

Help Us Develop a Test to Predict Future Risk for Suicide in Children

Richard C. Shelton, M.D.

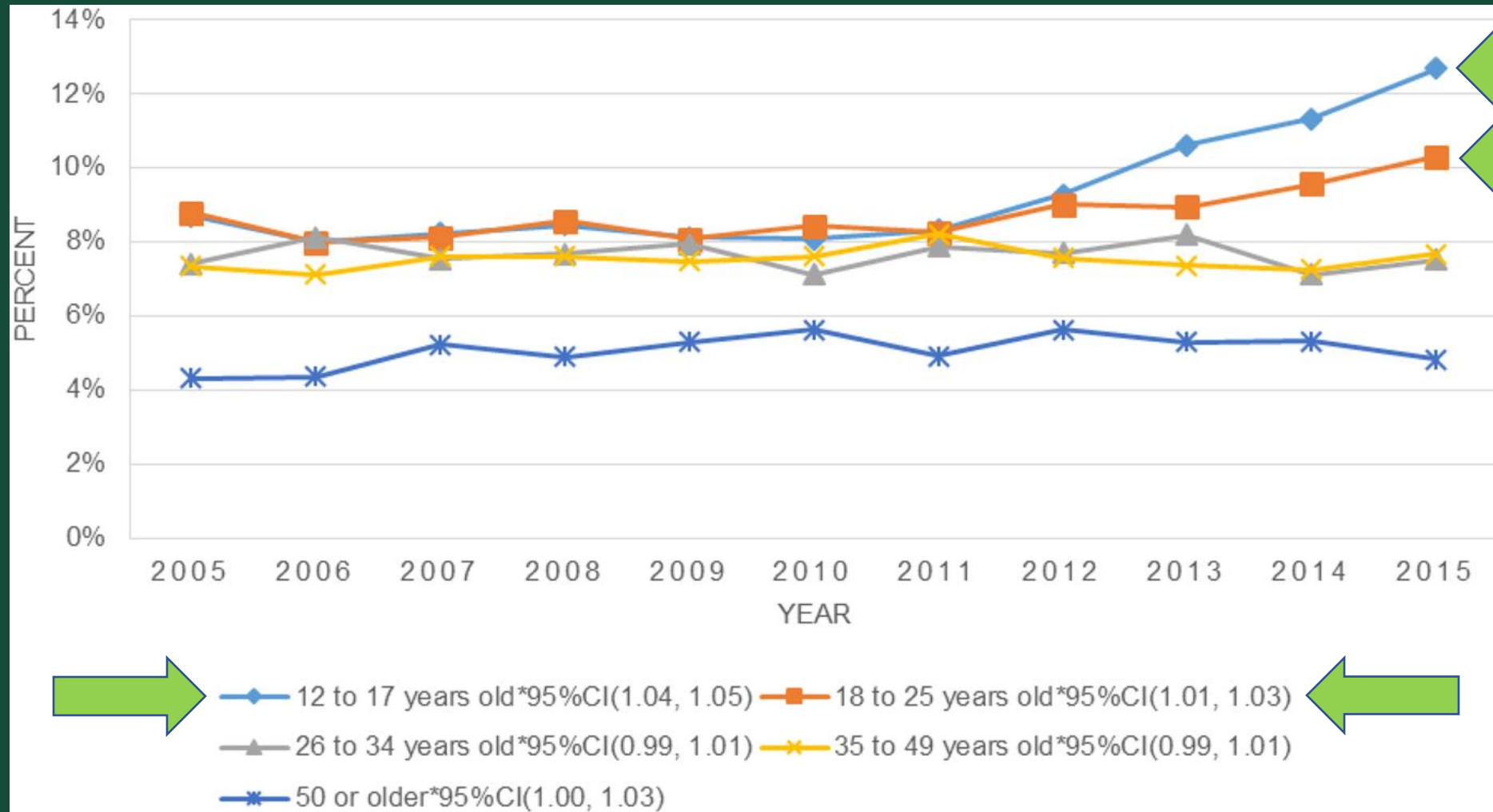
Director of Research

UAB Huntsville Regional Medical Campus

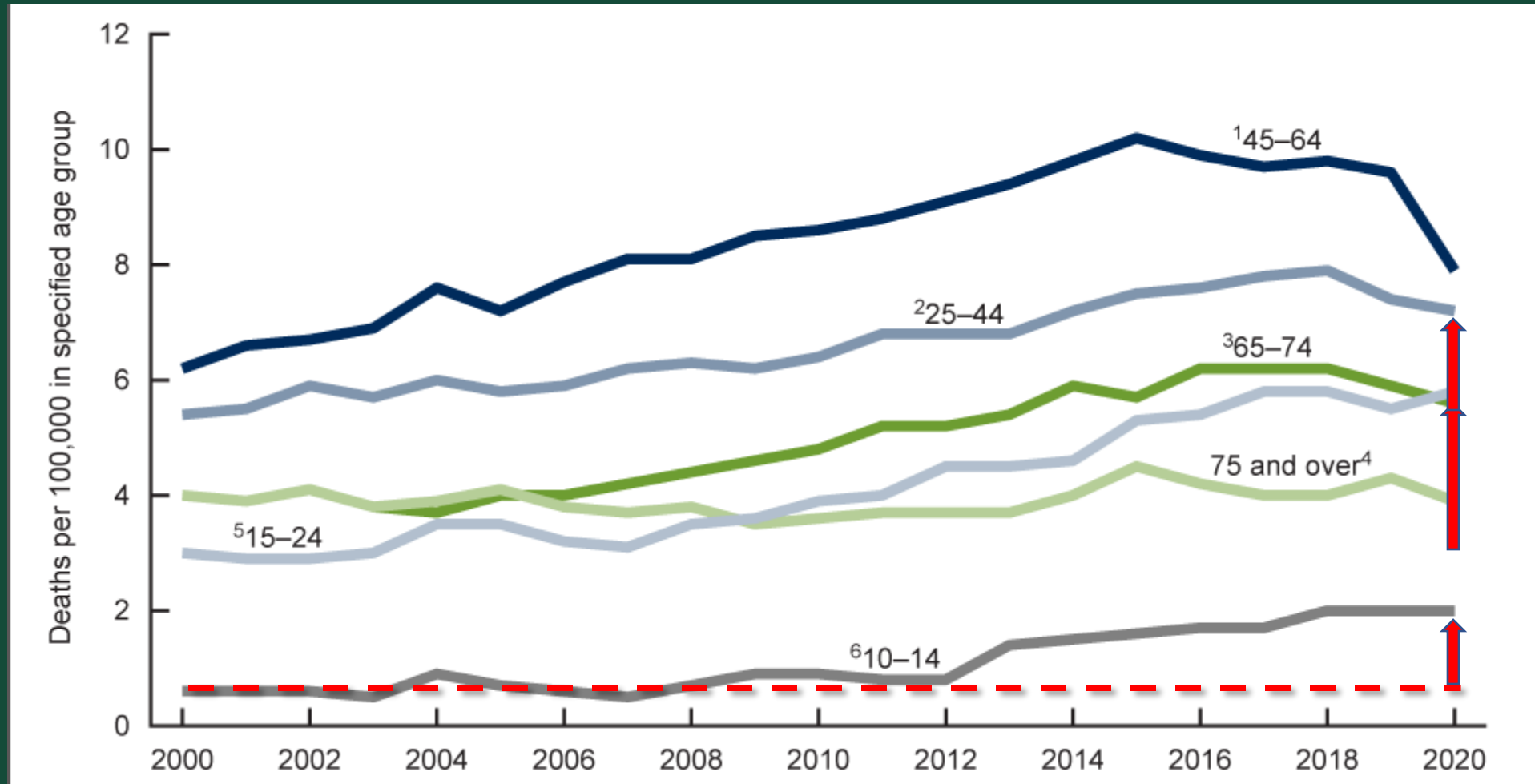
