

# BOTING NING

✉ ningb@bu.edu ☎ +1 412 605 9369 🌐 ningb.github.io

## EDUCATION

**Ph.D., Boston University, Bioinformatics**

Jul 2017 - expected Jun 2022

- Mentored by Beane, JE, Lenburg, ME and Spira AE
- Received Moorman-Simon fellowship

**MPH, Boston University, Biostatistics**

Sep 2014 - May 2016

- Received Merit Scholarship

**B.A., Vanderbilt University, Molecular & Cellular Biology**

Sep 2009 - May 2013

- Graduated with honor from Biology Department for outstanding research; Received VUSRP Scholarship

## RESEARCH & WORK EXPERIENCE

**Dr. Avrum Spira and Dr. Marc Lenburg's Lab**

05/2018-Present

*Graduate Research Assistant*

Boston, MA

- Identified airway basal cell specific miRNA that contributes to bronchial PML progression using sample-match gene and miRNA expression profiles
- Led interdisciplinary investigation on Hippo and TP63 pathways as novel therapeutic targets to intercept early lung cancer progression
- Developed novel algorithm and R package DReAmiR for detecting miRNA regulatory network rewiring across multiple cancer-subtypes or cell-types
- Evaluated the predictive power of nasal epithelium miRNA expression profiles in differentiating malignant IPNs

**Dr. Qiong Yang's Lab**

08/2016-05/2017

*Research Assistant*

Boston, MA

- Identified novel genetics factors and relevant pathways associated with Brain-Derived Neurotrophic Factors using genome-wide genotyping array and whole genome sequencing from FHS and other cohorts in CHARGE consortium.
- Performed GWAS collaborating with CKDGen Consortium using densely imputed FHS genotype data to identify novel loci related to kidney disease, while controlling for population substructure.

**Epidemico, Inc. (acquired by Booz Allen Hamilton)**

04/2015-08/2016

*Analyst*

Boston, MA

- Facilitated the development of machine learning classifier for SupplyChainMap based on health informatics data
- Improved natural language processing function of SupplyChainMap, resulting in high sensitivity for differentiating true safety alert (>95%)

**Framingham Heart Study, Dr. Rhoda Au's team**

05/2015-05/2016

*Research Assistant*

Boston, MA

- Built predictive regression model for neuropsychological and MRI outcomes based on traumatic brain injury status
- Used survival analysis to analyze dementia based on Clock Drawing Test and Digital Clock Drawing Test results, and the role of APOE in the association

**Ellen Fanning Lab at Vanderbilt University**

09/2012-07/2014

*Research Assistant*

Nashville, TN

- Identified new interaction sites between SV40 helicase and RPA 70N subunits using biochemistry and structural methods and provided evidence for its importance during viral DNA replication

**Daniel Kaplan Lab at Vanderbilt University**

09/2010-08/2012

*Undergraduate Research Assistant*

Nashville, TN

- Identified interaction domains between Eukaryotic helicase Mcm2-7 subunits and DNA replication initiation factor Dpb11

## PUBLICATIONS

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**Ning B**, Pfefferkorn RN, Liu G, Zhang S, Liu H, Stevenson C, Reid ME, Mazzilli SA, Spira AE, Lenburg ME, and Beane JE. The role of epithelial miR-149 in immune modulation and progression of bronchial premalignant lesions. *In preparation*.

**Ning B**, Tilston-Lunel A, Berthet JH, Mazzilli SA, Beane JE, Lenburg ME and Varelas X. Transcriptional crosstalk between YAP, TEAD and TP63 is associated with early lung carcinogenesis. *In preparation*.

**Ning B**, Spira T, Beane JE and Lenburg ME. Differential regulation analysis quantifies mirna regulatory roles and molecular subtype-specific targets. *Ready for submission*.

**Ning B**, Corbett S, Drizik E, . . . , Rothman N, Spira AE, Lan A and Lenburg ME. miRNA regulatory landscape in the DIESEL exhaust exposed nasal epithelium. *Ready for submission*.

Lim Y, Beane JE, Tanaka Y, **Ning B**, Husted CR, . . . , Zhang H. Exploration of alcohol use disorder-associated brain miRNA-mRNA regulatory networks. *Translational psychiatry* 11 (1), 1-10.

Zhu H and **Ning B**. Regulatory landscapes of specific miRNAs are conserved between cell lines and primary tumors. *F1000Research* 10 (633), 633.

