

Vicki Javier '05
Harlem Children Society
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Presentation Notes

Prostate Cancer and the Adenovirus

- MDA-7 is a gene that attacks prostate cancer cells and not normal ones
- LnCaP cells were attacked with the gene MDA-7 in Petri dishes
- Evidence of ryanodine receptor's presence will be proved by reverse transcript PCR
- In previous studies, RT PCR showed presence of RyR1 and RyR2
- Presence will be proven in 565 KDA marker in Western Blotting

Pharmacology

- pharmacology: study of how chemical substances interact with living systems
- absorption, distribution, metabolism, excretion: pharmacologists study these four aspects of drugs
- metabolism: chemical conversion of medication
- almost all drugs are xenobiotics
- instruments: liquid chromatography, pH meter, UV spectrophotometer
- future: examine drugs in health food

Finger Length and Personality: by Nusrat Chowdhury

- size fingers in males and females differs due to amount of testosterone in fetus
- no clear correlation between index finger and aggression
- height correlation is even more elusive

Safety of Drug Desensitization in Allergic Patients: by Cindy Law

- allergy is due to hypersensitive immune system
- foreign antigens cause production of antibodies which affect mast cells: B-lymph nodes and T-lymphocytes
- severe allergic reactions can happen in dermal signs
- it can be treated with epiPen (adrenaline) < intramuscular injection; constricts blood vessels and opens breathing passages
- one can detect allergy by scratch test with diluted allergens

Breast and Thyroid Cancer Detection: by Rami and Pankaj

- cancer can be acquired genetically or environmentally
- method to amplify: RT PCR
- locate tumor cells with fluorescent markers

T-Cells and Cytokines: by Alberto Rosarion

- luciferase is used to track down the T-cells
- PCR to see if the desired sample is present
- PCR involves two primers, polymerase (enzyme), and template DNA

Structural study of the alpha-12 Virus: by Elizabeth Brown

- microscope: cryo-EM is used to look at virus
- freeze samples with liquid nitrogen (-80°C)

Tactile Perception of Human Fingers: by Chamiere and Eric Belford

- goal: make it easier for blind people to use a computer
- human finger is able to perceive a 1mm dot in diameter, width, and height
- experiment: perform measurements to understand maximum optimization

Genomic Screening: by Princess Kara Parker-Smith

- question: What are the genes that allow the GPI protein to get into the cell walls
- *Candida albicans* are pathogenic fungi
- Method: process protein to remove unwanted carbohydrates

Architecture: Sustainable Housing: by Alfredo De Vido

- desired result: high level design with economy and that is fit for the neighborhood
- architects organize things like: space, light, climate, money (luxury)
- they also organize people (plumbers, excavators, and clients)
- models: Con-Ed house, Combe house, and earth-sheltered homes
- used cheapest lumber for De Vido house: sustainability

Humoral Rejection in Allografts: by Anastacia Gargadin

- key word: endomyocardial
- goal: to make successful heart transplant
- cargo study: reduce number of biopsies

Visual Artificial Tongue: Swapan

- human tongue and nose has hundreds of receptors
- experiment: analyzing metal cation
- experiment: transfer dye from tongue to a Well-plate
- analyze water
- sample = analyte

Biomedical Consulting: by Aliza Holtz

- goal: design clinical and preclinical trials
- suggest new biomedical products
- regulatory writing for the FDA
- skills involve having an “ear” for language
- data-based documents for knowledge
- success with Zantac, Azactam, Acutect, and Prozac

Detection of Amnionless Protein in Kidney Cells

- tissue sliced with a microtome and embedded in wax
- antibodies used for immunohistochemistry
- will be used to pinpoint mutations

Role of GPX in Emphysema: by Navida B.

- emphysema: abnormal enlargement of lung spaces
- antioxidants: Vitamins C, E, and selenium
- GPX1-mutated mice were exposed to cigarette smoke
- Result: GPX1 prevents emphysema

Tracing-Metal Analysis in Water: by Leilani Edwards

- question: how much metal is present in a solution?
- Metal can be found in vitamins, decaying plants, and mining
- Sea water will have more metal than drinking water

Amino Acids and Zinc Citraconate: by Rhomesia R.

- zinc complexes help with common cold and wound healing (Zinc Ion Therapy)
- experiment: zinc citraconate was attempted to be synthesized
- goal: to create purer zinc citraconate

The Cirtual Instrumentation of the Fuel Cell: by Pamul R.

- goal: study the basic theory of the fuel cell and develop a monitoring system
- hydrogen gets turned into ions to turn into energy and then to water

Tumor Biology and Cell Mestasis: by Olympia Jarboe

- procedure: growing cancer culture
- it's frozen with liquid nitrogen

Antibody and Melanoma Tumors: by David Perez

- nude mice are injected with melanoma
- these mice were labeled with antibodies

Scope Phase II: by Shaneena M.