Charles Byron Ireland Professor

UAB Department of Psychiatry
and Behavioral Neurobiology

Rates of Depression in the US, 2005-2015



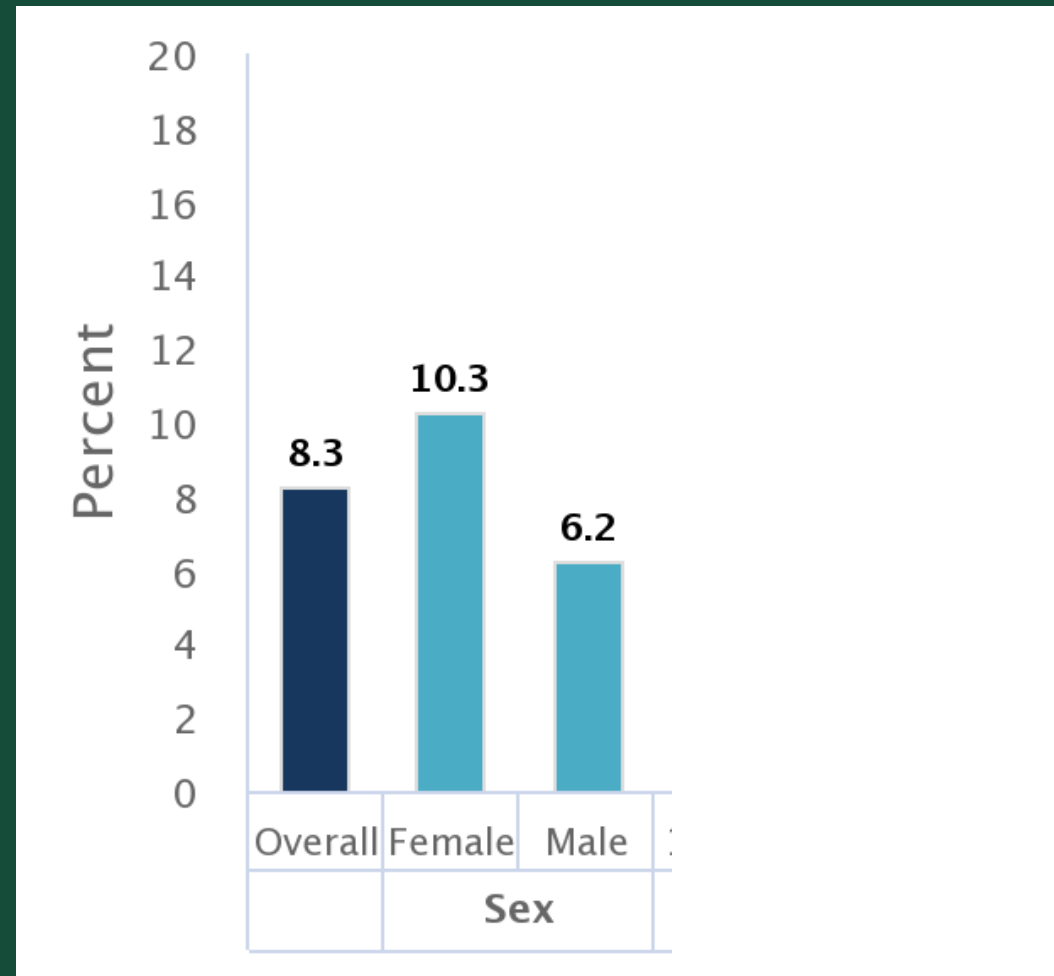
Changes in Suicide Rates in the US, 2000-2020



