Statement of Purpose

I am writing to express my interest to apply for PhD position on the project "Using waste products to sustainably produce peptide hydrogels for health care application" in the IITKGP-University of Manchester joint program as to fulfill the aspiration of being successful in the field of research and bring the same to others. With the completion of Bachelor's degree and now being at the edge of completing Master's degree, Ihave found a keen inclination of my interests towards research which now I want to go ahead with. I mention that I have completed my B.Tech degree in Chemical Engineering at Banasthali Vidyapith in India where I developed an interest in sustainable development and green chemistry which is the necessity of the near future for conservation and enhancement of environment. I am presently in the final semester of my Master's (M.Tech) degree in Fuel Engineering at Indian Institute of Technology (Indian School of Mines) Dhanbad in India.

In my M.Tech Project I studied about "Characterization and Assessment of a Hybrid Fuel Derived from Biochar and Refuse Derived Fuel (RDF)" which included Municipal solid waste (MSW), refuse derived fuel (RDF), waste to energy concept and methods, utilization of waste in different aspects, waste management and generation sources, Biochar production and utilization, applications of biochar in soil, fuel, adsorbents, etc. The idea of the project involves making of a hybrid fuel using RDF and biochar (produced from lignocellulosic biomass) which are biomass based fuel themselves. The mixing ratio of RDF and Biochar is supposed to be like 40-60%, 20-80% and so on. All the hybrid fuel samples are to be tested for their fuel properties such as energy density, autoignition temperature, CO_2 emission, heavy metals present in ash and flue gas and elemental composition of carbon, oxygen, hydrogen, sulfur and nitrogen using analytical techniques such as Gas Chromatography, XRD, XRF, GCV, Ultimate analysis, etc. Further the obtained fuel is to be compared with other conventional fuels that are currently in use to find the compatibility of hybrid fuel with them and find its suitable application. I wrote a review article related to thesis on the topic "Sustainable Prospects of Refuse Derived Fuel: Energy and Environment" which included the concerns related to waste generation and its disposal in environment, conversion of MSW into RDF, use of RDF in energy production and insights of RDF as fuel.

Along with the M.Tech thesis I have written a book chapter on "Insights into COVID-19 Non-Biomedical Waste Management: Composition, Current Practices and Challenges" which included sources, composition and disposal practices of Covid-19 waste. The book chapter gave me a better knowledge of type of waste and its composition. Also the disposal, conversion and utilization of

converted products as fuel and precursor for production of other products.

I believe that this opportunity will open up several aspects in the aforementioned domain and will be the best to learn from. Studying in an international environment will give me the privilege to build new relationships with people from different culture. I want to go ahead with the PhD program based on the foundation I have laid during my Master's degree for research by being part of several review and computational work. A guided PhD research would allow me push my knowledge to tackle real world problems.

From childhood, I love to be a part of sports activities which incorporated an attitude of not giving up in me and being in responsible positions such as class representative in my Master's course developed my communication skills and quick learning capabilities. All these traits especially came useful during the difficult lockdown period when I completed 4 review and computational projects working from home.

I think my dedication and perseverance for my work will be a valuable addition to the program. I hope to be given a chance as I am confident and capable of meeting and even exceeding the expectations. Thank you for considering my application.