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Poster #1

INTUITIVE UNDERSTANI)ING OF ENTROPY IN 3-5 YEAR OLDS
Carolyn Barton, Lucas Bradley, Rochelle Carrillo, and Carrie Ellsworth

In Physics, entropy roughly corresponds to the degree of disorder in a system. Adults have an intuitive understanding that the entropy of the elements in an isolated system cannot spontaneously decrease, that is that a disorganized set of objects is unlikely to become organized as a result of natural forces such as the wind. Friedman (2001) conducted three experiments concerned with 3-5 year olds' developing understanding of entropy. We replicated the third experiment with new, only pictorial forms of test stimuli, as opposed to Friedman's televised events. Both studies found that a significant majority of 5-year-olds predicted that a state that was initially ordered would become disordered with the application of a differentiated force. A majority of 4-year-olds made the same prediction, but not significantly so in both studies. Three year-olds chose disordered and ordered end states almost equally in both studies. None of Freidman's age groups had a significant majority that predicted a disordered end state would result from a disordered initial state. In contrast, we found that a significant number of 5-yearolds predicted a disordered end state when the initial state was ordered and when it was disordered. The results generally support the external validity of Friedman's findings across substantial variation in test stimuli.

Poster #2

APPRECIATION FOR UNIVERSAL DESIGN BY HEALTHY OLDER PEOPLE
Jorge Cedano. Gregory Erickson. Molly Sesata. Gary N. Howells

The purpose of this research was to assess the perceived usefulness of Universal Design (UD) features for older adults. Specifically, we were interested in how the house functioned as the user aged and experienced increased frailties. We asked participants to rate the estimated usefulness of UD products not currently available in their homes. Participants included post-70 year old male and female residents of a retirement community. The assessment included the SF-36 which measured health status; a survey measuring the helpfulness of designs already in their home; a measure assessing photographs featuring UD additional products; an assessment of lighting levels in key work areas; and a question on the importance of UD features were in their decision to select the residence. Respondents with physical, emotional and social problems were more appreciative of UD design features. Our readings of the lighting levels in the participants homes were to low. Our results showed support for Lawton & Nahemow's (1973) Ecological Theory that different UD features were valued, depending on level of competency.

Poster #3

ATTITUDES OF RESIDENTIAL LIFE AND HOUSING STAFF MEMBERS TOWARDS COLLEGE STUDENTS AS A FUNCTION OF DISABILITY
Lisa A. Nowinski

Attitudes of Resident Assistants (RAs) towards various kinds of college students (non-disabled, physically disabled, and mentally disabled) were measured, and it was hypothesized that RAs would have significantly more positive attitudes towards physically disabled residents than towards mentally disabled or non-disabled residents, and that female RAs would be significantly more sensitive to the resident than males. Each of the 30 Residential Life and Housing Staff Member participants (20 female, 10 male: age 18-28 years) was asked to read one of three vignettes in which RA -resident interaction occurred, to rate their feelings towards the resident described in the vignette they had been randomly assigned to read, and to complete a free response prompt to provide more qualitative data. The feelings of RAs towards non-disabled and physically disabled residents were significantly more positive than their feelings towards mentally disabled residents. There was no significant difference in the attitudes of male or female RAs.

Poster #4

FOUR YEAR OLDS INFERENTIAL USE OF TRAIT LABELS
Carrie Ellsworth and Heidi Okamoto

The study was a partial replication of two experiments by Heyman and Gelman (1999) concerned with 4-year-olds' ability to use trait labels to make inferences about someone's mental state and behavior. We replicated the story-telling procedures with 27 4-year-old children who completed both experiments. For four stories, the children were asked how the main character wanted to affect the other character, how the main character thought the other character would respond, and what was the main character's emotional response. In the first experiment we replicated Heyman and Gelman's effect of the trait labels "nice" and "mean" on attribution of the main character's motives, but the main character's ability to foresee the outcome effect on the other story character was substantially less than previously found. There were no significant effects on the emotional response measure. In the second experiment, the children attributed different motives to the characters in four stories depending on the shy, not shy label. However, contrary to the prior study's results, we did not find that the shyness label reliably affected the children's expectation judgments or emotional responses. Our results were not as consistent across measures as Heyman and Gelman found, however the results support the conclusion that 4 year olds can in some cases use trait labels to make psychological inferences.