Overall
↑ ~33%

Recent Major Depressive Disorder Data

2021 National Survey on Drug Use and Health



<https://www.nimh.nih.gov/health/statistics/major-depression>

Prevalence of Depression and Suicide, 2019 Adolescents Ages 12-17 (CDC)

- Ever had major depression: 20.9%
 - Past year: 15.1%
 - Current: 5.8%
- Persistently feeling sad or hopeless, past year: 36.7%
- Suicidal ideation or behavior (12 months)
 - Seriously considered suicide: 18.8%
 - Suicide plan: 15.7%
 - Suicide attempt: 8.9%

Predictors of Suicide

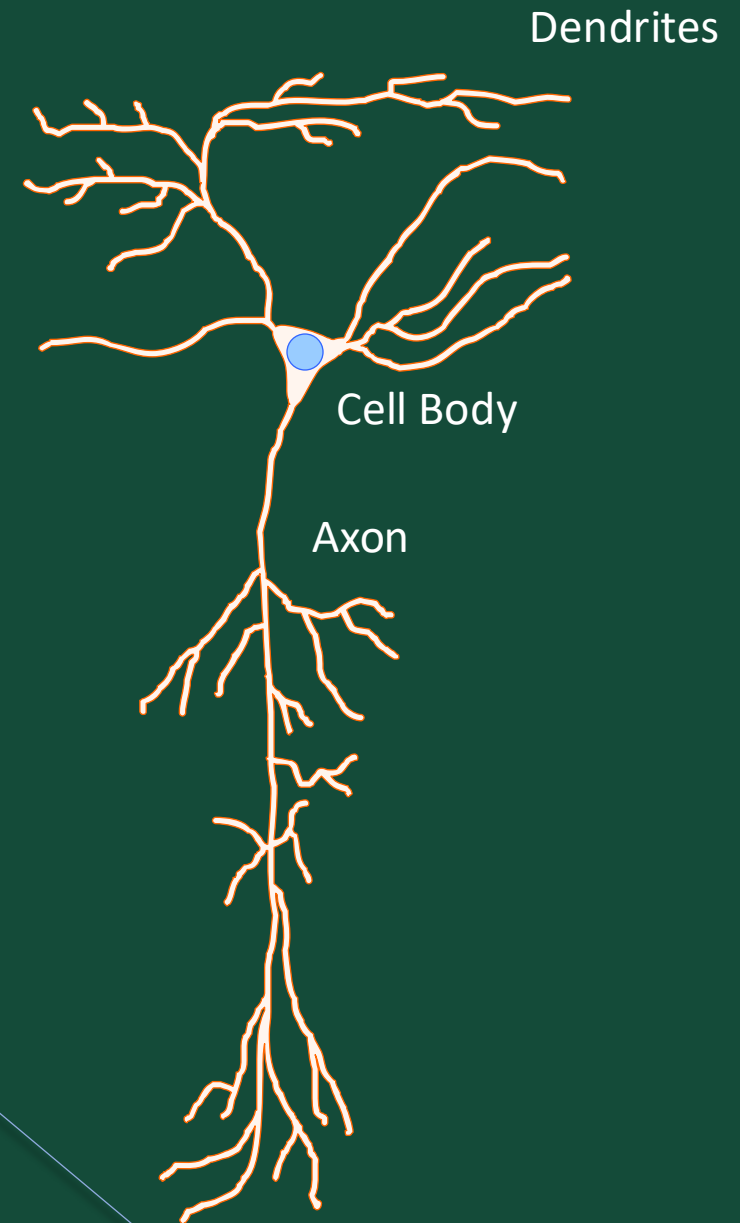
- Current/prior depression
- Prior suicide attempts
- Parent/sibling/close family member who died by suicide

