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# Nanobodies- The New Concept for Detection and Diagnosis of Pathogen

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**Abstract**—The Nanobody technology was originally developed following the discovery of camelidae (camels, llamas and alpacas) which possess fully functional antibodies that lack light chains. Nanobodies (Nbs) are antigen-specific, single-domain, variable fragments of camelid heavy chain-only antibodies (HCAs). These HCAs contain a single variable domain (VHH) and two constant domains (CH2 and CH3). The cloned and isolated VHH domain is a perfectly stable polypeptide harboring the full antigen-binding capacity of the original HCAs. These newly discovered VHH domains with their structural features, properties and production technologies are the potential for modulating immune functions in animals and plants pathogens. The great specificity and affinity of Nbs towards tumors, toxins, and pathogenic microorganisms form the basis of a new generation antibodies which were named Nanobodies. The innate supremacy of nanobodies are ability to specifically recognize unique epitopes with sub-nanomolar affinity. Nbs can be used as a renewable source of affinity reagents with high production yield in a broad variety of expression systems such as microorganisms and plants. Nbs have minimal size, great stability, reversible refolding and outstanding solubility in aqueous solutions as compare to conventional antibodies and its fragments. Nature-derived Nbs represent a beneficial tool in Antibody based markets with ready-to-use potential. Numerous Nbs have already proven useful for basic and advanced research in diagnostics, detection and inhibition of animals and plants pathogens. In vitro and in vivo studies have shown, at least in principle, Nbs show deep penetration into dense tissues, favorable kinetics for delivery of pesticides and drugs, recognition of hidden epitopes in seed and food contaminants and inhibition of ligand receptors interaction.