Steroid Hormones and You

A hungry, scary, stressful, reproductive story about men and women.

Controlling Your Body

The nervous system:

rapid and precise responses to stimuli

Controlling Your Body

The nervous system:

rapid and precise responses to stimuli

The endocrine system:

long-term control using chemical signals.

controls growth and maturation along

maintains homeostasis*

*(hómoios, "similar" and stásis, "standing still")

The endocrine system: a short list

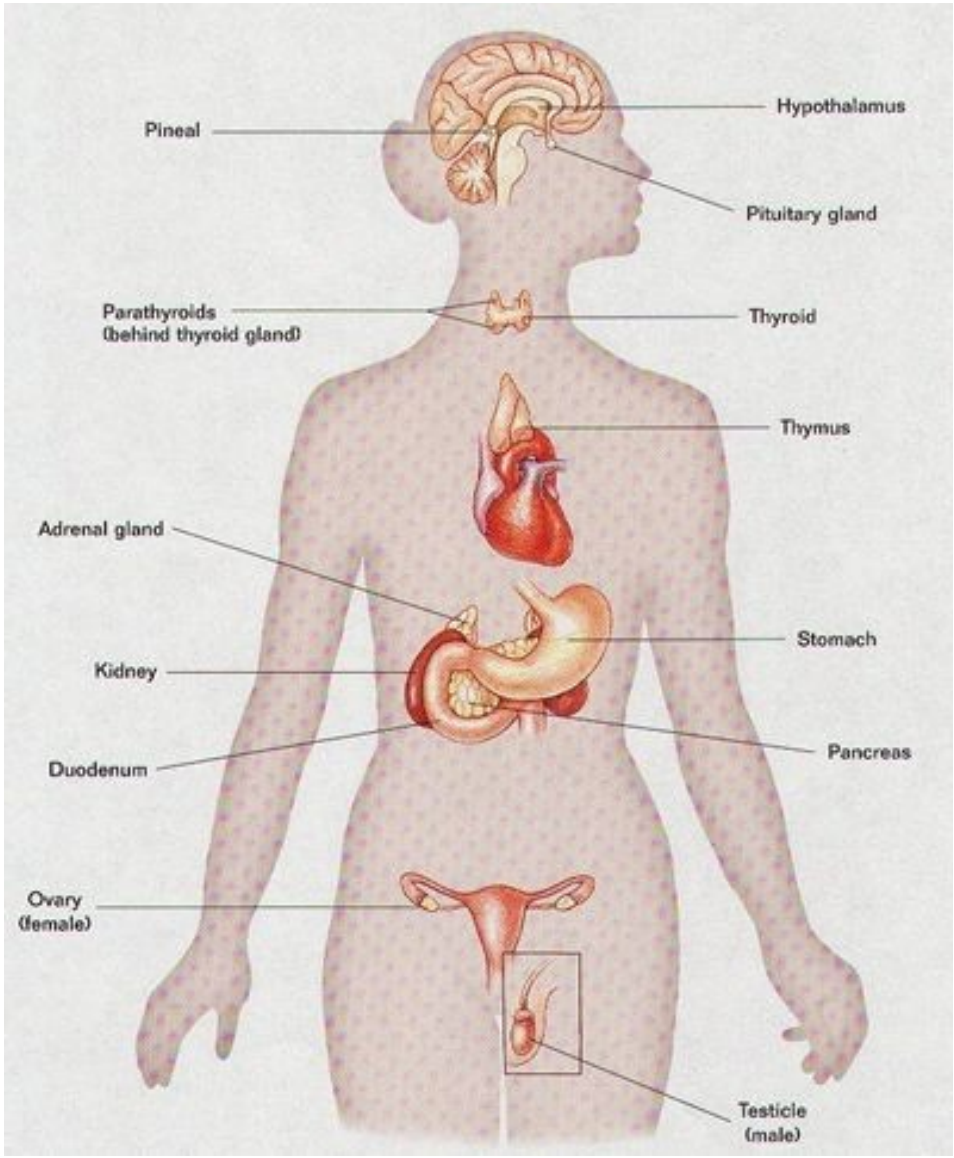
Pituitary and Hypothalamus:
Growth Hormones: cell size and number, bones
Thyroid Hormones: Temperature and metabolism
Oxytocin: contractions.
Prolactin milk production
Antidiuretic: water balance and blood pressure
Gonadotropins: Follicle-stimulating hormone (FSH) & Luteinizing Hormone (LH) controls gonads, menstration.

