

# Nil Sahin

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Email: [nil.sahin@mail.utoronto.ca](mailto:nil.sahin@mail.utoronto.ca)

Website: <https://nsahin.github.io>

Phone: +1 (416) 834-5441

## **Education:**

2015 – present **University of Toronto**, Toronto, Ontario, Canada  
PhD Candidate, Department of Molecular Genetics, Faculty of Medicine  
Co-supervisors: Dr. Brenda J. Andrews, Dr. Quaid Morris

2011 – 2015 **Sabanci University**, Istanbul, Turkey  
BSc. Molecular Biology, Genetics and Bioengineering  
Faculty of Engineering and Natural Sciences (**GPA: 3.90 / 4.00**)

2006 – 2011 **Robert College**, Istanbul, Turkey

## **Publications:**

Mattiazzi Ušaj, M\*, Sahin, N\*, Friesen, H., Pons, C., Ušaj, M., Masinas, M., Shkurin, A., Morris, Q., Boone, C., and Andrews, B.J. Systematic genetics and single cell image analysis reveals widespread pleiotropy and cell-to-cell variability. *Molecular Systems Biology* (2020). \*equal contribution

Rubanova, Y., Rujan, S., Harrigan, C.F., Li, R., Wintersinger, J., Sahin, N., Deshwar, A., Morris, Q. Reconstructing evolutionary trajectories of mutation signature activities in cancer using TrackSig. *Nature Communications* (2020).

Sokolov, A., Ashenden, S., Sahin, N., Lewis, R., Erdem, N., Ozaltan, E., Bender, A., Roth, F.P. and Cokol, M. Characterizing ABC-Transporter Substrate-Likeness Using a Clean-Slate Genetic Background. *Frontiers in Pharmacology* **10**:448 (2019).

Grys, B.T., Lo, D.S., Sahin, N., Kraus, O.Z., Morris, Q., Boone, C., and Andrews, B.J. Machine learning and computer vision approaches for phenotypic profiling. *Journal of Cell Biology* **216**(1) (2017).

Chandrasekaran, S., Cokol-Cakmak, M., Sahin, N., Yilancioglu, K., Kazan, H. Collins, J.J. and Cokol, M. Chemogenomics and orthology-based design of antibiotic combination therapies. *Molecular Systems Biology* **12**(5):872 (2016).

## **Research Experience:**

Jan. 2016 – present **PhD Thesis, University of Toronto**  
Co-supervisors: Dr. Brenda J. Andrews, Dr. Quaid Morris  
Developed image analysis pipelines to identify genetic regulators of cellular morphology in the context of genome-wide perturbations by applying machine learning and computer vision strategies

Oct. – Dec. 2015 **Morris Laboratory, University of Toronto**  
Supervisor: Dr. Quaid Morris  
**Mutational Signature Changes during Tumour Evolution**  
Implemented bioinformatics algorithms to quantify mutational signatures of 600

tumours from whole genome sequencing; identified significant signature differences between tumour types; created an opportunity for a new PhD thesis for a new student after this 5-week rotation project

Mar. 2013 – May. 2015 **Cokol Laboratory, Sabanci University**

Supervisor: Dr. Murat Cokol

**Large-scale Experimental *E. coli* Drug Interactions Screen**

Conducted drug interaction experiments among 25 antibiotics; analyzed results to find significantly synergistic drug pairs and relate them to mechanism of action of each antibiotic

Jun. – Aug. 2014

**Roth Laboratory, University of Toronto**

Supervisor: Dr. Frederick P. Roth

**Drug Sensitivity Profiles of ABC Transporter deletion strains in *S. cerevisiae***

Conducted screen to identify relationship between ABC transporters and drug sensitivity by using 16 *S. cerevisiae* strains and measured sensitivity of strains to 28 anti-fungal compounds with various mechanisms of action.