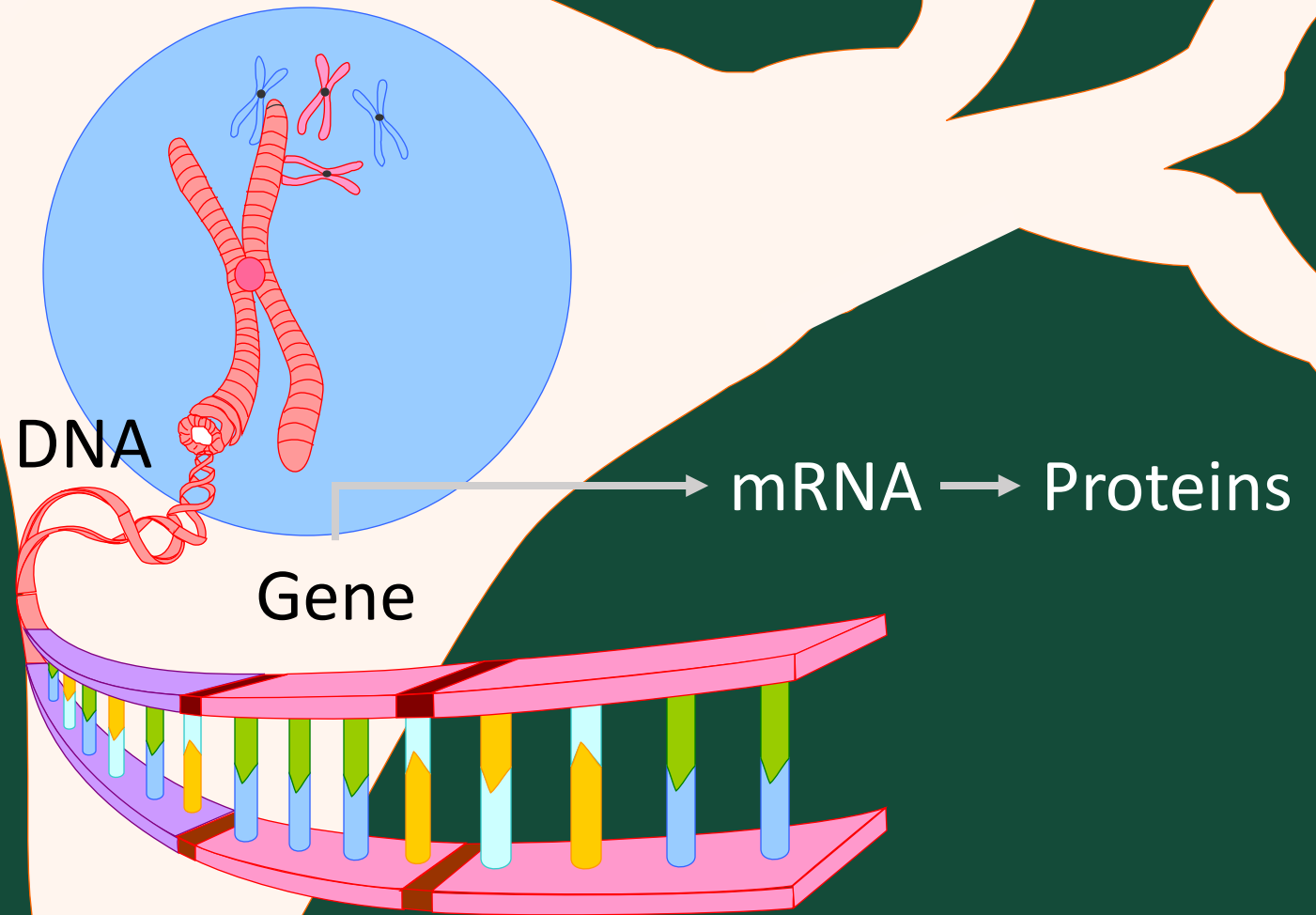
Problems

- Depression diagnosis: Once depression starts it becomes a lifetime problem >50% of the time
- Prior attempts: 79% of people who die by suicide do so on their first attempt
- Family member with attempt: We can't treat all
- Solution: Predict and prevent

