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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.

Alex Li showed that the shape of a molecule is a "code" that allows it to recognize molecules with similar codes. **(1A)** He starts with a flat molecule with two open bays where other chemical groups can be placed. **(1B)** Attaching a small chemical at each bay makes the molecule twist slightly to accommodate them. **(1C)** Attaching a larger chemical at each bay makes the molecule twist more.

(2) Molecules with slightly different degrees of twist associated to some extent. Those with very different amounts of twist didn't come together at all.

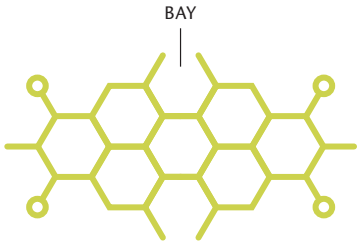

FIG 1A

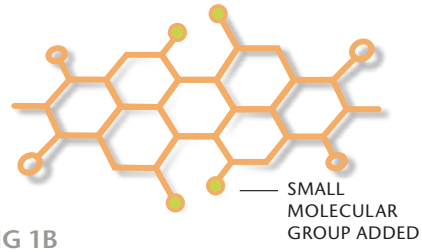

FIG 1B

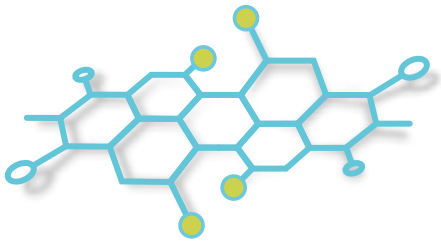

FIG 1C

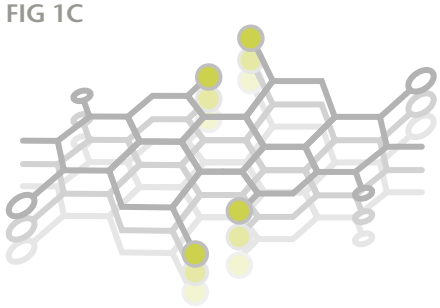

FIG 2 : TWISTED PLANAR STACK

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.