Poster #5

PRESCHOOL CHILDREN'S UNDERSTANDING OF PSYCHOGENIC BODILY REACTIONS

Rebecca Marlitt, Sharlene Messer, Heidi Okamoto, and Marie Ortega

Psychogenic bodily reactions are bodily reactions, such as ailments, that have mental origins. Notaro, Gelman, and Zimmerman (2001) completed two studies of children's reasoning about psychogenic bodily reactions. We partially replicated their second experiment with 28 3- and 4year-olds and 64 adults. Participants were asked if creatures from another planet could develop a physical response from either a psychological or a physical cause. Eight three-sentence illustrated stories with questions were presented. There was no significant difference between the mean number of psychological choices of the 3- and 4-year-olds, however adults selected more psychological choices than the children. Individual response patterns across the eight stories were categorized as primarily physical, psychological, or mixed. Similar to Notaro et al.'s results, among the primarily physical cause participants the percentage of adults was substantially less than the percentage of children. Preschool children view psychogenic bodily responses as more likely to be physical than psychological, but adults tend to expect both physical and psychological causes.

Poster #6

LANGUAGE COORDINATION IN BILINGUAL CHAT ROOMS: A CASE STUDY OF THE AOL CHAT ROOM "BERLIN”

Heather A. Torvend

I have conducted an anthropological case study of the AOL bilingual chat room "Berlin" in order to question whether language contact, accommodation, and code switching play a role in defining identity and power structures in online virtual communities. I used the method of participant observation in the community for a total of 50 hours, which produced over 700 pages of chat transcript. By analyzing this data, I was able to come to several conclusions. Although there is no physical contact between the chat room participants (meaning they cannot decipher race, sex, or other identifying features upon meeting one another), it can be expected that physical identity markets will be readily offered in order to distinguish identity, or linguistic cues (ex: writing in a location-specific dialect) will define identity. Language hierarchies and interpersonal relationships are also based on language choice and identity. German speakers can often times ignore English speakers in the room that do not understand German and vice versa (although this situation is much less likely to occur). What I have found occurring in the virtual community is that linguistic cues and markers including language contact, accommodation, and code switching, play a primary role in identity development and community hierarchies.

Poster #7

VIRTUAL LANGUAGE CONTACT: THE INTERNET AND LINGUISTIC THEORY
Heather A. Torvend

In this research paper I examine the effects of virtual language contact on the English language as measured through the share of English language electronically stored information (ESI) on the Internet. I test two hypotheses: 1) The proportion of English language ESI on the Internet has decreased since 1996, and 2) Lexical linguistic change (borrowing) occurs through virtual language contact (Internet contact). A commonly cited estimate from 1996 is that 80% of ESI on the Interpret is in English. I evaluate this estimate by carrying out 226 word searches in 10 categories with the Google search engine. The ten categories analyzed are Noted Personalities, Dictionary Terms, Noncount Nouns, Business, Chemistry, Travel, Computer, Environment, Culture, and Law. I find that the current share of English language ESI on the Internet is approximately 55% with categorical proportions ranging from Culture at 38% to Noted Personalities and Chemistry terms at 63% and 65% respectively. I test the second hypothesis by analyzing the specific web pages of terms in categories that lie under the 55% mark. I find that Non-English languages are borrowing English terms in approximately 75% of the web sites falling under these categories. Further, I define linguistic theory as it applies to the Internet by showing how English maintains its presence as a global language through what I call *passive influence* and *specific dominance.* The analysis of the data confirms both hypotheses, and supports my argument for the expansion of linguistic theory to include virtual language contact.

