Hasan Howlader's dissertation research focuses on the synthesis of nucleoside/nucleotide analogues with purine bases modified with reactive groups such, as halovinyl sulfones, at C2 or C8 position for the bioconjugation with amino acids, peptides or proteins. He already published two articles from this project in *ACS Omega* and *J. Org Chem*. Hasan also developed a successful collaboration with Dr. Barry Rosen, a world-renowned biochemist in the field of arsenic chemistry, on the chemoenzymatic synthesis (semisynthesis) of a newly discovered broad-spectrum antibiotic Arsinothricin (AST). The finding from this project has been published in the *J. Nat. Prod.* and has been also submitted for patent application. Hasan also developed a robust method for the chemical synthesis of racemic AST which can be further enzymatically separated into pure enantiomers. Hasan also established a successful collaboration with Dr. Ralf Kaiser, an experimental physical chemist from University of Hawaii and Dr. Alexander Mebel, a computational physical chemist from Florida International University. He is involved in the projects that are designed to explain formation of life in circumstellar envelopes of carbon-rich stars. These projects investigate processes of growth of polycyclic aromatic hydrocarbon (PAH) products. The mechanism for the growth of PAH from simple naphthalene or indene to pyrene, benzindene, coronene and/or corannulene has been reported in several collaborative publications including two in *Nature Commun*. As of the end of 2020 year, Hasan is co-author of 12 research articles in peer-reviewed journals from his dissertation projects. Hasan is also co-author of two patents and one book chapter on purine chemistry in the well-known monograph *Science of Synthesis*. He also presented on 12 national and local conferences.