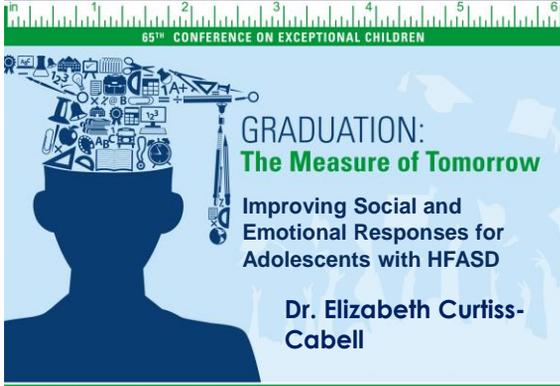


65TH CONFERENCE ON EXCEPTIONAL CHILDREN



GRADUATION:
The Measure of Tomorrow

Improving Social and Emotional Responses for Adolescents with HFASD

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PUBLIC SCHOOLS OF NORTH CAROLINA
State Board of Education | Department of Public Instruction

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Objectives

- ▶ 1. To understand the concept of epigenetics
- ▶ 2. To be able to discuss how epigenetics affects personal functioning.
- ▶ 3. To describe how epigenetics affects those with high functioning autism.
- ▶ 4. To develop strategies for helping students with HFASD in school.

What is epigenetics?

First – a Short lesson on genetics

Our cells have 23 chromosomal pairs - **our genes**.

½ from mom, ½ from dad.

Only monozygotic twins (woman's egg divides to create two children) have the same DNA.

Otherwise, your DNA is unique.

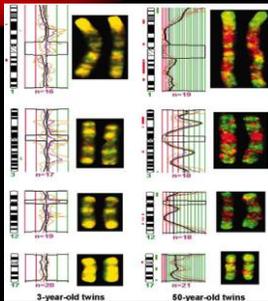


IDENTICAL TWINS



• If you are an identical twin, you started with exactly the same DNA, but you did not stay that way.

TWIN DNA PICTURES –

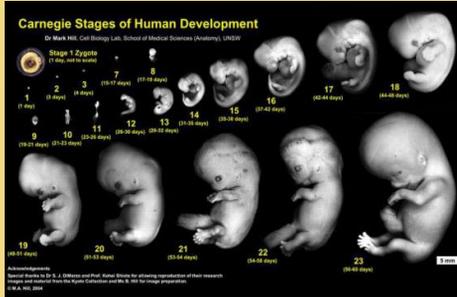


THE YELLOW SECTIONS ARE WHAT IS THE SAME BETWEEN THEM.

THE ONE ON THE LEFT IS OF 3 YEAR OLD TWINS, 50 YEAR OLD TWINS ARE ON THE LEFT.

Something affects how our DNA is used.

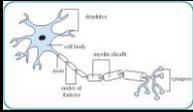
CELL DIFFERENTIATION



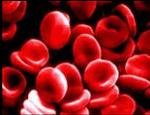
CELLS LOOK DIFFERENT AND HAVE DIFFERENT JOBS

People have an estimated 37.2 trillion cells in their bodies – this does not include microbes

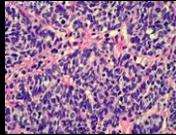
Nerve Cell



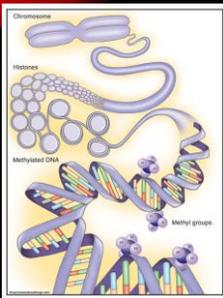
Blood Cells



Lung Cells



HOW DO CELLS DIFFERENTIATE?



- There are 2 ways cells differentiate themselves
 - 1. Histone wrapping
 - 2. Methylation

MOUSE AND CHERRY BLOSSOM STUDY BY DIAS AND RESSLER (2014) NATURE NEUROSCIENCE

- Transgenerational inheritance of the behavioral, Neuroanatomical, and epigenetic levels.



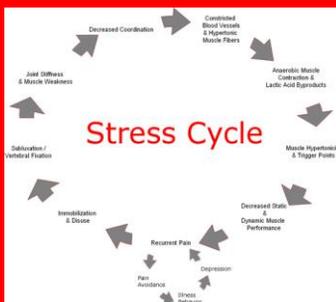
EPIGENETIC SUMMARY:



STRESS!!!!

How do we feel when we are stressed? How does our body work?

Stress changes how our cells work through epigenetic processes.



CONTROL THE STRESS!

Some stress is good for us and makes us more productive. Excessive stress is very bad for our health.

Since we WILL have stress in our lives, we MUST learn how to handle it. Experience helps!

