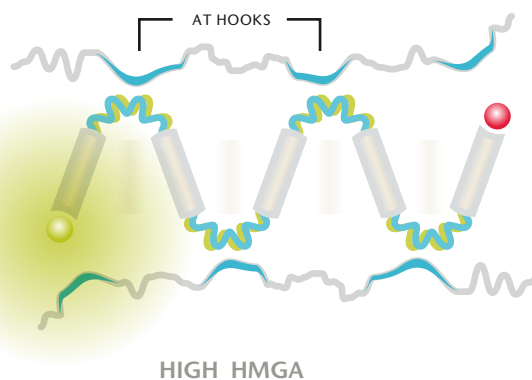
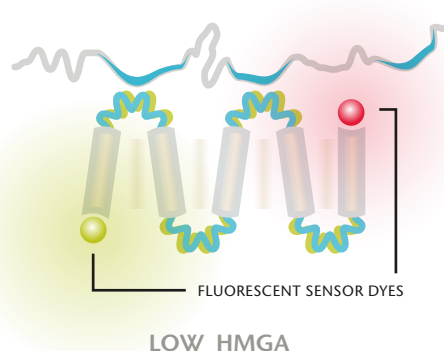
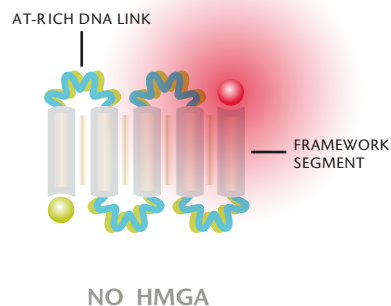


These molecules are made for each other

Proteins make up our hair and muscle, our brains and lungs, our enzymes and antibodies and countless other critical components of our bodies. To do their work, proteins must attain a particular shape, and most of them must partner with other specific proteins.

WSU biochemist Alex Li is exploring how proteins do those things, and how we can use similar strategies to create nano-scale machines that could assemble themselves. He has developed a theory that the bumps and grooves on the surface of a protein present a unique shape or “molecular code” that allows it to be recognized by other proteins with a matching code, the way a key fits its matching lock.

Li used molecular codes to design a biosensor that detects HMGA, a protein made by cancer cells. In the absence of HMGA, the biosensor is tightly folded and the fluorescent dyes at either end are close enough to interact. When Li shines green light on the biosensor, only the red dye emits light. When HMGA binds to some links of AT-rich DNA, the biosensor partially unfolds. The dyes move farther apart and both dyes emit light. When HMGA levels are high, the biosensor unfolds completely, and only the green dye lights up.



STAFF ILLUSTRATION



Alexander Li, Ph.D. :: Department of Chemistry, College of Sciences :: Areas of focus include macromolecular design and engineering, advanced materials synthesis, biofunctionality and nanotechnology integration, self-assembly and supramolecular systems, surface chemistry and catalysis, and metal oxide thin films.