SANCHIT CHOPRA

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EDUCATION

University of Calgary

BSc. Chemical and Petroleum Engineering, Specialization in Biomedical Engineering, Minor in Entrepreneurship and Enterprise Development, Internship Program **Sep 2017 – Apr 2022**

Thesis: Improving the Precision and Selectivity of CRISPR Base Editing
Capstone: Design of a Manufacturing Plant for Monoclonal Antibodies

FEATURED AWARDS

- Seymour Schulich Scholarship-Community Service/Entrepreneurial (Renewed x3) - $37,200
- Cannon Lachapelle Scholarship for Entrepreneurship - $10,000
- Intern of Merit, NOVA Chemicals/University of Calgary
- Dean's List – Schulich School of Engineering
- Biomedical Engineering Undergraduate Research Funding - $6,000
- Students Union 2019 Undergraduate Research Symposium Award – Engineering - $1,000
- Mathison Centre for Mental Health Research & Education Research Award - $1,000
- Jason Lang Scholarship (x3) - $3,000
- Alberta Great Kid Award - $2,000
- Genome Alberta Senior Award Best Project-Calgary Youth Science Fair - $1,000
- Alberta Sanofi Biogenius Competition Top 5 - $500
- Heritage Youth Summer Research Program Award - $3,000

PUBLICATIONS

Journal Papers

Ramasubbu, R., McAusland, L., Chopra, S., Clark, D. L., Bewernick, B. H., & Kiss, Z. H. T. (2021). Personality changes with subcallosal cingulate deep brain stimulation in patients with treatment-resistant depression. Journal of Psychiatry and Neuroscience, 46(4), E490–E499. https://doi.org/10.1503/jpn.210028

Conference Abstracts

McAusland, L., Chopra, S., Brown, E., Kiss, Z., & Ramasubbu, R. (2019). S106. Personality Changes in Subcallosal Cingulate Deep Brain Stimulation for Treatment Resistant Depression. Biological Psychiatry, 85(10), S338. https://doi.org/10.1016/j.biopsych.2019.03.857

RELATED EXPERIENCE

Dr. Pierre Billon Laboratory, Genome Stability and Editing, University of Calgary

Undergraduate Research Student **Sep 2021 – Present**

Honors Thesis: Investigating the role of DNA repair machinery to improve the efficiency of novel genome editing technologies (base editing, prime editing etc.)

- Engineering custom guideRNA to overcome base editing off-target edits and create a programmable system with high precision
- Using high-throughput methods for systematic analysis of spatially regulated proteomes to understand functional roles of DNA repair factors during CRISPR-based editing
- Developed a fluorescence-based assay for concomitant monitoring of prime and base editing efficiencies
- Techniques: Design of CRISPR elements, restriction enzyme cloning, flow cytometry, cell culture, transfection, Gibson assembly, PCR

NOVA Chemicals

Process Engineering Intern, Utilities and Off-Plots **May 2020 – Sep 2021**

Assisting process engineering in manufacturing infrastructure focusing on demineralization, clarification, co-generation, and river water systems

- Developed a mathematical model for a settling pond to predict total organic carbon that provided insight into seasonality changes and ideal dosage rates of coagulant
- Studied high turbidity in the phosphate removal system by correlating ASPEN process data to inventory data and provided recommendations to reduce chemical usage and shift turbidity within spec
- Targeted cause of early regeneration in demineralization system and hosted safety meetings
- Developed key performance indicator dashboards for visual management of financial data for leadership using PowerBI, Excel, and Python

Pharmaceutical Production Research Facility, Dr. Michael Kallos Lab, University of Calgary

Undergraduate Research Student **May 2019 – Nov 2019**

Designed/performed experiments for large scale production of human nerve and skin-derived Schwann cells required for clinical applications

- Cultured human cell lines before passaging into stirred suspension bioreactors (10mL and NDS-100mL), computer controlled Das Gip bioreactors, microscopy, protein isolation, mass-spectrometry
- Optimized growth factors including feeding, agitation and seeding densities resulting in 15x fold expansions (2x more than static culture)

