THE INTESTINAL ABSORPTION OF MACROMOLECULES IN ADULT MICE

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A thesis submitted for the degree of Doctor of Philosophy.

awarded Nov., 1980
ABSTRACT

The intestinal absorption of 2 bacterial antigens was studied in adult mice. These were flagellin (FLA), purified from *Salmonella adelaide*, and Boivin Antigen (BA), extracted from *Vibrio cholerae*. With the latter, 4 techniques were used, which demonstrated that small amounts of macromolecular BA were absorbed. These include the use of (1) $^{125}$-labelled antigen in *vivo*; (2) $^3$H-DNP-labelled antigen in *vivo*; (3) $^{125}$ specific antibody injected i.v. to detect cold, absorbed antigen in *vivo*; and (4) everted gut sacs. The use of $^{125}$ antigens in the intact mouse and rat (but not in everted sacs) was discredited by our studies. On the other hand, $^3$DNP was a stable and suitable tag. Using this system, we observed a marked difference between the absorption of BA and FLA, which was consistent with the observed fate of these antigens following their i.v. administration, and their relative degradabilities in intestinal juice.

Oral immunization inhibited the intestinal absorption of the specific antigen in the above models. The efficiency of this was generally low, but significant. This function may be a prerogative of IgA antibodies, since serum antibodies were found to induce intestinal anaphylaxis, as manifested by death or increased gut permeability.

The absorption of immunogenic BA was also demonstrated in mice. This was shown indirectly by the ability of oral doses of the antigen to prime an animal for an anamnestic, systemic response (on i.v. boosting), and directly by the ability of absorbed material recovered from the plasma *in vivo* or everted gut sacs to
prime normal mice when injected i.v.. In all cases, the resultant, humoral response in the recipient animals was qualitatively different (presumably due to IgA production) from that obtained in mice primed i.v. with the native antigen, and the significance of this is discussed.
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