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Proof of concept and validation of a novel format of stable single chain antibodies for the drug discovery studies in pre-clinical models

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Camelids and Sharks possess a unique subclass of antibodies comprised of only heavy chains. The antigen binding fragments of these unique antibodies are cloned and expressed as Single domain antibodies (SdAbs). Single domain antibody (SdAb) alkaline phosphatase and alpha amylase fusion proteins have been demonstrated to be useful immunodiagnostic reagents for bio-threat agent detection. This property is critical for the development of immunoassay for use in austere environments. Due to their unique characteristics, such as low molecular weight, good water solubility, and the ability to bind antigens, they act as therapeutic drugs in the treatment of serious human disease such as asthma inflammation. Since the advent of phage display technology dating back to 1985, antibody libraries displayed on filamentous phage surfaces have been used to identify specific binders for many different purposes. Phage display represents a high-throughput technique for screening billions of random fusion antibodies. A library is developed from the peripheral blood lymphocytes purified from the immunized Indian Camel. This library is estimated to have a size of ~10^6 by the number of transformant. To isolate alkaline phosphatase and alpha amylase specific SdAb from the phage display followed by ELISA. The predicted amino acid sequence is expressed as a soluble protein and purified its size (~16 KDa) is confirmed on Western blot. We are also developing single domain antibody against chronic allergy specific IgE. Further we are generating anti-fibrotic camelid antibody against allergic lung inflammation for bio-marker.

Biography

I am working with antibody engineering research work under Dr. Ena Ray Banerjee, Professor, Department of Zoology, Immunology and Regenerative Medicine Research Laboratory, Room no.214, Ballygunge Science college, University of Calcutta, India. My Ph.D topic is- "Development of novel format single domain antibodies against Toxins and Allergen specific IgE and validation *in Vitro* and *in Vivo* models of diseases of inflammation and degeneration". More elaborately I say, we are trying to ameliorate the disease of asthma and lung inflammation. Sharing the knowledge in this conference, we will try to input the innovative ideas in our research field. I hope this conference would play a great role in bringing us into the guiding discussion includes defining problem, developing possible solutions. In addition to this, as a young researcher I would work enthusiastically and refine our approach and it would be great way to improve our performance.

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