

MECHANISM OF ACTION OF E. COLI HEAT-STABLE ENTEROTOXIN (STa) IN SMALL INTESTINAL EPITHELIUM

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The molecular mechanism underlying activation of guanylate cyclase (GC) in intestinal microvilli by porcine STa, was explored at the level of isolated rat intestinal villous and crypt cells, brushborder (BB) and GTP-loaded brushborder membrane vesicles (BBMV). In all these models STa cause a 10-18 fold increase of Mg-GTP-dependent cyclic GMP formation without affecting a number of other enzymic or transport functions in the epithelium. Including Ca²⁺ transport in BB and BBMV, turnover of ³²P-labelled phospholipid in BB, and intracellular free Ca²⁺ levels probed by preloading enterocytes with the fluorescent Ca²⁺-indicator quin-2. Activation of BB-bound GC could not be mimicked by nitroprusside, hydroxylamine, arachidonic acid, exogenous phospholipases, or leukotrienes B₄ and C₄, well-known activators of GC in other tissues. Based on these and other data a "direct coupling" instead of a "phospholipid cascade" model for ST activation of GC is proposed in which a ST-receptor complex interacts directly with external domains of GC or with a membranal coupling factor associated with GC. Activation of GC could be inhibited effectively by (i) thiol-reagents like glutathione and N-ethylmaleimide, presumably blocking critical thiol and disulfide groups in GC and ST; (ii) membrane perturbing agents including melittin (50-200 µM), benzylalcohol (20-50 mM) and filipin (0.5 µg/ml). Cyclic GMP apparently changes electrolyte transport through the activation of a sofar unique BB-bound isoenzyme of cyclic GMP-dependent protein kinase (cGMP kinase) capable of phosphorylating both its own structure (autophosphorylation) and a small BB protein (25,000 M.W.) serving as a cosubstrate for endogenous cAMP kinase. A possible role of this protein as an inhibitor of microvillar NaCl cotransport is under present investigation. We also explore the possibility to block ST-provoked diarrhea by inhibitors of intestinal cGMP kinase, e.g. cGMP-receptor antagonists. The R_p diastereomer of guanosine cyclic 3',5'-phosphothiate was found a promising candidate because it bound to but did not fully activate BB-bound cGMP kinase.

O.R.S.T.O.M. Fonds Documentaire

N° : 24448

Cote : B

HYDROBIOLOGICAL EVALUATION OF SIDE EFFECTS OF LARVICIDE TREATMENTS AGAINST SIMULIUM DAMNOSUM IN WEST AFRICA

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Partly as a result of screening research on insecticides toxicity, carried out by ORSTOM hydrobiologists, Temephos (an organophosphate compound) has been selected as larvicide for *Simulium damnosum* control in West Africa.

Considering the risks of an environmental impact on the aquatic biota of a twenty year campaign of insecticide treatments, a full time monitoring programme has been conducted in the field. After now nine years of control, it is possible to point out clearly the short, medium and long term effects of Temephos applications in Ivory Coast.

Phyto and Zooplankton populations were not affected by Abate[®], the first one sometimes even benefiting from the supplementary input of nutrients represented by organophosphate addition to the water.

Macroinvertebrate populations are the most affected part of the aquatic biota. Each Abate[®] application led to a rapid increase of invertebrate drift. At a medium and long term scale, regular treatments result in a general decrease of invertebrates densities on the *Simulium* breeding sites, of about 20 to 30%.

All species are not equally affected by the treatments and Ephemeroptera and Trichoptera belong to the most sensitive taxa. On the other hand, short life cycle organisms such as Orthocladinae and Simuliidae, other than *S. damnosum*, appear to be less sensitive and benefit from the reduced number of their natural predators.

Fish populations are not very sensitive to acute effects of Temephos and no long term effects have been detected after years of application. The contamination of certain species through the food chain has been pointed out, but accumulation of residues is counterbalanced by rapid metabolization. The decrease of brain acetylcholinesterase activity which was detected in laboratory tests seems not to occur in the treated rivers.

Chlorophoxim treatments which were necessary to fight resistant larval populations of *S. damnosum* seem to have a more drastic impact on invertebrates than Temephos, but *Bacillus thuringiensis israelensis* which is also used for the same reason during the dry season, show a total innocuity for the same organisms.

APPLICATION OF THE ENZYME LINKED IMMUNOSORBENT ASSAY (ELISA) FOR THE SERODIAGNOSIS OF DENGUE

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The results of the application of ELISA for the diagnosis of Dengue and its comparison with those obtained by the Hemagglutination Inhibition Test (HI) and Radial Hemolysis (RH) are showed in this study.

43 paired sera samples from patients with clinical picture of Dengue showed that the results of ELISA and HI were close related, although ELISA detected more positives. There was a 93% of coincidence between ELISA and HI results and a 9% of sample were ELISA + / HI -.