Poster #8

FACTORS INFLUENCING DEPRESSION AMONG OLDER ADULTS
Gregory D. Erickson and Richard Gohlke

The incidence of depression among elderly residents of San Joaquin County was investigated. Since most of the elderly have at least one chronic health condition causing a decrease in their levels of independence and functioning, it was hypothesized that the lower their level of independence, the more likely they are to experience symptoms of depression. A questionnaire was administered to the populations of two assisted living centers, asking participants to rate their abilities on an IADL (independent activities of daily living) scale. The IADL assessment scale allows a health professional to establish the levels at which an elderly individual functions in caring for himself or herself and performing the more sophisticated tasks of everyday life. Participants were also asked to complete the Geriatric Depression Scale. This scale was developed as a basic screening measure for depression among older adults. The researchers also asked participants about religious involvement, family, and education level. Scores for the IADL assessment scale and Geriatric Depression Scale were correlated. Results indicated an increase in depressive symptoms for participants experiencing decreased levels of IADL functioning. These findings support the original hypothesis of elderly experiencing lower IADL levels to be at increased risks of depression.

Poster #9

AN INVESTIGATION INTO CUSTOMER ALIENATION BASED ON RACE, SEX OR INCOME LEVEL
Andreea Borcea

Through Likert scale surveys and analyzing previous research, we are trying to determine the effect of race, sex, or income levels on customer alienation, the perception that companies are not concerned with their customers. Our findings will specifically focus on each of these three explanatory variables separately as well as possible combinations of effects.

Poster #10

FACTORS INFLUENCING COLLEGE CUMULATIVE GPA
Sachin R. Trivedi, Nicole Ho Inouye

We are doing an empirical analysis using primarily Ordinary Least Squares Regression, to study the determinants of cumulative GPA of UOP athletes.

Poster #11

ROUTING PEOPLE TRAFFIC
Sachin R. Trivedi

Use of statistical theory, graphing theory, and algorithm analysis to route people traffic within London Underground.

Poster #12

LILYPAD NET: MOBILE SOFTWARE AGENTS FOR LEARNING AND SELF EXPRESSION
Ben Coburn

Lilypad Net (LPnet) is a Java based system for developing and supporting mobile agents: computer programs that can independently traverse the Internet and interact with users and other agents. The goal of LPnet is to provide a system built from ubiquitous, freely available parts which is both simple enough to provide an introduction to programming for agent based systems and powerful enough to support research projects. LPnet includes high-level, domain specific commands that greatly simplify its use by beginning programmers. For advanced users, LPnet supports a number of different programming languages and styles. These styles include: procedural or object oriented programming with Python via Jython, functional programming with Scheme, and declarative programming with Prolog. In short, LPnet is designed to introduce open source mobile agents to the general public.

Poster #13

TOUGH GLASS, TOUGH TOPOLOGY: THE FRACTAL DIMENSION OF FRACTURE SURFACES
A. Johns, L.C. Krysac

The process of brittle fracture is strongly affected by propagating stress waves. In studying the tensile failure of a brittle carbon foam, we observe that by damping out the stress waves, the fracture toughness (resistance of the material to crack growth) increases. This change in a material property leaves behind an altered fracture surface landscape, which can be characterized by a fractal dimension.

Poster #14

POP, CRACKLE AND SNAP: THE SOUND OF BROKEN GLASS
C. Landis, R. Clemons, P. Torres, A. Johns, L.C. Krysac

The Physics of Fracture is the study of a driven, disordered system with many degrees of freedom. The many degrees of freedom manifests itself in that any sample of a material can respond to the driving force in a multitude of ways. Like many other similar systems (such as earthquakes, martinsitic structural phase transitions, and magnetic materials in a changing magnetic field), a brittle material can *crackle* when pulled apart by a tensile force. Crackling is the emission of energy in discrete avalanches of many different sizes. In studying the tensile failure of a brittle carbon foam, we observe that the process of fracture passes through stages of "popping", "crackling" and finally "snapping". Each of these stages are described by a complex statistical model which may by applied to crackling systems in general.

