# Grayden Holliday

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## EDUCATION

**Washington & Lee University (W&L)** – Lexington, VA, USA Graduated May 2026
B.S. in Biochemistry, German Major, Music Minor
GPA: 3.982 on 4.0 scale

**Midlothian High School** – *Salutatorian* | Midlothian, VA, USA Graduated Jun 2022
Advanced Diploma, IB Diploma with seal of Biliteracy, Excellence in Mathematics Award (2022), Excellence in Biology Award (2022), IB Student of the Year Award (2022), 1560 SAT, National Science Honor Society (2021-22), National German Honors Society (President) (2021-22), National Mathematics Honors Society (2021-22), National Honors Society (2021-22), National Music Honors Society (2021-22), National History Honors Society (2021-22)

## RECOGNITIONS

**The American Institute of Chemists Foundation Student Award** 2026
- Awarded by the Washington and Lee Chemistry and Biochemistry department to honor outstanding seniors majoring in chemistry and biochemistry. Given in recognition of demonstrated ability, leadership, and professional promise.

**Major Field Test Award** 2026
- Awarded by the Washington and Lee Chemistry and Biochemistry department to senior with top performance on the Major Field Test, a standardized test used to assess chemistry and biochemistry majors at the end of their senior year

**Dickens-Youngblood Award** 2026
- Awarded by the Washington and Lee German department to a senior German major for outstanding dedication and academic performance in German studies

**Omicron Delta Kappa National Honor Society** 2025
- Offered membership as a senior for merit in campus leadership, scholarly achievement, and service in extracurricular activities. Induction is expected in March 2026

**Phi Beta Kappa National Honor Society** 2025
- Inducted as a junior based on academic excellence, liberal arts scholarship, and being in the top ten percent of class

**B.S. Stephenson Scholarship** 2024
- Awarded by the Washington and Lee German department to a rising junior for high academic achievement and involvement in German

**James Keith Shillington Scholarship** 2024
- Awarded by the Washington and Lee Chemistry and Biochemistry department to a rising junior and chemistry or biochemistry major displaying strong academic promise in their first 2 years and with the top performance in organic chemistry

**President's List** 2023-2026
- Awarded for exceptional academic performance and remaining in top thirty percent of class all four years of college

**German Rising Star Award** 2023
- Awarded by the Washington and Lee German department for showing exceptional potential in and dedication to German as a student near the beginning of their academic career

**Phi Eta Sigma National Honor Society** 2023
- Inducted as a freshman for excellence in scholarship and being within top twenty percent of the freshman class

## PROFESSIONAL EXPERIENCE

**Wall Manager and Route Setter** – *Washington and Lee Outing Club* | Lexington, VA, USA Sept 2023–Apr 2026
- Operated and supervised indoor climbing wall and provided guidance to visitors on safety protocols for climbing facilities
- Designed climbs tailored to specific skill levels and installed holds on wall
- Coordinated wall maintenance, hold removal and cleaning, and route setter team workdays

**Music Production Assistant** – *Washington and Lee Dept. of Music* | Lexington, VA, USA Aug 2022 – April 2023

- Oversaw elements of music performance streaming and logistics such as camerawork and entrance/exit coordination
- Set up and broke down chairs, music stands, and equipment for music ensemble rehearsals

**Governor's Language Academy Mentor** – *Virginia Department of Education* | Lexington, VA, USA June-July 2023

- Oversaw 46 German learners over the course of a 3-week full-immersion language program
- Planned and led a range of daily activities catered toward German learning and building social skills

## RESEARCH EXPERIENCE

**Undergraduate Researcher** 2025-2026 Academic Year

*Washington and Lee University Chemistry and Biochemistry Department* | Kim Lab | Lexington, VA, USA

- Developed hypoallergenic and sustainably producible biological alternatives to polyethylene glycol (PEG)-based liposomal stealth coatings for drug and vaccine delivery using elastin-like peptides (ELPs), working with Dr. Sarah Kim
- Designed, synthesized, and characterized novel cleavable ELPs of varying hydrophobicity, charge, and length.
- Optimized ELP purification schemes for scalability and evaluated the potential of ELP constructs as PEG alternatives.