Adrenal
Epinephrine & norepinephrine: flight and fight
Mineraloccorticoids: electrolyte balance
Glucocorticoids: immune response and inflammation

Thydroid:
Metabolism, growth & development, sexual maturi**ty**

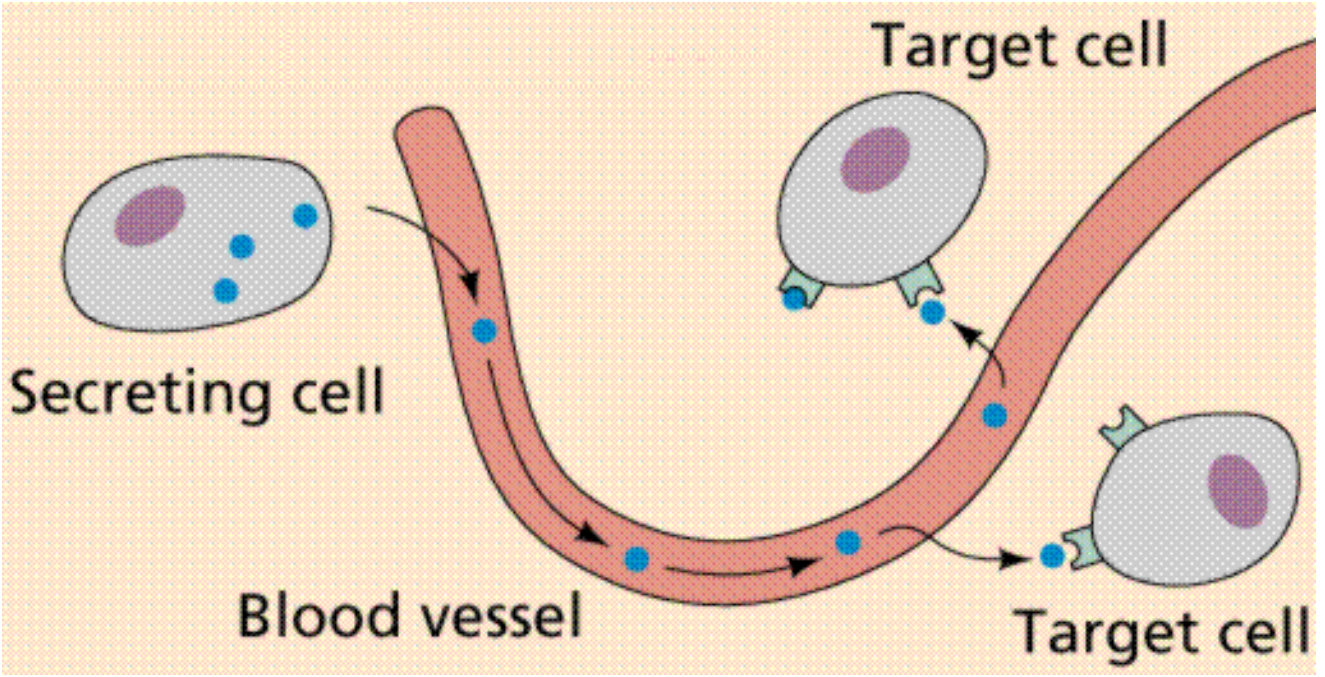
Pancreas
Insulin and glucagon: blood glucose levels

Gonads:
Testosterone, Estrogen & Progesterone: secondary sexual characteristics



What's a hormone ?
(A chemical messenger.)

Steroids
Peptides
Amines



The endocrine system is a collection of glands that secrete chemical messages we call hormones. These signals are passed through the blood to arrive at a target organ, which has cells possessing the appropriate receptor. Exocrine glands (not part of the endocrine system) secrete products that are passed outside the body. Sweat glands, salivary glands, and digestive glands are examples of exocrine glands. There are more than 50 different hormones!