### **Conference Presentations:**

Talk                      Machine Learning and Computer Vision Approaches for Phenotypic Profiling in Yeast  
*Nil Sahin, Mojca Mattiazzi-Usaj, Quaid Morris, Charles Boone, Brenda J. Andrews*

Dec. 2019                **Machine Learning in Computational Biology 2019**, Vancouver, BC, Canada

Oct. 2019                **CytoData Symposium and Hackathon 2019**, Heidelberg, Germany

Oct. 2018                **International Symposium on Health Informatics and Bioinformatics 2018**,  
Antalya, Turkey

Aug. 2018                **Yeast Genetics Conference 2018**, Stanford, CA, USA

Poster                    Machine Learning and Computer Vision Approaches for Phenotypic Profiling in Yeast  
*Nil Sahin, Mojca Mattiazzi-Usaj, Quaid Morris, Charles Boone, Brenda J. Andrews*

Dec. 2017                **Medicine by Design Symposium 2017**, Toronto, ON, Canada

Nov. 2017                **Genome Informatics 2017**, Cold Spring Harbor Laboratory, NY, USA

Sept. 2017               **Society of Biomolecular Imaging and Informatics 2017**, San Diego, CA, USA

May 2016                **Great Lakes Bioinformatics and the Canadian Computational Biology Conference**,  
Toronto, ON, Canada

Poster                    Drug sensitivity profiles of ABC transporter deletion strains in *S. cerevisiae*  
*Nil Sahin, Frederick P. Roth, Murat Cokol*

Sept. 2014               **EMBL Conference: Frontiers in Fungal Systems Biology**, Heidelberg, Germany

### **Awards and Scholarships:**

Jan. 2020                **2019-2020 Jennifer Dorrington Graduate Research Award** (one-time \$2,000.00)

Sept. 2017               **2017-2018 University of Toronto Open Fellowship** (one-time \$12,000)

Sept. 2017               **Poster Award (2<sup>nd</sup> place)**

Society of Biomolecular Imaging and Informatics, High Content 2017 Conference

Sept. 2016               **2016-2017 PPEF - Cecil Yip Doctoral Research Award** (one-time \$1,999.00)

- March 2016      **University of Toronto School of Graduate Studies Conference Grant**  
 Provided with financial support for students actively presenting their research at an academic conference from March 1, 2016 to September 30, 2016
- 2011 – 2015      **Sabanci University Full Honor Scholarship**  
 Awarded with full tuition fee and monthly stipend for 4 years for being in the first 0.07% in nationwide university entrance exam

## **Teaching Experience:**

- Winter 2019      **University of Toronto – Teaching Assistantship in Computational Biology and Bioinformatics Graduate Course**  
 Helped students at weekly office hours with their assignments and grading
- Fall 2017      **University of Toronto – Teaching Assistantship in Computer Science Course CSC120**  
 Helped students at weekly lab hours, holding and marking course exams
- Fall 2014      **Sabanci University – Teaching Assistantship in Cell Biology Course BIO332**  
 Evaluated student responses to innovative research papers from literature
- 2012 – 2015      **Sabanci University – Academic Support Program Education Coordinator & Executive Board Member**  
 Held weekly meetings with 11 moderators on their teaching abilities
- 2011 – 2012      **Sabanci University – Academic Support Program Teaching Assistant**  
 Tutored peers with Mathematics and Natural Sciences courses (Physics, Chemistry, and Biology) in weekly held study sessions after lecture hours for ten hours a week

## **Skills:**

Programming Skills:    Python, R, Bash, C++, MATLAB, Perl  
 Languages:                English (Native), Turkish (Native)

## **Extracurricular Activities:**

- 2018 – 2019      **University of Toronto – [Coders](#) Group Treasurer**  
 Conducted accounting for the club and held tutorials on Machine Learning and Image processing in Python
- 2017 – 2018      **University of Toronto – Donnelly Centre Graduate Student Association Presidency**  
 Established seminar series on developed technologies and trainee talks by Donnelly Centre laboratories.  
 Organized a scientific conference for Donnelly Centre Research Institute.

## **References:**

Dr. Brenda J. Andrews, Professor at the University of Toronto, [brenda.andrews@utoronto.ca](mailto:brenda.andrews@utoronto.ca)  
 Dr. Quaid Morris, Professor at Memorial Sloan Kettering Cancer Center, [quaid.morris@gmail.com](mailto:quaid.morris@gmail.com)  
 Dr. Charlie Boone, Professor at the University of Toronto, [charlie.boone@utoronto.ca](mailto:charlie.boone@utoronto.ca)