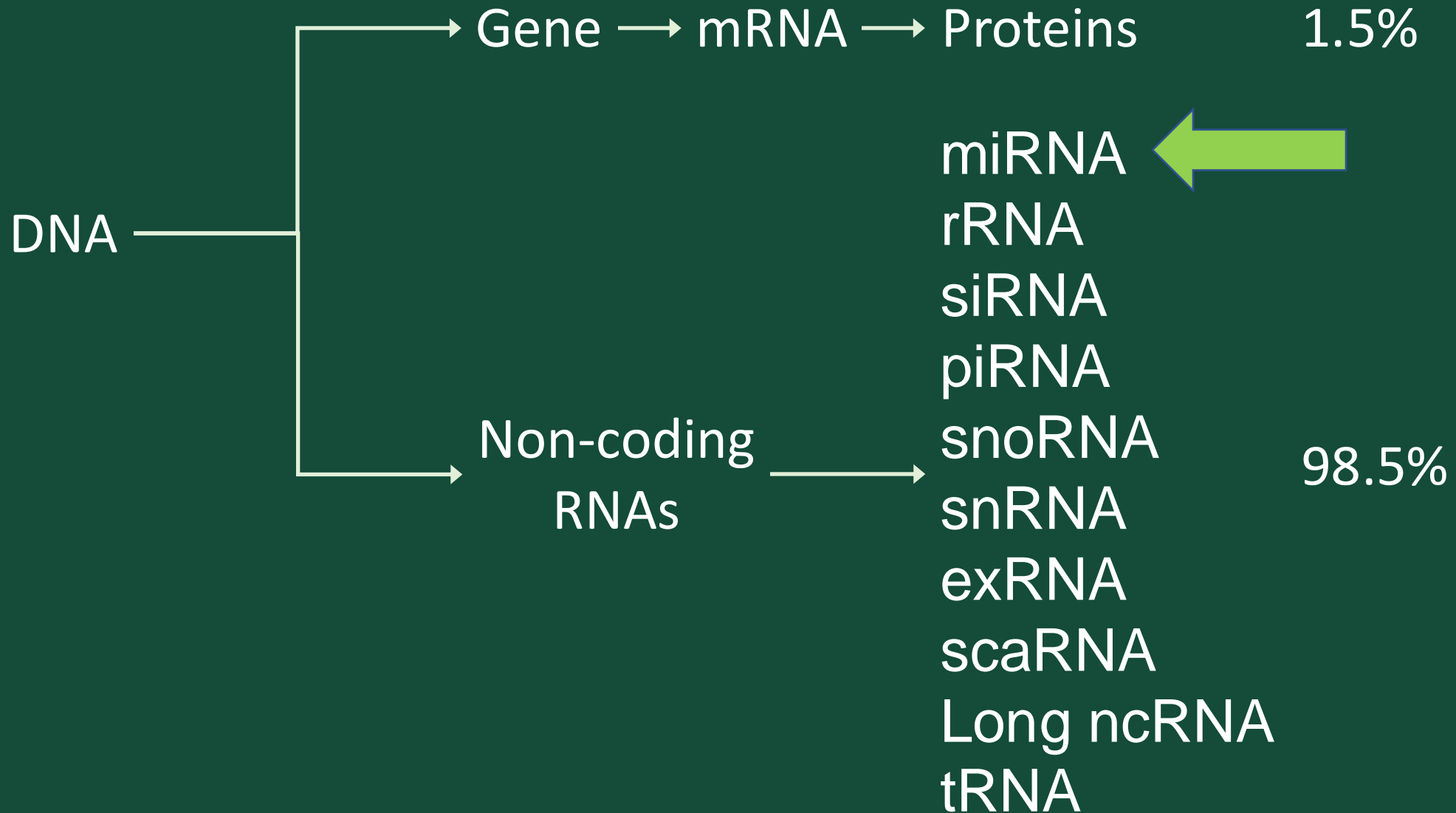
Genomics and Depression and Suicide Risk

- Goals:
 - To discover the genomic origins of both depression and suicide risk
 - To understand how early life trauma affects genomic risk for depression and suicide
- Ultimate goal:
 - To develop a blood test to predict risk for future depression and suicide

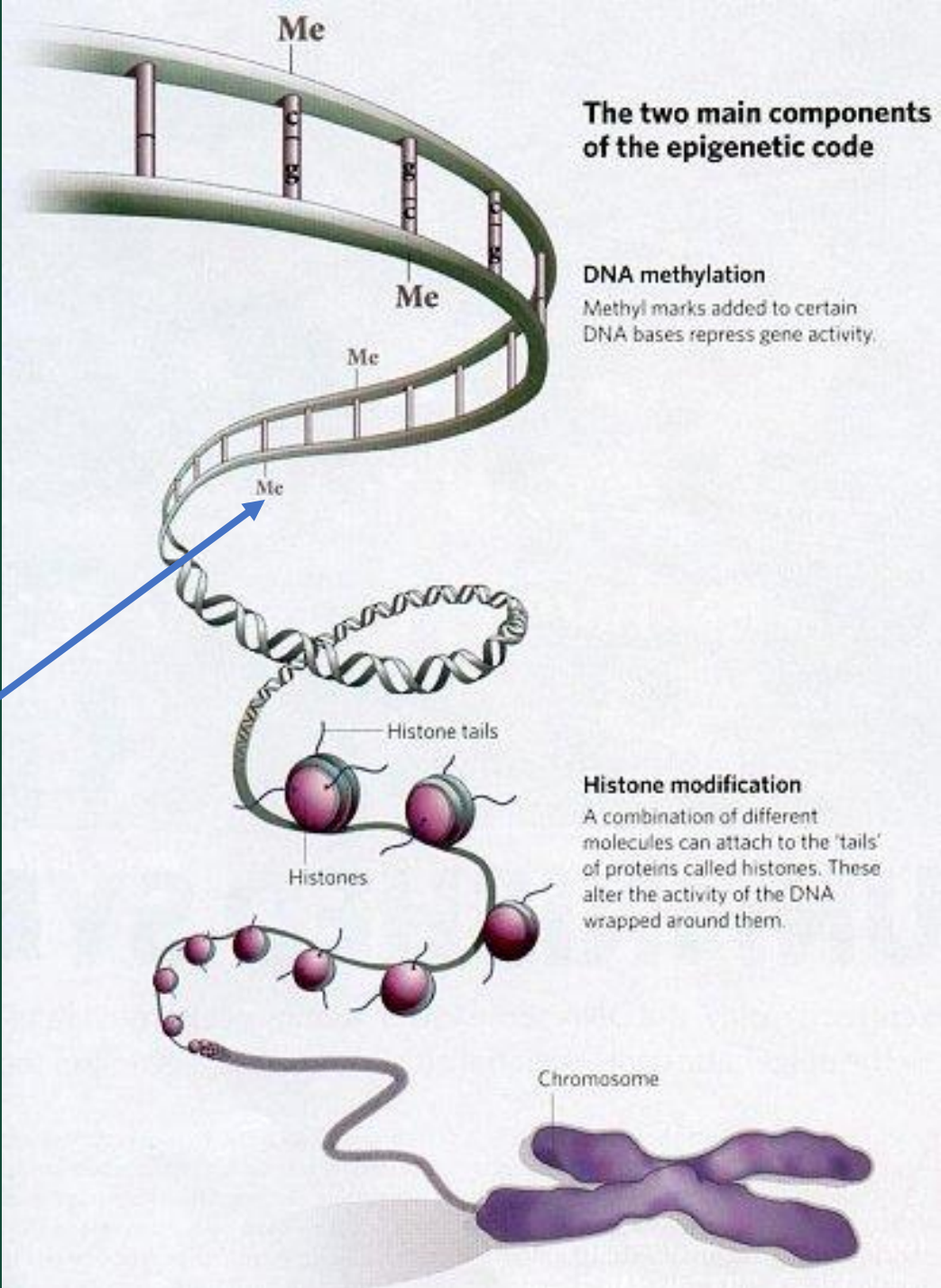
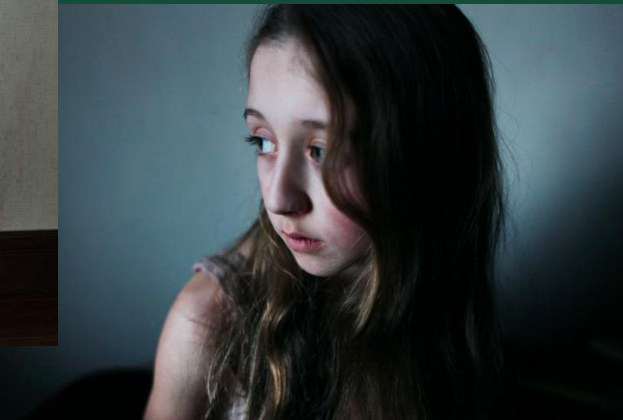