- goal: crate a variety of menus for patients for cancer centers
- cancer patients can log in their symptoms online
- future work: categorize cancer symptoms

HIV

- 60 million are infected (half are under 25!)
- Cd4+ count fall to less than 200 cells per millimeter (normal = 1000)
- When first infected: acute retroviral syndrome
- Pneumocystis pneumonia common in AIDS patients
- As well as herpes simplex virus and thrush

Mechanisms of Neuron Death in Neurodegenerative Diseases: by Dr. Shahana Mahajan

- neuron: fundamental cell in the nervous sstem
- AMPA receptor = glutamate-gated cationic channels
- Glur2 inhibits passage of Ca²⁺ ions
- Lou Gehrig Disease: motor neuron disease (death in 3-5 years)

- Patients have reduced GluR2 editing
- Isolate 14DIV neurons from rats to grow in culture then look for cell deaths (via immunocytochemistry)

Sexual Risk Behavior: by Temilola, Renee, Marsha

- risky sexual behavior: early start, without condoms, prostitution
- females are bound to have more peer-pressure
- males are involved in competitive pressure
- smoking early can lead to early start in sexual activity
- having meals together with family can lead to lower chance of teen sex
- depression and self-mutilation can be associated with early sex

Can Eyes Adapt to Defocus: by Kristian Galan

- retina- behind eye where image is focused
- with positive lens, images become blurry
- choroids thickens according to type of lens

The U.S. Environmental Protection Agency: by Diane Buxbaum

- 1970: year of first Earth Day
- 1970: first EPA administrator
- before creation of EPA: env. issue under dpt. of the Interior and Agriculture
- Headquarters in Washington, D.C. (10 region chapters)
- EPA saved extinction of the brown pelican and banned the use of DDT
- helped in the Donora, Penn. Fog of 1948
- Flammable Cuyahoga River due to dumping chemicals
- a school was built in Love Canal: toxic site
- teamed up with SUNY to inspect college labs (over 3,300 violations)

Principal Scientist: by William H. Kailey

- epidemiology- composes characteristics of people with disease
- studies with electric and magnetic fields
- association: observational, not experimental
- if relative risk ratio is same in both groups then there is “no association”
- interpreting results: all results are not equal

Mutagenesis in Worms: by Reginald Anyichie

- find new genes that cause mutation (mutagens)
- types of neurons: ASI, ASH, AIY-A, PVQ] allied neurons
- neural cord in worm has over 300 neurons

Understanding the molecular Mechanisms of Sarcomagenesis: by Eva Hernando

- tumors: liquid or solid
- liquid tumor: derived from blood cells
- solid tumor: carcinomal (epithelial origin) and sarcoma (mesenchymal origin)
- sarcoma subtypes can be formed by chromosomal fusions
- sarcoma is often resistant to conventional therapy

- can PTEN be responsible for tumors in the smooth muscle
- results: smooth muscles proliferated
- everolimus = treatment for the sarcoma (80% survival rate)

Mars Hybrid Rocketry

- main rocket component: fuel and oxidizer
- solid fuel rockets: inefficient fuel burners
- liquid fuel (turbo pump) rockets = most commonly used
- to build a hybrid rocket, they used very viscous /concentrated alcohol, sterno, and cellulose gels
- experiment: Everclear Rocket Design v1 and v2
- V1 was economical but weak
- V2 was modular, but heavy
- Plasma: 4th state of matter (electrons move freely)
- Ball lightning: a natural sphere which glows for few seconds
- To create plasma, an electron has to knock out another electron
- Nebula spins and condenses to form a star
- The study of Mars; orbit led to Kepler's Laws, which led to Newton's Laws
- Mars has the North Plains (few craters) and South Plains (many craters)
- Mars has highly oxidized soil, air glow, global dust storms, and greenhouse effects

Predicting 3D Protein Structure Using Homology Modeling

- the use homology modeling to model proteins to reveal their role in diseases
- input protein template in chemcom.com
- psoriasis = inflammatory disease of skin and joints
- HIF1 protein activates gene for hypoxia disease
- HER4 is able to lower expression of breast tumors

The Biocybernetics Initiative: by Farhan R.

- goal: to design an autonomous device to track insides
- current camera pill to attach to blood cells
- problem: pill needs constant energy supply
- GI tract is acidic; they need to build pill with suitable material

Fluorescence and Absorption of Biomolecular Mol.

