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Poster Session I

Poster Board No.1

**AN EXPLORATORY STUDY ASSESSING THE RELATIONSHIP BETWEEN
SYMBOLIC RACISM AND SOCIAL DOMINANCE ORIENTATION IN A
MULTICULTURAL ENVIRONMENT**

The primary aim of this study was to explore whether or not there was a relationship between symbolic racism, a new form of racism different from traditional racism, and social dominance orientation (SDO), an attitude predictors and standard personality variable, in a multicultural environment (location where four or more ethnic groups interact daily, and where no single ethnic group makes up more than 50 % of the total population). Thirty-three San Jose State University students enrolled in upper division psychology courses completed an eight-item symbolic racism scale and the Social Dominance Orientation Scale (Pratto, Sidanius, Stallworth, & Malle, 1994). The data confirmed a significant moderate positive relationship between symbolic racism and SDO. Implications for further research suggest conducting similar research with larger samples.

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Poster Session I

Poster Board No.2

**IDENTIFYING CULTURALLY COMPETENT CLINICAL SKILLS IN SPEECH-
LANGUAGE PATHOLOGISTS WORKING
IN THE CENTRAL VALLEY OF CALIFORNIA**

The purpose of this research study was to identify specific clinical skills in Central California speech-language pathologists (SLPs) that may constitute cultural competency. Through qualitative interview methods, data were collected from SLPs in Central California who have frequent contact with children and families who are culturally and linguistically diverse (CLD). Interview data were analyzed to identify descriptions of specific clinical practices, if any, the SLPs find are helpful when working with CLD children and families. Methods used to ensure trustworthiness, or credibility, believed to establish qualitative research validity included: (1) establishing descriptive validity, (2) working collaboratively, (3) searching for data triangulation, (4) seeking participant feedback, and (5) undergoing peer review. Clinical implications were discussed and suggestions for future research to document efficacy of identified culturally competent clinical skills were made. At the time of the composition of this abstract, data analysis had not yet been completed. Independent analyses to discover dominant themes will be conducted by the author of the research and the student presenter, who will then come to a consensus regarding the validity of those themes, which will then be discussed in this poster presentation.

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Poster Session I

Poster Board No.3

EFFECTIVENESS OF CARRIER RNA CO-EXTRACTION METHODOLOGIES USING THE QIAGEN BIOROBOT EZ1® AND EZ1® DNA INVESTIGATOR KIT

An internal method validation for the use of carrier RNAs (cRNA) to increase DNA recovery from highly degraded forensic samples was conducted for the Kern County Regional Criminalistics Laboratory (KCRCL) using Qiagen's BioRobot EZ1® automated DNA extraction platform. The validation study sought to identify the critical aspects of the procedure which must be controlled and monitored while additionally defining the limitations of the new procedure. The study evaluated the effects of cRNAs on the sensitivity/linearity, reproducibility, and concordance of the procedure on a host of known and nonprobative case samples. Substrates employed in the study included a certified reference material (NIST DNA-Standard 9947A), human blood, semen, calcified tissue and transfer (touch) samples. Study samples were run in triplicate with and without the addition carrier to cell lysates. Samples were purified using a Qiagen BioRobot EZ1® and EZ1® Investigator Kit. Quantitation of DNA extracts was performed using a Quantifiler™ Human DNA Kit and a 7500 Real-Time PCR System. Samples were amplified using a GeneAmp® PCR System 9700 with AmpFℓSTR™ Identifiler Kit. Genotyping of PCR products was carried out using a 3130 Genetic Analyzer and analyzed using GeneMapper® ID (ver3.2.1). Samples having carrier RNAs added to lysates showed a 1.2-22 fold increase in DNA recovery. The addition of cRNA to cell lysates presented to interference to downstream processes and was applicable to sample types encountered in a forensic context. The results of the internal method validation concluded the addition of carrier RNAs to cell lysates greatly increases the amount of DNA recovered as compared to non-carrier RNA containing samples. The method is now being considered for implementation in daily forensic DNA analysis at KCRCL.

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Poster Session I

Poster Board No.4

PERCEIVED SUPERIORITY IN ROMANTIC RELATIONSHIPS: BLAMING THE PARTNER FOR UNDESIRABLE FEATURES

People have a tendency to judge their own romantic relationship as better than others'. We tested this effect in two separate studies -- one study featuring a conventional rating system to examine the effect and the other featuring a thought listing procedure. Both of these studies produced statistically significant results displaying the perceived superiority effect. Based on these two studies, we have concluded that people tend to believe that their romantic relationships are better than others'. One previous study has shown that this superiority effect can be eliminated by asking people to be honest and accurate in their assessments. We hypothesize that this is because people can blame their partners for undesirable features of their romantic relationship. This hypothesis is currently being explored using a thought listing procedure.

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Poster Session I

Poster Board No.5

READING INTERESTS: A COMPARISON OF REQUIRED READING AND RECREATIONAL READING AMONG COLLEGE STUDENTS AND ITS IMPACT ON ACADEMIC SUCCESS DEFINED BY COLLEGE GRADES

The purpose of this literature review is to analyze any literature that focuses on the relationship between time spent by college students engaging in required reading opportunities versus the time spent doing recreational reading in relation to students' success. Prior research has shown that individuals engage in reading based on the motivation which is acquired and influenced by their surroundings. Other literature supports that reading habits and interests differ clearly across gender, age, socioeconomic status, and possibly race. Furthermore, studies have shown that situational interest, rather than choice or topic interest, promotes engagement in reading. Some literature conveys that reading interests mirror crystallized abilities and personality factors to a great extent. Several studies indicate that students perform academically better as they engage more in recreational reading. In terms of gender, research has demonstrated that there is an actual link between gender, reading interest, and reading engagement.

My future study will help to fill the gap in literature that will specifically explore the relationship between time spent by college students engaging in required reading opportunities versus the time spent doing recreational reading; moreover, we will look into any connection between both required reading and recreational reading and student's success.

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Poster Session I

Poster Board No.6

OPTIMAL STRATEGIES FOR A RIDE AND TIE RACE

In a world constantly looking to seek the fastest computers, shortest routes, and cheapest fares, methods for solving optimization problems are in high demand. In this project we explore a "ride and tie" race which is a race over a specified distance where teams of two compete against each other by interchangeably running and biking. The race starts with one person running while the other bikes, after an agreed upon distance, the competitor on the bicycle leaves the bicycle and starts to run. The competitor that was running then rides the bicycle once they reach its location and then they switch again at a further distance, and so forth. We study the problem of finding an optimal race strategy with a variety of different assumptions. Techniques in linear programming and nonlinear programming will be used, and properties of optimal strategies will also be discussed. Our models determine an optimal strategy based on the different strengths and weaknesses of the competitors. They also can be used to predict specific outcomes from various situations that may arise.

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Poster Session I

Poster Board No.7

**AN ANALYSIS AND REPRESENTATION OF GERMAN PHONETIC
CONSTRUCT EVIDENCED IN A BAVARIAN DIALECT WITH
HIGH GERMAN DIALECTAL INFLUENCE**

This paper accounts the construction of German phonology and addresses various attributes and unique qualities of the language. The particular dialect that was analyzed was that of a 24 year old man who was born and raised in Ebensfeld, Bavaria. As German is a pluricentric language, the individual tends to incorporate many pronunciations of the more standard German dialect of High German as he is studying business in a university setting at a more northern location in Germany. In conjunction, the writer has a working knowledge of the High German dialect. To acquire the data analyzed the author translated, recorded, and transcribed the individual's pronunciation of the 200 words which form the Swadesh list. The Swadesh list contains words that are distinctly unique to every language, lacking a high probability of words being borrowed or derived from another language and were determined by the use of lexicostatistics and glottochronology. The author broadly transcribed the pronunciation of all 200 words and then performed a comparative analysis of Germanic phonemes and categorized them according to their place and manner of articulation. The author then narrowly transcribed the words and repeated the process to reveal allophones, which fall in complimentary distribution, and consequently all distinctive attributes of the individual's pronunciation and dialect. Results for the distinctive features of this particular German dialect are numerous but entail some of the following: aspiration after voiceless stops excepting when followed by a sibilant, the transformation of Ich-Laut to ~Ach-Laut after back and central vowels, the assimilation of the nasal alveolar /n/ in the coda of a syllable when preceded by a stop or fricative with a different manner of articulation, and the nasalization of vowels before nasal consonants.

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Poster Session I

Poster Board No.8

THREE STAGE VIBRATION ISOLATION FOR UNMANNED AERIAL VEHICLE GIMBAL TARGETING SYSTEM

Model airplanes such as the Sig Rascal experience vibration and excitation forces derived from the rotating blades and the reciprocating parts of the gas engine. These forces are transmitted through the engine mounts to the fuselage and other parts of the airplane. The transmitted vibrations to the fuselage of the Sig Rascal caused the TASE gimbal and the electronics mounted in the fuselage of the Sig Rascal to fail in operation. In order for the mounted equipment to work properly, the vibrations had to be reduced to acceptable levels. The vibration studies were conducted to determine the loads exerted to the fuselage by the rotating blades and the gas engine. Vibration loads of 18g were recorded in the Sig Rascal TASE gimbal mount. Therefore, a major objective was to reduce the forces transmitted to the TASE gimbal mount. To resolve this, shock and vibration absorbing studies were conducted and proper materials were introduced to isolate vibrations from important components such as the TASE gimbal. The design of vibration isolators consisted of three stages. The first stage isolates the vibrations to the engine mount from the blades and the gas engine. The second stage isolates vibrations from the engine mount to the fuselage of the airplane.

The third stage isolates vibrations from the fuselage to the gimbal mount. The third stage incorporates Broad Temperature Range Elastomers (BTR) mounts, which were found to be of the optimum material given the base vibrations experienced by the TASE gimbal mounts. The vibration measurements show that the vibration loads to the TASE gimbal were reduced to less than 3g in all the X, Y, and Z axis with vibration absorbing materials. A performance comparison of the vibration isolation system between a gas and an electric engine was also studied. An effective solution was implemented that allowed the TASE gimbal to function satisfactorily and the airplane to achieve its mission goals.

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Poster Session I

Poster Board No.9

DEVELOPMENT OF PROTOCOLS FOR ENRICHMENT OF SPECIFIC ENDOCYTIC VESICLES INVOLVED IN $\beta 3$ INTEGRIN RECYCLING IN A CELL CULTURE MODEL SYSTEM

Integrins are transmembrane glycoproteins consisting of $\alpha\beta$ -heterodimer that mediates cell-cell, cell-extracellular matrix, and cell-pathogen interactions. Integrins directly influence cell signaling which, in normal cells, affects cell migration, proliferation, differentiation, and survival. $\alpha v\beta 3$ integrin is an important heterodimer involved in metastatic cancer. Integrins are known to be recycled from the membrane to the inside of the cell but, the specific pathway that is utilized is not clearly defined. Our study is to determine which pathway of endocytosis is utilized for integrin recycling. The two pathways we will look at are clathrin coated vesicle (CCV) and caveolae vesicles. We are using three cell lines in this experiment; $\beta 3/293$, $\beta 5/293$, and HEK/293.

Caveolae vesicles and CCVs are enriched by centrifugation from the pelleted cultures. The resulting enrichment is verified by use of immunoblotting. After establishing enrichment of the vesicles, the enrichments were immunoblotted for $\beta 3$ integrin. Reverse transcriptase polymerase chain reaction (RT-PCR) was done on caveolin-1, caveolin-2, and clathrin heavy chain.

Amplicons were resolved by agrose gel electrophoresis. Current findings suggest an increased expression of integrin in $\beta 3/293$ and $\beta 5/293$ from caveolae vesicle enrichment. Clathrin coated vesicle enrichment has not produced desired enrichment results. An interesting finding was discovered when optimizing caveolin-1 PCR primers. Cell lines $\beta 3/293$ and HEK/293 show an increased expression of caveolin-1 and caveolin-2. Further investigation of their isoforms is now being looked into. Further research and data is needed to help determine if caveolin is being over expressed and if so, in which cell lines. A more effective protocol is also needed in CCV enrichment so further experimentation can be done.

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Poster Session I

Poster Board No.10

**CORRECTING FOR THE EFFECTS OF EVAPORATION
ON THE GCMS ANALYSIS OF IGNITABLE LIQUIDS**

A GC-MS data pre-processing strategy has been developed that allows for the comparison of highly evaporated gasoline samples with a library of unevaporated source products. This pre-processing strategy improved the correlation (R^2) of data before and after being 90% evaporated by mass from 0.35 to 0.98. When searched against a library of over 100 unique source products, five gasoline samples were correctly identified to at least 75% evaporated and matched a gasoline product to greater than 98% evaporated.

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Poster Session I

Poster Board No.11

**EXPERIMENTAL STUDY OF STRUCTURAL, ELECTRICAL, AND
OPTOELECTRONIC PROPERTIES OF ZINC OXIDE NANOSTRUCTURES**

The semiconducting zinc oxide nanostructures are attracting increased attention in the science and technology communities partially because of their unique electric and optical properties with wide energy band gap (3.4eV) and large exciton binding energy (60meV). Their broad potential applications are from nanolasers, solar cells, photodetectors, and optical switches to piezoelectric generators, nanosensors, and electron transporters and transistors. Many of these applications are possible and enhanced due to the use of ZnO nanostructures. In this paper we present the synthesis of nanostructures including nanowires, nanobelts, and nanopillars using tubular furnace chemical vapor deposition techniques via vapor-liquid-solid mechanism. The as-grown ZnO nanostructures which greatly depend on synthesis conditions especially growth temperature were examined with SEM, TEM and XRD. Current-voltage (I-V) measurements were employed to investigate the electric properties of ZnO nanowires with various target gas environments and with laser irradiation. The I-V curves at temperature ranged from 150 to 300K were recorded under vacuum, and the Arrhenius plot shows perfect linear of I and $1/T$. the donor level of the semiconducting nanowires is about 326meV. We observed that with the laser beam the current increased 50% compared to that of laser absence. The I-V behaviors were found to be reversible with various target gases and it was enhanced by a factor of four under a reductive gas, CO. Further studies on ZnO nanostructural mechanical properties and bio-senor applications are undergoing.

