1003-54-122 **Okan Gurel*** (`protein@attglobal.net`), 630 First Avenue, New York, NY 10016, and **Demet Gurel** (`demetg@touro.edu`), 27-33 W 23 Street, New York, NY 10010. *Dynamics of Protein Structure.* Preliminary report.

Building on the earlier work of Linus Pauling (1901-1994), a physical chemist who focused on the structure of proteins and discovered the fundamentals of the surface geometry of these structures, and of Rene Thom (1923-2002), a geometer and global analyst who emphasized energy versus force and hypothesized the dynamic process of morphogenesis in the epigenetic landscape introduced by C. H. Waddington (1905-1975), a geneticist, we proposed Topological Mechanics as a systematic way of understanding the dynamics of protein structure. With Topological Mechanics, protein structure dynamics are explained in terms of the rotational energy of protein surfaces. With this new approach, we are able to illustrate systematically the analyses of experimentally studied functional structures from the literature, including those of bacteriorhodopsin by Lanyi, prions by Prusiner, the TbscL mechanosensitive channel by Rees, voltage-gated potassium channels by MacKinnon, and histones in nucleosome by Allis. References are: Abstracts of AMS [930-54-115]1998, [939-58-1089]1999, [962-92-1239]2001, [973-58-138]2002, [993-54-985]2004, and Mathematics and Molecular Biology VII Santa Fe, NM 2002. (Received August 09, 2004)