



Education

BA | Biological Sciences

George Washington University | 2017

- Concentration in Bioinformatics
- Cum Laude
- GPA: 3.51/4.0

Skills

Computing

Programming Languages

Python • R • Bash

Nextflow • Matlab/Octave

Operating Systems

Linux • Mac • Windows

HPC Platforms

Slurm • LSF • SGE • AWS

IDEs & Reproducible Research

Jupyter • RStudio • R Shiny

Vim • Docker • Singularity

Bioinformatics

Data Types

Whole Exome Sequencing (WES)

RNA-seq

Repositories & Databases

TCGA • GEO • GitHub

Bioconductor

Sequence Alignment

BWA • STAR • Bowtie

SNV and CNV calling

GATK • Samtools

VarScan2 • CNVkit • XHMM

Differential Gene Expression

limma/voom • DEseq2 • Cufflinks

Immunogenomics

MixCR • NetMHC • Optitype

Laboratory

PCR • qPCR • Western Blot

Mammalian Cell Culture

SDS-PAGE

General

Software

LaTeX • Photoshop • Illustrator

Languages

English (Native) • Spanish (Fluent)

Experience

Icahn School of Medicine | Associate Research I (Bioinformatics)

Department of Genetics & Genomics Sciences

Lab of Dr. Bojan Losic | May 2018 - Present

- Conducted research in multiple disease systems, including inflammatory bowel disease (IBD), glioblastoma, and hepatocellular carcinoma.
- Integrated multi-omics data, including RNA-seq, whole-exome sequencing (WES), and RRBS methylation profiling to characterize intra-tumoral heterogeneity and its relationship to the tumor micro-environment.
- Built WES data processing pipelines for internal use using Nextflow.
- Collaborated on multiple projects with other departments internally, with clinicians, and with external biotech industry partners.
- Managed data storage and organization for a large multi-omics dataset in collaboration with biotech industry partners using ad-hoc scripts.
- Drafted and prepared manuscripts for submission to peer-reviewed journals.
- Presented research findings at internal department seminars and externally at conference poster sessions.

George Washington University | Undergraduate Research Assistant

Department of Pharmacology & Physiology

Lab of Dr. Anelia Horvath | Aug 2015 - May 2017

- Integrated WES and RNA-seq data from TCGA to characterize the gene expression profiles of tumor suppressor and oncogenes in cancer.
- Processed WES and RNA-seq data using standard pipelines for alignment, QC, and variant calling.
- Wrote and implemented ad-hoc filtering and processing scripts using Python.
- Implemented the usage of citation management software to streamline manuscript preparation.
- Contributed to manuscript preparation and data analysis for three peer-reviewed publications.
- Trained nine new lab members in using relevant pipelines, software, and analysis.

George Washington University | Intern

Department of Medicine, Microbiology, Immunology & Tropical Medicine

Lab of Dr. Mudit Tyagi | May 2015 - Aug 2015

- Investigated protein expression in cell lines affected by HIV using western blot during a summer internship.
- Documented experiments in a laboratory notebook.
- Maintained cell lines using aseptic technique, mixed buffer solutions, and assisted with routine laboratory duties.
- Followed proper safety protocols for operating in a biosafety-level 2 environment.



Teaching

GWU | Teaching Assistant
BIOC 6240: Next Generation Sequencing

- Spring 2016
- Spring 2017

Awards

Jun 2020 Scholars in Training (AACR)
May 2016 Dean's List (GWU)
Dec 2016 Dean's List (GWU)

Coursework

Bioinformatics (Grad. Level)
Next Generation Sequencing (Grad. Level)
Neural Circuits & Behavior
Developmental Neurobiology
Biochemistry

References

Available upon request.