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Poster Session I

Poster Board No.12

**USING TAG TEACHING TO DECREASE TOE WALKING
IN A CHILD WITH AUTISM**

Many children with autism exhibit toe walking from an early age. Consistent toe walking can be damaging to the leg and ankle muscles as the child gets older making it more difficult to walk flatfooted. Few studies have been conducted using behavioral interventions for toe walking (Marcus, Sinnott, Bradley, and Grey, 2009). Studies employing methods to decrease toe walking have used techniques that may be aversive to some children and may be costly. TAG Teach (Teaching with Acoustical Guidance) is a method of teaching behaviors through positive reinforcement by using a “click” sound that identifies correct behaviors. In the current study, TAG teach was used to teach a four-year-old child with autism to walk flatfooted by providing the reinforcing “click” sound contingent on flatfooted steps. This has implications for decreasing toe walking in other children with autism and can easily be used by teachers and parents.

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Poster Session I

Poster Board No.13

THE IMPACT OF PHYSICIAN AT INTAKE ON PATIENT CARE AND STAFF SATISFACTION AT AN ACADEMIC EMERGENCY DEPARTMENT

Introduction/Objectives: Studies in emergency departments (EDs) have demonstrated that the time to see a physician and length of ED stay (LOS) have the strongest correlation to patient satisfaction as well as decreased left without being seen rates (LWBS). It is proposed that having a designated area (intake) will decrease time to provider and LOS. Intake is an area where patients with non-emergent complaints are seen by a doctor and a team of nurse and ancillary staff. They receive a screening exam and are either treated and discharged (if possible) or initial studies and treatment are begun until an ED bed becomes available. It is unknown if a physician in an intake area affects resident and nursing education in an academic institution. The objective of this study was to determine the effects of having a physician in intake on LWBS and LOS rates, patient satisfaction, resident education, and staff satisfaction. Methods: A prospective, observational, convenience sample survey was conducted among ED nurses, attending physicians, and residents. An attending physician was assigned to an intake area and paired with nursing staff in March, 2009. A pre-implementation survey was conducted in February, 2009 and a post-implementation survey was conducted one year later. Patient satisfaction surveys were collected prior to implementation and continued throughout the study period. The LWBS rate and average length of ED stay was extracted from hospital data from December, 2008 through May, 2009. Data from December 2008 through February, 2009 was compared to data from March, 2009 through May, 2009.

Averages were calculated for LWBS, time to provider, LOS, and staff, physician, and patient satisfaction before and after implementation. Results: LWBS for pre and post-implementation was 5.66%, n=26601 and 8.46% n=31362 ($p < 0.0291$) respectively (December, 2008 through February, 2009 and March through June, 2009). Average time to provider pre and post-implementation was 110 and 140 minutes ($p > 0.0918$). LOS for pre and post-implementation was 287 and 273 minutes ($p > 0.3657$). Patient Satisfaction prior to implementation was 4.3 (very good) and post-implementation was 4.6 (excellent) ($p > 0.0603$). Staff satisfaction prior to implementation was 2.9 (good) n=79 and was 3.25 (very good) n=63 post-implementation ($p > 0.2605$). The staff's view of the system's effect on resident education was 2.9 (good) prior to implementation and 3.5 (very good) post-implementation ($p > 0.5760$). Conclusions: Data collection is ongoing, but preliminary results suggest that physician presence in intake does not positively affect the LWBS rate or time to provider. LOS was reduced but was not statistically significant. Patient and staff satisfaction rates rose but were also not statistically significant. Key Words: Triage, intake, LWBS, patient satisfaction, time to physician.

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Poster Session I

Poster Board No. 14

KINETICS OF THE REACTION OF PROPYLENE OXIDE WITH CHLORINE ATOMS

Methyl bromide is an insecticide that has been widely used by the agricultural industry as a fumigant. However, the use of this pesticide is being phased out because of the damage that it causes to the stratospheric ozone layer, which protects the earth's surface from harmful ultraviolet (uv) light. Propylene oxide (PPO) has been proposed as a potential alternative for some of the current applications of methyl bromide. The atmospheric chemistry of this species has not been studied, therefore the impact of its use on air quality is unknown. An evaluation of the atmospheric chemistry of a pollutant requires that a) the reactivity of the pollutant in the atmosphere is known, and b) the reaction products are well characterized. This work focuses on the rate of reaction of PPO with chlorine (Cl) atoms. Cl is widely used in atmospheric chemistry studies as a proxy for OH radicals, which is the most important initiator of chemical change in the atmosphere. The rate of reaction of chlorine atoms with PPO was measured in a smog chamber using the relative rate method. Mixtures of PPO, chlorine, air and a reference compound were introduced into the chamber, and were then irradiated using uv light from internally mounted blacklight lamps. Changes in the chemical composition were monitored by long-path Fourier Transform Infra-Red (FTIR) Spectroscopy. The rate coefficient for Cl + PPO was then determined from the relative decrease in the concentrations of PPO and the reference compound. Rate coefficients of 2.4×10^{-11} and 2.6×10^{-11} cm³.molecule⁻¹.s⁻¹ were measured using methanol and acetaldehyde as the reference compounds, respectively. There are no previous measurements of this quantity for comparison, but the rate coefficient is about five times higher than that of ethylene oxide, as expected based on the structure of the two molecules. The chemical and atmospheric implications of these results will be discussed.

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Poster Session I

Poster Board No.15

INDIVIDUAL DIFFERENCES IN THE TENDENCY TO TRANSMIT NEGATIVE GOSSIP

Foster (2004) defines gossip as “the exchange of personal information (positive or negative) in an evaluative way (positive or negative) about absent third parties.” Positive gossip refers to information about socially approved behavior. Negative gossip refers to information about negative social occurrences and information that has potentially bad influence on others. Research has suggested that there are individual differences in gossip behavior. However, no research has been done on individual differences in transmitting negative gossip. This study examined the personality predictors for the tendency to transmit negative gossip. The personality predictors included: 1. Social values: Gossip as a way to gain information and relationships. 2. Moral values: Concern about the ethics to gossip and the truthfulness of gossip. 3. Interpersonal curiosity: The desire to get information about others. 4. Social desirability: A need for social approval. 5. Machiavellianism: A strategy of social conduct that involves manipulating others for personal gain, often against the other’s self-interest. 6. Indirect interpersonal aggression: An intention to harm others without face-to-face interaction. Participants were recruited through the experimenter’s email list and the Psi Chi International Honors Society, CSUF chapter’s students. Two hundred and twenty four people volunteered to participated in this study, 78 participants were excluded due to incomplete questionnaires and that left 146 participants (Male: 39, Female: 107; Asian: 70, Non-Asian: 69). Online surveys were created using SurveyMonkey.com. Participants completed five personality questionnaires (Attitude toward Gossip Scale, Interpersonal Curiosity Scale, Social Desirability Scale, Machiavellianism Scale, and Indirect Interpersonal Aggression Scale) followed by a 6-item questionnaire developed by the experimenter to measure the tendency to transmit negative gossip. At the end of the online survey, participants were asked to fill in their demographic data.

A reliability analysis was conducted for the 6-item questionnaire ($\alpha = .847$) which suggested the 6-item questionnaire was reliable. The results showed that all personality predictors were significantly correlated with the total score of the 6-item questionnaire. The results indicated that moral values and indirect interpersonal aggression were the strongest predictors of the tendency to transmit negative gossip. In conclusion, although all personality variables were significantly correlated with tendency to transmit negative gossip, moral values and indirect interpersonal aggression are the strongest predictors to predict whether a person is more likely to transmit negative gossip.

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Poster Session I

Poster Board No.16

“A QUALITATIVE STUDY OF THE REFUGEE HMONG IN FRESNO COUNTY CALIFORNIA: HEALTH BELIEFS ABOUT CHILDHOOD INJURY AND HEALTH

"A Qualitative Study of the Refugee Hmong in Fresno County California: Health Beliefs about Childhood Injury and Health" is a pilot exploratory study to examine Hmong parental beliefs about injury and health in their young children. A focus group of English literate Hmong parents evaluated a standardized questionnaire to determine conceptual and contextual validity, for the Fresno Hmong parent population. A typical case network sampling qualitative methodology was applied to provide conceptual and contextual validity input for the questionnaire that measures parental health beliefs effecting childhood injury prevention measures for Phase 1 of this 3-part study. The participants provided input concerning the major conceptual categories of the tool based upon the Health Belief Model: Susceptibility, Seriousness, Barriers, Benefits, Self-efficacy and Social Support and the 65 contextual sub-questions. Input resulted in changes that will be incorporated into Phase 2 for validity testing to determine the use of this questionnaire in safety and health promotion strategies in Hmong-American families for their children.

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Poster Session I

Poster Board No.17

**TOLERANCE OF ACANTHAMOEBA TO LOW OXYGEN LEVELS:
IMPLICATIONS FOR PATHOGENICITY**

Acanthamoeba is a common free-living soil amoeba, perhaps the most frequently isolated naked amoeba from the environment. On rare occasions, this amoeba is opportunistically pathogenic and invades the cornea giving rise to a sight-threatening disease, Amoebic Keratitis. Although rare (1 to 2 cases per million lens wearers) this remains a concern for contact lens wearers. The reasons why amoebae should invade the eye are unknown and there is a need for research to understand the etiology of this disease. Amoebae are unique amongst the protists in that they live within bacterial biofilms. Here, they may experience reduced levels of oxygen. It is hypothesized that a poorly cleansed contact lens may harbor a bacterial biofilm and permit acanthamoebae to proliferate (if they are indeed capable of growth in low O₂). The tolerance of a collection of strains (pathogens + non-pathogens) was compared for cultures grown aerobically and microaerophilically. Blocks containing exponentially growing trophic amoebae were dissected from stock cultures and grown on non-nutrient agar with *E. coli* prey.

The distance migrated (mm) was measured after 5 d incubation in air and under reduced oxygen levels in a gas jar. Migration was a function of cell division and thus was an index of growth. Acanthamoeba spanning a range of genotypes were tested since some published data suggests the T4 genotype is of greater concern than other types. Results demonstrated that all Acanthamoeba (regardless of genotype) grew well under both aerobic + microaerophilic conditions. In fact most strains grew better in reduced oxygen. This ability of the genus to thrive in low oxygen conditions may indeed be an important factor in the course of the disease. Poorly cleansed lenses may harbor populations of amoebae capable of invading the cornea particularly when wearers are asleep and the surface of the eye experiences reduced oxygen.

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Poster Session I

Poster Board No.18

**EFFECT OF PHYSICIANS' EXPRESSIONS OF UNCERTAINTY AND PHYSICIAN
SEX ON PATIENT PERCEPTIONS**

Effect of Physicians' Expressions of Uncertainty and Physician Sex on Patient Perceptions
Janna Tassop and Paul C. Price California State University, Fresno Traditionally, physicians have been discouraged from expressing uncertainty (e.g., Katz, 1984). Recently, there has been a shift from the paternalistic approach to a shared decision making model. With SDM, the patient is viewed as an active participant in their healthcare and the communication of uncertainty is encouraged. There is some evidence that physician expressions of uncertainty have negative effects on patient satisfaction (e.g., Gordon et al., 2000; Ogden et al., 2002). In the present study, we try to replicate this effect in a carefully controlled experimental design—while also varying the sex of the physician, which has not been done before. This seems worthy of examination because the number of female physicians continues to grow, because prior research on the sex of a physician and overall patient satisfaction is conflicting (e.g., Hall et al., 1995; Zandbelt et al., 2004), and also because it seems possible that the effect of expressing uncertainty could be different for each sex. Students will (data collection to begin next week), read a prompt asking them to imagine they have been experiencing a set of symptoms before hearing a diagnosis from “Dr. Williams.” The doctor will be either male or female and give either a certain diagnosis (where only one possibility is presented) or an uncertain diagnosis (where two possibilities are presented). They will rate the physician on various dimensions, including competence and confidence. We predict that the uncertain physician will be viewed less favorably and that there may be an interaction between uncertainty and sex—with the uncertain female physician being viewed least favorably.

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Poster Session I

Poster Board No.19

NON-TEMPLATE POLYMERIZATION OF NUCLEOTIDES INTO GENETIC ELEMENTS BY THERMOPHILIC DNA POLYMERASE IN VITRO

DNA synthesis is the corner stone of all life forms and is required to replicate and restore the genetic information. It constitutes the structural genome and the genetic molecular communication system of living organisms on earth. The replication and evolution of the genetic information occur on pre-existing DNA or RNA templates with high fidelity. In living cells, the replication of genetic information is catalyzed by DNA polymerase, after initiation by primase in the 5' to 3' direction. Genetic information cannot be created without DNA or RNA templates in vivo, although the exception may be the process of translesion DNA synthesis, which is a pathogenesis-related nucleotide repeat expansion due to slippage during DNA replication or repair when DNA damage occurs (Gavin KA et al, 1995. *Science* 270: 1667-1771. Fumio Hanaoka. 2001. *Nature* 409: 33-34. Ji J, et al., 1996. *Nucleic Acids Research* 24: 2835-2842). We report here that DNA molecules could be created by thermophilic DNA polymerases in the absence of any DNA or RNA template at constant high temperature (74 °C), alternative changing temperature (74°C/37°C), or physiological condition (37 °C) during various lengths of time. We tested native and recombinant Taq DNA polymerases, Tth Taq DNA polymerases, SuperTaqPlus DNA polymerase, and Pfx DNA polymerase from various suppliers. Most DNA polymerases produced DNA molecules with all 4 kinds of dNTPs in various sizes except the Pfx DNA polymerase. Non-template DNA was also successfully polymerized with 2 or 3 individual free dNTP combinations, including dATP+dTTP, dGTP+dCTP, dATP+dTTP+dGTP, and dATP+dTTP+dCTP, by Taq DNA polymerase under the reaction condition with lower Mg⁺⁺ concentration in the way of MgCl₂ at 0.2 mM at 74 °C or 80 °C. The non-template DNA could be completely digested by DNase I and S1 nuclease, but not by RNase A, indicating their biochemical nature as DNA molecules.