Poster #15

STUDY OF MAGNETIC DAMPING IN LIQUID METAL SURFACE WAVES
David Pace

Knowledge of liquid metal surface waves and instabilities provides insight regarding turbulence in plasmas and the magnetohydrodynamic(MHD) model used to describe plasmas generally. Such work is also critical in the development of liquid lithium walls to be used in fusion reactors. The Liquid Metal Experiment (LMX) is designed to study magnetically induced damping of liquid gallium surface waves by driving such waves in the presence of a magnetic field. Previous work measured the dispersion relation and confirmed that a magnetic field aligned perpendicularly to the direction of wave propagation has no effect. More recent findings have demonstrated that a magnetic field aligned parallel to the direction of wave propagation causes significant damping of the waves which follows a gaussian dependence, and confirmed that the wave number varies in the presence of a magnetic field.

Poster #16

BANDWIDTHS, WIRELENGTHS AND CUTWIDTHS OF COMPLETE GRAPHS OF TRIANGULAR AND RELATED NUMBERS EMBEDDED ON TRIANGULAR LATTICE GRID HOST GRAPHS

LeeAnn Feathers

This poster will present the use of a triangular lattice grid as a host graph for complete graphs of triangular or related numbers. The bandwidth, wirelength and cutwidth will be analyzed.

Poster #17

THE AFFECT OF VELDT GRASS ON RAINFALL DISPOSITION AND EVAPOTRANSPIRATION AS MEASURED FROM SOIL MOISTURE

Susan C. Akers

Veldt grass *(Ehrharta calycina) is* native to southern Africa and has become an invasive plant in California coastal areas (California Exotic Pest Plant Council, 1999). In areas where veldt has become established, it competes with native vegetation. My objective is to investigate the soil moisture content directly below grass plants and the surrounding soil in order to interpret the affect of individual veldt grass plants on rainfall disposition and evapotranspiration. My hypothesis is that the veldt grass structure causes the water to channel into and through the soil in a manner that would increase the water available to it and lower the availability for plants in the vicinity. The location of the study is the Bodega Dunes in the Sonoma Coast State Park, which is a coastal dune area. A grid of 10-cm cells was used to sample soil moisture content around individual grass plants with time domain reflectometry. Sampling was done after a rainfall event in February 2002 and evapotranspiration effects will be measured in April 2002. The data will be translated into two continuous contoured surface and vertical plots using Surfer. The results of this study will show us the effects of individual plants on their immediate surroundings and how they manipulate their microclimate.

Poster #18

EXPLORING THE CHEMISTRY OF DIRHENIUM(III) CARBOXYLATE COMPOUNDS WITH 9-ETHYLADENINE

Sivly Boun and Elizabeth F. Day

It has been shown that dinuclear metal carboxylate compounds display antitumor activity; however, the mode of activity is poorly understood. This study involves compounds with a core comprised of two Re(III) metal atoms bridged by *cis*-carboxylate ligands. This core interacts with the purine nucleobase derivative 9-ethyladenine (9-EtAH) to give compounds that exhibit binding modes that model the binding of dinuclear metal compounds with DNA. Characterization of a recently synthesized dirhenium compound with the proposed formula, $Re_2(O_2CCH_3)_2(9EtAH)_2Cl_4$ will be presented. Also, the preliminary results of the reactions of $Re_2(0_2CCH_3)_2Cl_4$ with 1,4,7-triazacyclononane and 9-ethyladenine will be discussed.