- studied the four bases of DNA
- fluorescence: substances absorb radiation and absorb light
- amino acids were studied

Reverse Micellar Synthesis of Selenium: by Alejandro

- Quantum dots are responsible for fluorescence] bigger in size than dye molecule
- it can be found in DVD's (blue light reads data)
- the redder, the lower the energy; the bluer, the higher the energy
- goal: filter strong laser intensity to make it less harmful
- future work: use quantum dots as filter

Producing a Line of CHO Cells: by Tomi O.

- Task-1 = protein responsible for making membrane of a. Cell more hyperpolarized
- Problem: platelet-activating factor (PAF) inhibit current of Task-1
- Experiment: create a line of CHO cells to put in Task-1

Data Networking Testing

- key words: WiFi, LANs, Hotspots, Ping, IP, Bandwidth
- materials: cellphone models and NYC maps
- experiment: use devices to scan Manhattan

pH-sensitive Liposomes for Efficient Release of Therapeutics: by Savita

- liposomes are used to deliver drugs
- materials: prepared liposomes, pipettes, spectrometer
- higher content release at lower pH which leads to more leakage of liposome membranes

Alzheimer's Disease: by Derek Kenyenso

- AD is a degenerative brain disease
- mild, moderate, and advanced forms
- it is the most common form of dementia
- in advanced AD, brain shrinks due to cell death
- treatments include: aricept, exelon, razadyne
- experiment: clinical trial to see if drugs are efficient enough

Youth Fulfillment in Child Care: by Christina Romero

- Beacon Center: helps underserved children
- core beliefs: safety, permanency, education, literacy, self sufficiency, strength-based services
- focus in literacy and science for grades 1-8 (intensive staff training)
- advantage: build social skills for pre-vet field
- student progress reports

Food and Drug administration: by Mark Klang

- drug issues: (ADME)
- only un-ionized drugs are absorbed
- taking acid-tablets might hinder drug absorption due to pH change
- some foods compete for same absorption sites
- when grapefruit juice is frozen, it alters enzymes
- tablets can clog up feeding tubes
- sorbitol is put into many liquid medicines to make it taste good
- warfarin- anticoagulant used to reduce strokes
- but broccoli hinders absorption
- Steroids increases glucose level

Global Warming and Water Pollution: by Maria Sacta

- the earth's temperature has increased 1% over the past century
- it has accelerated in the past two decades!
- natural greenhouse effect and enhanced greenhouse effect (more CO₂ concentration)
- in the artificial one, more heat is trapped
- melting of ice caps leads to higher sea level
- worldwide precipitation has decrease by 1%

Characterization of an Immune Response in Melanoma: by Suren R.

- melanoma- abnormal growth of melanocytes
- high chance of metastasis
- procedure: dissect mice and remove spleen
- crush spleen for flow cytometry
- look at the "landscape" of the tumor

The Role of Estrogens in the Hippocampal- Neuropeptide Y: by Damali Ferreira

- seizure- sudden burst of electrical activity in the brain
- hippocampus- responsible for transferring information into memory
- what is the role of estrogen for the hippocampus?

C-FOS Expression in Rats with Hypoglycemia: by Alejandro

- hypoglycemia- low sugar level
- which brain structures are involved with hypoglycemia?

SE Test and Coronary Heart Disease: by Mobeen F.

- fibrous plaque- build-up of fatty deposits in arteries
- atypical chest pain can be physically felt
- coronary heart disease = most common type of heart disease
- doctors shouldn't be so quick to advise stress test
- made table of patients to look for a CAD pattern

Age-Related Macular Degeneration: by Basiru Lee Leigh

- the retina sends impulses to the brain
- AMD gradually destroys the sharp vision
- two types: wet AMD, and Dry AMD (no treatment)
- objective: to see if vitamins can reduce vision loss

Quantitative Chem. Cal's and Plant Lignin: by Lauren Lisbon

- lignin: chemical compounds that allow plants to stay upright
- objective: calculate process of lignin and coniferyl alcohol formation

Estrogens in the Hippocampal- Neuropeptide-Y: by Tamara Dennis

- (same as Damaly's)
- To determine the estrogen receptor ERB and ER alpha
- Procedure: ovariectomy, perfusion, immunohistochemistry, and cell counting

Acute Leukemia and the FLT3 Receptor: by Betty Sa

- there are four major types of leukemia
- experiment is focus: Acute/Lymphocytic Leukemia (ALL)
- there are different sub-types of AML
- FLT3 = FMS-like tyrosine kinase three gene
- There are two mutations in FLT3
- Goal: get better understanding of the molecular abnormalities underlying acute leukemia

Interactive Keys to the Woody Geneva

- study plant biodiversity in NY metro area
- map all vascular plants known in the region
- encompass all counties within a 50-mile radius
- see the changes due to the global warming and non-native invasive species
- plant species are classified through binomial nomenclature (genus and species)
- interactive keys: computer system used for classifying plants
- goals: continue the generation of native plants

Assessing of Quality Case-Control of Childhood Leukemia: by Sandy H.