AUTISM

- Increased incidence: The CDC has the incidence of **1 in 88** babies born in 2012 will have an ASD; **1 in 58** in North Carolina
- The comorbidity rate of mental health concerns is very high with this population, up to 86%
- Family stress is higher for families with children with ASD than for any other physical or mental disability.
- The number of individuals who have ASD and are fully employed ranges from 10% to 33%. Many are under-employed or unemployed.
- Lower levels of adaptive functioning, poor social impairments, repetitive behaviors, and internalizing and externalizing difficulties equals lower levels of health related quality of life.
- Pharmacologic and non-pharmacologic interventions

Generalization and Vocational Outcomes

- Generalization
 - Conceptual understanding vs. behavioral skills
 - Natural settings
- Vocational Outcomes
 - Underemployment
 - Unemployment
 - Social interactions

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MENTAL HEALTH FOR INDIVIDUALS WITH ASD

Primary comorbid disabilities:

- Anxiety
- Depression
- OCD
- ADHD
- Schizophrenia (less frequent)

WORK CONCERNS AND PROBLEMS

All work has an element of social and communication issues associated with it.
 Social behaviors are variable; contextual information must be considered and understood to communicate socially appropriate behaviors.
 Social interactions increase stress and comorbid mental health problems. This is a vicious cycle.

AUTISM

Always
 Unique
 Totally
 Interesting
 Sometimes
 Mysterious

Methylation

How do you think under methylation affects people with ASD?
 SENSORY PROCESSING!!!!!!
 SOCIAL STRESS!

SENSORY STRESS

- Because individuals with ASD are under methylated, their cells are unable to appropriately process sensory stimulus.
- This leads to attending to details in the environment.
- Shutting out the environmental stimulus because it is overwhelming.
- Engaging in behaviors where the environmental stimulus is either ignored or altered by their behavior.

SOCIAL STRESS

- Individuals with ASD have difficulty understanding and interpreting social cues.
- Theory of Mind, social intelligence, cognitive empathy – the ability to understand the mental states of others, their feelings, thoughts, intentions, knowledge, and potential behavioral reactions.
- Global contextual information, weak central coherence
- Social behavior is often rejected, leading to social isolation, peer rejection, victimization, behavioral problems, comorbid disorders such as anxiety and depression
- Higher social expectations for higher functioning individuals.
- Anxiety levels are higher for individuals with ASD who do not initiate peer interactions.

DETAILS VS WHOLE PICTURE

Individuals with ASD look at details – they do this with visual activities as well as social situations.

They may remember a detail that you did not notice, but yet not remember a very important concept of an interaction.

There are similar deficits for verbal language. Details may be remembered, but contexts may not be remembered.



STRESS IS CONTAGIOUS!

Autism is a social and communication disability. Autistic children do not understand nor are they able to verbalize their social stressors. They may also have social inaccuracies in their stories.

- Try to stay calm
- Model how to handle stress when it happens.
- Help students understand situations and stress.
- Work with students when they encounter stressful situations and coach them on how to handle them



FOR PARENTS, WAYS TO REDUCE STRESS INCLUDE:

Support from family members, friends, ASD services.

Other: exercise, diet, doing things you enjoy

When stress is reduced, health is improved down to the cellular level.

Methylation is decreased and cells are better able to do their jobs.



THINGS WE DO IN SCHOOL TO HELP WITH STRESS

Stress Analyzation



Positive Peer Interactions



Relaxation



STRESS ANALYZATION



- Examine a stressful situation each week.
- What was the situation?
- What were your feelings about the situation?
- What was your reaction?
- How did you handle the stress?
- Would you handle it the same in the future?

RELAXATION TECHNIQUES



Used to decrease and manage stress
Reduces stress hormone levels
Draws on the interplay of the mind, emotions, body, and behavior

UNDERSTANDING SOCIAL CONCEPTS CAN REDUCE STRESS

- What size problem is this?
- What is the expected behavior?
- Are you spiraling?
- Is this an attracting or repelling behavior/conversation?
- Are you going into the "weird" zone?
- You may not be able to control your feelings, but you can control your behavior



SOCIAL AND COMMUNICATION SKILLS TEACH SOCIAL AND COMMUNICATION CONCEPTS!



POSITIVE PEER INTERACTIONS



- Individuals with ASD have problems:
 - Interpreting global contextual information
 - Social cues
 - Social interactions
- Those with positive personal interactions have:
 - higher quality of life
 - better vocational prospects
 - lower levels of comorbid mental health disorders.

STUDENTS NEED TO LEARN TO TAKE CONTROL

Emotion

Learn to control emotions.
Learn to think critically and problem solve in social settings.
Requires natural social settings to practice in – schools.

Skills must generalize to be effective. A student will learn what the autism support teacher expects or, far as social skills responses, but these must be generalized to other students to be useful.