DNA, RNA, non-coding RNA



Epigenetics: Chemical Modification of DNA

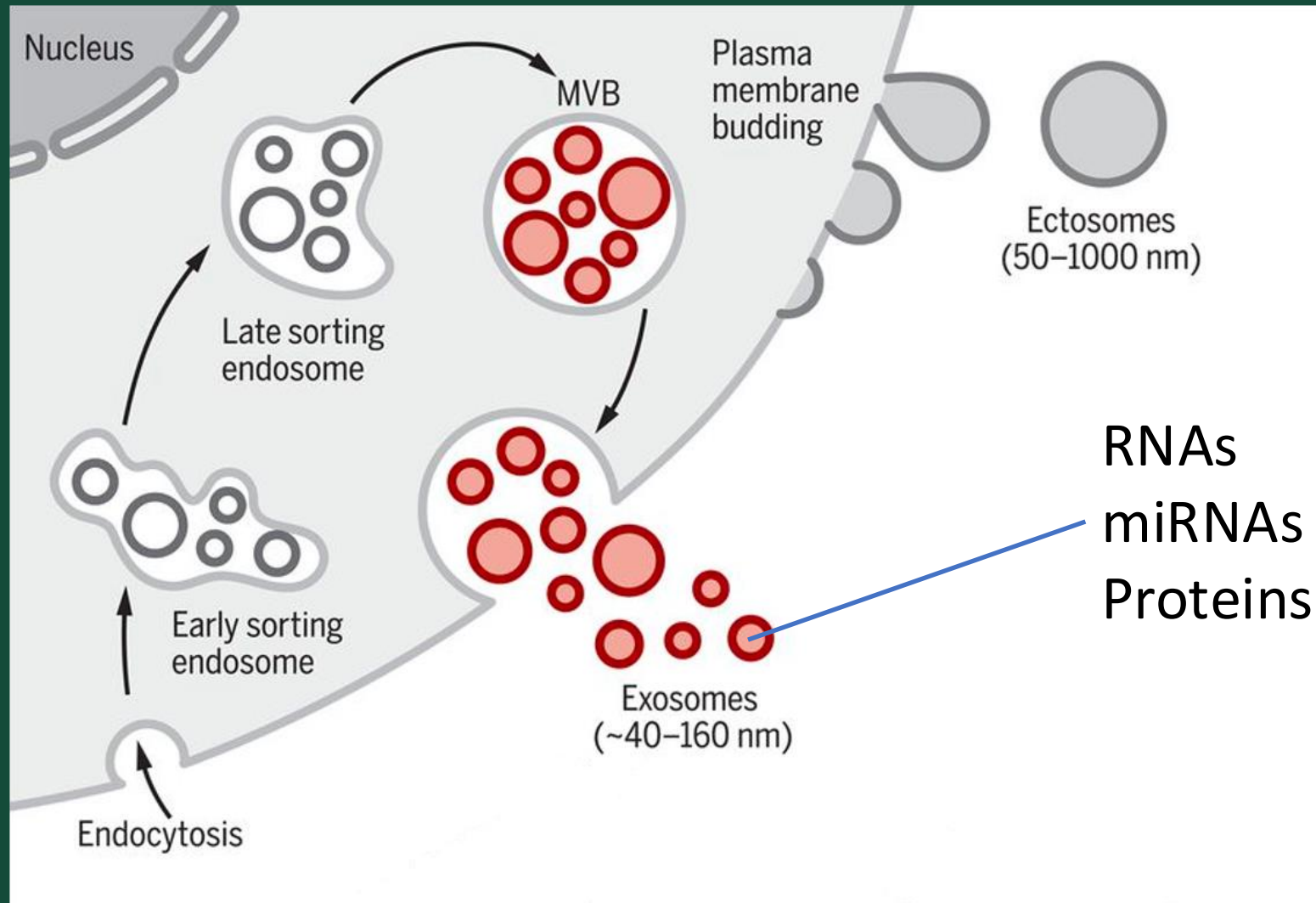


DNA Methylation in Disease

- Cancers
 - Cardiovascular disease
 - Neurological disorders
 - Angelman's syndrome, Prader-Willi syndrome
 - Aging
 - Alcohol use disorder
 - PTSD
 - Memory
 - Depression
 - Suicide risk
 - Etc.
- 

How can we “see” genomic activity in the brain?

