Wisconsin-Upper Peninsula of Michigan
Junior Science and Humanities Symposium

**JSHS OBJECTIVES**

**To Promote**
research and experimentation in the sciences, humanities, mathematics, and engineering at the high school level.

**To Recognize**
the significance of research in human affairs, and the importance of humane and ethical principles in the application of research results.

**To Search Out**
talented youth and their teachers, recognize their accomplishments at symposia, and encourage their continued interest and participation in the sciences, humanities, mathematics, and engineering.

**To Expand**
the horizons of research-oriented students by exposing them to opportunities in the academic, industrial, and governmental communities.

**To Increase**
the number of future adults capable of conducting research and development.

The Wisconsin-Upper Michigan Junior Science and Humanities Symposium is presented annually by the University of Wisconsin-La Crosse, School of Education, and Department of Military Science in cooperation with the National Science Teachers Association and the United States Army Research Office, Office of Naval Research, and Air Office of Scientific Research.

The Symposium is one of 48 similar regional programs conducted by the National Science Teachers Association.

Outstanding students from regional symposia will be chosen to participate in the virtual 58th National Symposium, April 14–17, 2021.

**2021 JSHS PARTICIPANT LIST**

**Columbus Catholic High School**
Marshfield, WI
Mark Fieweger*
Michael McQuillen*
Joshua Scholin*
Cody Timmer*

**Galesville-Ettrick-Trempealeau High School**
Galesville, WI
Kyle Shanley*
Cindy Stetzer

**Homestead High School**
Mequon, WI
Ethan Wang**
Weihong Wang

**Lake Linden High School**
Lake Linden, MI
Jenna Beaudoin*

**Living Word Lutheran High School**
Jackson, WI
Ellie Eckert

**Oregon High School**
Oregon, WI
Samuel Halverson
Carter Johnston
Adam Mikkelson
Israel Mikkelson
Scott Mikkelson
Blake Pankratz

**Ripon High School**
Ripon, WI
Caledonia Grant*
Rachel Thorson

**Shorewood High School**
Shorewood, WI
Riju Dey**

**University of Wisconsin-Lacrosse**
Milwaukee, WI
Rohan Anne**
Aditya Pillai**

**Verona Area High School**
Verona, WI
Julie Berndt
Hannah Bertrand*
Mame Bertrand
Oliver Bertrand
Abigail Chase*
Morgan Grignon*
Elizabeth Mikkelson
Hope Mikkelson
Jaden Quinn*
Harry Williams*
Kathleen Williams
* PosterPresenter
** OralPresenter

**Judges**
- Jennifer Docktor, Ph.D., Physicist
- Megan Lister, Ph.D., Biologist
- Lisa Pilott, Ph.D., Science Educator

**Speakers**
- Ahmad Abdel-Azim
- Lieutenant Colonel Erik Archer

**JSHS Support Staff**
- Heidi Masters, Ph.D., Regional Director
- Karen McGarvey
- Milandrie Wakim

**University of Wisconsin-La Crosse**

Join us again next year for the Wisconsin-Upper Peninsula of Michigan JSHS, January 22–23, 2022 at Treehaven in Tomahawk, WI
**HANNAH BERTRAND**

*Verona Area High School*

**Encoding Using the Loci Method vs. Stimuli Method in Geriatric Patients to Determine Memory Formation and Retention**

Much of the population for the older generation have problems encoding new memories and retaining the ones they already have. Based on multiple cognitive psychology studies on memory improvement. My study analyzes whether or not stimulus is better for retaining information, or if the loci method. The loci method is a mnemonic technique that involves inserting new information or objects in specific locations that are visually linked, which is specifically for the elderly individual. Stimulists contains something new or exciting, however it's often encoded for longer as episodic memory. My study will utilize semantic information recall, as well as visual memory, however this will test the theory if my hypothesis is true. The lobe method is considered to be a more effective method for the elderly to remember information, and therefore be tested in many older adults, a promising finding that led to a deeper study of remembrance. These methods are currently being explored by factors as to how to improve memory of the elderly. My study proposed a model to predict the effects of lobe method, and the effectiveness of the lobe method in memory improvement.

**ABIGAIL CHASE**

*Verona Area High School*

**Future Remyelination Therapies for Multiple Sclerosis**

Multiple sclerosis and other neurodegenerative diseases can re-route the central nervous system, interfering and even diminishing efficient communication between neurons. This process, which ultimately leads to physical and neurological impairments of varying severity, is a result of deterioration of the myelin sheath that effectively insulates the neurons’ axons, impairing its ability to allow electrical signals to pass through brain cells and neural circuits. Though the last few decades have seen the emergence of many viable treatment options for this disease, most are accompanied by side effects and carry less than optimal success rates. None of the medicines or therapies currently on the market are able to reverse the effects of multiple sclerosis; as they simply aim to slow the progression of the disease and sustain a remission, and therefore has been observed in many small mammals, a promising finding that led to a deeper study of remembrance. These methods are currently being explored by factors as to how to improve memory of the elderly. My study proposed a model to predict the effects of lobe method, and the effectiveness of the lobe method in memory improvement.

**MORGAN GRIGSON**

*Verona Area High School*

**Examining Risk Factors within Genetics, Lifestyle, and Environment that Can Lead to Development of Breast Cancer**

Breast cancer is a common disease and I will explore the questions of what factors are involved in the development of breast cancer and how breast cancer can put someone in the same family at a higher risk of developing it as well. Not only do people with breast cancer and their relatives have an increased risk of developing breast cancer, but those with a family history of breast cancer are also at a higher risk of developing breast cancer. A family history of breast cancer increases the risk of developing breast cancer for women with a family history of breast cancer and breast cancer is a deadly disease. A family history of breast cancer increases the risk of developing breast cancer for women with a family history of breast cancer and breast cancer is a deadly disease. A family history of breast cancer increases the risk of developing breast cancer for women with a family history of breast cancer and breast cancer is a deadly disease.

**JAIDIN QUINN**

*Verona Area High School*

**Bone Marrow Grafting in Accelerating the Heating Time of Nuisance or Delayed Union Fractures**

Bone fractures and injuries cause millions of people a year to become partially or completely immobilized. Healing the process for fractures can take time to completely repair, which can be stressful for athletes, people who are obese, or elderly people. Though the last decade has seen the emergence of many viable treatment options for fractures, most are accompanied by side effects and carry less than optimal success rates. None of the medicines or therapies currently on the market are able to reverse the effects of fractures; as they simply aim to slow the progression of the disease and sustain a remission, and therefore has been observed in many small mammals, a promising finding that led to a deeper study of remembrance. These methods are currently being explored by factors as to how to improve memory of the elderly. My study proposed a model to predict the effects of lobe method, and the effectiveness of the lobe method in memory improvement.