Science Fair 2025/2026 Logbook
Grade 11

July 14th, 2025
Find/Exploring Topics

1. Preterm babies in Africa and South Asia
    a. Why so many there
    b. What causes it

2. Cystic Fibrosis

3. Malaria and Sickle Cell Disease → Case Study of Africa
    a. Why people with sickle cell anemia are less prone to getting malaria
    b. Impacts in Africa
        i. Why it is prevalent there

4. Schizophrenia, Celiac Disease

5. Human calculators or photographic memory
    a. How the brain looks/works

6. Immunotherapy for cancer
    a. AI and predictive models

Starting research/exploring
Sept 29th, 2025

Types of Immune Drugs: Pembro

Oct 6th-11th, 2025

Looking at research and articles:
What is the immune system
- How does it work

Nov 12th, 2025
LOOKING AT A NEW TOPIC OF INTEREST
Stem cells and Alzheimer's disease or Parkinson's Disease

Dec 14th, 2025

Ethics form done
Wrote the “problem”
Articles and researching stem cells and AD

Stages of Alzheimer’s Disease Table

Stage	Symptoms
Stage 1	- No memory issues
Stage 2	- Memory lapses - Forgetting familiar names and locations of objects - These lapses typically are not obvious to others
Stage 3	- Mild forgetfulness - Difficulty learning new things - Difficulty concentrating - Problems with orientation, such as getting lost - Communication difficulties such as finding the right word - Loss or misplacing of valuable objects - Difficulty handling problems - Issues can become noticeable to family, friends or co-workers
Stage 4	- Some memory loss involving one’s personal history - Difficulty with complex tasks - Impaired ability to perform challenging mental arithmetic, e.g. counting backwards
Stage 5	- Major gaps in memory - Help is needed with day-to-day tasks
Stage 6	- Continued memory loss - Loss of awareness of recent events and experiences in their lives - Assistance is needed with activities of daily living, e.g. getting dressed, bathing - Difficulties counting - Personality and emotion changes

	such as confusion, anxiety, suspiciousness, anger, sadness/depression, hostility, apprehension, delusion and agitation - Obsessions such as repetition of simple activities - Disruption of normal sleep/waking cycle - Increasing episodes of incontinence
Stage 7	- Severe cognitive impairment - Vocabulary becomes limited and verbal abilities eventually disappear - Loss of ability to walk independently and sit without support - Help is needed with eating and using the toilet; usually incontinent

Dec 22nd, 2025
Pathophysiological causes of AD

- I noticed a connection between mtDNA and AD, interesting

Dec 24th, 2025
Done and edited pathophysiology
Start and finished pathology

Dec 25th, 2025
Researching stem cells

- NSC
- MSC
- ESC

Jan 4th-8th, 2026

- wrote/edited pathology
- Stem cells types
    - Multipotent
    - Pluripotent
        - Note write about later

Jan 10th, 2026
Stem cells I am focusing on:

- NSC
- MSC
- ESC
- *iPSC
    - Induced pluripotent stem cells
        - Lab grown

Jan 10th - Feb 13th 2026
Continuous research on stem cells

- What are they
- Research and trials done on them

Stem cells	Description of Study
NSC	Amyloid precursor protein mouse models - Positive
NSC	Neuron-specific enolase protein on mutant mice with AD - Positive
ESC	BFCNs on mice models - positive
ESC	Yan Liu converted hESCs into NKX2.1 MGE - like progenitor cells - positive
MSC	Preclinical trial of hMSC injections - One week - Ten weeks - positive
MSC (exosomes)	BMSC-exosomes in animal models - Positive results
iPSC	2009 groundbreaking study - Reprogramming cells to become pluripotent - iPSC's - positive
iPSC	Protein iPSC = glial cells - positive
iPSC	iMGLs from iPSCs (originally were iPSCs) - Resembled actual microglia - positive

Feb 13th, 2026
Finished problem and method

Feb 13th - 15th, 2026
Start Researching Clinical Trials

- Important to note that MSCs are the only stem cells that have been used and allowed for clinical trials
    - Not NSC → find out why
- There have only been phase 1 and 2 clinical trials

Feb 20th, 2026

- Ethics
- Risks
- Challenges
- Negative outcomes

Feb 22nd - March 4th, 2026
Editing and revision of the entire project

- Getting images and data
- Citation formatting
- Added some negative trials and negative factors in general

March 4th, 2026
Online portion DUE!