FREE COMMUNICATIONS XVI
Platelets: Control and Interactions.

THE CONTROL OF PLATELET FUNCTION BY CYCLIC AMP AND THROMBOXANE SYNTHESIS. N.U. Bang,
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Platelet (P) levels of cyclic AMP (cAMP) and thromboxane (TX) synthesis have been identified
as major regulators of P aggregation and release. We have utilized as probes drugs which
ever decrease TX synthesis by cyclooxygenase inhibition (aspirin and indomethacin) or which
increase P cAMP (adenosine, I-nor; theophylline; isobutylmethylxanthine; and SH-609, a dihydride-
mole analog) to evaluate relative contributions of cAMP and TX and their possible interactions
in mediating P function. Cyclooxygenase inhibitors at concentrations 0-10 fold lower than those
inhibiting P aggregation and release caused almost complete inhibition of TXB2 synthesis from
exogenous [14C]-arachidonic acid (aa) and malondialdehyde (MDA) production in P stimulated by
thrombin (T) or N-ethylmaleimide (NEM). Drugs elevating P cAMP at concentrations equal to or
greater than those causing complete inhibition of P aggregation and release did not inhibit
TXB2 synthesis from exogenous [14C]-aa, nor did they inhibit MDA production in P stimulated by
NEM or by concentrations of T sufficient to produce maximal TX synthesis. However, these drugs
variously inhibited MDA production when P were stimulated at lower T concentrations causing only
mild P TX synthesis. Thus, elevated P cAMP did not inhibit TX synthesis from aa but appeared to
weakly inhibit as phospholipase. We conclude that TX synthesis cannot be the sole, final
mediator of P aggregation and release but that these events result from as yet unidentified
mechanisms modulated largely independently by TX synthesis and intra-P cAMP levels.

CALCICUM BINGING SITES IN HUMAN BLOOD PLATELETS. S. Hopplntall. University Department
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Extracellular calcium ions are required for platelets to aggregate in response to various
aggregating agents. Although some agents can sometimes stimulate aggregation they only do so when a small amount of calcium is present. The calcium bound to reactant human
platelets suspended in buffered saline containing 0-200uM ClCaCl2 depends upon the
extracellular calcium concentration. Rebound analysis of the binding data suggests that
a few (0.8 x 10^9) relatively high affinity (K = 93,000) calcium binding sites are present on
each platelet. When 2.5M CaCl2 is included in the saline suspensions the calcium bound to the platelets is only released at the higher calcium concentrations. Magnesium ions do not displace the tightly bound calcium. It is suggested that these specific
 calcium binding sites are involved in platelet aggregation.