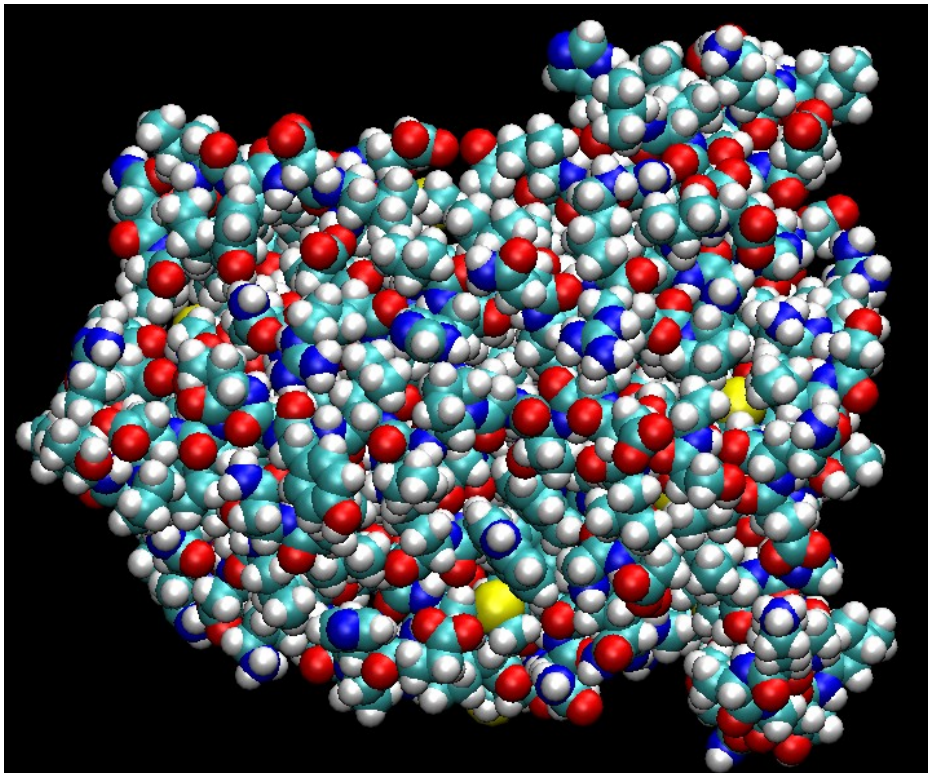
Your assignment.

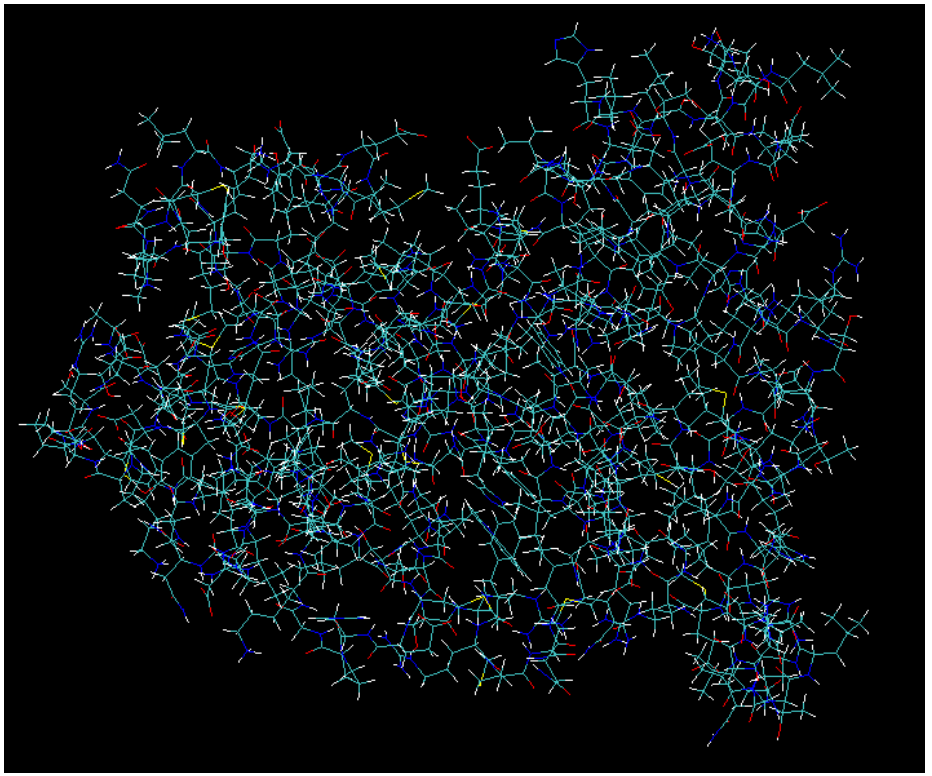
1) Make a model of the receptor (pipe cleaners)

