Properties of Antibodies

Linus Pauling

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During recent years there has been developed through the work of many investigators (Landsteiner, Heidelberger, Haurowitz, Marrack, Stuart Mudd, and others) a ~~detailed picture~~ general idea of the nature of ~~antibodies.~~ This has been extended into a detailed picture of the structure and process of formation of antibodies by the application of our present knowledge of the structure of molecules and the nature of intermolecular interactions.

immunological processes.

My collaborators, Dr. Dan

Campbell, Dr David Freeman, and Mr Carol Ikeda and I have now obtained quantitative experimental results along several lines which support this picture.

~~Following up the~~

~~Using~~

We have found that bivalent and trivalent haptenes, similar to those used by Landsteiner and van der Scheer, give precipitates with antibody-antigen molecular ratio close to 1. This ~~result~~ and other results support the postulate that antibodies effective in the precipitin reaction are bivalent.

Precipitates have also been obtained between antiserum

and azoproteins with an average ~~of~~ of only two haptenes per molecule. It has also been found that haptenes can be attached by azo groups to erythrocytes without hemolyzing the cells, and agglutination has been produced ~~with~~ of cells with only about fifty haptenes per cell.

by antihapten

It was predicted that antibodies could be manufactured outside of the animal by

a process of denaturing a protein and slowly renaturing it in the presence of antigen. This has now been done, with use of a variety of denaturing agents. The dye methyl blue and an azo dye containing atoxyl have been used as antigens.

The ~~synthe~~ protein solutions obtained have various properties characteristic of antibodies, including specificity to the antigen used and solubility

of antigen-antibody precipitate in excess of antigen or of haptene.