



Camels Validate Germ Terrain Duality [Gtd] Theory; Could Hold Key to Malaria Immune Boosters



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Opinion

The camel is an artiodactyl of the suborder Tylopoda, represented in the old world by the Bactrian (two humps) and Arabian (one hump) camels and in the new world by the llama, alpacas, guanacos and vicunas [1].

Camels differ from all other mammals by having oval shaped red blood cells [1]. This condition is called elliptocytosis or ovalocytosis [2-3] and results in a smaller red blood cell surface compared to the surface area of the round red blood cells in other mammals. This anatomical variation limits/hinders the activity of microbes and over successive generations has conferred a certain amount of immunity on the camel. This will explain the unique properties of camel milk viz-Camel milk is high in powerful immunoglobulins, potent immune-boosting substances. The immunoglobulins in camel milk are smaller than human immunoglobulins and can more effortlessly pass into tissues in the body.

Camel milk contains more vitamin C and iron than bovine milk, is very high in insulin [an advantage for diabetics] and has shown promise in therapy for autism. In general Members of the camelid family have particular heavy-chain antibodies. These antibodies can be used to clone nanobodies, which are antibody-derived therapeutic proteins. One of the most powerful advantages of nanobodies is that they can be easily attached to other proteins and nanoparticles by simple chemical procedures. Important technical advances mean that it is now possible to synthesize antibodies against important *Plasmodium* antigens that could be used for therapeutic purposes [4-15].

The above peculiarities of the camel are as a result of the peculiar morphology of the camel red blood cells. If terrain had nothing to do with disease all these unique features of camel blood and milk would not be. The camel therefore validates the germ terrain duality [GTD] theory [16-21] and could hold the key to creating highly effective malaria immune boosters.

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