2) Make a model of the hormone (marshmallows)

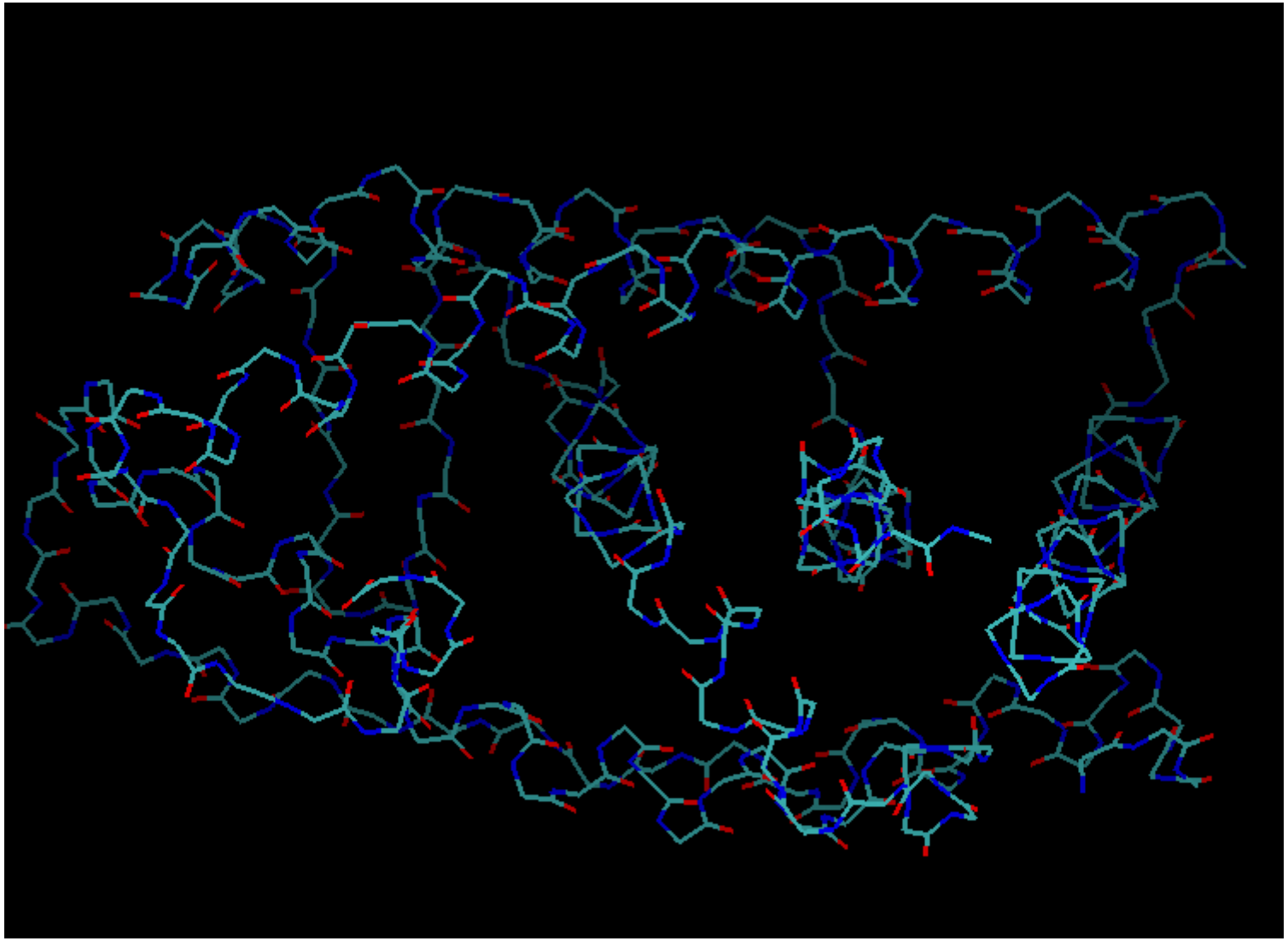
3) Dock the hormone to the receptor without unfolding the receptor.

