

# Urjeet Khanwalkar

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## EDUCATION

**Dartmouth College**, Hanover NH  
Graduate Student, Thayer School of Engineering

Aug 2020 - Present

**Northeastern University**, Boston MA  
Bachelor of Science, Biology

Aug 2011 - May 2016

## PATENTS & PUBLICATIONS

1. Kahvejian et al. "Compositions and Methods Related to Therapeutic Cell Systems Expressing Exogenous RNA." International Patent Application Publication No. WO 2018/009838, published November 1, 2018.D
2. Khanwalkar et al. "Amplifiable RNAs for Therapeutic Cell Systems." International Patent Application Publication No. WO 2019/140116, published October 1, 2019
3. Khanwalkar et al. mRNA-based engineering of Red Cell Therapeutics (RCTs) to generate potent, allogeneic cellular therapies. Poster presented at: RNA Therapeutics Symposium; 2019 June 26 – 28; Worcester, MA

## SKILLS & TECHNIQUES

**Molecular techniques:** Proficient in multi-colour flow cytometry, electroporation, confocal microscopy, western blot, SL-qPCR, ISH, viral titration & neutralization assays, bacterial cloning & vector recombination, site-directed mutagenesis, CRISPR based knock-in and knock-out mutations, DNA sequencing, restriction digests, fluorescent and compound microscopy, and spectrophotometry.

**Cell culture:** Proficient in primary human CD34+ hematopoietic stem cell expansion, erythroid differentiation & maturation, adherent and suspension cell culture, & experienced in carrying several cell lines, including HEK 293T, K562, & HeLa

**Nanoformulations:** nucleic acids encapsulated lipid and polymeric nanoparticle formulation; characterization by DLS, Ribogreen, and Picogreen assays.

**In-vivo expertise:** Comfortable in working with several species of mice and fish; with proficiency in Icefish & Zebra fish care, in-vitro fertilization, embryo culture, mouse colony care, dosing and sampling various tissues from both mice and fish species.

**Computational:** Proficient in SnapGene, Lasergene8, Vector NTI, Seqbuild, Electronic lab notebooks (Benchling, OpenLab, & Biovia), Microsoft Excel; and adept at GraphPad.

## WORK EXPERIENCE

**Rubius Therapeutics**, Cambridge MA

**Associate Scientist**

Feb 2019 – Aug 2020

**Senior Research Associate**

Sep 2017 – Feb 2019

**Research Associate**

Jul 2016 – Sep 2017

- Spearheaded development of nanoparticle-based delivery of mRNA to erythroid progenitors, by designing cell-stage specific targeting moieties and novel lipid formulations
- Lead a team focused on RNA design efforts for engineering RNA to achieve optimized stability and translational capacity in the context of erythroid cell biology
- Conceived the idea of an amplifiable RNA, which was filled for patent
- Optimized electroporation of mRNA into primary human hematopoietic stem cells and erythrocyte progenitors for expression of therapeutic proteins and engineering red cell therapeutics (RCTs). (Published as a poster presentation)
- Demonstrated clinical-scale feasibility of electroporation and nanoparticle-based gene engineering of primary human hematopoietic stem cells to generate RCTs
- Represented Rubius in collaborations with several academic and industrial groups
- Actively contributed to Rubius' culture by founding and participating in the Rubius Activities Committee

**Dicerna Pharmaceuticals, Cambridge MA**

Jul 2015 – Dec 2015

**Intern: Pre-Clinical Development**

- Optimized an ex-vivo stability assay and employed it to screen DsiRNA molecules for biologically relevant stability
- Developed alternative stability assays using recombinant enzymes
- Tested and troubleshot ISH method to detect RNA knockdown in tissue samples
- Generated pharmacokinetic and gene knockdown data while assisting with dosing (I.V. & S.C.) and necropsies for in-vivo studies
- Maintained various mammalian cell lines and generated in-vitro potency data for given DsiRNA molecules

**Sanofi Pasteur, Cambridge MA**

Jul 2014 – Dec 2014

**Research Assistant**

- Generated prospective vaccine candidates, against Respiratory Syncytial Virus by inducing specific mutations
- Established a fluorescent microscopy-based assay to measure the activity of a viral fusion protein

**Palmer Station - Antarctica, Detrich Laboratory**

Apr 2014 – May 2014

**Research Assistant**

May 2013 – Sep 2013

- Worked independently to obtain and raise Icefish embryos, sample, and observe their embryonic development
- Designed and built an improved incubator system for raising Icefish embryos
- Investigated the effects of rising ocean temperatures on Icefish's embryonic development
- Dissected and collected various tissue samples from adult fish, including blood from live fish

**Detrich Laboratory, Northeastern University, Boston MA**

Nov 2011 – Dec 2015

**Research Assistant**

- Sequenced and cloned several genes from *N. coriiceps* and *C. aceratus*, to interrogate mechanisms for the ROS pathway
- Prepared plasmid stocks and analogous DNA probes for those genes
- Performed in-situ hybridizations on Icefish and zebrafish embryos

## **LEADERSHIP & TEACHING EXPERIENCE**

**College of Science, Northeastern University**

Jan 2014 – Apr 2014

**Lab Teaching Assistant**

Jan 2015 – Apr 2015

- Conducted a lab section of 15-20 students; where I taught required lab skills, prepared, and graded reports and quizzes.

**Northeastern Biology Club, Northeastern University**

**President**

Aug 2015 – Apr 2016

**Treasurer**

Aug 2012 – Sep 2015

- Initiated and established NU Talk – a TED Talk style student presentation platform for undergraduate research
- Lead the executive board of the club that successfully organized several events through the years
- Represented the Biology Department student in several panels for incoming & prospective students
- Helped foster an environment where students interested in biology could meet like-minded individuals, collaborate on ideas, and build a network of peers
- Secured over \$15,000 in funding for the Club