- epidemiology- study of transmission of diseases
- objective: look at electric and magnetic fields with childhood leukemia
- experiment: make spreadsheet for analysis

Invasive Vegetation and Phragmites: by Brenda and Cathya

- they studied the different types of stream banks
- used data sheet for each site
- spartina is codgrass (rare now because of phragmites)
- use minnow traps to catch fish (to put formaldehyde)

Cataloging Biacoustic and Anthropogenic Sounds

- only top layer of river receives sunlight
- fish have to rely on other senses other than sight
- the higher the frequency the higher the pitch [measured in Hertz]
- use passive acoustic technologies used to record underwater sounds
- purpose: to record sounds in Hudson River
- result: anthropogenic sounds were higher than biological sounds
- future work: educate fishermen to have quieter motors since it may confuse fish with their communication

Scientific Growth of Plants Using Hydroponics and Aquaponic Methods

- Use hydro. And aqua. Methods to grow plants in desert and space
- Hydro.- the growing of plants without using soil
- Aqua.- a hybrid methods of hydro. And aquaculture
- "A" Frame Hydro. System: grow things like lettuce without soil, just the bare nutrients

- grow veffies without soil, adjusting pH factors and calculating algorithms
- ammonia level wasn't measured: can be toxic for fish] stress level goes up
- microorganism diversity is greatest when medium amount of nutrients is used

The Role of TCR gamma-delta T cells in Celiac Disease

- Celiac Disease damages the small intestine] worsened by glutenin
- Objective: to determine if the TCR gamma-delta IELS (intraepithelial lymphocytes) have anything to do with regulatory/ depressing T-cells
- It has FOXP3 so it is most likely a suppressor

Teen Smoking: by Akua and Nathali

- made survey for the teens (86) ages 12-19 years
- 83 of them were non-smokers
- one of factors was the role of the media
- cigarette has: butane, cadmium, hexamine, urea, nicotine...
- future goals: find out which factor outweighs others

Is the Methoprene Tolerant Gene Transcribed during Mosquito Metamorphosis?

- Malaria risks: South America and Africa (about 300 kids die each day)
- four states of meta. (instar) in mosquito
- methoprene = juvenile hormone analog which helps larva not develop
- isolate midgets to obtain RNA to obtain DNA by reverse transcriptase

Community-Oriented Family Care: by Tahima Salam

- takes responsibility of population of certain area] their needs are looked up
- look at effect of Macy's in Parkchester
- look up death-adjustment rates, income level, age, social class in Parkchester

Skin Problems in Men of Color: by Carlton Moses

- look at pseudofollicitis Barbae and Acne Keloidis Nuchae problems
- epidermis is made up of: keratinocytes, melanocytes, langerhans, and Granstein cells
- the epidermis has 5 layers: stratum corneum, stratum spinosum, stratum lucidum, stratum granulosum, and stratum basale
- etiology of PFB encompasses the unique structure of hair in people of color
- folliculitis: infection of the hair follicle by staph bacteria
- in AKN, hair follicles grow on the inside
- future research: look at other ethnicities and create table of other skin diseases

Bronx River oyster Project

- objective: to clean up Bronx River to reintroduce disappearing species
- brackish water: slightly salty water
- calcium is secreted by oysters who filter rivers
- in river: sea squirts, barnacles, oysters, slipper shells, tubeworms, blue crabs

Language Focus Terms and Pragmatics: Liviana Sa

- explanatory talks relates to the acquisition of literacy skills in young children
- goal: replicated the findings of El, et al (2001) in relation to younger children
- methods: have different class children record dinner recordings
- types of experimental talks: intentional/action segments
- number of average = 403 words; in gifted dialogue family = 1805 words
- both groups have more dialogue than other people who don't have dinners

Effects of 9/11 on birth Outcomes: Shimul Befum

- analysis of 9/11 dust had high levels of toxins
- Beth Israeli, St. Vincent's, and NYU hospitals were the grounds for research due to their own proximity to the WTC
- Women who gave birth at these centers were given surveys
- Candidates couldn't have used drugs, drank alcohol or smoked during pregnancy
- On average, these babies were a third of an inch shorter and were delivered 3.6 days earlier
- Future research: let babies grow up for IQ tests

Schizophrenia and the Brain: by Awa

- Schizophrenia = illogical thinking; attacks pre-frontal lobe and hippocampus
- Hippocampus controls memory and emotions
- Exp: send electric currents to left side of rats to make them have schizophrenia
- In typical schiz. Patients, left hippocampus is smaller than right side
- Future work: Can it be detected earlier for cure?