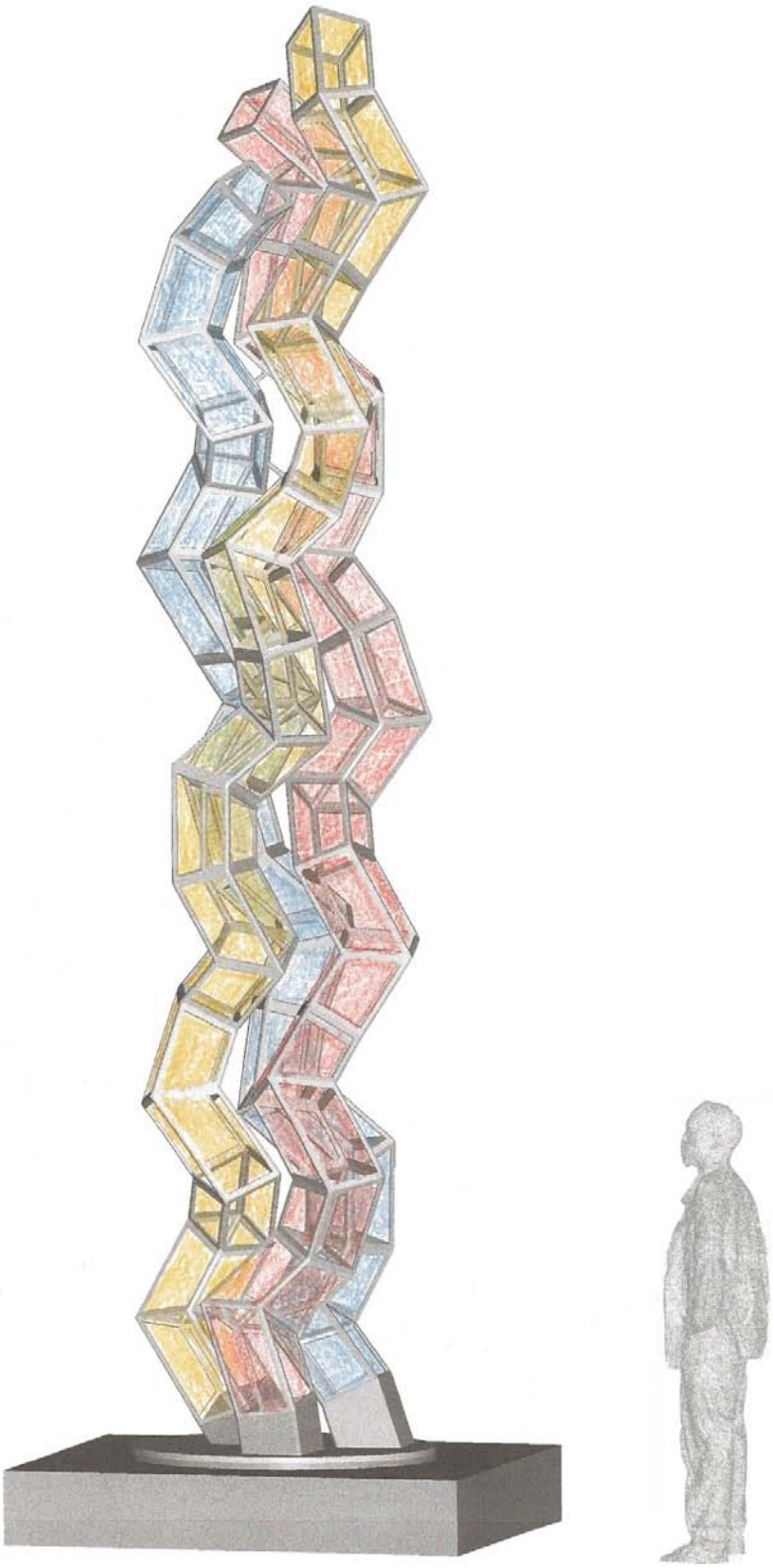

Figure 1: Sketch of the sculpture with a 6' (1.80 m) person for height comparison. For a video clip see http://youtu.be/bST6edTo3bU.

Each of the three strands will have its own color, a subtle tint of relatively un-saturated versions of the primary colors (see samples shipped to Helen Berman on 3/1/13). This hand-made glass comes in slightly differing shades which creates a rich visual quality. Due to its open structure, the light passing through the sculpture will give rise to a number of beautiful optical effects that will, together with the sparkle of the stainless steel, enliven the piece. The sculpture will be illuminated from the inside through three lights in the footing and four flood lights outside the sculpture, giving the piece a strong visual presence at night as well.

The sculpture will be installed adjacent to the seating area in front of the CIPR right next to the electrical box, on top of an approx. 1' (30 cm) tall 6' x 6' (180 x 180 cm^2) plinth. In order to visually integrate the two basement air vents into the design, the plinth will have the same height as the vents and will be aligned to the North with the larger vent (see Fig. 2).

Figure 1: Sculpture site. The red outline shows the footprint of the 6' x 6' plinth. The height of the plinth is the same as the vents, about 1'. The smaller of the two vents can be seen in the background.

