**Ethan Elliot Rajkumar**

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**EDUCATION:**

University of British Columbia ***Sept 2019-Present***

* BSc: Honors Chemistry, 3rd year
* 80% Overall GPA

**TECHNICAL PROJECTS**

***SYNTHESIS OF DICHLORO-[1,2-BIS(DIPHENYLPHOSPHINO)ETHANE]NICKEL(II)***

* Synthesized dichloro-[1,2-bis(diphenylphosphino)ethane]nickel(II) using treatment of 1,2-bis(diphenylphosphino)ethane with nickel(II) chloride hexahydrate
* Characterized product using 1H NMR Spectroscopy and High Resolution Mass Spectrometry (EI)

***SYNTHESIS OF 4-METHOXYBENZALDEHYDE***

* Synthesized dichloro-[1,2-bis(diphenylphosphino)ethane]nickel(II) using treatment of 1,2-bis(diphenylphosphino)ethane with nickel(II) chloride hexahydrate
* Characterized product using 1H NMR Spectroscopy and High Resolution Mass Spectrometry (EI)

**TECHNICAL SKILLS:**

***Chemistry:*** Organic and Inorganic Synthesis, Reflux, Extraction, Gravity and Vacuum Filtrations,Evaporations, NMR, IR and Mass spectrometry, Simple Distillations, Recrystallization, TLC, Column Chromatography, Melting Point Analysis, 31P, 1H, and 13C NMR, Ion exchange chromatography, HPLC, GC, ICP-MS, UV-Vis Spectroscopy, NIR spectroscopy.

***Molecular and Cell Biology:*** Agarose Gel Electrophoresis, PCR, real-time qPCR, Nanodrop UV-spectrophotometry, Western Blots,

***Software:*** Cadnano, CellProfiler, Fiji/ImageJ, AutoCad, Fusion360, Microsoft365 (Word, PPT, Excel), Jupyter Notebook, Python, R, HTML5/CSS, Windows 10/11

***Certification:*** UBC ChemSafety and BioSafety Certifications, Preventing and Addressing Workplace Bullying and Harassment Training, COVID-19 safety certificate

**RESEARCH EXPERIENCE**

***November 2019- present***

***BIOMOLECULAR DESIGN TEAM (BIOMOD)***

*University of British Columbia Life Sciences Institute*

*Undergraduate Researcher, Team Lead*

* Designed and optimized DNA-origami structures that self-actuate and can self-assemble with applications in drug-delivery, immunology and nanosurgery
* Performed procedures based on team-designed protocols such as agarose gel-electrophoresis and SDS-PAGE gels, DNA filtration techniques.
* Reviewed existing literature of current experiments in the field of nanobiotechnology related to projects
* Maintained communication and workflow between team members, holding weekly meetings for sub team group

***VALLANCE LAB***

BC Children’s Hospital Research Institute

*Summer Undergraduate Researcher*

***May 2021- September 2021***

* Developed an invitro model of *C. rodentium* infection using 2D IEC monolayers generated from organoids
* Examined pattern recognition receptors that enable detection of pathogen-associated molecular patterns and activate innate immune response in the epithelial cell lining
* Used techniques such as pathogen burdens, qPCR, Nanodrop UV Spectrophotometry, ELISA and immunofluorescence staining to characterize mucosal response
* Thoroughly analyzed all data, using CellProfiler, Fiji, Excel, R and Python and created a pipeline to automatically count cells.

**Awards & Achievements**

*Scholarships*

Canadian Association of Gastroenterologists ***2021***

Beedie Luminaries Scholarship; ***2019***

Horatio Alger  ***2019***

BC Housing Awards  ***2019***

*Publications*