Sample Abstracts

Abstract #1

Sensitivity Analysis of DSC Measurements of Denaturation of a Protein Mixture

Quantifying the kinetics of denaturation of heated proteins can lead to insight into protein folding, for example. Differential scanning calorimetery (DSC) measures changes in enthalpy of a specimen as its temperature is changed. DSC is a popular method to study the kinetics of polymers and biological materials. Increasingly, researchers are using DSC to measure changes in the enthalpy of mixtures of proteins and in cells. The confidence region of the parameters reported in these studies maybe unclear, because numerous parameters are being estimated using a single enthalpy trace. The present study examines using DSC to denature rattail tendon, which is predominantly Type I collagen. Analyzing the resulting data provides values for the kinetic parameters, in particular those describing a first-order Arrhenius model, governing the reaction. Several different methods for determining the parameters have been presented in past studies. In this study, the sensitivity of the parameters to the variables of the reaction, including the method to determine the parameters, is investigated. The results can be used to as a starting point to study the reliability of parameters for DSC experiments involving the denaturation of multiple proteins.

Abstract #2

Recycling in Rhode Island

Within our culture, recycling is seen as an important way in which we can help preserve our wildlife and protect the earth for our children’s future. With this positive reputation and strong public interest it would be reasonable to believe that recycling programs are widely supported and funded throughout the state of Rhode Island. However, this is not the reality. Within our research we plan on investigating three prominent Rhode Island cities, Providence, Newport and South Kingstown. Each city has its own recycling history and we are delving into the legislation and statics surrounding the emergence, or absence of a recycling program in each city. We hope to discover trends which point to why some cities have become more involved in the recycling phenomenon. We seek to determine what types of economic, social and political conditions are necessary in order for a city to introduce and fund a comprehensive recycling program.

Abstract #3

The Role of Src-Homology-3 in the Activation Mechanism of MLK3

Mixed-lineage kinases (MLKs) are mammalian protein kinases that play critical roles in mitogen-activated protein kinase (MAPK) signaling pathways. MLK3 is activated by the small GTPase, Cdc42. Our lab has demonstrated that the src-homology 3 (SH3) domain of MLK3 is involved in an autoinhibitory interaction with a single proline containing sequence located between the Cdc42-binding region and leucine zipper domain of MLK3 The purpose of this study is to determine the thermodynamic parameters (?G, ?S, ?H and Ka) of the binding interaction between the SH3 domain of MLK3 and a peptide corresponding to the MLK3 autoinhibitory region using isothermal titration calorimetry (ITC). The SH3 domain of MLK3 was digested from pGEX-2T-1-SH3 plasmid and re-ligated into a bacterial expressed vector pGEX-6P-1, which contains a PreScission protease sequence, using the BamHI and EcoRI restriction sites. pGEX-6P-1-SH3 plasmids were transformed into Rosetta (DE3) pLysS cells. The GST-SH3 fusion proteins were induced by adding IPTG and then purified using glutathione affinity agarose. We are currently working to remove the GST tag from the purified fusion protein in order to produce pure SH3 of MLK3 for ITC experiments.

Abstract #4

Individual Differences in Memory in Relation to Emotional Stimuli

Although research has been done showing that dysphoria correlates with an increased amount of mood congruent false memories in both dysphoric participants and negative mood induced participants, no research prior to this study has examined how inducing a negative mood in dysphoric participants affects mood congruent false memories. One hundred undergraduate participants viewed lists of depression-relevant, neutral and positive words that they were asked to recognize later among lure words. Participants were grouped as dysphoric, mid-dysphoric, or non-dysphoric as determined by BDI-II scores. This study hypothesized that dysphoric participants induced into a negative mood would have a greater number of mood congruent false memories than all of the other groups. A 2 x2 x3 x 3 – way mixed-model analysis of variance (ANOVA) with Mood Induction (positive, negative), Gender (male, female), and Group (dysphoric, mid-dysphoric, non-dysphoric control participants) as between-subject variables and Word Type (depression-relevant, neutral, positive) as a within-subject variable and correlation analyses were used to examine the depression relevant false memory results. Correlation analyses revealed that dysphoria is related to an increased amount of mood congruent false memories (r = .22; p< .04). The results of this study add to previous research in the field of depression and memory on a small scale. Further research in the area is needed for a more complete understanding of how memory functions in dysphoric individuals, and may be used to augment or create treatment techniques.

Abstract #5

The Prevalence of Theoretical Behavior Change Components in the Top Breast Cancer Websites to Encourage Detection or Prevention Behaviors and to Solicit Donations

The Internet has become a primary resource for the general public who seek health information about a variety of topics, including breast cancer. This particular research is part of a larger study which evaluated the use of basic design tenets and theoretical behavioral change components in the top 157 breast cancer websites. Fourteen components were taken from three behavioral change theories. The focus of this particular project was to assess the use of these 14 theoretical components on breast cancer websites as they persuade users towards prevention or detection behaviors. It will also discuss how some of these components were additionally used to persuade users to contribute money to the organizations that sponsor the websites. It should first be noted that overall, theoretical components were absent from the websites in general. Nine out of the 14 components were found to be used primarily for detection, as opposed to prevention. This is an important finding because it is just as valuable, if not more so, for a person to prevent a disease as it is to detect it early. Four of the 14 were considered when assessing persuasion in terms of fundraising. Of these four that were assessed, three were used more than 50% of the time when soliciting money. These results lend ideas for future research on such topics as well as ideas to better the current state of the top breast cancer websites.

Abstract #6

Memoirs of Genocide: From Poland to Sudan

For this project, related to my research assistance for Dr. Kenneth Waltzer in his work on "The Rescue of Children and Youth in Buchenwald," I will look at several different memoirs rooted in experiences of mass violence undergone by children and youth. I want to draw parallels between memoirs of youthful survivors who lived through the Nazi Holocaust in Europe, and the “Lost Boys,” who survived recent violent conflict in Sudan. My sample of memoirs includes works in French by Polish Jewish boys who survived the Holocaust in ghettos and work camps, finally winding up in Buchenwald. The Sudanese memoirs trace the paths of boys as they fled from destroyed homes to refugee camps. They are written in English, often involving the collaboration of American authors. Besides engaging each story individually, the exploration of these works urges broader questions about memory of horrific violence. How is memory presented and organized in memoir? What is emphasized and why? What are the motivations for speaking as witnesses of horror and survivors of violence? What are the implications of personal memoir for the larger task of preventing violence and genocide? These stories are diverse—they take place in worlds and times apart, they involve different actors and contexts. Yet they are also connected, involving experiences by youth of mass violence, survival, and finally efforts to represent memory years later as warning, as remembrance, and as an effort to help others understand.

Abstract #7

Embodying Social Advocacy

Whether on or offstage or in or out of the classroom, social advocacy is integral to dance. Choreographers often engage elements of social advocacy in order to empower dancers in their learning and understanding of dances. This notion is critical for students as their education enhances awareness of the art form. Such empowerment invites them to have ownership – in movement vocabulary and choreographic intent. Dancers’ voices, visually and audibly, become active agents of the creative process. We are investigating ideas concerning humanity and humanitarians. A unique research model is evolving as we investigate, creatively and through scholarship on socio-political issues. An overarching question is how, if at all, do our attitudes reflect in our dancing? As we interface physical and cognitive research, we have the opportunity to arrive at new ways of embodied knowing.