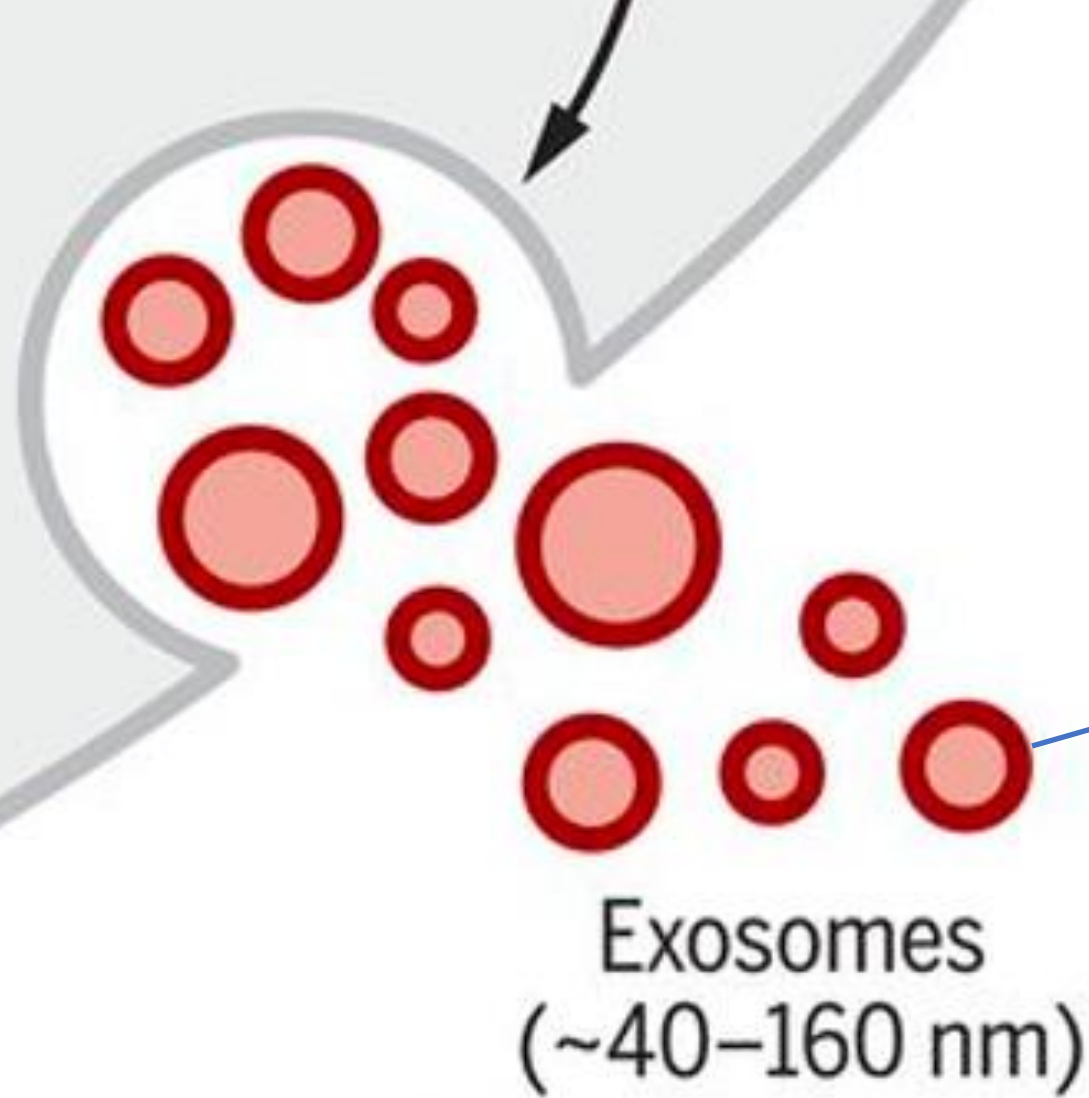
Exosomes



Dr. Yogesh
Dwivedi

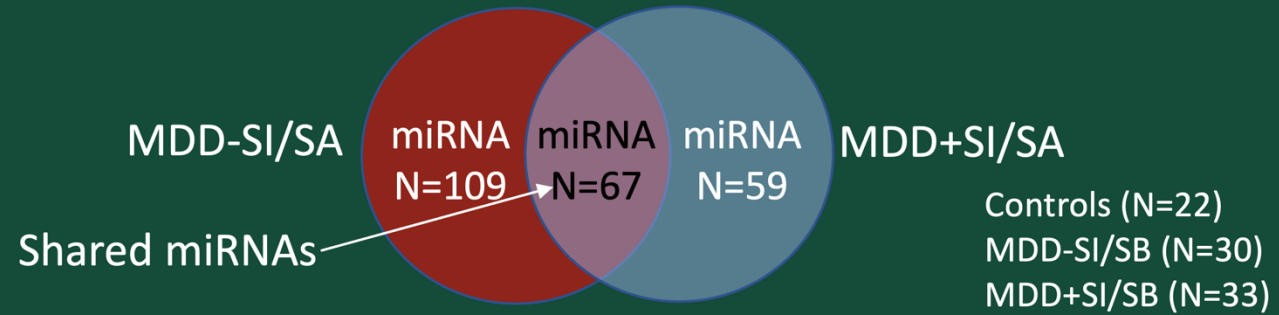
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e



Unique
cell surface
markers

Number of miRNAs specific to MDD with (MDD+SI/SB) and without (MDD-SI/SB) suicidal ideation/suicidal behavior or shared between the two groups



Demography		
	N	%
Female	47	55.3%
Male	38	44.7%
Hispanic/Latino	2	2.35%
White/Caucasian	50	58.8%
Black/African American	32	37.7%
Asian/Pacific Islander	1	1.2%

Select miRNAs specific to MDD and Suicidal Behavior					
Specific to Depression		Shared between Depression and Suicide		Specific to Suicide	
miRNAs	Regulation	miRNAs	Regulation	miRNAs	Regulation
miR-550	Downregulation	Let7a-5p	Downregulation	miR-34c-5p	Upregulation
miR-199a-3p	Upregulation	miR-184	Upregulation	miR-639-3p	Upregulation
miR-92b-3p	Downregulation	miR-134-5p	Downregulation	miR-16-5p	Upregulation
let-7g-5p	Upregulation	miR-625	Upregulation	miR-581	Upregulation
miR-151a-3p	Upregulation	miR-181b	Upregulation	miR-486-5p	Upregulation
miR-1908	Upregulation	miR-584-5p	Upregulation	miR-579	Upregulation
miR-27a-3p	Upregulation	miR-20a-5p	Upregulation	miR-146a	Downregulation
miR-363-3p	Upregulation	miR-17-5p	Upregulation	miR-132-5p	Downregulation
miR-106b-3p	Downregulation	miR-93-5p	Upregulation	miR-224-5p	Downregulation
miR-24-3p	Upregulation	miR-183-5p	Upregulation	miR-330-3p	Downregulation
miR-370	Upregulation	miR-409-3p	Upregulation	miR-26a-5p	Downregulation
miR-22-3p	Upregulation	miR-219-5p	Upregulation	miR-451a	Upregulation
miR-99b-5p	Upregulation	miR-10a-5p	Upregulation	Let-7d-3p	Upregulation
miR-155-5p	Upregulation	miR-1908	Upregulation	miR-103a-3p	Upregulation