Electronic microscopy observation revealed that the non-template DNA molecules were all linear in a range of lengths detectable from 0.01 μm to 1.0 μm approximately. DNA cloning and sequencing showed that the majority of the non-template DNA represented short sequence blocks, repeated sequences, intergenic spacers and other uncharacterized nucleotide polymers.

Thus, a new DNA molecule pool rich in various genetic elements was created by DNA polymerases in the absence of DNA or RNA templates in vitro. Our study proposes a potential molecular mechanism of the biogenesis and origin of genetic information without pre-existed nucleic acid templates. Our hypothesis is that DNA polymerases could use the bound free dNTPs as an error "seed template" to form and extend the oligonucleotide chain by random and alternative polymerization. The non-template DNA polymerization could create new sources of genetic information and may have facilitated the evolution of living cells through the life history.

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Poster Session I

Poster Board No.20

**A NEW CHALLENGE: APPLICATION OF EPIGENETIC THEORY
AND METHODS IN PLANT BREEDING**

Epigenetics is an emergent theory to study the genetic origin of any changes of acquired characteristics, heritable traits or gene expression patterns other than changes in the underlying DNA sequence. In principle, it views how the epi-alleles are originated and control inheritable “epigenetic” traits for “epi-phenotypic” variation during individual development, multi-generational transmission, environmental adaptation, evolutionary differentiation and gene flow in populations. The molecular basis of epigenetic mechanisms may involve DNA methylation, chromatin remodeling, RNA interference, sequestration of protein conformation, morphogen-induced genetic memory, paramutagenesis, and genomic imprinting. Recent evidence shows that epigenetic variations can arise at high frequency in response to environmental challenges or “genomic shocks” and contribute significantly to single and complex traits. How to integrate the epigenetic information into plant genomic mapping and breeding program is a new challenge at present. Morphogenesis assay in our study indicates that seeding pattern changes greatly in many wheat species, varieties and selections that interact to environment conditions. Polarized selection of best and worse seeds in opposite directions from single homozygous plant of wheat (*Triticum aestivum* L.) cv. Dexter, for three consecutive generations created two “epigenetic” lines, Dexter-L with larger seeds and Dexter-S with smaller sizes. Plant yield component analysis showed that the Dexter-L plants gained about 53% seeds/spike, 19% grams/1000k, 15% plant height, and 12% tillers/plant more than the Dexter-S plants. Genomic DNA methylation analysis showed that the DNA methylation patterns between the selected lines were quite different. Reciprocal hybridization and segregation analysis showed that the heritability of seeds/spike, grams/1000k, plant height, and tillers/plant were very high over 62% in estimate. Our research results provided evidence that some epi-alleles would be created, differentiated and fixed through epigenetic mechanisms during the polarized selection.

Based on current evidence, we propose a new technical approach potential for plant epigenetic breeding: (1) Define the optimized environment to meet with breeding objectives; (2) Select best single plants with desired traits with epigenetic agents;

(3) Select best seeds (or other traits) from the best plants; (4) Repeat steps (2) and (3) until the desired epigenetic traits are fixed; (5) Follow other standard breeding procedures to build cultivars. In addition, epigenetic markers could be developed from DNA methylation profiling and other epigenetic technologies. Application of epigenetic markers in genome mapping and marker-assisted selection will enhance plant breeding in the future. (*) Presenter: D. W. C. is an adjunct Assistant Professor

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Poster Session I

Poster Board No.21

**ON-CUSTODIAL DIVORCED FATHERS: A QUALITATIVE/QUANTITATIVE
REVIEW ON THE RELATIONSHIP BETWEEN FATHER/CHILD CONTACT AND
EMOTIONAL WELL-BEING AMONG**

Divorce is a serious issue for all members of the family. Often divorce ends with the children living with their mothers, and the non-custodial divorced fathers (NCDF) are left to face the many misconceptions and strain that reduce them to insignificant roles as fathers. Therefore NCDF have to face extra challenges to redevelop their relationship with their children. This study provided quantitative and qualitative research on the relationship between the NCDF's father/child contact and their emotional well being. In addition, the study investigated the factors that can contribute to their father/child connectedness. A total of six NCDF participated in the survey; four completed the survey and phone interview. The primary survey measured NCDF overall emotional welling and relationship with their children. Other surveys included questions related on the father's general demographics and current divorce situation. The study also implemented qualitative phone interviews, which was used to cross analyze the survey results. Similar themes and results were shared across all NCDFs. The most significant similarities were their role confusion as a father, negative perception of the legal system, and feelings of loss of their children and control over their own lives. The major weakness of the research was the lack of including fathers with full and joint custody. Comparing differences between fathers who have full and joint custody compared to non-custody and legal custody divorced fathers can increase the validity and accuracy of the results. Professionals should be aware that working with divorced fathers faces many conflict with the court system. Divorced fathers deal with a lot of grief and loss issues because they feel that they have lost their children. Much of these issues are expressed with anger. It is important for counselors to help fathers identify, accept, and resolve their source of anger.

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Poster Session I

Poster Board No.22

**PROTEIN ANALYSIS OF THE ONTOGENETIC CHANGES OF THE SKELETAL
MUSCLE PROTEIN IN ZEBRAFISH (DANIO RERIO)**

Vertebrates like toadfish and rattlesnake have superfast muscles that can contract more than 80 times per second. These muscles occur in sound producing organs, such as the rattle of the rattlesnake. These muscles generate very little force, and therefore are hypothesized to be unsuitable for locomotion. However, we know that zebrafish larvae swim with tail beat frequency of 100 Hz for a brief time during their development (at age 3 to 5 days post fertilization). These high tail beat frequencies suggest that larval swimming muscles are able to contract like superfast muscles. As the fish grow older and larger, their tail beat frequency drops to 10 Hz, and the fish might lose their superfast fibers. The superfast muscles that we know so far have a specialized type of myosin (type XII). However previous studies found that zebrafish larvae have only muscle fiber type I and II, typical for slow and fast muscles, but not XII for superfast muscles. The main goal of my project is to identify which myosin isoforms occur in zebrafish from embryo (1 day post fertilization) to metamorphosis into juveniles (15 day post fertilization) with a special focus on whether we can find more than I and II isoforms in larvae aged 3 to 5 days post-fertilization. As the first setup in this project, an existing protocol was validated for myosin protein extraction using various sample buffers. The amount of protein present in the fish sample was analyzed using SDS-PAGE. A gradient 4- 20% resolving gel was used since myosin has a high molecular weight. The SDS gel was stained with Coomassie blue dye to visualize the protein bands. It was observed that there were various proteins bands obtained which might be myosin heavy chain, myosin light chain, actin and tropomyosin based on its molecular weight. The concentration of the protein sample will be determined by the Bicinchoninic Acid Assay (BCA). The next step would be to perform Western Blot, to blot protein myosin. Primary and secondary antibodies will be used to confirm the isoform of myosin protein present. It is expected that the amount of fast myosin protein should be less in juvenile as compared with larval zebrafish.

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Poster Session I

Poster Board No.23

**INVESTIGATING THE EXPRESSION DYNAMICS OF CELL ADHESION GENES
DURING GASTRULATION IN NEMATOSTELLA VECTENSIS**

The phylum Cnidaria is considered to be the sister group to Bilateria and serves as an appropriate out-group to study the diversity and complexity of bilaterians. Among cnidarians, the sea anemone *Nematostella vectensis* has emerged as an important model system to investigate cnidarian development due to its simple body plan, developmental plasticity and utility for studying embryogenesis. The regulation of cell-cell adhesion is crucial to the molecular control of gastrulation. The levels of expression of cell adhesion genes at various stages of gastrulation in *Nematostella* will provide insights into the contribution of adhesion to embryogenesis and evolution of tissue morphogenesis in cnidarians as well as bilaterians. In situ hybridization will determine the spatial distribution patterns of cadherins, integrins, junctional components and other cell adhesion genes involved during gastrulation in *Nematostella vectensis*. To design probes to be used for in situ, the 3' untranslated region of cell adhesion genes in *Nematostella* was chosen to increase specificity towards the mRNA of interest. The designed probe sequences were then cloned, ligated into pGEM-T vector, purified, sequenced and used for riboprobe synthesis by in-vitro transcription. Sense and antisense probes have been successfully constructed for seven cadherin genes related to the Fat- and Flamingo- families of cadherins, as well as for integrin genes related to integrins $\alpha 4$, $\beta 1$, $\beta 3$ and $\beta 6$. These will now be used for in situ hybridization to determine the different stages and locations at which the genes are expressed. Unraveling the intricate details of distribution, patterning and regulation of cell adhesion genes during morphogenesis in *Nematostella* will yield a rich source of information about the regulation of cell adhesion in the cnidarian–bilaterian ancestor.

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Poster Session I

Poster Board No.24

IMPLEMENTING DOMAIN-SPECIFIC LANGUAGES USING SERVICE-ORIENTED ARCHITECTURE

Implementing Domain-Specific Languages using Service-Oriented Architecture Shih-Hsi Liu, Adam Cardenas, Xang Xiong California State University, Fresno, USA {shliu, alcardenas, xangxiong}@csufresno.edu Domain-Specific Languages (DSLs) are specialized high level programming/modeling languages that are constructed for users of specific domains and have been widely used throughout the industry and academia. Commonly, DSLs are implemented using a compiler/interpreter approach. This is done by paring a DSL program that decomposes predefined keywords/constructs, with a complier/interpreter that then later invokes the assigned functions consisting of the semantics of such constructs. Programming with DSLs, although increases productivity (5~10 times) and reliability, falls short when the need for additional/removal/evolution of DSL constructs arises. Additionally, DSLs disallow multiple programming language implementations and contain limited tool support to assist DSL developers and DSL users. Service-Oriented Architecture (SOA) is a software engineering paradigm that facilitates software extension and evolution when business requirements change. A set of technology-neutral specifications and standards can assist with interoperability and integration. To facilitate such advantages and overcome aforementioned challenges, two compiler/interpreter DSLs called Programmable Parameter Control for Evolutionary Algorithms (PPCea) and Feature

Description Language (FDL), are re-implemented following SOA: The DSLs' original constructs are converted into web services. Business Process Execution Logic (BPEL) then is used to describe DSL programs which invoke the web services deployed to distributed servers. Our experiments (available at <http://zimmer.csufresno.edu/~shliu/research/SOA-PPCea.html>) show that the conversion for both DSLs was a success, resulting in a complete test case matching the original compiler/interpreter design. The same tools that would be used later for SOA DSL development were used in great extent for the conversion process. Compared to the restrictions of compiler/interpreter based DSLs, redesigning PPCea and FDL in a SOA environment increases robustness and scalability of DSL development. This approach also provides the interoperable ability of DSLs constructed by multiple programming languages (e.g., C# and Java), increased syntactic and semantic modularization and maintainability, and a growing array of tools and support for DSL development. In conclusion, the SOA-based DSL development is a novel approach that solved many of the current struggling issues including DSL scalability, evolution, extension and compiler/interpreter restrictions. The SOA approach also brings a new handle on DSLs with the ability of multiple language implementations and integrating the growing field of SOA tools support.

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Poster Session I

Poster Board No.25

**SCHOLAR ATHLETES: EDUCATION, SPORTS, AND COMING OF
AGE IN LOS ANGELES, 1940-PRESENT**

The Chicana/o-Latina/o population in the United States has actively engaged in athletic activities in pursuit of a diversity of goals. For countless Chicanas/os and Latinas/os, athletic activities have provided an opportunity to develop ethnic and family pride, as well as to establish an individual identity and career, by weaving dynamic pathways to advancement through sports participation. Their undertaking of this endeavor is classed, gendered, and racialized, producing equally empowering and charged circumstances and opportunities stemming from the pressure of the power dynamics framing athletic activities. Nonetheless, among Chicanas/os-Latinas/os nationwide, these activities have created an outlet that has allowed this population to envision and pursue their goals in innovative ways. This literature review will focus on the relevance and power of athletic activities in the Chicana/o-Latina/o community of Los Angeles from the 1940s to the present. I will explore the scholarship on the trajectory of the relationship between athletic activities and Chicana/o-Latina/o pursuit of empowerment and success across race, class, gender and ethnicity.

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Poster Session II

Poster Board No.1

**PRELIMINARY EVIDENCE SUGGEST THAT TADALAFIL (CIALIS®) IMPROVE
HEALING IN A RAT FLAP MODEL**

In a preliminary study, Sprague-Dawley rats were fed regular chow or tadalafil-containing chow at 6.6mg/kg/d and 1.1mg/kg/d. McFarlane-type caudally based skin flap was performed on the dorsum of the rats. All rats continued to receive the respective chow 10 days post-surgery. The areas of flap necrosis were measured 10 days post-surgery. Flap necrosis in rats fed with Cialis for 10 days before surgery started showing signs of necrosis early (within the first 3 days) and then stopped. The maximum necrotic tissue was approximately 23%. The rats fed with Cialis for 18 hours before surgery presented necrosis in the flaps later after surgery (after the 6th day) but the necrosis was more extensive, reaching 43% in one rat and 34% in the other. Even though few animals were used and dosage and timing needs to be investigated further, these preliminary data suggest that treatment with Cialis during pre-surgery improves healing of McFarlane-type caudally based skin flap. More experiments are being performed to confirm these results.

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Poster Session II

Poster Board No.2

THE CONCEPT OF CLIENT-SIDE PROGRAMMING AS THE DRIVING FORCE OF COMPLEX COMPUTATION IN WEB BASED APPLICATIONS

A politician once described the Internet as a series of tubes. While politicians might only be interested in what clogs these fictitious tubes, a bioinformaticist understands, and can exploit the technology adding a new stream of wealth and knowledge to the surging resources the scientific community currently possesses. It is common protocol when creating web-based applications to use server-side coding to handle computational components, leaving the client-side to handle visualization and form processing. A point that is commonly overlooked is that client-side coding possesses all the needed components that most complex computations require. Using client-side programming to do complex computations opens a completely different set of doors to the user: computation speeds change from depending on the processing power of the server to the processing power of the user's computer. Submitted data stays local and is not uploaded to a server. There is no queue system if multiple users access the program concurrently. To demonstrate the potential of client-side programming, a simple sequence repeat (SSR)-finding software was programmed in pure client-side JavaScript/HTML. The software highlights SSRs of interest and can give flanking sequence data for effortless primer development. While client-side programming in its current state might have only selective application, it is an area less explored and is full of potential. Further research and development into this area of computational biology could lead to the next generation of web-generated analysis. The software can be utilized at www.csufresno.edu/ssrfinder.