Hicks-Berthet J, **Ning B**, Federico A, Tilston-Lunel A, Matschulat A, Ai X, Lenburg ME, Beane JE, Monti S and Veralas X. Yap/Taz inhibit goblet cell fate to maintain lung epithelial homeostasis. *Cell reports* 36 (2), 109347.

Gorski M, Jung B, [et al, including **Ning B**]. Meta-analysis uncovers genome-wide significant variants for rapid kidney function decline. *Kidney international* 99 (4), 926-939.

Tin A, Marten J, [et al, including **Ning B**]. Trans-ethnic genome-wide association meta-analyses and fine mapping elucidate novel pathways influencing albuminuria. *Nature genetics* 51 (10), 1459-1474.

Teumer A, Li Y, [et al, including **Ning B**]. Target genes, variants, tissues and transcriptional pathways for the regulation of serum urate levels in humans. *Nature communications* 10 (1), 1-19.

Wuttke M, Li Y, [et al, including **Ning B**]. A catalog of genetic loci associated with kidney function from analyses of a million individuals. *Nature genetics* 51 (6), 957-972.

Piers RJ, Devlin KN, **Ning B**, Liu Y, Wasserman B, Lamar M, Price PC, Swenson R, Davis R, Penney DL, Seshadri S, Wolf PA, Au R and Libon DJ. Age and Graphomotor Decision Making Assessed with the Digital Clock Drawing Test: The Framingham Heart Study. *Journal of Alzheimer's Disease* 60 (4), 1611-1620.

Dhingra N, Bruck I, Smith S, **Ning B** and Kaplan DL. Dpb11 helps control assembly of the Cdc45-Mcm2-7-GINS replication fork helicase. *Journal of Biological Chemistry* 290 (12), 7586-7601.

**Ning B**, Feldkamp MD, Cortez D, Chazin WJ, Friedman KL and Fanning E. Simian Virus Large T Antigen Interacts with the N-terminal Domain of the 70 kD Subunit of Replication Protein A in the Same Mode as Multiple DNA Damage Response Factors. *PLoS One* 10 (2), e0116093.

## CONFERENCE PRESENTATIONS

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Transcriptional crosstalk between YAP, TEAD and TP63 is associated with early lung carcinogenesis. AACR Annual Meeting 2021 (04/2021).

microRNA Expression Differences in Nasal Epithelium for Identifying Malignant Indeterminate Pulmonary Nodules. 11th EDRN Scientific Workshop (09/2019).

miRNA Regulatory Landscape in the Diesel Exhaust Exposed Nasal Epithelium. ATS 2019 International Conference (05/2019).

Genome-wide Association Study of Brain-derived Neurotrophic Factor. CHARGE 2017 NYC (03/2017).

Effects of Traumatic Brain Injury on Neurophysiological Test and MRI Scans in the Framingham Heart Study. International Brain Injury Association Conference (03/2017).

Displacement of the Minute Hand as a Preclinical Marker of Dementia: Clock Drawing in the Framingham Heart Study. INS 44th Annual Meeting (02/2016).

Investigating the Interaction of Dpb11 with MCM2-7 and DNA. Cold Spring Harbor Lab Annual Eukaryotic DNA Replication and Genome Maintenance meeting (09/2013).

Physical Interaction of SV40 T Antigen with the Checkpoint Recruitment Domain of Human RPA Facilitates Viral DNA replication. Cold Spring Harbor Lab Annual Eukaryotic DNA Replication and Genome Maintenance meeting (09/2013).

## SKILLS

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**Bioinformatics:** (single-cell)RNA-seq, ChIP-seq, CUT&RUN, Small RNA-seq

**Statistics & Machine Learning:** Generalized Linear Model, Network Model, Supervised/unsupervised Learning

**Program Languages:** R, Python, Bash, Nextflow, SAS

**Public Databases:** GEO, cBioPortal, TCGA, CCLE, ENCODE, DepMap, CMAP, GTEx, FANTOM5

**Scientific Communication:** RShiny, plotly, LaTeX, (R)markdown, Jupyter Notebooks

## TEACHING & MENTORING EXPERIENCE

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**Mentor, Pioneers China Program** 12/2019-05/2021

Conceived the study and mentored a high-school student to complete a bioinformatics project on comparing miRNA regulatory landscape between TCGA and CCLE data.

**Student Mentor, BUBPWTF** 09/2010-08/2021

Designed workshops for first-year Bioinformatics PhD students on R/Python/Bash and high performance computing environment.

**Teaching Assistant, Boston University Introduction to Biostatistics** 08/2019-12/2019

Led discussion, taught R programming and graded home work for Introduction to Biostatistics (BS704).