ROGER B. SWARTZ
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Objective: To obtain a position in **Quantitative Finance** as a **Quantitative Engineer or Machine Learning Engineer** in the **investment industry**, applying advanced data analysis, time series analysis, mathematical predictive modeling using python, SQL, MATLAB and LLM programming skills to drive impactful financial results.

SELECTED EXPERIENCE

SPRINGBOARD (Full-time) Remote from Lexington, MA
DATA SCIENCE AND MACHINE LEARNING ENGINEER BOOTCAMP September 2024 – July 2025 (expected)

- Skilled in Python, SQL and Large Language Models to Carry Out Broad Scale Data Analysis and Predictive Modeling
- As part of a Capstone Project Developed a time series model to forecast U.S. inflation (CPI) for any 2- to 8-year period from 1940 to the present, using extensive feature engineering and historical economic data dating back to 1939. Incorporated and evaluated ~15 key economic indicators (e.g., GDP, government and non-Government debt, commodity benchmarks) to enable highly predictive modeling with very low mean squared error across all 2- to 5-year periods (1941–1953) and all 6- to 8-year windows (1954–2025). Applied advanced model tuning and optimization techniques to maximize forecasting accuracy.
- The predictive time series model is primed to apply to different bonds, commodities and a broad range of securities.
- Designed and Implemented Logistic Regressions, Time Series Modeling, Statistical Modeling, Gradient Boosting, Grid Search in KNN, Random Forests Models and Ensemble Methods, Decision Trees, Automated Feature Engineering, Bayesian Optimization, one-hot encoding, Euclidian and Manhattan distances and applying Standard Scaler.
- In depth training and analytics in the entire data science workflow of data collection, gathering data, organizing data it into a structured format, imputing missing values, exploring the data, conducting feature engineering and finally building machine learning models and concluding with data storytelling.
- Mentored weekly by a Professional Machine Learning Engineer

IMMUNOFUSE; AUTISM GENE THERAPY August 2019 – Present
Co-Founder

- Invented a global immunization to HIV-1 by incorporating the V-region of a highly neutralizing antibody (HGN194) for the conserved V3 crown of HIV-1 into a dimeric immunoglobulin A1 (dIgA1-HGN194) framework encoded for by a lentivirus that targets memory B-cells where through alternative splicing the resulting memory B-cell expresses exogenous IgA1-HGN194 receptor that can be activated with the target binding site e.g. mRNA encoded HIV-1 GP-120/GP-41 glycoprotein to differentiate into a long lived dIgA1-HGN194 plasma secreting B-cell that will migrate to the bone marrow and provide a 20 – 40 year immunity to HIV-1 from a single administration.
- Engaged in discussions with several scientists and multiple rounds of proposals included invited proposals with the U.S. Government's Emory National Primary Research Center to complete a Simian Macaque HIV-1 viral challenge using Immunofuse's technology.
- Prepared a grant proposal for an invited grant from the National Science Foundation.
- Communicated with more than 50 Venture Capitalists in the Life Sciences Space
- Posted positions and interviewed more than 100 candidates from receiving more than 1,000 resumes and incorporated 7 top tier interested candidates into Investor Deck.
- Prosecuted every aspect of the patent process prior to examination—from writing the entire non-Provisional Patent to making amendments, to amending patent applications as part of negotiated scope of invention with the U.S. Patent examiners.
- Negotiated initial terms of employment contingent on funding with potential candidates.
- Prepared a Business Plan and detailed market analysis of the entire space in biopharmaceuticals for treatment of non-Small Cell Lung Cancer (NSCLC)
- Designed a genetically engineered mouse model (GEMM) for metastasizing non-Small Cell Lung Cancer Squamous Cell Carcinoma (NSCLC-SCC) with EGFR upregulation.
- Risk Analysis for therapeutic program selection.
- Worked with an investment Bank to prepare materials for potential investors and venture capitalists.