In another group of 37 paired sera from Dengue patients studied at the same time with ELISA and RH it was found that a 75% of coincidence exists between ELISA and RH results but ELISA also detected more positives.

The study of 120 blood donors showed a positivity level similar to the obtained for our population through a national survey of antibody by HI test.

The comparison of the results obtained with blood samples collected on filter paper and those obtained with serum didn't show significative difference between them.

The results obtained with ELISA together to its technical characteristic and economy make it useful for the sero diagnosis of Dengue.

REVIEW OF THE MALARIA SITUATION IN THE EASTERN MEDITERRANEAN REGION

Dr. L. F. Dellini

At the end of 1982 the estimated population of the 23 member States in the Region was 262 million of whom approximately 10.4 million still lived in areas where no organized anti-malaria measures were being carried out.

On the basis of the present status of the anti-malaria campaigns, the 23 countries of the Region have been classified into three groups as follows:

Group I (six countries)

Those with malaria but without a country-wide malaria control programme: Democratic Yemen, Djibouti, Oman, Somalia, Sudan and Yemen Arab Republic.

Group II (eight countries)

Those with nation wide malaria control programmes: Afghanistan, Egypt, Iran, Iraq, Pakistan, Saudi Arabia, Syria and the United Arab Emirates.

Group III (nine countries)

Countries in which malaria transmission may occur only sporadically or in which malaria has been eradicated or has disappeared: Bahrain, Cyprus, Israel, Jordan, Lebanon, Libya, Kuwait, Qatar and Tunisia.

The number of confirmed malaria cases reported from the Region shows a trend towards an increase in malaria transmission with about 272 000 cases in 1982 against some 156 000 in 1981.

Several impediments have occurred during the recent past which are hampering further progress in the fight against malaria: manifold increase of operations due to global inflation; pluri-resistance of malaria vectors to residual insecticides, lack of general health services support and of community participation, increased malarionogenic potential, etc.

To offset the above the Regional Office promotes: flexible planning, collaboration at all levels, greater involvement of communities and primary health care systems, training and research.

EVALUATION OF ELISA, IIP, IIF, IHA, TIA, CIEP AND SPECIFIC IgE IN IMMUNODIAGNOSIS OF URINARY SCHISTOSOMIASIS

S. Della

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Diagnosis of urinary schistosomiasis is normally based on parasitological criteria (presence of eggs in urine), but false negative results, frequently in chronic cases, have spearheaded the development of new and innovative immunological test procedures. In recent years we have studied this problem by investigating the comparative values of different tests commonly employed in this parasitosis. We report here a comparative analysis of the results obtained from a study of 228 serum samples drawn from Somalian and Tanzanian patients infected by *Schistosoma haematobium*. The results can be summarized as follows:

	ELISA	IIP	IIF	IHA	TIA	CIEP	IgE
patients	93.4	91.2	91.2	73.2	86.8	58.3	86.4
other parasitosis	11.6	0	0	5.0	20.0	15.0	0
controls	1.6	0	0	0.6	2.6	2.6	0

The value of an immunological test depends mainly on the balance between the sensitivity and specificity of the method, these often stand in marked contrast. A comparison of the tests used by us in the immunological diagnosis of urinary schistosomiasis shows that the best reading can be attributed to IIP and IIF methodologies with 100% reading for specificity and 91.2% sensitivity respectively, followed by specific IgE with respectively 100% and 86.4% and by ELISA with 88.4% and 93.4% results; IHA seems preferable to TIA with CIEP occupying last place. All cases negative to ELISA test have also been negative to all other methods, but in certain cases positive readings with ELISA have been shown to be negative when compared to other methodologies. The superiority of ELISA, IIP, IIF and specific IgE over IHA, TIA and CIEP techniques is discussed.

LABORATORY AND FIELD TRIALS FOR THE EVALUATION OF FICAM (OMS 1394) AGAINST THE PHILIPPINE MALARIA VECTORS

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Laboratory and field trials of FICAM W against the Philippine malaria vectors was conducted by the Malaria Eradication Service in cooperation with FIC Limited, England, to test new insecticide as probable substitute to DDT. The malaria vectors were found to be susceptible to bendiocarb. The residual effect on different walling materials in 7 months under laboratory condition and 4 months under field condition. Small scale field trial was conducted in Pagbilao, Quezon, which is about 160 kilometers south of Metro Manila. The impact of house spraying with FICAM W at a dosage rate of 400 mg a/m² against the vector biting population is impressive. Indoor biting vector was eliminated in the trial area.

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ABSTRACT AND POSTER VOLUME

XI
INTERNATIONAL
CONGRESS
for
TROPICAL
MEDICINE
& MALARIA

CALGARY, CANADA
SEPTEMBER 16 - 22, 1984



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B 24 457