What do proteins look like?

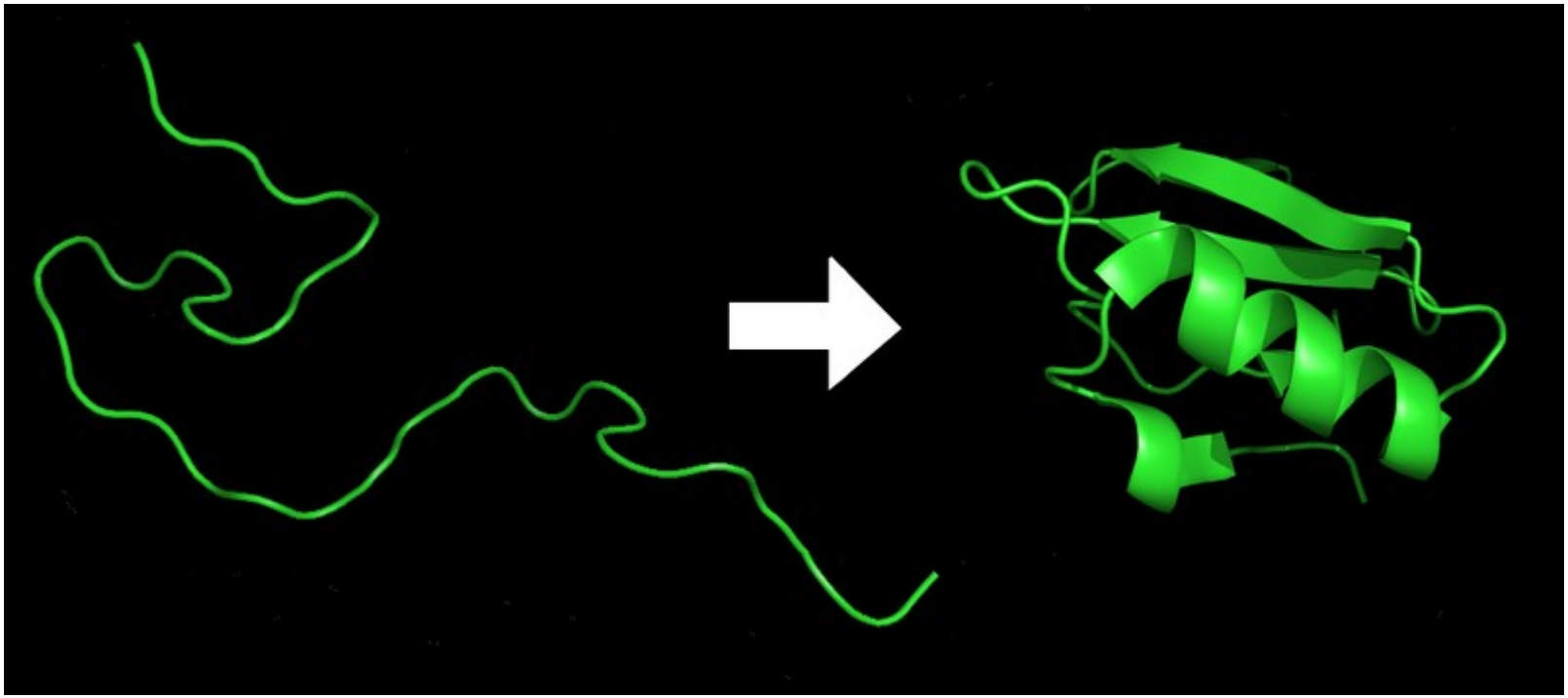




You want me to make what?