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Poster Session II

Poster Board No.3

**ON THE ROLE OF HUMANOID AGENTS AND LINGUISTIC FACTORS IN
PERSPECTIVE-TAKING**

People often take an egocentric perspective when describing space. However, they occasionally take an alternative perspective that accommodates a listener's position relative to the scene. When and why do individuals do this? We explored this question in a series of experiments that extend previous work on perspective-taking (e.g., Schober, 1993; Tversky & Hard, 2009). In one experiment, participants were given photographs of two objects on a table (book, water bottle). Objectively, the scene could be described from either the perspective of the person viewing the picture or from the opposite perspective (i.e., facing the viewer). To test which viewpoint would be elicited, we asked participants to describe where an object was relative to another. In one experiment, a toy humanoid robot (facing the participant viewing the photograph) was included in the scene to determine whether or not people would take its vantage point when referring to object locations, and how this inclination might vary according to changes in accompanying linguistic information. Our results indicate that people often spontaneously take the perspective of an agent-like toy when describing object locations. These findings are interpreted within the context of embodied accounts of spatial cognition and language use.

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Poster Session II

Poster Board No.4

EVALUATION OF THE USE OF INFRA-RED PHOTO-ACOUSTIC DETECTION FOR MEASURING POLLUTANT EMISSIONS FROM DAIRY FACILITIES

The San Joaquin Valley experiences some of the poorest air quality in the United States. During the summer, levels of ozone exceed both Federal and State limits on an almost daily basis. Ozone is formed in chemical reactions involving sunlight, oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). In most regions, VOC emissions are mostly unburned fossil fuels and are often dominated by vehicular sources, but in Central California, emissions from dairy facilities are believed to contribute substantially to the emissions inventory for this pollutant. A number of studies have investigated VOC emissions from dairies over the past five years or so, and many have used commercial instruments employing the Infra-Red Photo-Acoustic Detection (IR-PAD) technique to monitor VOC concentrations. However, there is some evidence that this technique can be inaccurate under certain conditions. The goal of this work is to evaluate the accuracy of the IR-PAD technique for emissions measurements from dairies. VOC calibration standards were placed in vials within a flux isolation chamber. Clean air was swept into the chamber where it mixed with the VOC standards evaporating from the vials. Samples were then pumped from the chamber and were analyzed using an INNOVA IR-PAD instrument. The true flux of each VOC was then determined by measuring the mass of the compound that had evaporated during the experiment. The experiments focused on acetic acid, which has been shown in previous studies to dominate the VOC emissions from dairies. Results show that the INNOVA instrument typically underestimates acetic acid fluxes by a factor of 2-3. A comparison of fluxes measured at six Central California dairies using IR-PAD and a second technique (gas chromatography-mass spectrometry) are consistent with systematically low measurements by the INNOVA. Acetic acid was also found to interfere with other channels of the INNOVA instrument, giving non-zero readings for both methanol and 2-propanol. Collectively, these data show that measurements made using the IR-PAD technique should be treated with caution when evaluating VOC emissions from dairy operations.

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Poster Session II

Poster Board No.5

SAE BAJA

The purpose of the SAE (Society of Automotive Engineers) Baja competition is to engineer, fabricate and test an off-road vehicle that would be produced by a fictitious company. In designing an off-road vehicle, aspects such as reliability, manufacturability and performance of the vehicle, need to be considered. The SAE BAJA competition is an international intercollegiate competition where approximately one hundred prototype vehicles will be ran through a gauntlet of events to test every aspect of the vehicle. Such events include acceleration, maneuverability, hill climb, rock crawl and a four hour endurance race. Prior to the actual dynamic events the vehicle will also be graded on engineering design characteristics and considerations of meeting actual customer needs. Since the vehicle will be ultimately graded by judges as a product to be produced by a fictitious company all product considerations should be considered such as reliability, performance and even cost. At the end of the competition each collegiate team will then be graded on the accumulation of points a crewed during the duration of the competition, to take place May 19th through the 22nd, 2010.

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Poster Session II

Poster Board No.6

THE EFFECTS OF AIR POLLUTANTS AND PULMONARY FUNCTION

Previous studies have shown that the San Joaquin Valley has high levels of particulate matter (PM) which may exacerbate health problems such as asthma and cardiovascular disease. It is hypothesized that following a viral infection, an individual's immune system may be weakened to the point where exposure to quinones may trigger an asthma attack. To investigate the possible link between air pollution, viral infection, and asthma exacerbation and the exposure of an individual, the levels of the pollutants or their metabolites in the urine of the subject may be monitored. Experiments were carried out by evaluating urinary quinones as biomarkers for exposure to air pollution and PM. Urine samples were collected from a cohort of 19 patients during the period from November 2007-August 2008. Daily PM mass loadings and polycyclic aromatic hydrocarbons (PAHs) were simultaneously measured at two sites in Fresno County. Extracts were derivatized and analyzed by gas chromatography/mass spectrometry. In separate work conducted by another group, the presence of markers of viral infection is also being evaluated. Spirometer tests and daily symptom diaries are used to simultaneously track the lung function and asthma symptoms of the patients. Of the ten monitored quinines, 3 were detected to be above the limit of quantification along with five PAHs. Urinary levels of two quinines (phenanthroquinone and anthraquinone) are positively correlated with atmospheric mass loadings of the corresponding quinines monitored. Implications of these results for the use of urinary quinines as biomarkers will be discussed.

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Poster Board No.7

EXTRUSION PROCESSING OF FRUIT POMACE

Fruit co-products have found very limited utilization in the food processing industry. They have been primarily used as animal feed, applied to agricultural land for soil amendment or composted and applied to farms for growing crops. Some of these disposal methods are not environment friendly, while others are costly. This study was undertaken to examine the possibility of utilizing peach pomace as a source of soluble dietary fiber in expanded extruded food products. The effects of four levels of peach pomace in blends with rice flour were investigated on the physical and rheological properties of extrudates. Blends of peach pomace and rice flour were prepared by mixing and drying to a moisture level of 13.5% (W/W). Particle size of the blends was reduced to fine flour and the moisture level was pre-adjusted to 13.5% prior to extrusion. These blends were fed to a twin-screw extruder (Cletral EV-25) at the rate of 15 kg/h. The temperature profile from feed to die end was 25°C, 25°C, 25°C, 25°C, 60°C, 70°C, 80°C, 90°C, 100°C and 120°C; the extruder L/D ratio was 40:1 and the screw speed was maintained at 400 rpm. The response variables measured were specific mechanical energy, apparent and true densities, radial, overall and axial expansion ratios, extrudate porosity and breaking strength. The apparent density for the extrudates ranged between 133.94 and 183.93 kg/m³ while the true density ranged between 1171.2 and 1254.72 kg/m³, respectively. A linear increase in extrudate porosity (85.11-88.54%) and radial expansion ratio (13.5-19.3) and a steady decrease in breaking strength (104-50.74 kPa) were observed with increasing peach pomace level in the blends. The data clearly indicated that peach pomace can be effectively used in extruded products without compromising quality attributes. Development of an extrusion process will lead to better utilization of fruit harvest.

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Poster Session II

Poster Board No.8

**A QUALITATIVE STUDY OF THREE COMMUNITY GROUPS IN THE SAN
JOAQUIN VALLEY: EMERGING NEIGHBORHOOD GROUPS AND
RELATIONS OF SOCIAL CAPITAL**

The purpose of this exploratory study/report is to examine how some Valley residents involved in small community groups in three different locations across the region construct the meaning of their membership as having an impact on their personal sense of health and well-being. It studies these perceptions through an examination of how the members narrate the group as contributing to their sense of belonging, community and place through a grounded theory approach. The data from 7 interviews conducted during the summer of 2009 was analyzed using a grounded theory approach, 13 categories were constructed from the data using NVivo software. These categories were then linked through relationships which produced three main themes: home and neighborhood, community and safety, and the sense of health and belonging to community. The findings were that a common ethnic identity combined with a similar history of recent migration certainly seemed to enhance bonding social capital, particularly in a low social power community. The work of community organizers with the group that had a common ethnic identity reinforced relations of bonding social capital in which residents felt they could trust and help one another. Safety issues were very present in marginalized groups with low social power. Members of these groups stated that they often felt physical fear in their neighborhoods. An organizing aim of the groups was to collectively deal with these fears, though only one showed success in developing concrete social action to change the situation. Members of the two groups that had low social power reported looking to the groups to find a community and reduce stress. Members of these groups saw them as a safe emotional space to be with others like themselves, as well as a means to reduce loneliness. This implies that the process of community organizing in areas of low social power as well as with marginalized groups is worthy of further study, particularly in the San Joaquin Valley which has a relatively high level of urban and rural poverty. The impact of migration will continue to be an issue in developing relations of social cohesion throughout the San Joaquin Valley.

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Poster Session II

Poster Board No.9

THE BRIEF SYMPTOM INVENTORY

This study is a needs assessment and outcome study of college student counseling. For many years, it was assumed that college students were protected from mental illness because of their higher intelligence and social class. However, recent studies have indicated that students have similar prevalence rates of mental illness as the general populations. This study explored this phenomenon using a standardized measure of psychiatric symptoms, the Brief Symptom Inventory (BSI). Students seeking counseling must complete a BSI questionnaire every four sessions by request of their counselor. Several hypotheses were tested. The first hypothesis was that students would show less distress than a psychiatric outpatient normative sample in terms of BSI subscale scores. Results indicated that scores on all of the BSI subscales were similar to the means of a psychiatric outpatient normative sample, and thus did not differ as expected. The second hypothesis was that students would show similar scores at the first administration of the BSI (4 weeks), but then show decreasing scores at the 8 week and 12 week administration. There was a trend for scores to decrease between the 1st and 4th administrations, but increase by the 8th administration. However, there was a large drop in the number of students (75%) between the first and fourth administrations and proportional drops in the number of students who complete the 8th and 12th administrations. In conclusion, college student counseling clients are similar to other psychiatric outpatient populations at intake. It was interesting that the scores decreased at the second administration, but increased again by the 8th. Perhaps this is because the students with the most severe symptoms remain in counseling and thus, look like they are not changing over time. Another possibility is that situational stressors increase between the fourth and eight sessions of counseling. Results have implications for monitoring change across the course of counseling and funding college student mental health research and treatment programs.

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Poster Session II

Poster Board No.10

**IMAGING CHANGES FROM PARTIAL BREAST RADIATION THERAPY BY
VARIOUS APPROACHES – IORT, SAVI, CONTURA.**

The purpose of this study is to report imaging changes from partial breast radiation therapy by various approaches – IORT, SAVI, CONTURA. Breast-sparing surgery (lumpectomy) followed by radiation has equivalent survival benefits to mastectomy and has become treatment of choice for women with early stage breast cancer. PBI (partial breast irradiation) is a new way to give radiation therapy to the breast after a lumpectomy. Studies have shown that PBI reduces the rate of post-radiation complications that can occur with whole breast irradiation (WBI). Retrospective review was performed on the records of 75 patients who had undergone partial breast radiation at UCSD Moores Cancer Center. All patients in the study had biopsy-proven carcinoma, either stage 0 (DCIS) or stage I or II invasive adenocarcinoma of the breast with no evidence of metastatic disease. If stage II, tumor size must be 3 cm or less. Patients have undergone a lumpectomy. 3 technologies for delivering PBI were utilized – IORT, SAVI and CONTURA. Technique selected is based on technical considerations and patients' preference. All of the initial and follow-up imaging studies were evaluated by board-certified radiologist. Mammograms, sonograms and MRI images were examined for the presence of skin thickening, diffuse and focal increased density, mass, lucency, and calcifications.

Skin thickening was graded as none, mild to moderate, or severe. The other categories were recorded as present or absent and were not graded.

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Poster Session II

Poster Board No.11

**DESCRIPTION OF DIABETIC PATIENTS BY NEPHROPATHY
(KIDNEY DISEASE) STATUS**

Introduction: Type 2 Diabetes (DM2) is a major cause of nephropathy (kidney disease) in the United States. Early diagnosis of DM2 and early intervention are critical in preventing progression to diabetic nephropathy (DN). Although some studies have shown a relationship between high glycosylated hemoglobin (HbA1c) levels and diabetic complications, HbA1c has not been demonstrated as a definitive predictor for DN. Further, Low Density Lipoprotein (LDL) and its role in DN has not been clearly demonstrated. Methods: A retrospective chart review of DM2 patients from the Family Medicine Clinic at the University Medical Center, Fresno, California, was done. Study subjects were at least 18 years old, with established DM2, as defined by ICD-9 code classification, and had a chart audit completed between 2002 and 2009. Information gathered included: DN status, HbA1c and LDL levels. Results: 1,098 records were reviewed. DN status was available in 911 patients, of which 16% (143) of patients were diagnosed with DN. Chi-squared analysis of HgA1c categories comparing patients with and without DN was not statistically significant ($P = 0.55$). 33% of patients with DN had controlled HbA1c ($< 7\%$) compared to 37% of patients without DN. In contrast, 8% of patients with DN had uncontrolled HbA1c ($> 12\%$) compared to 10% of patients without DN. Chi-squared analysis of LDL categories was not statistically significant ($P = 0.35$). 85% of patients with DN had LDL levels < 130 , compared to 80% of patients without DN. Conclusions: Lack of control of HbA1c and LDL levels was not associated with DN in DM2 patients. Further study is needed to investigate other factors that may contribute to the development of DN. Audit information available used a LDL cutoff of 130, other levels may show different results, such as LDL < 100 or LDL < 70 .

