

Dillon B. Nye

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410 Calvin Ave. • Baltimore, MD 21218

EDUCATION

Johns Hopkins University

PhD, Chemical Biology

Dissertation: Heme coordination and hemoglobin structure

Baltimore, MD

Expected December 2018

Reed College

BA, Biochemistry and Molecular Biology

Portland, OR

2013

RESEARCH EXPERIENCE

Johns Hopkins University

Graduate Researcher; Advisor: Juliette Lecomte

Biophysical investigation of cyanobacterial and algal hemoglobin enzymes

- Used NMR spectroscopy to study structure and dynamics of several hemoglobins and variants.
- Described hemoglobin iron ligand switching phenomena as a pH response.
- Identified and characterized novel globin conformations with relevance to the superfamily.

Baltimore, MD

2013 - Present

Reed College

Undergraduate Researcher; Advisor: Arthur Glasfeld

Structure solution of a virulence-related metalloregulatory protein

- Characterized a transcription factor from the opportunistic pathogen *Streptococcus mutans*.
- Solved the X-ray structure from data collected at the ALS to 3.1 Å resolution.
- Assessed binding affinity for cognate DNA sequence in presence and absence of metals.

Portland, OR

2011 - 2013

SKILLS and TECHNIQUES

- Solution NMR spectroscopy of biomolecules with specialty in paramagnetic systems
- Protein structure determination in the solid (X-ray) or solution (NMR) state
- Proficient with NumPy and BioPython for analysis and modeling of biophysical data
- Recombinant protein preparation and purification
- Common biophysical techniques, e.g., circular dichroism, protein stability measurements, binding assays

LEADERSHIP and OUTREACH

Johns Hopkins University

Head RA, Biophysical NMR Facility

- Coordinated 3 – 5 other graduate researchers in maintenance of spectrometers under supervision of the facility manager.

Baltimore, MD

2016 - 2018

Mentor, Women in Science and Engineering (W.I.S.E.)

- Assisted a high school student for 4 hours a week for 1 semester with a preliminary research project.

2018

- Provided lab demonstrations for 2 Baltimore high school students each Friday over 1 summer.
- Developed a close relationship with a single student over the course of a research project lasting 6 hours a week for 2 semesters.

CONFERENCE PRESENTATIONS

Nye, D. B., Preimesberger, M. P., Majumdar, A., and Lecomte, J. T. J. A histidine-lysine axial ligand switch in a hemoglobin. Poster presentation and flash talk delivered at the Biophysical Society annual meeting, San Francisco, CA, February, 2018. *Travel grant awardee*.

Nye, D. B., Preimesberger, M. P., Majumdar, A., and Lecomte, J. T. J. A role for the heme propionates in a monomeric hemoglobin. Poster presentation delivered at the Gibbs Conference on Biothermodynamics, Carbondale, IL, October, 2016.

Nye, D. B., Martinez, J., Preimesberger, M. P., Majumdar, A., and Lecomte, J. T. J. A role for the heme propionates in hemoglobins: Dictating the nature of the iron distal ligand. Poster presentation delivered at the Protein Society symposium, Baltimore, MD, July, 2016.

Nye, D. B., Preimesberger, M. P., Kougentakis, C., Rice, S. L., and Lecomte, J. T. J. Heme coordination versatility in a truncated hemoglobin. Poster presentation delivered at the Biophysical Society annual meeting, Baltimore, MD, February, 2015.

PUBLICATIONS

Nye, D. B. and Lecomte, J. T. J. (2018) Replacement of the distal histidine reveals a non-canonical heme binding site in a 2-on-2 hemoglobin. *In Review*.

Johnson, E. A., Russo, M. M., **Nye, D. B.**, Schlessman, J. L., and Lecomte, J. T. J. (2018) Lysine as a heme iron ligand: A property common to three truncated hemoglobins from *Chlamydomonas reinhardtii*. *Biochim. Biophys. Acta* 1862, 2660 – 2673.

Nye, D.B., Preimesberger, M. R., Majumdar, A., and Lecomte, J. T. J. (2018) Histidine-lysine axial ligand switching in a hemoglobin: a role for the heme propionates. *Biochemistry* 57, 631 – 644.

Preimesberger, M. R., Johnson, E. A., **Nye, D. B.**, and Lecomte, J. T. J. (2017) Covalent attachment of the heme to *Synechococcus* hemoglobin alters its reactivity towards nitric oxide. *J. Inorg. Biochem.* 177, 171 – 182.

Spatafora, G., Corbett, J., Cornacchione, L., Daly, W., Galon-Donlo, D., Wysota, M., Tivan, P., Collins, J., **Nye, D. B.**, Levitz, T., Breyer, W. A., and Glasfeld, A. (2015) Interactions of the metalloregulatory protein SloR from *Streptococcus mutans* with its metal ion effectors and DNA binding site. *J. Bacteriol.* 197, 3601 – 3615.

Johnson, E. A., Rice, S. L., Preimesberger, M. R., **Nye, D. B.**, Gilevicius, L., Wenke, B. B., Brown, J. M., Witman, G. B., and Lecomte, J. T. J. (2014) Characterization of THB1, a *Chlamydomonas reinhardtii* truncated hemoglobin: linkage to nitrogen metabolism and identification of lysine as a distal heme ligand. *Biochemistry* 53, 4573 – 4589.