Poster #19

WITH 9-ETHYLADENINE AND 1,4,7-TRIAZACYCLONANE

Sok Ngoun and Elizabeth F. Day

Dinuclear metal carboxylate compounds have been shown to repress tumor growth. It is proposed that the anticancer activity of dinuclear metal systems is a result of their interaction with the purine DNA nucleobases, adenine and guanine. Two possible coordination modes for these ligands are bridging the dinuclear core or chelating to one metal center of the dinuclear core. This study focuses on the chelating coordination mode. Reactions of dimolybdenum(II) and dirhenium(III) carboxylate compounds with 1,4,7-triazacyclonane (TACN) and 9-ethyladenine (9-EtAH) may result in isolation of products containing a chelating nucleobase. The coordinated solvent molecules of $[Mo_2(0_2CCH_3)_2(CH_3CN)_6][BF_4]_2$ will be replaced by the strongly coordinating tridentate TACN macrocycle and the added 9-EtAH will be forced to chelate to the remaining equatorial metal sites. The reactions of $Re_2(0_2CCH_3)_4Cl_2$ with TACN and 9-EtAH will also be explored. Preliminary results of newly synthesized compounds will be discussed.

Poster #20

ANALYSIS AND COMPARISON OF *EOLAMBIA*
Jorge Abaunza, Jason Hsiao, Kris Kawamoto, Marie Miranda

Bones of eight individuals of *Eolambia* were found in the Mussentuchit Member of the Cedar Mountain Formation in Emory County, central Utah. The species were excavated by the Oklahoma Museum of Natural History (OMNH) and the University of the Pacific (UOP). The various skeletal elements, including the pectoral girdle, forelimb, hindlimb and pelvis of *Eolambia* were described, measured and compared with *Iguanadon, Bactrosaurus, Tenontosaurus*, and *Ouranosaurus.* Results of the analysis and comparison of each part suggests that *Eolambia is* most closely related to *Bactrosaurus.*

Poster #21

THE EXPRESSION OF C. *ELEGANS* SPE-9 RECEPTOR IN *P. PASTORIS*
Jack C. Nguyen. Dr. Joan Lin-Cereghino. Dr. Andy Singson

The use of the *Pichia pastoris* yeast allows for efficient heterologous protein secretion. The SPE-9 extracellular domain is cloned into two Pichia expression vectors, pPICZB and pPICZαB. The differences in the two vectors are that pPICZB expresses heterologous proteins intracellularly, whereas pPICZαB contains an α-mating factor signal sequence, which results in extracellular protein secretion. The SPE-9 gene encodes for a sperm transmembrane protein required for fertilization in the nematode worm *Caenohabditis elegans.* SPE-9 functions as a sperm ligand during gamete interactions. Production of SPE-9 protein will allow us to further understand the functional roles of various genes required for fertilization, reproduction, and development.

Poster #22

THE EXPRESSION OF HUMAN FKBP12 GENE IN *PICHIA PASTORIS*
Colin Au, Kris Kawamoto, & Joan Lin Cereghino

Recent studies have suggested that the regulatory protein, FKBP12 plays a role in T lymphocyte reproduction via the calcium influx pathway. Improper functioning of FKBP12 could lead to uncontrolled T lymphocyte production, which is responsible for T lymphocyte cancers. To enable Dr. David Thomas of the University of the Pacific Dept. of Physiology and Pharmacology to explore how FKBP12 affects calcium dependent growth decisions of cells in the immune system; production of a large amount of the protein is necessary. The yeast, *Pichia pastoris* has the ability to express proteins from other organisms at high levels. Thus, once the gene coding for FKBP12 was deduced, polymerase chain reaction (PCR) was used to amplify the gene. The gene was then inserted into two different expression vectors for *Pichia pastoris.* The vector, pPICZα has gene secretion capabilities and the other strain, pPICZ does not have this ability. The most efficient vector will be used to synthesize the protein that Dr. Thomas will use in his cancer research.