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Poster Session II

Poster Board No.12

Structural Studies of Di- μ -chloro-bis[(η^6 -ethoxybenzene)chlororuthenium(II)]

X-ray crystallography was used to determine the molecular structure of an organometallic complex (i.e a metal complex with a carbon bond) that is used as a starting material for synthesizing more complicated ruthenium complexes. Crystallography data gives the bond angles and distances within a compound. It can also provide evidence for interactions between different molecules. Di- μ -chloro-bis[(η^6 -ethoxybenzene)chlororuthenium(II)] has been crystallized using slow diffusion of hexanes into a dichloromethane solution. This ruthenium dimer complex was prepared using 1-methoxy-cyclohexa-1,4-diene and ruthenium(III) chloride in ethanol. Single-crystal X-ray structure determination was carried out at 208(2) K on a Bruker P4 Diffractometer equipped with a Bruker APEX detector. Mo K α radiation ($\lambda = 0.71073 \text{ \AA}$) was used, and the structure was solved by direct methods with Shelxs-97 and refined by full-matrix least-squares procedures utilizing SHELXL-97. The ruthenium metal atoms are at the center of the molecular structure, and they are linked to each other by 2 bridging chlorides. The face of the ethoxy benzene ring binds to the ruthenium atom. In addition, the distance between the oxygen atoms of one molecule are close enough to a hydrogen of an adjacent molecule (3.433 Å) to indicate a particular type of intermolecular interaction known as hydrogen bonding.

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Poster Board No.13

**CHARACTERIZATION OF bis(O-Ethyl-L-Cysteinato)nickel(II): UNDERSTANDING
BROADENED ¹H-NMR SIGNALS**

Nickel is a toxic metal that can cause cancer and other health related problems. We are trying to mimic the way nickel interacts in living systems. We use the simple cysteine amino acid to model nickel bonding sites in the body. Bis(O-ethyl-L-cysteinato)nickel(II), Ni(cysE)₂, serves as a model compound for sulfur-rich zinc proteins in which the zinc of a healthy protein has been displaced by nickel. Displacement by nickel results in oxidative damage, hindered DNA repair, and cancerous growth. Proton NMR spectra of Ni(cysE)₂ in various solvents show significant broadening for some peaks. Magnetic susceptibility studies confirmed our hypothesis that the broad peaks seen in our spectra is not due to paramagnetic shifts since the complex is diamagnetic in both solution and solid state. The broad signals are likely the result of complicated coupling due to a chiral carbon center and poor magnetic field strength. Variable temperature experiments may also explain broad proton signals as possible dynamic processes.

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Poster Board No.14

**CHARACTERIZATION OF VARIOUS REPETITIVE ELEMENTS IN PEPPER
(*Capsicum annuum*)**

Previous experiments show that repetitive DNA makes up a large fraction of the pepper genome, and contributes to its four-fold size difference with tomato. Further isolation and characterization of repetitive DNA is needed to achieve a better understanding of pepper's genetic makeup. A random genomic library was constructed from mechanically sheared pepper DNA. Twenty-seven clones, containing anywhere from 500 to 3000 basepairs, were sequenced and their sequences analyzed using BLAST, SGN Blast, TIGR, and MEME/MAST. Sequencing results indicate that pepper nuclear DNA is mostly made up of microsatellite and minisatellite repetitive elements. Some of these repetitive families include MITE, LINE, transposons, retrotransposons, non-LTR dispersed repeat CR1, LTR TY-1-copia reverse transcriptase, ribosomal DNA, and others. This information was used to further characterize repeat motifs and copy number, as well as isolate which repeat families occur within members of the Solanaceae family using a PCR based approach.

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Poster Board No.15

A COMPARISON OF FACIAL COMPOSITE LIKENESS MEASURES

Computer-generated facial composites are often used by law enforcement to assist in suspect apprehension. However, there is a dearth of research on the effectiveness of software in creating identifiable composites. Previous research has used both lineup selection and individual characteristic scales to assess the accuracy and subsequent utility of facial composites. The purpose of this study was to assess composite/target similarity using two established methods and investigate the relationship between these measures. Using facial composites created with FACES 3.0 composite software, participants either selected a target face from a five-photograph lineup or rated the similarity of twelve individual characteristics (e.g., age, hair, friendliness, intelligence). Results indicated a positive correlation between the overall proportion of picture lineup selections and the mean of the individual characteristic scales, $r(78) = 0.65$, $p < .01$. This correlation extended to each of the twelve individual characteristic.

These findings suggest that these characteristics are all useful in indicating the likeness of a facial composite to a target face. Implications for future research on the efficacy of facial composite software are

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Poster Board No.16

THE CREATION AND VALIDATION OF THE LONELINESS ENGAGEMENT SCALE

Lonely individuals are typically thought of as shy, withdrawn people who lack social skills and become anxious in social situations. However, a new theory postulates that there is a second type of lonely individuals who are social and friendly, but do not feel emotionally close to others. Consequently, the Loneliness Engagement Scale (LES) was conceived to differentiate between two types of loneliness: hyperengaged (that is, people who are overly demanding and clingy in relationships, thereby causing a cycle of loneliness) and disengaged (that is, people who are shy and withdrawn because of an extreme fear of rejection in any social setting). The current study involved the creation and construct validation of the LES by confirming its proposed two factors, assessing its internal consistency reliability, and assessing its relationship to other measures of loneliness, self-esteem, rejection sensitivity, social anxiety, and social skills. Five steps were taken to ensure the creation of a psychometrically sound scale: 1) item pool creation, 2) subject matter expert consultation, 3) focus group consultation, 4) pilot testing of items, and 5) construct validation of the final scale. Factor loadings indicated that the LES consisted of two main factors: disengaged loneliness and hyperengaged loneliness. The LES was also found both reliable and valid, with very good internal consistency and significant correlations between the two loneliness types and other measures of loneliness, self-esteem, rejection sensitivity, social anxiety, and social skills as predicted. Overall, the LES was a successful creation which introduces a unique and previously nonexistent measure of loneliness into the literature. Results also demonstrate the existence of the two loneliness types as conceptualized. With this new scale and information, lonely individuals can be identified by type and intervention programs can be created or revised accordingly.

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TEMPERLEY-LIEB ALGEBRA REPRESENTATION OF BRAID GROUPS

A braid is a set of strings, all of which are attached to a horizontal bar at the top and bottom. Each string intersects any horizontal plane between the two bars exactly once. We can always pull the bottom bar around and glue it to the top bar, so that the resulting strings form a knot or link, called the closure of the braid. One of the primary goals in knot theory is to distinguish between different representations of the same knot or link. This may be done using various knot invariants, which are some "quantities" that remain the same for equivalent knots, regardless of how they are diagrammed. The Jones polynomial of a knot is such an invariant, whose discovery generated immense excitement among knot theorists and huge developments in topology and related areas. Since a closed braid represents a knot, one can study braids to gain information about knots. Braids form a group under the operation of concatenation, and in this project we focus on the study of the braid groups and their representations. We consider the oriented version of the Jones polynomial, and show it can be derived from a representation of the braid group into the so-called Temperley-Lieb algebra, via a geometric oriented form of it. In order to obtain this oriented description of the Temperley-Lieb algebra, we first construct the oriented version of the Temperley-Lieb category, and show that it can be given in terms of generators and relations. Then we define a representation of the braid groups with the oriented Temperley-Lieb category and show how we can recover the Jones polynomial via this new construction.

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Poster Board No.18

OPTIMIZATION OF DATA TRANSFORMATION FOR CHROMATOGRAPHY USING PETROLEUM DISTILLATES

This research seeks to further explore ways to improve the performance of gas chromatography as a tool for identification of complex mixtures through chromatogram comparisons. Previous work at CSU Fresno by Seth Yates used gas chromatography in this manner to correctly identify evaporatively weathered samples of gasoline using a preprocessing algorithm on the chromatograms before computing similarity scores. Current research seeks to improve and expand the preprocessing algorithm to account for in-lab variability due to instrument-to-instrument variation and sampling amounts of petroleum distillates. Rather than focusing on individualizing products, identification of product specific marker compounds, this projects is focused on reducing instrument-to-instrument variability so that an expanded library can be applied to chromatograms collected in different laboratories and on different instruments in the same way that the National Institute of Science and Technology (NIST) libraries for mass spectra are currently used. A collection of reference and test data has been collected under different instrument conditions including variation of the temperature program, flow rate, and injection concentration on an Agilent 7890 Gas Chromatograph – 5975 Mass Selective Detector to simulate different instruments. The variation in peak separation and patterns for gasoline, kerosene, and an n-alkane mixture has been examined to determine whether it interferes with chromatogram comparisons. Work is continuing to evaluate the potential of data preprocessing algorithms such as retention indexing and binning to address the variations observed in this test data set.

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Poster Board No.19

COLLEGE STUDENT ATTITUDES TOWARD MENTAL HEALTH TREATMENT

The objective of the study was to look at college students' attitudes toward seeking services for depression before a campus wide mental health education effort to increase awareness of depression. Students in Introductory Psychology classes took a questionnaire at the beginning of a class meeting and received "research credit" for participation. The questionnaire evaluated whether students had learned about mental health issues via a "screening event," classes, or their own personal counseling.

There were questions about the stressors of college life and both positive and negatives techniques for managing stress with a question about how well the stress management techniques were working. There were questions about the likelihood of seeking counseling and taking medication for emotional problems and their awareness of the availability of personal counseling and mental health services on campus. Finally a question evaluating mental health stigma was included. Four hundred twenty-six students completed the questionnaire. The mean age was 18.7 (SD 1.5). Twenty percent of the students had sought some sort of treatment for stress/emotional problems before completing the questionnaire. In terms of knowledge of available services: 50% knew that "free personal counseling" was available on campus, but only 13% knew that the campus offered outpatient psychiatry. As a group, students reported that they would "possibly" seek counseling if they had a personal or emotional problem (M=4.63, S.D. 2.10). Students who endorsed knowing about campus counseling services were more likely to report using these services (M=4.93, S.D.=2.21) than were students who did not know about the services (M=4.34, S.D. = 1.94) ($F(1,424) = 8.61, p < .005$). As a group, students "completely" agreed with the statement that "Emotional well-being is as important as physical well being" (M=7.88, S.D. 1.58). In conclusion, about half of the students in our sample were aware of free personal counseling on campus and all of the students were somewhat open to using these services. Also, students seemed to understand that mental health is as important as physical health. However, there seemed to be a difference between willingness to seek needed services for oneself and endorsement of this positive attitude about mental health. These findings may reflect that students are willing to support other people with mental illness, but still have enough stigmatizing attitudes toward mental illness that they would not seek services themselves.

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Poster Board No.20

OPTIMAL METHODS OF ICLICKER USE IN A CLASSROOM SETTING

This study examined how the use of an electronic classroom response system (i.e., iClicker) affects memory retention over a period of seven days. Twelve multiple-choice questions on current classroom material were presented twice, spaced by a one-week interval. Two identically-taught cognitive psychology classes were randomly assigned to use the iClicker system on Week 1 or were simply presented with the questions and answers. Both classes used the iClicker system on Week 2 to respond to the same questions and answers in a different order from Week 1. The findings showed a significant increase in proportion of correct responses within the clicker-use condition after one week. Unexpectedly, the mean proportion correct on Week 2 was statistically higher for the group that did not use the Iclickers on Week 1 than the group that did. The findings suggest that classroom response systems may sometimes be non-optimal in facilitating retention.

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Poster Board No.21

GEOSPATIAL WINE GRAPE QUALITY MODELING FOR OPTIMUM SAMPLING STRATEGY

Spatial variability in wine grape vineyards is major limiting factor in achieving maximum fruit and wine quality. Wine grape growers and winemakers have recognized this for decades and have devised a wide range of management practices to overcome this problem. However, variability in vineyards is inevitable posing lower economic returns and management difficulties. The use of new technologies to increase our awareness and understanding of variability in wine grape quality across a vineyard, although not unexpected, is providing new insights and suggesting new strategies to growers and winemakers alike in their efforts to produce better fruit and high value wines. In this study, an optimum sampling protocol was developed for determination of sampling sites required for mapping wine grape quality parameter, anthocyanin content, in order to facilitate feasible data collection and to quantify spatial variability of anthocyanin with minimal sampling resources in differential harvesting programs.

In this research we collected samples from two vineyards and geostatistical techniques focusing on spatial structure of a variable, that is, the relationship between a measured variable at a given location and that same variable measured at location some distance away from it. And krigging method was used to develop the interpolated maps for coming up with results.

Anthocyanin dataset from Twin Creeks 2006 and Merjan 2007 were analyzed spatially using geostatistical techniques in the ArcGIS environment, more specifically, geostatistical analyst extension. The spatial dataset has approximately a maximum of ten samples per acre, which was used as a reference for analysis of 3, 5, and 7 samples/acre for both Twin Creeks 2006 and Merjan 2007. Overall, Strategy I did not yield predictions as good as Strategy II due to the variability possible in sample sites affecting predictions, especially on the lower samples/acre. The results of the study clearly demonstrated this phenomenon of poor predictions with 3 samples/acre in Strategy I irrespective of the vineyard. At the same time, 7 samples/acre predictions of the Strategy I was fair based on the cross validation statistics and in comparison with the ~10 samples/acre. However, Strategy II was the best in terms of predictions as both the 5 and 7 samples/acre dataset across vineyards resulted in predictions complying to the requirements of the two fruit quality coding differential harvesting programs despite the fact that 5 samples per acre is not recommended for any more than two fruit quality coding programs.

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Poster Board No.22

**THE EFFECTS OF FIRE AND FOREST THINNING ON SEED WEIGHT OF
CONIFERS IN THE SIERRA NEVADA, TEAKETTLE
EXPERIMENTAL WATERSHED**

Research shows that fires are important for the circulation of nutrients, clearing of underbrush and establishment of species, and pivotal for the opening of serotinous seeds, among other things, in terrestrial habitats. In this study, we examined the effects of fire coupled with either understory or overstory thinning on seed weight of coniferous tree species in the Teakettle Experimental Watershed, located in the Kings River Watershed of the Sierra National Forest. A 2x3 factorial design with three replicates each (18 total) of fire (control) or no fire, and understory thinning, over story thinning, or no thinning (control) was implemented at the test site in the summer of 2000 and 2001 for the control plots, and in the summer of 2001 and 2002 for the experimental plots. The data used for this experiment were gathered during the first two weeks of September 2008, and weighed to the nearest 0.0001g. Data were analyzed using Analysis of Variance (ANOVA). There were no significant effects seen on seed weight in this seed year. Future studies will extend analysis to examine seed weight of species to previous and future years.