Stress

Linked to somatic, psychological, and psychosomatic problems.
Linked to physical conditions – hypertension, cardio vascular problems, stomach malfunctions, sleep disorders

Those with ASD often have higher levels of stress due to social and communication deficits and frustrations.
Stress affects comorbidity rates.

Relaxation

One way to deal with stress.
Relaxing and stretch reduces stress hormones.
Breathing exercises

Learn to take control of your emotions, environment, and behavior.

ENVIRONMENTAL CONTROL – WE ALL WANT IT!

When people have personal control they are able to influence their outcomes.

Personal control improves psychological and physical health outcomes.

Individuals must learn to depend on themselves – self-advocacy skills.

Use positive thoughts to decrease stress.



THE MAIN COMPONENTS OF EPIGENETICS ARE: MIND, BODY, SPIRIT, EMOTION.

- **Mind** – social skills, generalization
- **Body** – diet, exercise, environmental conditions
- **Spirit** – positive interactions, self-reflection, relaxation
- **Emotion** – positive interactions, taking control of your emotions, calm and accepting environments



Significance of the Study

- Relaxation component helped students learn how to cope with the stress they encounter during social interactions or other situations.
- Improvement in peer interactions may continue into adulthood, increasing quality of life, improving life satisfaction, and improving mental health outlooks.
- Vocational potential
- Generalizability because of the natural setting the intervention has taken place and topics of interactions are student generated, real-life situations.

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Emotional Stress Results

Calming Response Improved

Post-Program Calming Response

Calming Response	Number of Students
Improvement in Using Calming Response	9
Similar Calming Response	4
Decrease in Calming Response	1

Coping with Stress Improved

Post-Program Coping with Stress

Coping	Number of Students
Improvement with Coping	9
No Change in Coping	4
Decrease in Coping	1

Other Stress Related Results

- 4 students decreased the number of situations that were stressful to them.
- 4 students improved their behavior/responses when stressed
- 10 teachers saw improvement in their students responses to stress.



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Peer Interaction Results

- 8 parents described changes in their child's peer interactions
 - 2 children wanted to have friends
 - 1 would describe interactions with peers in class
 - 1 began playing with peers in the neighborhood
 - 1 began attending school-sponsored events
- Teacher observed improved changes in 3 areas (11 students improved in at least one area)
 - Interactions with peers and communication (7 teachers)
 - Group work (6 teachers)
 - Helpful relationships (4 teachers)



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Overall Program Evaluation

Overall Program Evaluation According to Parents

Parent Evaluation Category	Number of Parents
Process Events and Understand Self	4
Better Understand Emotions and Feelings	4
Increased Reluctance Portion of Class	3
Improved Self-Expression and Communication	2
Academic Improvement	2
Self-Advocating Improvement	1
Problem Solving Improvement	1
Accept Changes	1
No Improvement	1
Confusion with Middle School Expectations	1

Note: There was overlap as some parents described more than one evaluation category.

- Teacher evaluation:
 - 4 could not comment
 - 2 gave outlet for student decomposition
 - 2 provided students with a better understanding of social boundaries and communication filters
 - 2 saw students use skills taught in the epigenetically focused classroom
 - 1 felt the student did not stand out as much
 - 1 saw their student using appropriate coping strategies

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Evaluation of Findings

- Classroom participants used the social milieu of their peers to facilitate their social learning.
- Parents and general education teachers able to see changes in the students' behavior.
- Daily practice in relaxation strategies possibly led to generalized improvement with 9 students' stress responses.
- Phenotypic and behavioral changes take time due to the difficulty of changing epigenetic structures, phenotypic responses, and behavior.

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IMPLICATIONS

- Strategies on stress responses taught in a traditional school helped students
- Stress related phenotype was changed
- Students examined their daily outside interactions safely
- Students need to have social schemata or a conceptual understanding of social interactions to respond in appropriate, socially acceptable ways.
- Program provides additional support students need to be successful in traditional public schools

Practical Recommendations

- Students with ASD should learn and practice relaxation techniques or another type of stress coping response
- Individuals with ASD need to be provided with a safe outlet to explore and discuss their social interactions

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Conclusions

- According to the participants, there were generalized observable qualitative differences in the students' behavior related to stress responses and peer interactions.
- Traditional schools need to consider the epigenetically friendly approach for students with Level 1 or 2 ASD.

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HOMEWORK!

- **Ponder the epigenetics in your life.**
- **Think of your own chemistry and biology.** *Are there ways you can improve this?*
- **Think about your classroom.** *Are there ways you can create an epigenetically friendly classroom environment?*

➔ **You, your students', and even their families whole functioning can be happily affected by using this knowledge!**

EPIGENETIC RESOURCES

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