

# Curriculum Vitae

James D. Beck

**Current Position:** Ph.D. Candidate - Eric Hayden lab

**Institution:** Boise State University

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## EDUCATION

2018-2022 **PhD Candidate** / Boise State University, Boise, ID USA

Dissertation: *Improved Computational Prediction of Ribozyme Function and Structure with Enhanced Parameter Selection and Library Design*

1996-2002 **Juris Doctorate** / Marquette University, Milwaukee, WI USA

1993-1996 **MBA** / Marquette University, Milwaukee, WI USA

1984-1990 **BS Healthcare Administration** / University of Wisconsin, Eau Claire, WI USA

## WORK EXPERIENCE

8/2019 – Current

**Member of Hayden Lab at Boise State University, ID, USA.** Computational molecular biology research of non-coding RNA structures and functions. Developed visualizations and analysis of self-cleaving ribozyme variants. Built machine learning neural network models predicting the impact of mutations using data from deep mutational scanning of ribozyme variants. Implemented curve fitting for catalytic parameter selection. Developed PCA training materials and applied genomic data for sagebrush. Implemented differential gene expression analysis for APOE4.

1/2015 – 12/2015

**Owner of Yellow Dog Consulting, ID, USA.** Developed a franchised, neurosciences offering in Ohio and Pennsylvania and Interim CEO of Neurosurgical Operating Unit.

8/2013 – 12/2014

**Principal at Clifton Larson Allen LLP, MN USA.** Integrated Beck Advisory Group operations post acquisition and led physician practice services for the organization.

7/2006 – 7/2013

**Owner of Beck Advisory Group Boise, ID USA.** A professional consultancy offering strategic, transactional and physician integration services to physician groups, hospitals, and integrated health systems.

2/1998 – 6/2005

**Chief Financial Officer and Senior Vice President at Wheaton Franciscan Healthcare, WI USA.** Led the financial and business operations of a \$500 Million integrated health system.

10/1996 – 1/1998

**Chief Financial Officer at St. Nicholas Hospital, WI USA.**

11/1994 – 9/1996

**Supervisor Provider Finance at Blue Cross/Blue Shield of Wisconsin, WI USA.**

1/1994 – 10/199

**Management Intern at Memorial Hospital of Burlington, WI USA.**

12/1990 – 12/1992

**Administrator at Consulting Management and Education, Inc., USA.**

## PUBLICATIONS

### SUBMITTED

**Beck, J. D.**, Roberts J. M., Kitzhaber J., Trapp A., Serra, E. , Spezzano, F. & Hayden, E. J. (2022). Predicting higher-order mutational effects in an RNA enzyme by machine learning of high-throughput experimental data. In final review at: *Frontiers in Molecular Biosciences*.

Roberts J. M., **Beck, J. D.**, Pollack, T.B., Bendixsen, D. P. & Hayden, E. J. (2022). RNA sequence to structure analysis from comprehensive pairwise mutagenesis of multiple self-cleaving ribozymes. Submitted to: *eLife*. (bioRxiv: **doi:** <https://doi.org/10.1101/2022.05.17.49234>)

### PUBLISHED

Hudon, S. F., Palencia Hurtado, E., **Beck, J. D.**, Burden, S. J., Bendixsen, D. P., Callery, K. R., ... & Hayden, E. J. (2021). Primers to highly conserved elements optimized for qPCR-based telomere length measurement in vertebrates. *Molecular Ecology Resources*, 21(1), 59-67.

Rohn, T. T., **Beck, J. D.**, Galla, S. J., Isho, N. F., Pollock, T. B., Suresh, T., ... & Hayden, E. J. (2021). Fragmentation of Apolipoprotein E4 is Required for Differential Expression of Inflammation and Activation Related Genes in Microglia Cells. *International journal of neurodegenerative disorders*, 4(1).

Melton, A. E., **Beck, J.**, Galla, S. J., Jenkins, J., Handley, L., Kim, M., ... & Buerki, S. (2021). A draft genome provides hypotheses on drought tolerance in a keystone plant species in Western North America threatened by climate change. *Ecology and evolution*, 11(21), 15417-15429.

Hudon, S. F., Hurtado, E. P., **Beck, J. D.**, Burden, S. J., Bendixsen, D. P., Callery, K. R., ... & Hayden, E. J. (2020). Universal assay for measuring vertebrate telomeres by real-time quantitative PCR. *bioRxiv*, 797068.

## ACHIEVEMENTS

GUTT NSF Grant Fellowship, Award #1826801

NVIDIA Academic Hardware Grant

## SKILLS

### SOFTWARE ENGINEERING

Operating Systems

Linux/Unix, MacOS, Windows

Languages

Bash, C, C++, CSS, HTML, JavaScript, Julia, Latex, Python, R

Databases Filemaker, JSON, NoSQL, SQL (MySQL)

Other Technologies CUDA, Globus, Singularity, Slurm

## BIOINFORMATICS

Metagenomics Bowtie2, FastQC, HUMAnN2, MetaPhlAn2

RNA-Seq DESeq2, hisat2, htseq-count, Infernel, K-Seq, RFam

Statistics Clustering, K-Fold Cross Validation, PCA, Tmap, tSNE, Umap

Visualizations CairoMakie, D3.js, Matplotlib, Tmap

## MACHINE LEARNING

Pytorch AutoEncoder, DataLoader, DataSet, LSTM

Scikit-Learn OneHotEncoder, RandomForest, SVR

## REFERENCES

Available upon request