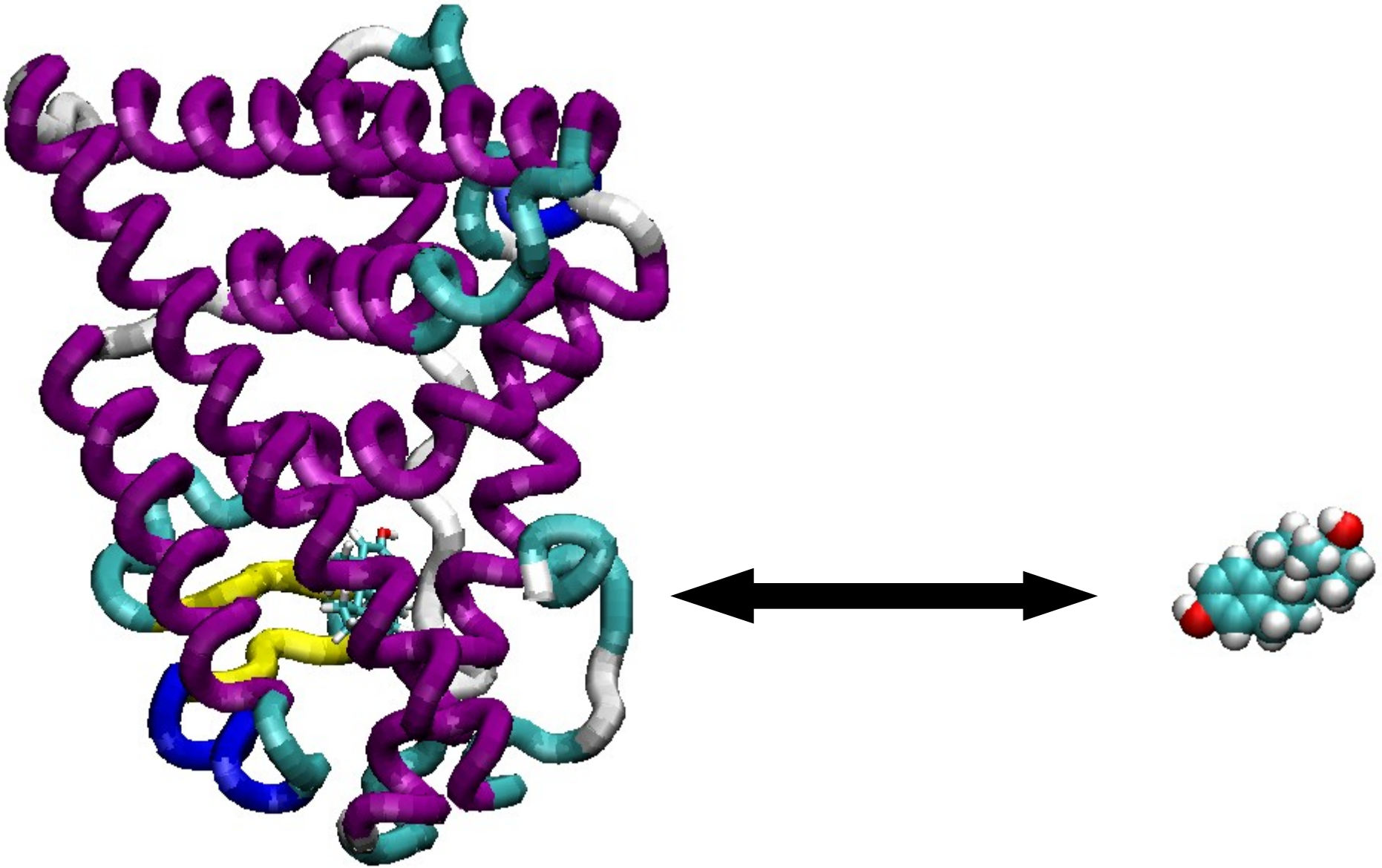


What do proteins look like?



A protein is a chain of amino acids that folds into a specific shape, also known as a conformation. The sequence of amino acids (primary structure) determines the secondary structural elements (helices, sheets) and how they pack together into the final tertiary structure.

The Docking Challenge
Put estradiol in the receptor



The Estrogen Receptor