Poster #23

THE DEVELOPMENT OF A KANAMYCIN RESISTANCE GENE FOR POSITIVE SELECTION IN THE YEAST PICHIA PASTORIS
James Castelo and Alex Chan

The yeast *Pichia pastoris is* used as a host for the production of proteins for basic and applied research. Over 400 foreign proteins, such as human insulin, bacterial tetanus toxin, and Syrian hamster prion protein, have been successfully expressed in this yeast. In order for *P.pastoris* to make a desired protein, the gene encoding this protein must be transformed and integrated into the yeast genome. However, in order to identify a yeast strain that has taken up the foreign gene, a selectable marker gene must be covalently linked to this foreign gene. The presence of a selectable marker gene confers a property on the yeast cell that helps you identify the cells containing your favorite foreign gene. We are trying to develop the bacterial kanamycin resistance gene into a selectable marker gene for use in P. *pastoris.* If we are successful, we will be able to transform *P.pastoris* cells with plasmids containing the kanamycin resistance gene and the desired foreign gene and then identify the yeast cells that have taken up the foreign genes by their ability to grow on kanamycin, which is cheaper and easier than some current methods.

Poster #24

CONSTUCTION AND SCREENING OF NEW EGFP-PTS1 VECTORS IN *PICHIA PASTORIS*
Claire Orazem

EGFP-PTS1 is a fusion of the gene for enhanced green fluorescent protein and a peroxisome targeting sequence. Originally this complex was inserted into a vector with zeocin as a selectable marker. Zeocin is an expensive antibiotic to work with. Amino acids such as histidine and adenine are less expensive to use. In order to generate a similar vector based on amino acid auxotrophy, the EGFP-PTS1 gene will be removed from the zeocin vector and inserted into vectors selecting for either adenine or histidine. Through different screening techniques I hope to determine which new complexes are accurate and functioning.

Poster #25

ISOLATION AND CHARACTERIZATION OF THE ACTIVATED B CELL FACTOR 1 HOMOLOG IN *CAENORHABDITIS ELEGANS*
Kaitlin P. Nguyen, Kathryn Bermoy, Alex Dansa, Ousama Suliman, and AhMee Lee

The gene called CeABF-1 of the nematode *Caenorhabditis elegans* encodes a protein very similar to the vertebrate activated B cell factor (ABF-1) protein. In vertebrates, the ABF-1 gene encodes a Class II basic helix-loop-helix (bHLH) transcription factor which is implicated in B cell development. Class II bHLH proteins heterodimerize with Class I bHLH proteins like E2A to act as regulators of transcription. E2A proteins (as homodimers) are also transcriptional regulators. Class I bHLH homodimers and Class I/Class II heterodimers such as ABF-1/E2A have different regulatory properties. CeABF-1 can replace ABF-1 in mammalian cells, showing that these proteins are functionally identical. CeABF-1 expression is highest during that 13 and 14 larval stages, during which several reproductive structures develop and some parts of the nervous and muscular system are modified. We are interested in determining the normal functions and partners for CeABF- 1 in nematode development. To do this, we have begun two experiments. We are also using a Yeast two hybrid screen to identify other nematode proteins which interact with CeABF-1. We have also entered a collaboration to find mutations in the CeABF-1 gene in order to study its developmental function. These studies will help us understand the function of CeABF-1 in C. *elegans* and the function of ABF-1 like genes in all organisms.

Poster #26

STEREOSELECTIVITY IN THE REACTION OF IODONIUM: ION WITH DIHYDROPYRAN

Matthew Polster

In order to study the stereoselective halogenation reaction of dihydropyran with halonium electrophiles, gas phase *ab initio* calculations have been performed on the chiral bridged intermediate. The effect of different a-substituted alkane groups are studied in order to determine relative stabilities of the *syn-* and *anti-* isomers of the intermediate, which break up to form the S,S- and R,R- enantiomers, respectively. The effect on the stereoselectivity of the final products is described, supporting experimental results. While little sensitivity to substituent group is found, a-substitution in general is found to stabilize the *syn-* intermediate relative to the *anti-* form.

