

# Chase Brown

Neuroscientist and Bioinformatics Ph.D. Candidate  
Chemical and Biological Materials Engineer, B.Sc., M.Sc.

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chasebrown.io

**I am:** Highly motivated neuroscientist/bioinformatician with expertise in natural language processing (NLP), biostatistics, machine learning (ML), and nanomaterials.

**Research Goal:** To develop novel ML architectures to automate and understand the process of scientific discovery and hypothesis generation for application towards drug discovery.

## EXPERIENCE

### PhD Candidate in Neuroscience

Oklahoma Medical Research Foundation — Bioinformatics Department  
University of Oklahoma Health Sciences Center — Neuroscience Department  
2016 - PRESENT

- Constructed an API for performing meta-analyses on transcriptomic and epigenomic signatures
- Developed a literature-based discovery (LBD) system consisting of multiplexed networks (multiple edge and node types). Multiplex networks are generated via text extraction with neural network multi-headed attention systems (i.e. transformers)
- Combined the LBD and meta-analysis system for application towards drug discovery for glioblastoma

### Graduate Research Assistant - Chemical and Biological Materials Engineering

University of Oklahoma, Norman, OK — Chemical and Biological Materials Engineering Department  
2013 - 2016

- Produced stimuli-responsive catalytic nanoparticle supports in multiphase systems for rapid reaction halting and recycling in biofuel production
- Modeled the effect of acid treatments and carbon nanotube defect chemistry on the stability and properties of Pickering emulsions

### Lead Research and Development Engineer and Supervisor

SouthWest Nanotechnologies, Norman, OK — Research and Development Department  
2010 - 2016

- Managed separations and characterization operations. Increased product purity from 40% of desired chiral purity to >80%
- Developed software for spectral analysis by applying photophysical theories
- Lead plant production of conductive nanomaterial ink products.

## EDUCATION

### PhD — Neuroscience

University of Oklahoma Health Sciences Center, Oklahoma City  
2016 - 2020

Focus: Knowledge Discovery in Bioinformatics for Cancer Therapy

Dissertation Advisor: Jonathan Wren, PhD

### Master's — Chemical and Biological Materials Engineering

University of Oklahoma, Norman  
2013 - 2016

Thesis: Carbon nanotubes and magnetic particles as Pickering emulsion stabilizers - Particle control for phase selective reactions

Thesis Advisor: Steven Crossley, PhD

### Bachelor's — Chemical and Biological Materials Engineering

University of Oklahoma, Norman  
2007 - 2013

Minor: Physics

## SKILLS

Machine Learning

Natural Language Processing

Tensorflow

PyTorch

spaCy

Transformers

RNA-seq

Drug Synergy

Drug Discovery

Photophysical modeling

Stanford coreNLP

## Languages

- Python
- Bash
- R
- SQL
- Julia
- LaTeX
- Java
- Matlab
- C++

## Software

- Blender
- OriginLab
- PyMol

## AWARDS / POSITIONS

- 1st place @ Competition on Kaggle (AI symposium)
- Seed Grant: Metformin induced DNA methylation change in glioblastoma
- Best paper "ALE: automatic label extraction" at MCBIOS

## EXTRACURRICULAR ACTIVITIES

- OKCatalyst program for business development from university research
- Graduate Student Association (Treasurer)
- Judge at 2019 GREAT Conference
- Guest lecturer at NeuroNight
- Boy Scouts of America - Eagle Scout

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## GRANTS / PUBLICATIONS

- **Oklahoma Center for Neuroscience Seed Grant:** "Metformin Methylation in Glioblastoma Multiforme –Drug Synergy Mechanisms and Repurposing Discovery with Bioinformatics Systems"
- Brown, Chase. "Carbon Nanotubes and Magnetic Particles as Pickering Emulsion Stabilizers: Particle Control for Phase Selective Reactions." (2016).
- Giles, Cory B., et al. "ALE: automated label extraction from GEO metadata." BMC bioinformatics 18.14 (2017): 509.
- Towner, Rheal A., et al. "OKN-007 increases temozolomide (TMZ) sensitivity and suppresses TMZ-resistant glioblastoma (GBM) tumor growth." Translational oncology 12.2 (2019): 320-335.
- Briggs, Nicholas, et al. "Stable pickering emulsions using multi-walled carbon nanotubes of varying wettability." Colloids and Surfaces A: Physicochemical and Engineering Aspects 537 (2018): 227-235.
- Perz, Aleksandra I., et al. "MNEMONIC: Metagenomic Experiment Mining to create an OTU Network of Inhabitant Correlations." BMC bioinformatics 20.2 (2019): 96.
- Zalles, Michelle, et al. "Optimized monoclonal antibody treatment against ELTD1 for GBM in a G55 xenograft mouse model." Journal of Cellular and Molecular Medicine (2019).