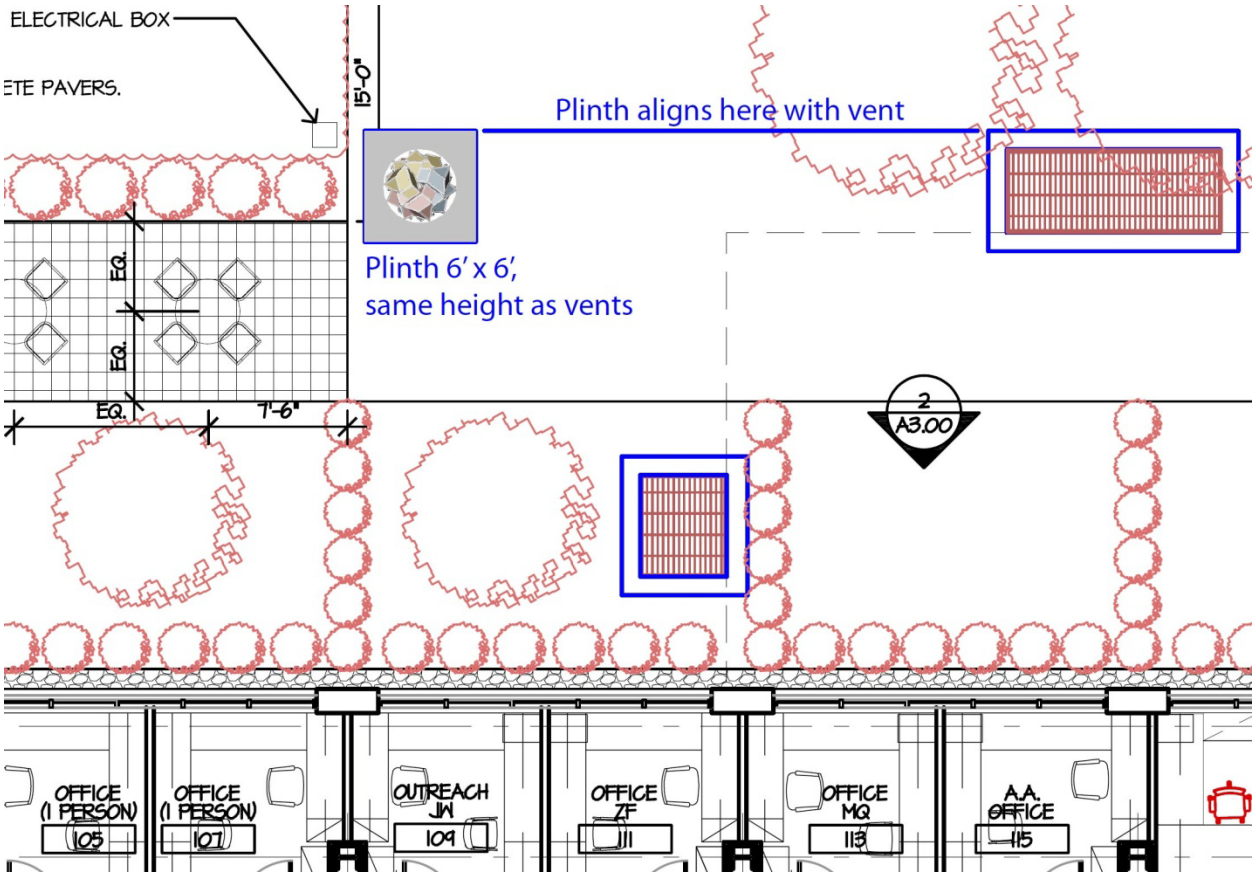

Figure 2: Site plan. The sculpture plinth/foundation is located close to the paved seating area to the West and aligns with the larger vent in the North.

Each collagen strand is indispensable in its contribution to the success of the overall structure making collagen a wonderful metaphor for the interdisciplinary character of the center's research. In addition to its conceptual appeal, the proposed sculpture will convey an immediate sense of the beauty inherent in the world of proteins.

TECHNICAL SPECIFICATIONS

Height of the sculpture (steel structure):	19' (5.80 m)
Width and Depth:	4' (1.20 m)
Weight:	2,800 lbs (1,300 kg)
Height of the plinth:	1' (0.30 m)
Total height:	20' (6.10 m)
Materials:	10" x 10" stainless steel grade 304 square tubing, laser-cut and welded. Wall thickness either 3/8" or 1/2", depending on engineering specifications. Colored sheet glass (Bullseye Glass Co.) 3 mm (1/8") thickness, laminated onto 1/4" (6 mm) clear colorless (low iron) glass "Starphire" (PPG Industries) and water jet-cut. Glass thickness after laminating 3/8" (10 mm).

[1] A. Rich and F. H. C. Crick. *J Mol Biol* 3, 483-506 (1961).
[2] R. D. B. Fraser, T. P. MacRae and E. Suzuki. *J Mol Biol* 129, 463-481 (1979).