- Delivered on-stage **presentation at Biomedical Engineering Society's 2019 Annual Meeting** (Philadelphia, USA) and **poster presentations at Alberta Biomedical Engineering Conference and Hotchkiss Brain Institute Symposium**

Mathison Centre for Mental Health Research Education Dr. Rajamannar Ramasubbu, University of Calgary

Undergraduate Research Student **May 2018 – Sep 2018**

Investigation of neural markers and predictors of treatment response to antidepressant treatment using fMRI, genetic imaging in mood disorders, and deep brain stimulation for treatment resistant depression

- Focus on new Theta Burst Stimulation (TBS) study, analyzing data from Deep Brain Stimulation (DBS) study, helping with administrative work, and delivered **poster presentation at Hotchkiss Brain Institute Symp.**
- Developed a mixed model analysis method of longitudinal repeated measures using SPSS
- Administered theta burst stimulation to patients using the visor2 XT neuronavigational device
- Electroencephalography setup and processing using MATLAB and MRI Level 1 training
- Extensive data analysis using R/MATLAB/SPSS/Excel resulting in a publication

Dr. Mark Ungrin Laboratory, University of Calgary

Student Research Assistant **Jul 2016 – Sep 2017**

Student researcher in the Department of Comparative Biology and Experimental Medicine. Projects and expertise focus on regenerative medicine and synthetic biology. I assisted and conducted projects working directly with a postdoctoral fellow.

- Used CRISPR-Cas9 activation (CRISPRa) to model Facioscapulohumeral Muscular Dystrophy (FSHD) in human cells
- Identified and designed genetic elements such as gRNA through online software, Gibson assembly cloning, gel electrophoresis, cell culture, and assisted on an R-based script to identify gRNA sequences
- **Presented research at the Calgary Youth Science Fair** (received a gold medal and the Genome Alberta best senior project) and the **Sanofi Biogenius Competition** (received top 5 award)

VOLUNTEERING EXPERIENCES

Canadian Red Cross

Emergency Management: Personal Disaster Assistance Responder

Jul 2021 – Present

Assessing needs of individuals affected by emergency events (fire, flood, etc.) Providing access to services by the Red Cross including shelter, food, clothing, registration of evacuees and emotional care and comfort through outreach activities.

Multiple Sclerosis Society of Canada and Alberta Health Services (Foothills Medical Centre)

Friendly Visiting Volunteer

Jan 2016 – Mar 2020

Visit a person who has progressive MS, cognitive impairment, and severe depression every week. Fundraising events such as Hike for MS, A&W, Burgers for MS research funding.

Alberta Health Services (Foothills Medical Centre)

Patient Experience Volunteer

Sep 2015 – Mar 2020

3-hour shift weekly to interact and help patients recover from traumatic injuries (Unit 58) and assisting in language barrier (Hindi to English)

Entrepreneurship Initiatives

- **HelpAKid.org** – Increasing the transparency of donations worldwide. Built functioning service, received partnerships from NGOs, registered as non-profit, received seed funding from Calgary Foundation
- **Stores24x7.com** – Website design, logo design, search engine optimization and marketing, web analytics. Actively working with local businesses to improve online presence amidst COVID-19 pandemic
- **UMetabolic.com** – Personalized dietary monitoring project. Completed the 50-startups incubator program, Schulich Incubator, and received NEXT 36 finalist interview
- **DormMarket.com** – Built a student marketplace for buying and selling a variety of products

Consulting Experiences

- **Alberta Health Services**: Feasibility analysis and recommendation report for a revenue generating, on-site childcare facility at the Foothills Medical Centre. Developed a user centered business case operated through the lens of a social enterprise
- **Enactus Calgary:** Managed a start-up development project for entrepreneurs on the spectrum. Assisted with grant writing and website design/development

REFERENCES

Available on request.