Poster #27

THE TUBULIFORM GLANDS OF THE BLACK WIDOW SPIDER (LATRODECTUS HESPERUS)

Jonathon A. Lamarque

Two forms of tubuliform glands (white and orange) are present within the abdominal cavity of the black widow spider (Latrodectus Hesperus). It is believed that these glands produce silk used in the production of egg cases. This study was performed to determine if the two different forms produced two different types of silk. The spiders were immobilized using carbon dioxide gas, followed by a microdissection of the abdominal cavity. This procedure was performed repeatedly on both male and female black widow spiders. White tubuliform glands were found in nearly every male and female spider dissected. Orange tubuliform glands, on the other hand, were only present in the female spiders. In the twenty-nine dissections performed on the female spiders, eleven were determined to contain orange tubuliform glands. When a chi square analysis was performed, them value was calculated to be .10. Since this p value is still relatively high, the Null hypothesis cannot be disproved, and there is still a chance that the observations occurred due to chance alone. These results lead to the possibility that white tubuliform glands serve a function of producing a type of silk required throughout the lifetime of the spider, most likely scaffolding silk. The orange tubuliform glands, in contrast, are only needed at certain times of the female black widow's life. This observation supports the hypothesis of orange tubuliform glands producing the silk responsible for making the egg cases. In future research, gel work may be performed in order to accurately determine the function of each silk gland. These gels will compare the silk collected from the web to the silo taken directly from the gland.

Poster #28

THE EFFICIENCY OF BLACK WIDOW GVMFOOT LINES
Yurixsa Lopez

Like other theridiid spiders, the black widow *(Latrodectus hesperus)* ***constructs*** gumfoot lines at the bottom of its cobweb. Gumfoot lines are vertical strands of silk that are tautly attached to the surface and detach easily when an insect touches them. Previously, I found that the median weight that the gumfoot lines could pick up was 10 mg. Here, I show that the gumfoot acts like a spring when it picks up a weight. The thread is already stretched when it is attached to the ground. When the gumfoot detaches, it uses the stored energy to pick up the weight. I wanted to find out how much energy went into and out of the system as the thread was stretched and unstretched. Using a force transducer, Tensiometer 400A (50.0 mN Force), I was able to stretch the gumfoot lines each 3 times at 2 and 10% of their original length. I could then calculate the efficiency and the strain. At 2% (pre-yield) it was found that the gumfoot had an efficiency of about 8 l .4%, but at 10% (post-yield) had an efficiency of about 23.9%. What this means is that not all the energy put into the stretch comes out again when the gumfoot relaxes. Knowing that the median weight that gumfoot lines can pick up is 10 mg and that they have a high efficiency, gumfoot lines are an ideal catching tool for black widows provided they are stretched less than 2% of the original length. (NSF DBI-0112165).

Poster #29

LIQUID AND SPIDER SILK ANALYISIS IN *LA TRODECTUS HESPSERUS*
James R. Wilson

Spiders store silk as a liquid substance in glands within their body. We expect that the cause for property differences from liquid to solid silk comes from molecular folding. To test this hypothesis we preformed micro-dissections of black widow spiders *(Latrodectus Hesperus),* excising silk glands and preforming Ci3 nuclear magnetic resonance (NMR) of them. NMR was preformed by B.A. Lawrence at Eastern Illinois University on a sample of 58 major ampulate glands. We compared the NMR spectrum of solid dragline silk with the spectrum of the major ampulate gland sample. There are measurable shifts in peaks of the alanine carbons from liquid state to solid. The property differences may be from molecular structure going form random coil to F-sheet conformation. Further analysis will be done on the other types of silk glands found in the spider.

Poster #30

INVESTIGATIONS OF THE ACTIVATED B CELL FACTOR PROMOTER REGION
Anthony Eusebio, Eric Chen, Hahn My Bui

Activated B cell factor 1 (ABF-l)/MyoR is a basic helix-loop-helix (bHLH) transcriptional repressor that controls B cell proliferation and skeletal muscle differentiation. It has been suggested that the ABF-1 gene is regulated by HES6, another member of the bHLH family. To investigate the role that HES6 plays on the regulation of the ABF-1 gene, we have cloned the mouse promoter region and compared the sequence to the human promoter for conserved regulatory elements. Over a 1.8 kb region, two conserved regulatory elements were identified, both showing over 90% homology within a 70 bp region. In order to determine the potential role of HES6, we have performed a set of transient transfection assays using several different DNA constructs carrying 5' deletions of the human ABF-1 promoter linked to the firefly luciferase reporter gene. The role of HES6 on the regulation of the human ABF-1 promoter will be presented.