miR-223-5p	Upregulation	miR-320c	Upregulation	miR-148b-3p	Upregulation
miR-92a-3p	Upregulation	miR-409-3p	Downregulation	miR-21-5p	Downregulation
miR-150-5p	Upregulation	miR-215	Upregulation	miR-127-3p	Downregulation
miR-1307-3p	Upregulation	miR-101-3p	Upregulation	miR-30c-5p	Downregulation
miR-140-3p	Upregulation	miR-222-3p	Upregulation	miR-877	Downregulation
miR-30d-5p	Upregulation	miR-100-5p	Upregulation	miR-376a	Upregulation

Key Questions

- Adult study: Do people with a history of abuse have the same or different pattern of miRNA expression?
 - Important regarding developing a predictive test
- Adolescent study: Do adolescents with depression or serious suicidal ideation show the same pattern as adults or different?

Adolescent Study

- Clinical interview
- Baseline blood sample
- Follow-up at 6 weeks, second blood sample
- Participants reimbursed
 - Baseline:
 - \$100 to adolescent
 - \$50 to parent
 - Follow-up: \$100

Adult Study

- Clinical interview
- IV – blood samples
 - Baseline, times 0, 15, 30, 60, 90 minutes
- Mild stress induction procedure
 - Trier Social Stress Test
 - 5-minute speech
 - Mental arithmetic
- Participants reimbursed \$100

Participants

- Controls
- MDD, no suicidal ideation or recent attempts
- MDD with SI
- MDD with suicide attempt

How you can help

- If you identify anyone with depression, suicidal ideation or behavior, please contact our research staff:
 - Phone: 256-551-4431
 - Email: hsvpsychresearch@uabmc.edu
- If people with depression do not have resources and would benefit from a medication, we can help if they will consider participating in a study.

Questions?