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Poster Session II

Poster Board No.23

TRAINING A FISH TO PERFORM VOLUNTARY TURNS FOR HIGH SPEED VIDEO RECORDING AND KINEMATIC ANALYSIS

Fish employ different swimming styles in different situations: constant-velocity cruising, for example, or sudden starts for prey capture and escape. The kinematics and hydrodynamics of steady swimming have been studied extensively. However, so-called unsteady movements, during which fish change their swimming speed and direction, are more difficult to measure and analyze. Unsteady maneuvers include escape responses (which can be provoked in the lab by a visual or auditory stimulus) and voluntary turns. The aim of our study is to explore the mechanisms that fish use to turn. We expect that turning performance depends on body shape, turning mechanism, and motivation (spontaneous versus reflexive). The main goals of this project are to (1) train a fish to perform voluntary turns, and to (2) optimize the setup for high-speed recording and video analysis. Our current focus is the tilapia (*Oreochromis mossambicus*), a tall body morph with large dorsal and anal fins. We selected a cooperative individual and trained him to swim through hoops. The fish was trained by positive conditioning with a feeding probe, first to swim through one hoop, and then through two. By arranging the hoops along various points of an arc, we encouraged the fish to turn through predetermined angles and radii. However, after filming it became obvious that significant data could also be obtained as the fish spontaneously turned through the hoops and around them (the trained fish has a tendency to swim in the area where the hoops are positioned). The fish now routinely performs voluntary turns that have been filmed from two perspectives with high-speed video. Of particular interest are small-radius turns that superficially resemble the reflexive escape response, which we have also filmed. It is hoped that quantitative comparison of these recordings will reveal fundamental differences in the turning mechanisms.

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Poster Session II

Poster Board No.24

PHOSPHORUS FLAMETHROWER: ALLOTROPE DEMONSTRATION

Chemical education is an active field of research at Fresno State. A demonstration for descriptive inorganic chemistry, which displays the unique behavior of a familiar element, phosphorus, while at the same time making chemistry more accessible to the introductory student, was developed. Allotropes are different arrangements of atoms of an element. Common examples are the allotropes of carbon which are diamonds and graphite in pencil lead. These different arrangements result in different physical and chemical properties. The common allotropes of phosphorus are black, red, white and violet. The reactivity of the allotropes can be related to the structure of the allotrope. In this demonstration, small amounts of the white phosphorus allotrope are synthesized from red phosphorus that can be obtained from a matchbook. White phosphorus is exposed to oxygen in the air using a disposable pipet and large pipet bulb to yield an attention-grabbing flame. This simple and effective demonstration highlights two of the common allotropes of phosphorus and their differences in reactivity.

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Poster Board No.25

ZOLEDRONIC ACID (Zometa®) PREFERENTIALLY INDUCES CELL DEATH IN A BONE METASTASIZING BREAST CANCER CELL LINE

Bone is the most common organ for tumor metastasis in breast cancer patients. Currently, bisphosphonates are a mainstay of cancer treatment known to reduce and/or delay the skeletal related events of malignancy by impairing osteoclast-mediated bone resorption. The purpose of this project was to define differences between the breast cancer cell line, MDA-MB-231, and an osteotropic clone, MDA-231BO, in response to the bisphosphonate, zoledronic acid (ZA). Results demonstrate that MDA-231BO cells are more sensitive to ZA cytotoxicity and the salutary effects are both media- and calcium-dependent, as elevating exogenous calcium levels increased ZA cytotoxicity. To investigate possible mechanisms of ZA-induced cell death, total RNA, whole protein lysates, or mitochondrial-enriched fractions were isolated from treated MDA-231BO cells and compared to non-treated controls. Using semi-quantitative RTPCR, ZA-treated cells exhibited a down-regulation of CYR61, a matricellular protein over-expressed in highly invasive cancers while using a combination of 2D-PAGE separation and MALDI-MS/MS, we report the identification of a small subset of differentially-expressed proteins including an up-regulation of antiangiogenic proteins. Taken together, our results provide a better understanding of the molecular mechanism associated with ZA exposure in osteotropic cancer cells.

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Poster Session III

Poster Board No.1

**NEW INFRASTRUCTURE FOR PANAMA TO AID RURAL FARMERS AND
PROMOTE ECONOMIC DEVELOPMENT**

The Republic of Panama is an isthmus in Central America, connecting North and South America. Panama is home to the Panama Canal, which has a large stake in the country's success. Panama is a less developed country with 10,000 farmers. Because a majority of Panama's GDP is dependent on the Canal, banking systems, and duty free zones, the focus on infrastructure in indigenous areas has become absent. This study proposes to focus on the economic development needs of indigenous farmers in the autonomous western region of Panama because this is where the poorest farmers are. New infrastructure will address the issue of rural poverty and allow for shipment of crops. Data was collected through the use of internet websites, scholarly journals, and books. To better understand Panama's economy and lifestyles, information examined includes physical geography, agricultural and food systems, people, economy, and the government. Once the collected information was analyzed, a development plan was assembled to assist Panama with economic development. While skyscrapers, billboards, and bustling streets are found within the major cities of David, Colon and Santiago, the remainder of Panama is heavily forested, has rolling hills and various mountain ranges. Fifty-seven percent of Panama's land is dedicated to forest while the remaining 43% is broken down as follows: 20% is devoted to permanent pastures, 7% is for arable land, 2% consists of permanent agricultural crops, and 14% is used for various other purposes (roads, homes, etc.). While Panama is a sophisticated country with many highways connecting not only Panamanian cities, but continents as well, there are not enough roads in rural sections of Panama to enable swift and safe transportation of agricultural commodities and foodstuffs to provide an adequate lifestyle for farmers. And of the 6,996 miles of roads that do exist, only 2,350 miles are paved. Three-fourths of all roads are in terrible condition due to the lack of maintenance and weigh stations. This project proposes construction of secure and stable roads that will run north, south, east, and west to connect all rural areas to large cities. The newly paved roads will be equipped with several weigh stations to ensure strict cargo weights are followed. The construction of new infrastructure will help rural farmers with the transportation of their crops to local farmers' markets and to large cities for exportation. In addition to the introduction of newly paved roads, the opportunity of growing more crops per acre will be introduced to farmers in hopes of improving production and land use, providing more capital, and raising income of rural households. Maintenance of roads will be presented to the public through user-friendly guidelines to ensure safety and the roads' longevity. The cost of all activities would be approximately \$2 billion.

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Poster Session III

Poster Board No.2

EFFICACY OF PHYSICAL THERAPY INTERVENTION ON FEAR OF FALLING IN COMMUNITY-DWELLING OLDER ADULTS

Background: Older adults are at greater risks of falls which can potentially lead to severe medical complications. U.S. population is aging as the baby-boomers will reach retirement age as earlier as 2011. According to Iglesias et.al., the main burden associated with unintentional falls in the elderly, measured as impact on health-related quality of life is due to fear of falling (FoF) rather than actual falls or their sequelae such as fractures. Tinetti et.al. defined FoF as low perceived self-efficacy at avoiding falls during essential, non-hazardous activities of daily living. Thus, the fear is a psychological pathology with physical manifestations. Purpose: The purpose of this evidence-based practice study was to determine the effect of Physical Therapy related interventions on FoF in community-dwelling older adults. Hypothesis: Exercise, a common Physical Therapy intervention, has been shown to influence psychological wellbeing. We thus, hypothesized that physical therapy-related interventions will effectively reduce FoF. Study design: A systematic review with meta-analysis of clinical studies examining physical therapy interventions. Methods: Exhaustive literature search was conducted with PubMed, CINAHL and Cochrane. Inclusion criteria for the clinical studies were: 1) subjects being community-dwelling, independent individuals over the age of 60 and 2) studies using a clinically established FoF outcome measure such as ABC or FES. Validity of the selected clinical studies was determined using the PEDro and the Jedad Scales. A mixed method approach was undertaken using narrative and fixed effects meta-analysis. Results: Four Randomized Controlled Trials met the inclusion and exclusion criteria. Methodological quality of the studies varied from moderate to high. Individually, the studies showed an effect size ranging from .08 (small) to .75 (medium-large). There was a weighted mean effect size of 0.32 ± 0.1 ; indicating a moderate level of efficacy.

Conclusion:

This study found that Physical Therapy interventions help reduce the fear of falling.

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Poster Session III

Poster Board No.3

A CANDIDATE GENE STRATEGY TO IDENTIFY RESISTANCE GENES IN PEPPER TO PHYTOPHTHORA CAPSICI

Phytophthora capsici is a deadly soil-borne disease that is responsible for the epidemics of bell and chile pepper root rot and crown blight. It also affects tomato, cucurbit crops, and many other species. There is no major commercial variety of pepper that shows resistance to a majority of pathogen isolates. Currently, our lab is investigating several resistance genes that allow pepper to fight the disease. My project investigates the genetics of resistance against P. capsici through the use of a candidate gene strategy. A candidate gene is a gene suspected of being involved in the expression of a particular trait. I am using previously cloned resistance genes from other members of the Solanaceae family as candidate genes for genes that confer resistance to P. capsici. PCR amplification of DNA from our two mapping parental plant lines can detect differences, or polymorphism, between the two lines. Analyzing these polymorphisms in the progeny lines will indicate where the candidate genes are located. After conducting multiple searches on GenBank for potential candidate gene DNA sequences, primers were developed that will amplify those sequences. Polymorphisms between parental lines are currently being sought. Polymorphic candidate genes will be placed onto the pepper molecular genetic linkage map. If any map to the same location as any of our previously identified resistance genes, then there is a high likelihood that the candidate gene actually confers resistance to P. capsici

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Poster Session III

Poster Board No.4

**DEVELOPMENT OF TRANSGENIC TOBACCO PLANTS CONTAINING A
NEMATODE XYLOTRANSFERASE RNAI GENE: A NOVEL APPROACH FOR
PLANT PARASITIC NEMATODE CONTROL**

Plant parasitic nematodes are a major source of agricultural destruction and cause an estimated \$125 billion in annual agricultural damage. Currently, the most popular methods of controlling these destructive parasites are by means of toxic chemical nematicides; many of these chemicals such as methyl bromide are being currently phased out due to environmental and health hazards. Rather than creating new toxic compounds to combat these pests, a novel, and sustainable approach must be explored. This project will approach this ever-present problem by creating a nematode-resistant plant system using recombinant DNA technology. This novel system will be first tested by inserting a gene into tobacco plants that will form a double-stranded RNA (dsRNA) molecule in the form of a stem loop upon transcription. The dsRNA, once ingested by the plant parasitic nematode *Meloidogyne incognita*, will trigger the process of RNA interference (RNAi) and silence an endogenous nematode xylotransferase gene. This project also aims to express the dsRNA only in the root system of the plant because this is the area in which the parasitic nematodes live; this will be accomplished with the insertion of root-specific promoter sequences into the gene construct. Due to its length, this project will be divided into several steps. Step one, which involves in silico research and development of the gene construct, has already been completed. Step two, which is currently underway, involves cloning the gene construct into a plant transformation vector (pCAMBIA1301), which will express the gene once inside the plant. The next step of the project will be to conduct *Agrobacterium*-mediated transformation of the gene construct into tobacco plants and test for its effectiveness in stopping nematode infestation.

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Poster Session III

Poster Board No.5

**PLACEMENT OF DEMOGRAPHIC QUESTIONS ON SURVEY ITEM
NONRESPONCE**

Placement of Demographic Questions on Survey Item Nonresponse Presentation Preference: Poster Nicole Arbabzadeh* and Jennifer L. Ivie, Ph.D. California State University, Fresno 1524 E Via Estrella Dr. Fresno, CA 93730 (559) 349-2906 nicolesa1121@comcast.net Undergraduate Student There have been few studies conducted on demographic placement (beginning or end of a survey) and its effects on response rates. These studies have not utilized college students who are a population often examined in the social sciences. Furthermore, research has been limited in regards to demographic placement, sensitivity of these items, and the sensitivity of the survey questions. Experts in survey methodology suggest guidelines on demographic placement, yet their advice is based purely on common sense rather than on empirical evidence. This study empirically tested item nonresponse in relation to the placement of demographic questions, sensitivity of the demographic questions, and sensitivity of the survey questions via mail administration. Out of 256 envelopes handed out, 157 participants returned one of eight survey conditions. Item nonresponse was assessed by the total number of times that a participant chose the option "Refuse to Respond". For overall item nonresponse, there was a significant three-way interaction between demographic placement and sensitivity and survey sensitivity. In general, item nonresponse on the non-sensitive survey was higher when sensitive demographics were used, regardless of their placement. However, item nonresponse on the sensitive survey was highest when non-sensitive demographics were placed in the front and lowest when they were placed in the back. There was not much difference due to demographic placement in item nonresponse on the sensitive survey when the demographics were sensitive. Overall, demographic placement seems to matter when the demographics are non-sensitive in nature and the survey is sensitive in nature. However, when the survey is non-sensitive in nature, sensitivity of the demographics is more important than placement.

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Poster Session III

Poster Board No.6

EXTRACTION EFFICIENCY OF METHAMPHETAMINE IN FORENSIC CASEWORK

It is the job of the forensic analyst during the analysis of controlled substances to correctly identify unknown substances through a series of chemical color tests and analysis using the Gas Chromatograph/Mass Spectrometer (GC/MS). By using the GC/MS to identify retention times and mass to charge ratios of the ions an accurate depiction can be made as to what the unknown sample originally contained. There are many methods for extracting a controlled substance such as methamphetamine that will prepare the sample for GC/MS analysis. However, some may optimize for selectivity of a specific compound at the expense of extraction efficiency. Selecting an extraction method based on performance criteria requires that we know the relative efficiencies of potential extraction methods. Several factors influence the solubility and therefore the extraction of a chemical. Influences on liquid-liquid extractions can come from the choice of organic and aqueous phases, pH of solution and concentration of the chemicals as they interact to reach equilibrium. To better understand these interactions for amphetamines encountered in forensic casework, a case study using methamphetamine was performed where the quantity of methamphetamine in different liquid-liquid extractions was compared.

