

Society of Engineering Science 51st Annual Technical Meeting

1–3 October 2014

Purdue University, West Lafayette, Indiana, USA

Computational modeling approach to predicting the shape and mechanical properties of DNA-based nanostructures

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ABSTRACT

This study also has implications that reach beyond the realm of mechanics and engineering. An increase in bone fracture risk generally occurs with age, due to both a loss of bone mass and bone quality (Ritchie et al. 2009). It is also common for the discs between individual vertebrae to degrade due to age or disease. Our work thus seeks to find an explanation for the loss of bone mass from the aspect of changing boundary conditions (degradation of the discs). In this way, our work serves two purposes: first to provide a better understanding of an optimal structure already present in nature and second to enhance our understanding of the change to our own bone structure that occurs with age.