- Invented A New Vaccination/Immunization Platform and Modality to Protect Against COVID-19 and Future Pandemics and Non-Pandemic Viruses. Emphasis is on episomal and genomic expression of Dimeric Immunoglobulin A1 (dIgA1) to enable mucosal and hematological-based immunity.
- Invented, wrote and filed 8 Patent Applications: 5 Provisional Patent Applications that Are Active; 3 non-provisional patent applications. Additional Patent Application in Preparation.
- Created Several Pitch Deck Versions for Investors
- Designed an Autism Gene Therapy Efficacy and Evaluation Standard for Humans and mice to project cognitive and adaptive behavior gains from an autism and neurodevelopment disorder gene therapy program.
- Identified the top 2 or 3 gene candidates out of 1,100 possible gene candidates narrowed down through three rounds of selection to 100 genes.

Princeton University Princeton, NJ
Graduate Research Assistant July 2008 – June 2010
Synthetic Organic Chemistry Methodology Research: Thesis: Synthesis and Evaluation of fluorinated hemi-labile Ligands in Asymmetric Catalysis. Demonstrated that a carbon-fluorine bond in a chiral ligand framework can provide a secondary mode of coordination to cationic Nickel species in a chiral ligand framework, allowing for a novel mode of coordination in asymmetric transition metal catalysis.
Teaching Assistant: Organic Chemistry Lab I and Organic Chemistry Lab II

PFIZER Inc., Global R&D Groton, CT
Medicinal Chemist October 2006 – December 2007
- Proposed drug target design and their synthetic routes based on the biological activity of a collection of predecessor molecules
- Successfully completed several multistep syntheses of targets at various levels of molecular complexity
- Devised and synthesized high yielding, multi-step, environmentally benign synthetic scale-up for compounds in a chemical series with nano-molar biological activity. The scale up was used for small animal testing.
- Collaborated in biological and chemical matters with biologists, X-ray diffraction experts and computational chemists.

NON-PROVISIONAL PATENT PENDING LIST FROM 8 FILED PATENTS

Title: Comprehensive Platform for the DNA and RNA In Human Expression of Dimeric and Polymeric Immunoglobulin A Delivered in a Single Payload.
Inventor: Roger B Swartz
Non-Provisional Patent Pending: Filed Length: 343 Pages **Published Length:** 176 Pages
Application No. 17/368,957 Filed: July 7, 2021
Publication Date: February 3, 2022
Publication No. 20220033851
International Application No. PCT/US2022/073525
International Publication No. WO2023279121
https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2023279121&_gid=202301
Status: Pending

Title: Episomal expression, genomic integrated lentiviral vector expression and mRNA expression of Potent Immunoglobulins Including Dimeric Immunoglobulin A1 and A2 via a furin cleavage site and 2A self-processing peptide to Enable Mucosal and Hematological Based Immunity or Protection via Gene Therapy for Allergens, viruses, HIV, bacteria, infections, pathology associated proteins, systemic pathologies, cancer, toxins and unnatural viruses.
Inventor: Roger B Swartz
Non-Provisional Patent Pending: Length: 178 Pages
Application No. 17/227,372 Filed: April 11, 2022
Publication Date: October 20, 2022
Publication No. US20220333130A1
Status: Pending

Title: Episomal Expression of Potent Immunoglobulins Derived from Human Blood to Enable Short Term Vaccination / Immunization to COVID, COVID-19 and Mutants and Other Pandemic and non-Pandemic Viruses Designed for Rapid FDA Emergency Use Authorization and Approval.
Inventor: Roger B Swartz
Non-Provisional Patent Pending: Length: 69 Pages
Application No. 16/995,829 Filed: August 18, 2020
Publication Date: March 3, 2022
Publication No. US20220064265A1
Status: Pending

PROGRAMMING SKILLS AND SECURITY ANALYSIS

Programming – Python, SQL, MATLAB, Machine Learning, and Large Language Models to Carry Out Broad Scale Data Analysis, Machine Learning and Predictive Modeling. Logistic Regressions, Time Series Modeling, Statistical Modeling, Gradient Boosting, Grid Search in KNN, Random Forests Models and Ensemble Methods, Decision Trees, Automated Feature Engineering, Bayesian Optimization, one-hot encoding, Euclidian and Manhattan distances and applying Standard Scaler. Data science workflow of data collection, gathering data via APIs, organizing data it into a structured format, imputing missing values, exploratory data analysis, conducting feature engineering, and modeling via building machine learning predictive models and concluding with data storytelling. Extensive Application to securities, economic indicators and image processing.
Securities Analysis – Fundamental Analysis and Quantitative Analysis of Stocks, Bonds, Commodities and Options. Financial Modeling and Portfolio Allocation for Risk Minimization.

