1086-57-491 **Candice Renee Price*** (candice.r.price@gmail.com). *Biological Application for the Oriented Skein Relation.*

The traditional skein relation for the Alexander polynomial involves an oriented knot, K_+, with a distinguished positive crossing; a knot K_-, obtained by changing the distinguished positive crossing of K_+ to a negative crossing; and a link K_0, the orientation preserving resolution of the distinguished crossing. We refer to (K_+, K_-, K_0) as the *oriented skein triple*.

Topoisomerases are proteins that break one segment of DNA allowing a DNA segment to pass through before resealing the break. Effectively, the action of these proteins can be modeled as $K_- \Leftrightarrow K_+$. *Recombinases* are proteins that cut two segments of DNA and recombine them in some manner. While recombinase local action varies, most are mathematically equivalent to a resolution, i.e. $K_\pm \Leftrightarrow K_0$. The oriented triple is now viewed as K_- = circular DNA substrate, K_+ = product of topoisomerase action, K_0 = product of recombinase action.

The theorem stated in this work gives a relationship between two 2-bridge knots, K_+ and K_-, that differ by a crossing change and a link, K_0 created from the oriented resolution of that crossing. We apply this to *difference topology* experiments using topoisomerase proteins to study SMC proteins. (Received September 04, 2012)