
A fraction which competes with intact platelets for interaction with collagen was isolated from human platelets by Sepharose collagen (SC) affinity columns, followed by lysis with a nonionic detergent and extensive wash with water (treated SC columns), reducing the columns' capacity to subsequently bind platelets and induce serotonin release. This fraction was proportional to the number of platelets that had been applied to SC columns. Treated SC columns could be partially regenerated with solutions of high ionic strength (1 M NaCl or Tris-3MCl) and most effectively with 0.3% sodium dodecylsulfate (SDS), but not with 5% urea, 15% ethanol, or 15 Triton X-100, indicating an ionic interaction. A fraction eluted with SDS from treated SC columns manifested receptor activity when rebound to collagen; it caused a dose-dependent decline in interaction of the collagen with intact platelets, as measured by binding and serotonin release. The receptor activity was sensitive to heat and was absorbed by an anionic exchange resin. When the membranes of intact platelets were labeled with 125I and lactoperoxidase, the derived receptor fraction contained a small proportion (about 3%) of the label.

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PLATELET ALPHA-ADRENERGIC RECEPTORS: DIRECT IDENTIFICATION BY [3H] DIIHYDROERGOCRYPTINE.
Platelet aggregation induced by epinephrine is an α-adrenergic response which is blocked by α-adrenergic antagonists. We now report the successful identification of human platelet α-adrenergic receptors (AR) by direct binding studies with the potent α-adrenergic antagonist [3H]dihydromegacryptine (DH). Specific binding to platelet AR was assayed by incubating DH with platelet lysates for 17°C at 25°C. Binding of DH had the specificity expected of binding to AR. The α-adrenergic agonist (+)-epinephrine increased (Δ) receptor, but also to a high density of platelet binding site, causing half-maximal inhibition of DH binding at a concentration (EC50) of 0.8 μM. A series of α-adrenergic agonists competed for the binding sites in an order of potency (4) epinephrine (E), norepinephrine (NE), and phenylephrine (PE). These results indicate that human platelet AR can be directly labeled and studied with DH.

INTERACTION OF PLATELETS WITH SEROTONIN AND DOPAMINE.
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Serotonin and dopamine are transported by platelets, and serotonin also stimulates platelets to change shape. Drug values for transport are around 1 μM for serotonin and 40 μM for dopamine. Both amines also enter platelets by diffusion. Antidepressant drugs (e.g. chlorimipramine; Lilly 110140) inhibit serotonin and dopamine uptake with equal potency and also block the stimulatory action of serotonin, but serotonin antagonists (e.g. metysergide; d-lysergic acid diethylamide) which are potent inhibitors of the serotonin-induced shape-change do not affect the transport of serotonin or dopamine. Binding studies with [3H]-serotonin show heterogeneity of receptors: one site has characteristics consistent with the uptake carrier, and another is selectively blocked by serotonin antagonists. We conclude that dopamine is transported into platelets by the serotonin carrier (although with a much lower affinity) and that a separate site mediates platelet stimulation by serotonin. The concept of platelets as models for serotonergic neurons in the central nervous system may be valid for serotonin but does not hold for dopamine.