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Poster Session III

Poster Board No.7

EYEWITNESS MEMORY FOR FACES AT TACTICAL SPEEDS

Although much research has addressed eyewitness memory for faces, little has addressed eyewitness memory at the “tactical speeds” typical of real world crime situations. This was the subject of the present experiment, in which 75 college-aged respondents participated with proper informed consent and debriefing. A photograph of a crime scene was derived from a simulation used in SWAT training. This scene depicted a man aiming a handgun in the direction of a female “victim.” This scene has been successfully used in previous series of experiments in our laboratory. Twenty-five respondents participated in each of three conditions, varied as to scene exposure time. The exposures were the five-second period used in previous research in this program, a two-second interval, and a 0.5-second interval; these latter two exposure times effectively bracket the typical duration of a violent gun encounter according to law enforcement experts. After a ten-minute retention interval, respondents were asked to identify the perpetrator, if present, from a “six-pack” lineup typical of current police usage. Instructions and procedures were identical to those used in actual law enforcement settings. On average, accuracy was poor. Across exposure times, respondents generated only 13% as many correct as incorrect identifications. Surprisingly, exposure time made no significant difference to this pattern of results. However, this finding is consistent with theoretical considerations which emphasize the parallel, “gestalt” characteristics of face processing, as opposed to the more time-dependent, “feature-intensive” dynamics characteristic of the cognitive processing of inanimate objects. Additionally, the 5s exposure time yielded significantly more failures to choose anyone in the lineup than did the shorter exposures. This result indicates the importance of cognitive mediation, as facilitated by longer exposure time, in the dynamics of eyewitness memory. Results are further discussed in terms of the necessary integration of cognitive science and modern police and forensic psychology.

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Poster Session III

Poster Board No.8

COMPARING DIFFERENT RADIOLOGICAL MODALITIES FOR EVALUATING BREAST IMPLANT COMPLICATIONS

Introduction: Complications after breast augmentation or reconstruction with implants include abscess and hematoma. Associated symptoms of pain, enlargement and asymmetry of the breasts may be confused with other underlying problems. Ultrasound (US) has been the method of choice for diagnosing these two complications. However, some medical centers have reported using computed tomography (CT) or magnetic resonance imaging (MRI) for making such diagnoses. Methods: We will briefly review the technical aspects of the three radiologic modalities in relation to abscess or hematoma detection in the breast. We will conduct a literature review to compare the efficacy of the three radiologic modalities in evaluating for abscess or hematoma after breast implants. Results: US uses high frequency (5 to 7 MHz) transducers to capture real time tomographic images and evaluate for fluid collection in the breast. CT uses ionizing radiation to acquire its images, while MRI uses non-ionizing radio frequency signals, under at least 1.5 Tesla, to visualize its images. MRI provides the best soft-tissue differentiation among the 3 modalities. In addition, different pulse sequences can be utilized in MRI to provide high resolution image contrasts, based on the different chemical sensitivity under magnetic resonance. MRI can therefore differentiate between simple fluid collection, hemorrhagic fluid collection and pus accumulation. Most of the studies focused on US assessment of postoperative complications after implant placement. It appears that US is more user dependent and can pose more challenge in differentiating seroma versus hematoma relative to CT or MRI. Early phase hematomas caappear as complex cystic mass while late phase ones can be hypoechoic in US which are hard to differentiate from subcutaneous fat. While either CT and MRI will provide much better spatial resolution than US, MRI provides the best contrast resolution for additional diagnostic accuracy.

On the other hand, CT costs at least two times, and MRI costs at least three times that of an US. The additional costs may not always translate into information that will affect final decision for surgical intervention. Conclusions: US, CT and MRI can all be used to evaluate complications such as abscess and hematoma after implant. The relatively inexpensive US is generally effective in making diagnosis but requires a skillful sonographer to make proper interpretation. While CT and MRI provide much better spatial resolution than US, their costs may be prohibitive in certain instances. Hence, the choice of imaging modality for definitive diagnosis of hematoma or abscess has to be made according to the clinical situation.

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Poster Board No.9

THE ANALYSIS OF BOWLING FOR PLAYERS WITH DIFFERENT TECHNIQUES

The purpose of the study was to investigate the sport of bowling and the different techniques used to knock down the greatest amount of pins. The research involved two factors: position for throw and amount of curve applied to the ball. The method of study was done via hands-on experimentation. Two people participated in the study. Each person had a total of 20 bowling attempts with 9 possible combinations to utilize. All attempts were random. Furthermore, the data was collected and analyzed by using the two-way analysis of variance method and Microsoft Office Excel software package. The results of the study showed significant evidence from the data to support that there is a difference for knocking down more pins with specific factors applied.

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Poster Session III

Poster Board No.10

**DNA EXTRACTION FROM CALCIFIED TISSUES: A COMPARATIVE STUDY
USING HYDOXYPATITE AND CARRIER RNAS**

The extraction of DNA from calcified tissues often presents a variety of problems that prevent usable DNA profiles from being developed; including contamination, degradation, and PCR inhibition. This study compared the quality and quantity of DNA extracted from calcified tissues, assessed by short tandem repeat [STR] and mitochondrial DNA [mtDNA] typing. Human bone samples were subjected to four different treatments: bone powder with PCIA alone, bone powder with PCIA and cRNA, isolated HAp fraction with PCIA alone, and isolated HAp with PCIA and cRNA. STR and mtDNA analysis was employed on each of the four samples respectively; furthermore each process was tested in triplicate to ensure quality results. Samples were ground under liquid nitrogen and subjected to de-calcification. HAp crystals were obtained by isolating a small portion and removing the collagen matrix with bleach. The Real-Time PCR and Quantifilier® Human DNA Kit were used on STR samples following purification. Samples were then amplified and genotyped using an AmpFISTR® Identifiler Kit and an ABI® 310 Genetic Analyzer. MtDNA samples were amplified using PCR and quantified using an Agilent® 2100 Bioanalyzer. The 310 Genetic Analyzer using a Big Dye Terminator® Kit was employed on all samples for sequence determination. The addition of cRNA showed at least a two fold increase in DNA recovery over non-cRNA containing samples. DNA quantities gathered from the HAp methods were slightly lower ($\approx 75\%$) than the standard method. However, the quality of DNA as assessed by the total number of allele calls made was determined to be higher. These results indicate that DNA attained from HAp crystals are in a better state of preservation and may be a valuable source when working with highly degraded samples.

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Poster Board No.11

THE INTERACTION BETWEEN ALZHEIMER'S DISEASE-RELATED PROTEINS, APP AND X11

Introduction Alzheimer's disease (AD) is hypothesized to be caused by the accumulation of a polypeptide derived from the proteolytic processing of the transmembrane Amyloid Precursor Protein (APP). Mint/X11 a family of neuroadaptor proteins that mediate docking and fusion of synaptic vesicles binds to APP, via its phosphotyrosine interaction domain (PID) and retains the complex in the endocytic pathway. This process prevents the recycling of APP back to the cell surface, leading to a decrease in levels of amyloid beta peptide, A β 40 and the neuritic plaque forming A β 42. For APP to be processed X11 must be expressed at sufficient levels; overexpression or silencing of X11 prevents A β formation. Thus manipulating levels of X11 expression could possibly diminish the processing of APP to neurotoxic A β plaques. Methods I have qualitatively studied the strength of the interaction between APP and X11 α (an X11 isoform) using complex immunoprecipitation (co-IP) and Western blot to verify the interaction between these two proteins. The pluripotent NTera 2/cl.D1 (NT2) cells cloned from human testicular embryonal carcinoma were transiently transfected with myc-tagged X11 α and APP. The cell lysate from the double transactions were co-IP'd using reciprocal antibodies (IP with APP and then detect X11 and vice versa). Results Reciprocal Co-IPs showed the interaction between APP-X11 α was qualitatively determined to be robust, based on resistance to added detergent to the cell lysates. Conclusion and Future Directions Since there is a strong interaction between the two proteins, the proteolytic processing of APP to A β polypeptides can be prevented thereby reducing AD. Further studies will involve a quantitative test of the interaction using fluorescence-tagged proteins and Fluorescence Energy Resonance Transfer (FRET). In FRET, proteins can be visualized only within 5 nm of each and therefore can be said to be strongly interacting.

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Poster Session III

Poster Board No.12

IDENTIFYING MATING TYPE OF PHYTOPHTHORA CAPSICI ISOLATES

This project involves determining the mating types of roughly eighty different isolates of *Phytophthora capsici* and eventually mapping their mating type locus on an existing *P. capsici* genetic linkage map. When opposite mating types are placed together in the same Petri dish, a successful mating causes formation of oospores. For example, if one of the unknown isolates forms oospores when crossed with A1, then the isolate must be of opposite mating type, A2. Isolates were crossed with known mating types A1 and A2 on 60 x 15 mm polystyrene Petri dishes on clarified V8 media. The dish was divided by a line down the middle; a plug of known mating type was placed on one side, and the plug of the unknown isolate on the other, spaced 1cm apart. The control crosses were: A1 x A1, A2 x A2, and A1 x A2. The crosses were wrapped in aluminum foil and set in a 25°C incubator. After two weeks, a sample of mycelium that had grown midline between the two plugs was taken and was prepared on a microscope slide, then examined under a light microscope. The crosses were then incubated another two weeks and more mycelial samples were taken. No oospores were seen on any of the controls after two weeks. After a month of incubation, there were oospores seen in the A1 x A2 control. There were also oospores seen in some, but not all, of the other *P.capsici* crosses with both, A1 and A2 mating types. More crosses must be made to ensure the highest level of certainty of the mating type of each of the isolates. Information from isolates for which mating type can be identified will be used to map the mating type locus.

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Poster Session III

Poster Board No.13

**IMPROVING IPM OF HOUSE FLIED AT COMMERCIAL DAIRY OPERATIONS
THROUGHT PEST MONITORING AND DETERMINATION OF NUISANCE
THRESHHOLD**

House flies are a common nuisance pest associated with animal agriculture operations such as commercial dairy operations and other confined animal operations. There are no standardized methods for accurately measuring house fly abundance so that an IPM (integrated pest management) program can used to effectively reduce the population. The objective of the study was to evaluate the performance of spot cards, fly tapes, insecticide baited traps, and Alsynite traps as a means to monitor house fly numbers at commercial dairy operations. House fly abundance was measured at three Central California Dairies from June through August. At each dairy ten spot cards, five bait traps, and five Alsynite traps were placed at different locations around the facility to provide full coverage of the dairy. Five fly tapes were also placed on at least two sides of a milking parlor. Spot cards are an indirect count of resting flies that leave behind regurgitation and defecation spots. Monitoring devices were collected weekly and captured flies counted and identified by species and sex as well as spots on the cards counted. Spot cards and bait traps were similarly effective for a wide range of fly numbers. Fly tapes proved to be ineffective due to the harsh summer environmental conditions, which lead to an 18% failure rate. Bait traps were effective most of the time, however flies do build genetic resistance to the bait. Spot cards and bait traps provided the best measurement of fly populations on the dairies. Spot cards required less effort and cost to deploy and with a computer aided spot counting program it is the recommended method. No matter the method utilized, dairies cannot be compared to one another; instead it is the change in the count over time at each facility that matters.

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Poster Board No.14

**CHARACTERIZATION OF OXAZOLIDINE BYPRODUCTS IN
METHAMPHETAMINE LABORATORY CASEWORK**

In clandestine laboratories, ephedrine or pseudoephedrine is the main starting material used in the synthesis of methamphetamine. Ephedrine is often present in derivatives known as oxazolidines. Reporting of ephedrine impurities is important because it can uncover information on the synthetic methods used to produce the drug. There is a lack of reference data and proven structures of these oxazolidine compounds. Industry criteria require published reference data before these compounds can be identified and reported. Oxazolidines of ephedrine with acetone, formaldehyde, benzaldehyde and acetaldehyde have been prepared from three ephedrine isomers with the corresponding aldehyde or ketone. They were analyzed by GC-MS to determine the EI-MS and retention index information. Their rates were evaluated for consistency with their probable structures. A mechanism has also been proposed for the reactions.

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Poster Session III

Poster Board No.15

**COMPOSTED MUNICIPAL GREEN WASTE AS AN ECONOMICALLY-AND
ECOLOGICALLY-SOUNDED GERMANATION MEDIA FOR USE IN THE
CALIFORNIA VEGETABLE TRANSPLANT INDUSTRY**

California is a leading producer of vegetables in the United States with an estimated value of \$7.8 billion in 2007. This industry relies heavily on the use of media composed primarily of sphagnum peat, vermiculite and perlite for seed germination. Among these, peat is found in the highest percentage, often as high as 75%, primarily due to its high water holding capacity, good CEC etc. Unfortunately use of such a high percentage is not without some cost, both ecologically since peat is a considered a non-renewable resource and its harvest significantly alters natural ecosystems, and economically with peat acquisition consuming a significant portion of the transplant industry's annual propagation expenses. With this in mind, there is a considerable effort to identify regionally produced peat alternatives. The objective of this study is therefore two-fold: provide an economical and ecologically feasible 1) peat alternative for the vegetable transplant industry, and 2) waste disposal outlet for municipalities (composted green waste, CGW). Germination rate/%, plant height, and root zone integrity (RZI) of Broccoli (*Brassica* sp.) Tomato (*Solanum* sp.) and Pepper (*Capsicum* sp.) seedlings were assessed in commercially available peat/perlite and/or CGW blends. In *Brassica* sp. there is little difference in growth parameters between the media formulations suggesting that CGW can be successfully incorporated without negatively impacting transplant vigor. Qualitative analyses also suggested that RZI may be enhanced by addition of CGW. For *Solanum* sp. there is a wide range of germination %, suggesting that some media formulations may not be acceptable for use in the transplant industry. Considerable variation in germination within treatments was also observed, a quality not well tolerated in the transplant industry. There were; however, two media formulations for *Solanum* sp. that look promising for use in the transplant industry. It is evident that the use of CGW at either a 25 or 50 % did not negatively affect seedling height. As with *Brassica* sp., RZI in *Solanum* sp. was also enhanced by incorporation of CGW. Data for *Capsicum* sp. is currently being analyzed as planting for this species occurred at a later date. These data suggest that CGW may be a viable alternative media component for the California vegetable transplant industry. Subsequently reducing production costs and reducing any potential negative impacts resulting from the continued use of peat.

