

Names: _____

Protein-Protein Interactions I *Human Collagen*

Reading: <http://chemconnections.org/general/chem106/Tech%20Prep/Protein%20Activity%20II.1-2016.html>



Using the beads and string provided, assemble a string of amino acids for the following primary protein sequence of a portion of one chain of human collagen. Use one colored bead to represent each amino acid. Refer to the amino acid handout that was provided in class. There are only ten different colors of beads in the kit. If more than ten different amino acids are present, use the same color twice. Tag your string with your names and turn it in with this form. Provide the color key that you used on the back of this page.

PGFFTSIGQMT DLIHTEKDLVT SLKDYIKAEED KLEQIKKWAEK LDRLTSTATKD

One knotted end is to be taped red to represent the acid terminus and should be on the right of your string. The other knotted end is to be taped blue to represent the amino terminus and be on the left of the string.

Each of you in your group is to build a different amino acid from the following group: aspartate, leucine, isoleucine, histidine, glutamate, valine using <http://molview.org>. Enter the amino acid name in the molview search box and you will expedite the build, or you can assemble it by combining ammonia, methane and formic acid then modifying as necessary. When completed, from the Tools drop down menu, select Embed, copy and paste the embed code into an e-mail, with the name of the amino acid as the title of the e-mail, send to Dr. R., who will place it in the course ChemWiki vocabulary page.

A Google search of **Collagen Beauty Treatments** produced 2,720,000 hits (April 2016). The vast majority of these Web sites are commercial, **.com** domains. The Food & Drug Administration (FDA) has approved four physician administered, directly injected collagen products for use as skin “fillers” in human treatment. The American Academy of Dermatology (<https://www.aad.org/>) cautions that side effects and alternatives should be considered in choosing any treatment. Among the most popular invasive collagen promoting, “non-filler” treatments are: **MICRONEEDLING**, where tiny needles are used to poke holes in the skin, as the skin heals, collagen synthesis is stimulated. **BEE VENOM FACIAL**, which stimulates the production of collagen, but establishing that there is an absence of allergies to bee stings is absolutely needed. **VAMPIRE “FACE-LIFT”** where a patient’s blood is drawn and processed to produce a platelet-rich plasma, which is then injected back into the patient’s face. Pain and bruising can occur, and the full-effect takes weeks to months with multiple sessions often needed. **PLACENTA FACIAL** that uses an injectable serum derived from sheep placenta that stimulates collagen production.

Non-invasive, topically applied over-the-counter products with ingredients such as retinol, a form of Vitamin A, are alternatives to invasive needle treatments.

Retinol is a form of **Vitamin A**. It has an alcohol function and is found in many foods. It is present in beef, chicken, turkey, fish, milk, and packaged breakfast cereals. The retinol form of Vitamin A is oxidized to the aldehyde form (*retinal*), which is essential for vision, and also for healthy, soft skin and tissues.

Common side effects of topical retinol treatment is skin irritation, peeling, redness, itching, dryness, and sun sensitivity.