Poster #31

THE SEARCH FOR THE GENE SEQUENCE OF DRAGLINE SILK FROM THE MAJOR AMPULLATE SPIDROIN II GLAND IN THE BLACK WIDOW SPIDER (LATRODECTUS HESPERUS)
Amanda Ngan and Norma Reyes

Each type of silk from the black widow spider (Lactrodectus Hesperus) have different functions. We expect that the gene differences of each type of silk will lead to differences in their material properties. The goal of our research is to find the molecular gene sequence for the dragline silk of the Major Ampullate Spidroin II gland (MaSp2) in the black widow spider. A cDNA library was constructed using the DNA of MaSp2 glands because of their high composition of silk mRNA's* 10%. Primers were designed to accommodate the degeneracy of the DNA code at a silk region that is evolutionarily thought to be a common motif amongst other spider species. Three PCR reactions were run with forward and reverse primers, forward primers only, and reverse primers only with an annealing temperature ranging from 45-52 degrees Celsius for each. Using gel electrophoresis, three distinct bands were found for the PCR product with forward and reverse primers. The three gene pieces were each inserted into a cloning vector and transformed into E. colt. Plasmid vectors were isolated and sequenced. A positive clone was found with high homology to previously reported silk genes and its relevance will be discussed.

Poster #32

ISOLATION AND PARTIAL CHARACTERIZATION OF A NEW GENE ENCODING A HELIX-LOOP-HELIX TRANSCRIPTION FACTOR FROM BLACK WIDOW SPIDERS THAT HAS HOMOLOGY TO THE ACHAETE SCUTE COMPLEX PROTEINS (LATRODECTUS HESPERUS)

William Thayer

Helix-loop-helix (HLH) transcription factors are found in a wide range of different organsims ranging from yeast to humans. HLH proteins are important regulators of cellular proliferation and differentiation. It has been proposed that HLH proteins may be found in other organisms as well. In order to examine this proposal, we have searched for the presence of HLH proteins in the black widow spider. Following the screening of a cDNA library prepared from the black widow spider, we have isolated a single gene that encodes a novel member of the basic HLH family of transcription factors. Analysis of the retrieved cDNA shows a single open-reading frame that predicts a protein of a molecular weight of 25 kDa. The spider HLH protein shows 47% identities over a 44 amino acid stretch to achaete-scute HLH complexes, proteins involved in neurogenesis in the fruit fly *Drosophila.* In vitro transcription and translation of the spider gene produces a protein of approximately 36 kDa. To determine the transcriptional activity of the gene, mammalian transient transfection assays have been performed and the results will be presented.

Poster #33

THE WATER DECONTAMINATOR

John J. Paoluccio

Groundwater contamination is a major problem in our world today. There are many sources of contamination; vehicles, parking lots, landscaping and industry. During the early rains these contaminants are picked up and delivered into our catch basins. The polluted water eventually ends up in our groundwater. I have worked in our family owned engineering and invention development company, Inventive Resources, Inc. (IRI), for over 15 years. One of the patented products that I have helped design, build, test and install has been the Water Decontaminator. As part of a research project I wanted to work more closely with UOP's engineering department to learn more about how absorbents work and how to improve the design of this system. The goal is to eliminate the problem at the source, intercept the urban runoff at each catch basin with a device that can help remove oils, pesticides, chemicals and other contaminates from the run-off before it reached the groundwater. The system should be low in cost, easily installed, long lasting, effective and easy to dispose of.

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