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Poster Session III

Poster Board No.16

**A COMPONENT ANALYSIS OF THE EFFECTS OF GRADUATED EXPOSURE AND
DIFFERENTIAL REINFORCEMENT ON PHOBIC BEHAVIORS**

Anxiety disorders are one of the major psychological health issues confronted by the recipients and treated by the providers of mental health services today. Anxiety has historically been a central research topic of mainstream psychology. Although behavior analysis has paid relatively little attention to the subject in the past, there has been a growing interest by behavior analytic researchers on the subject, and a small number of studies on specific phobias – a subset of anxiety disorders – have been conducted. The findings of this research point to the effective combination of the treatment techniques of graduated exposure and differential reinforcement in the treatment of specific phobias. However, there are no known studies that have examined the efficacy of these individual treatment components. The current study conducted a component analysis of graduated exposure and differential reinforcement. Three California State University, Fresno students participated based on their individual fear of spiders questionnaire scores (Szymanski & O'Donohue, 1995). An alternating treatments research design was employed. The independent variables were graduated exposure, differential reinforcement, and graduated exposure plus differential reinforcement. The dependent measures were Behavioral Relaxation Training (Poppen, 1998) and heart rate. The three experimental conditions were randomly ordered within sessions, and three-to-four sessions were conducted with each participant. Results suggest that no single component was more effective than the other. Therefore, the application of these component techniques individually or in combination should be determined by the individual seeking clinical support for specific phobia.

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Poster Board No.17

RESPONSE OF SOIL MOISTURE SENSOR READINGS TO SOIL TEMPERATURE

Residential irrigation water use efficiency can be improved through the use of state of the art irrigation technologies such as “smart” controllers and soil moisture sensors. Smart Water Application Technologies™ (SWAT™) was initiated by water purveyors to promote residential irrigation water use efficiency through these technologies. Excess water can be saved by canceling water cycles scheduled for times when the soil is already saturated with the use of these “smart” controllers and soil moisture sensors. A crucial phase in this process is to evaluate the reliability, effectiveness and accuracy of various soil moisture sensors when exposed to different soil temperatures. The set of sensors being evaluated operate on the principle of Time Domain Transmissometry (TDT). In this technique an electro-magnetic (EM) step pulse travels down a transmission line and a voltage threshold is detected at the other end of the transmission line. The transmission of the EM signal is directly related to the moisture content of the soil medium, and is therefore influenced by soil temperature. Therefore, in the current study, we focus on the effects of temperature on TDT soil moisture sensor readings. A series of tests were conducted under laboratory conditions in accordance with the standardized protocol established by the Irrigation Association. Data generated for TDT sensors installed in sandy loam and maintained at various soil temperatures (15°C, 20°C, 25°C, 30°C, 35°C) indicate a high correlation (R² values ranging from 0.86 to 0.98) between the volumetric moisture content measured by the sensor and our calculated values for the various soil temperature treatments. In future work, we will also evaluate the performance of the sensors to the various soil temperatures when installed in relatively more coarse (sandy) and finer (clay) textured soils.

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Poster Session III

Poster Board No.18

FUNCTION AND EXPRESSION DYNAMICS OF Rho, Rac and Cdc42 GENES IN THE STARLET SEA ANEMONE, *Nematostella vectensis*

The objective of this study is to examine the patterns of gene expression and function of the Rho family of small GTPases (including Rho, Rac, and Cdc42) during development in the starlet sea anemone, *Nematostella vectensis*. *Nematostella* is a member of the phylum Cnidaria, which is the sister-group to the Bilateria, all animals exhibiting bilateral symmetry, such as humans, mice and fruit flies. *Nematostella* has recently become an important model organism for the study of cnidarian developmental biology due to the wealth of molecular tools being developed. Studying the function of genes in cnidarians and comparing them to those of bilaterians can give us insight into how these genes' functions have evolved over time. Rho GTPases play a significant role in regulating the actin cytoskeleton, and therefore are involved in regulating the cellular behaviors required for development. Our initial studies have been aimed at cloning and determining the expression dynamics of these genes. We have used a number of different techniques such as PCR and Gel Electrophoresis to amplify and extract the *Nematostella* Rho, Rac and Cdc42 genes. After cloning these genes, probes were constructed via transcription reactions, and the levels and patterns of gene expression were visualized in fixed embryos via in-situ hybridization reactions. We have observed that Rho and Rac genes are ubiquitously expressed throughout the embryo at different stages of development including gastrula and planula stages, whereas Cdc42 is expressed mostly in the endoderm layer. In addition, all three genes have a higher level of expression in the endoderm layer during the later stages relative to the earlier stages of development. In the next stage of our research, we intend to microinject *Nematostella* embryos with morpholino antisense oligonucleotides to knockdown gene expression and gain insight into the functions of these genes.

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Poster Session III

Poster Board No.19

**EVALUATION OF AN ECO-FERTILIZER AND UREA AMMONIUM
NITRATE FOR GROWING BELL PEPPERS**

This study was conducted as part of the on-going effort to optimize fertilizer use efficiency in vegetable cropping systems typical of California. The overall goal of the research was to investigate the efficacy of manure based eco-fertilizer on bell peppers grown in a sandy loam and a salt affected clay soil. The eco-fertilizer used is a relatively new product derived from fresh cattle manure that has the potential to work as both an eco-fertilizer and as a soil conditioner. In this phase of the research we compared eight application protocols for the eco-fertilizer (T1, T2, T3... T9), to that of the typical farmer's practice (T1) with urea ammonium nitrate (UAN-32) for bell peppers grown under greenhouse conditions. For each soil type, there were 27 completely randomized pots representing three replicates of the nine treatments. In addition to soil samples were analyzed 90 days after transplanting (DAT) for the amount of ammonia and nitrate in the root profile ($P < 0.05$). In the sandy loam experiment, the fertilizer treatments had no significant effect on both ammonia and nitrate levels. In the saline clay soil, there were no significant differences in relative levels of ammonia and nitrate. Moreover, there was no significant difference in the plant yield of both clay soil and sandy loam soil. These results are important as the eco-fertilizer was applied once at transplanting while UAN-32 was applied during six different applications, thereby implying that the use of the eco fertilizer can result in potential labor cost and energy savings.

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Poster Session III

Poster Board No.20

COMPARING FACIAL COMPOSITE SOFTWARE EFFECTIVENESS IN CORRECT TARGET IDENTIFICATION

Little is known about the effectiveness of computer generated facial composite software regarding the correct identification of suspects. Even less is known about the effectiveness of one facial composite software version to another. This study compared versions 3.0 and 4.0 of the FACES software from InterQuest Inc. in assessing which version yielded the most correct target identifications. In phase 1, participants created composites from memory of a mugshot photograph using either FACES 3.0 or 4.0 software. In phase II, separate participants were presented with those composites along with a forced-choice five-photograph lineup. Participants selected a target photograph that was perceived to be most similar to the composite and rated their confidence in their selection. As predicted, results demonstrated significantly higher target/composite likeness when composites were created with FACES 3.0 (63%) than the newer FACES 4.0 (45%) software. These results are interpreted as a buildup of interference caused by exposure to more facial features in the newer software version 4.0. Contrary to intuition, this suggests that a larger library of features in facial composite software may reduce target/composite likeness when composites are created from memory.

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Poster Session III

Poster Board No.21

COMPARATIVE RESPONSES OF NATIVE CALIFORNIA GRASS SPECIES TO DROUGHT: POTENTIAL SIGNIFICANCE FOR RESTORING RETIRED AGRICULTURAL LAND

In California, less than 2% of native grasslands remain due to agricultural expansion and presence of non-native plant species. Reductions in water supply have resulted in the retirement of agricultural land and an interest in re-establishing native species. Understanding native plant species biology is required to develop suitable management options for restoration, especially in the drought-prone San Joaquin Valley. This growth-chamber study examined two native grasses, *Hordeum depressum* (HODE) and *Vulpia microstachys* (VUMI) and their responses to adequate (control) and limited (treatment) water supply over a 90 day period. Responses measured were biomass (determined by a final destructive harvest, n=10) and photosynthetic rate (determined using a LiCor LI-6400 gas exchange system, n=7). Control conditions provided 200 mL water per week, whereas treatment conditions progressively reduced water availability during the final four weeks of growth to 150 mL, 100 mL, 80 mL and 50 mL per week. Under control conditions, total biomass of HODE and VUMI were 0.270 gDW and 0.236 gDW, respectively. These values declined under treatment conditions to 0.211 gDW in HODE ($P < 0.036$) and 0.132 gDW in VUMI

($P > 0.015$). Limited water resulted in root biomass declines of 16.7% and 41.9% in HODE and VUMI, respectively. Leaf biomass was also reduced under treatment conditions, but the impact on VUMI (48.1% reduction) was greater than in HODE (30.9% reduction). At the start of the experiment (day 36), HODE had a significantly greater ($P > 0.006$) photosynthetic rate ($4.84 \mu\text{mol m}^{-2} \text{s}^{-1}$) than VUMI ($1.76 \mu\text{mol m}^{-2} \text{s}^{-1}$). However, by day 90 both species exhibited similar photosynthetic rates ($\sim 1.95 \mu\text{mol m}^{-2} \text{s}^{-1}$) that were not significantly affected by water availability. These results suggest that species specific variation in carbon partitioning patterns (root vs. leaf) and early season photosynthetic rate are likely to be critical in determining plant growth and therefore success in re-vegetating retired agricultural

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BENEFICIAL AND HARMFUL EFFECTS ON MEMORY FOR RELATED INFORMATION USING ICLICKERS

Personal classroom response systems have been shown to increase student engagement as well as providing useful immediate feedback to instructors during instruction. However, there is no research relating such systems to basic memory research demonstrating the mnemonic benefit of retrieval. In a 2x4 mixed-subjects design, we investigated how using the IClicker system might be used to enhance memory for related information. After reading passages of mundane factual information, participants used IClickers on one set of multiple-choice questions in four ways: with the alternatives presented at a delay after the multiple-choice questions (retrieval-delayed), with the alternatives presented simultaneously (retrieval), with the correct alternative highlighted (re-presentation), or without questions. A second set of related multiple-choice questions was then given to all participants in a standard manner. Questions in this second set were either difficult or easy, as measured through pre-existing question norms. Not surprisingly, results demonstrated significantly higher performance for easier multiple-choice questions.

Results also demonstrated an overall benefit from presenting questions and then presenting alternatives at a delay. This benefit seems to occur only when the initial questions were easier. Together, these findings have implications for optimal use of personal response systems from the perspective of memory benefits from retrieval on related information.

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TRACKING THE FATE OF ACORNS IN OAK WOODLANDS

California's Oak woodlands are partly threatened by low regeneration rates in many oak species. Western Scrub Jays eat and cache (store for later) acorns and are natural oak dispersers. To measure the effectiveness of dispersal by scrub jays, we must track the fate of individual acorns from the source to the cache to eventual consumption or germination. Understanding this is key to potentially using scrub jays to disperse acorns to help the oak populations recover. Our objective is to test a new method for tracking the fate of cached acorns. Previous studies tracked acorns by tagging them with 1) radioactive isotopes, 2) metal tags, or 3) radio-transmitters hidden inside; each method has limitations. Isotope tagging presents safety issues and is not easily permitted. Metal detectors cannot discriminate between tagged acorns and other metals in the soil necessitating disturbing the cache for verification. Radio-transmitters are expensive for large-scale use, and require long antennae which deter scrub jays from picking tagged acorns. We are testing a new method using cheap radio-frequency identification (RFID) tags inserted into the acorns coupled with visual observations of foraging behavior. RFID tags (N = 50) are inserted into acorns placed in feed trays within several western scrub jay territories. Teams of three observers watch the trays: 1) to monitor if the acorns are eaten or taken to be cached; 2) to follow the birds as they leave the tray to cache the acorn. Observed cache locations are recorded with a GPS unit after verification with a hand-held RFID tag reader. Cache sites are then visited twice weekly to determine whether the acorns are intact or have been eaten/moved. Observations to date suggest that scrub jays cache approximately 15% of all acorns selected. Survival rate of cached acorns is now being measured.

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**USING FLOURENCE MICROSCOPY TO CHARACTERIZING
THE NEUROSPECIFICITY OF THE ENVIRONMENTAL TOXIN, BMAA**

BMAA (b-methylamino-L-alanine) is a non-protein amino acid implicated in causing amyotrophic lateral sclerosis/parkinsonism dementia complex (ALS/PDC), a fatal neurodegenerative disorder often characterized by progressive muscular atrophy, lost of motor functions, and dementia. Interest in BMAA began when it was discovered that the high incidence of ALS/PDC reported among the Chamorro people of Guam during the 1950s could be linked to their diet, which included cycad seeds that naturally contained BMAA. So far, research has been able to confirm BMAA as a neurotoxin, but further research is necessary to establish an association between the development of ALS/PDC and exposure to or consumption of BMAA. Using *Drosophila melanogaster* Canton S flies as an insect model, I hope to determine the specificity of BMAA for different classes of neurons. The three neuron classes of interest are: motor neurons, which are associated with ALS; cholinergic neurons, which are associated with Alzheimer's Disease or disorders characterized by dementia; and dopaminergic neurons, which are associated with Parkinson's Disease. Canton S flies that have had their motor neurons, cholinergic neurons, or dopaminergic neurons transgenically modified to co-express green fluorescent protein

(GFP) will be treated with BMAA. Fluorescence microscopy will be used to assess cell viability in response to the toxin. The results from this study will help to further establish the association of BMAA with ALS/PDC, potentially providing valuable information for the development of successful chemical and therapeutic treatments for some of today's most detrimental and prominent neurological disorders.