**Undergraduate Summer Researcher** Summer 2025

MSRP-Bio Program | *Massachusetts Institute of Technology* | Shoulders Lab | Boston, MA, USA

- Synthesized and characterized proteins with the aim of developing a novel targeted protein degradation system specific to the endoplasmic reticulum, working in the lab of Dr. Matthew Shoulders
- Performed multi-week protein purification schemes to generate tagged protein domains for use in small molecule binder screens, then characterized ligand binding affinities
- Initiated a secondary investigation into an alternate protein candidate for the system, performing a literature search, ordering necessary reagents, then successfully generating a plasmid for expression of the protein in *E. coli* from a commercially available mammalian plasmid
- Presented work in a poster session at the conclusion of the program

**Undergraduate Researcher** Winter 2024-2025

*Washington and Lee University Chemistry and Biochemistry Department* | Friend Lab | Lexington, VA, USA

- Investigated cell-type vulnerability to transposable genetic element (TE) expression and its correlation with disease, working with Dr. Kyle Friend
- Developed code in python to process raw single-cell RNA sequencing (scRNAseq) data from normal and cancer-trajectory brain tissue across fetal and embryonic development stages into a gene count matrix
- Analyzed count matrix with the Seurat package in R to identify differentially expressed genes across aforementioned cell types

**Undergraduate Summer Researcher** Summer 2024

Summer Undergraduate Research Program | *Virginia Military Institute Chemistry Department* | Brown Lab Lexington, VA, USA

- Investigated the synthesis and characterization novel oxorhenium-based cyclo-frustrated Lewis pair (FLP) systems, working with Dr. Caleb Brown.
- FLP systems are a rapidly emerging class of catalysts serving as an alternative to traditional transition metal catalysts.
- Computationally determined theoretical geometrically optimized structures of cyclo-FLP complexes and investigated their electronic properties as well as the effects of novel steric modifications.
- Presented research in Undergraduate poster session at the Southeast Regional Meeting of the American Chemical Society (SERMACS) in Atlanta, GA and orally at the Mid-Atlantic Conference for Undergraduate Scholarship (MARCUS) at Randolph College.

## ACTIVITIES

**WLU Chemistry Department** – Organic Chemistry Lab Teaching Assistant Sept 2024–Apr 2025

- Assisted students in the proper set-up and execution of labs
- Ensured that students follow proper lab safety practices each week
- Provided instruction on how to run instrumentation and correctly prepare samples for analysis

**WLU Outing Club** – Key Staff and App Adventure Trip Leader Aug 2024–Apr 2026
- Organized and led student activities in the outdoors
- Held regular clinics teaching outdoor and technical skills
- Guided incoming first-year students each year on a week-long backpacking trip on the Appalachian trail in Virginia

**Languages for Rockbridge** – Volunteer Sept 2023–Apr 2026
- Volunteered weekly at a local elementary school to introduce students to the German language and German culture

**WLUR Radio** – Radio DJ Sept 2023–Apr 2026
- Hosted a weekly radio show showcasing different genres and unique artists

**Campus Kitchen** – Volunteer Sept 2022–Apr 2026
- Volunteered for cooking shifts to aid in supplying food to lower income members of the Lexington community

**W&L Climbing Club and Crux Climbing Team** – President, Trip Leader Sept 2022–Apr 2026
- Coached members on climbing technique, planned outdoor climbing trips, and aided in running team practices

**W&L German Club** – Member Sept 2022–Apr 2026

**W&L University Orchestra** – Cello Player Sept 2022–Apr 2026

## Skills/Interests

Rock Climbing, Backpacking, Music (composition, cello, and piano), Biking, Gardening, Logic Puzzles, Solving Rubik's Cubes, Meditation, 3D Printing