

Natalie Muren
Willamette University
2004 Winner



Natalie graduated *summa cum laude* and Phi Beta Kappa from Willamette University in 2006 as a Chemistry and Spanish double major. Motivated by an interest in the many ways that protein-DNA binding can fluidly tune gene expression, she began graduate work in chemistry that same year at the California Institute of Technology in Prof. Jackie Barton's research group.

At Caltech, Natalie first worked to fabricate a multiplexed, gold chip platform for DNA-based, electrochemical applications. She then used this platform to characterize DNA-mediated charge transport chemistry over long distances. With an interest in precision medicine, in which treatment decisions are informed by an individual's profile of biomarkers, Natalie next used this platform to detect DNA-binding protein biomarkers. She targeted DNA methyltransferases which play a critical role in the epigenetic regulation of gene expression and whose aberrant activity is a characteristic of many types of cancer. With much trial and error, Natalie developed a highly effective electrochemical assay for the detection of human methyltransferase activity.

Natalie earned her Ph.D. in chemistry from Caltech in 2013, but continued postdoctoral work in Prof. Barton's group to apply this assay to the detection of human methyltransferase activity in crude patient tumor samples. Following this, Natalie completed additional postdoctoral work at USC's Ellison Institute for Transformative Medicine. There, she worked toward the development of mass spectrometry-based bioassays for detecting and monitoring prostate cancer.

Since the fall of 2017, Natalie has been exploring her interest in teaching as a full-time, adjunct chemistry professor at Occidental College in Los Angeles. At Oxy, she primarily teaches a core biochemistry lecture and lab, but has also had fun teaching organic and general chemistry labs. Additionally, she has enjoyed developing and teaching two new courses including one on science literacy, communication, and writing, and another on bioinformatics and precision medicine. Natalie has also mentored student researchers through Oxy's summer research program.

When she isn't teaching, Natalie enjoys, practicing yoga, running, swimming, and writing. She also loves to visit her family in Seattle and Denver, where she is a new aunt to three amazing nephews and one amazing niece, who were all born recently, within a single year.