Publications

- **Restrepo P**, Bubie A, Craig A, Labgaa I, Schwartz M, Thung S, Stolovitzky G, Losic B, Villanueva A. **Intra-tumoral epigenetic heterogeneity signatures and aberrant molecular clocks in hepatocellular carcinoma**. Manuscript in Preparation. 2020 Aug.
- Słowiński P, Li M, **Restrepo P**, Alomran N, Spurr LF, Miller C, Tsaneva-Atanasova K, Horvath A. **GeTallele: a method for analysis of DNA and RNA allele frequency distributions**. Frontiers in Bioengineering and Biotechnology. 2020 Aug 4. Accepted for Publication. Preprint available on BioRxiv. doi:10.1101/491209.
- von Felden J, Garcia-Lezana T, Dogra N, Kozlova E, Eren Ahsen M, Craig A J, Gifford S, Wunsch B, Smith J T, Kim S, Long J, Chen X, Labgaa I, Haber P K, Olsen R, Han D, **Restrepo P**, D'Avola D, Hernandez-Meza G, Allette K, Sebra R, Saberi B, Tabrizian P, Asgharpour A, Dieterich D, Llovet J M, Cordon-Cardo C, Tewari A, Schwartz M, Stolovitzky G, Losic B, Villanueva A. **Unannotated small RNA clusters in extracellular vesicles detect early stage liver cancer**. BioRxiv. 2020 May 02. doi:10.1101/2020.04.29.066183.
- Losic B, Craig AJ, Villacorta-Martin C, Martins-Filho SN, Akers N, Chen X, Ahsen ME, von Felden J, Labgaa I, D'Avola D, Allette K, Lira SA, Furtado GC, Garcia-Lezana T, **Restrepo P**, Stueck A, Ward SC, Fiel MI, Hiotis SP, Gunasekaran G, Sia D, Schadt EE, Sebra R, Schwartz M, Llovet JM, Thung S, Stolovitzky G, Villanueva A. **Heterogeneous immune and tumor clonal evolution patterns in liver cancer**. Nature Communications. 2020 Jan 15. doi:10.1038/s41467-019-14050-z. PubMed PMID: 31941899.
- **Restrepo P**, Yong R, Laface I, Tsankova N, Nael K, Akturk G, Sebra R, Gnjjatic S, Hormigo A, Losic B. **Tumoral and immune heterogeneity in PD-1 responsive glioblastoma: a case study**. Cold Spring Harbor Molecular Case Studies. 2020 Jan 6. doi: 10.1101/mcs.a004762. PubMed PMID: 31907277.
- Spurr L, Li M, Alomran N, Zhang Q, **Restrepo P**, Movassagh M, Trenkov C, Tunnessen N, Apanasovich T, Crandall KA, Edwards N, Horvath A. **Systematic pancreatic cancer analysis of somatic allele frequency**. Scientific Reports. 2018 May 16. doi: 10.1038/s41598-018-25462-0. PubMed PMID: 29769535.
- **Restrepo P**, Movassagh M, Alomran N, Miller C, Li M, Trenkov C, Manchev Y, Bahl S, Warnken S, Spurr L, Apanasovich T, Crandall K, Edwards N, Horvath A. **Overexpressed somatic alleles are enriched in functional elements in Breast Cancer**. Scientific Reports. 2017 Aug 15. doi: 10.1038/s41598-017-08416-w. PubMed PMID: 28811643.
- Movassagh M, Alomran N, Mudvari P, Dede M, Dede C, Kowsari K, **Restrepo P**, Cauley E, Bahl S, Li M, Waterhouse W, Tsaneva-Atanasova K, Edwards N, Horvath A. **RNA2DAlign: nucleotide resolution allele asymmetries through quantitative assessment of RNA and DNA paired sequencing data**. Nucleic Acids Research. 2016 Dec 15. doi: 10.1093/nar/gkw757. PubMed PMID: 27576531.

Posters

- Bubie A, **Restrepo P**, Craig A, Labgaa I, Schwartz M, Thung S, Stolovitzky G, Losic B, Villanueva A. **Regional DNA methylation profiling reveals novel epigenetic intra-tumoral heterogeneity signatures and aberrant molecular clocks in hepatocellular carcinoma**. Poster Presentation. Abstract nr 1507. American Association for Cancer Research Annual Meeting. 2020. Virtual Format.
- **Restrepo P**, Yong R, Laface I, Tsankova N, Gnjjatic S, Hormigo A, Losic B. **Mapping tumoral and immune heterogeneity in PD-1 responsive glioblastoma**. Poster Presentation. Abstract nr 2528. American Association for Cancer Research Annual Meeting. 2019. Atlanta, GA.
- **Restrepo P**, Yong R, Laface I, Tsankova N, Gnjjatic S, Hormigo A, Losic B. **Mapping tumoral and immune heterogeneity in PD-1 responsive glioblastoma**. Poster Presentation. Abstract nr B088. Fourth CRI-CIMT-EATI-AACR International Cancer Immunotherapy Conference: Translating Science into Survival. 2018. New York, NY.