OFFICE SKILLS

Commercial Opportunity Creation: Comprehensively read 30 publications in neuroscience, immunology, oncology and virology in the span of a few hours or single evening while developing hypothesis and designing research plans and experiments related to hypothesis.
Data Trending: Finds patterns in disparate data in neuroscience, pathology and immunology and then to take that data, develop a technological solution or find an existing technology that solves an identified problem and develop a potential commercial product.
Biotechnology Therapeutic Program and Therapeutic Target Risk Management and Risk Analysis: Generates risk analysis for a biotechnology, platform technology, a therapeutic target and therapeutic program. Approach includes extensive literature review looking for unestablished trends in the data to generate new and novel analysis. Risk analysis entails a detailed review of the literature inclusive of hundreds or publications and patents, reviewing the advantages and disadvantages of the technology in addition to what are essential questions that may need to be answered in order to reduce risk. Identification of research questions that can be answered with relatively low-cost experimental program. Full analysis of appropriate translational models for mouse studies as an example review the risk there and also make suggestions as to novel translational models that may allow for greater translational likelihood in human.
Patent Prosecution: Execute all aspects of Patent Prosecution including writing and filing traverses and Petitions as well revising to Specification, Claims and Drawings without incorporating new matter. Appropriate use of language in claims and specifications to meet generally practiced patent nomenclature.
Job Posting and Interviewing Candidates:
Office Skills: Patent Writing, Medical Writing, Proposal Preparation, Pitch Deck Creation, Westlaw, MS Word, MS Excel, MS PowerPoint, Outlook and Adobe Photoshop.

EDUCATION

SPRINGBOARD (Full-time) Remote from Lexington, MA
Certificate in Data Science with Machine Learning Specialization September 2024 – July 2025 (expected)
Capstone Project: Inflation (CPI) modeling and forecasting from 1940 – Present using time series analysis of economic indicators. Incorporated and evaluated ~15 key economic indicators (e.g., GDP, government and non-Government debt, commodity benchmarks) in both original collected form and feature engineered form to enable highly predictive modeling with very low mean squared error across all 2- to 5-year windows (1940–1953) and all 6- to 8-year windows (1954–2025).

The predictive time series model is primed to apply to different bonds, commodities and a broad range of securities.

EDUCATION (cont'd)

PRINCETON UNIVERSITY Princeton, NJ
Graduate Diploma in Synthetic Organic Chemistry July 2008 – June 2010

UNIVERSITY OF PENNSYLVANIA Philadelphia, PA
Chemistry Program and other Life Sciences Coursework January 2005 – May 2006
While enrolled in the M.S. in Chemical and Biomolecular Engineering Program

DREXEL UNIVERSITY Philadelphia, PA
B.S., Commerce and Engineering, Finance Concentration (GPA 3.75/4.0) September 2000 - December 2002
Magna cum Laude and ranked 1st of 35 in major among graduates of the 02' – 03' academic year

STANDARDIZED TESTS

- GRE Revised General Test: Quantitative 166/170 (92%); Verbal 162/170 (91%) June 2015
- Society of Actuaries: Exam P (Probability) – CBT: Passed (9/10) Range: 129% - 140% of the pass mark September 2012

AWARDS

- The Wall Street Journal Award in Recognition of Outstanding Academic Achievement (Drexel University) May, 2002
- Beta Gamma Sigma National Business Honor Society Award (Drexel University) May, 2002
- Circle K, Community Service Organization Distinguished President Award April, 2002
- Drexel University Alexander Van Rensselaer Student Service Award and Scholarship May, 2001