To The Editor:

In the June 15, 1998 issue of Blood, Serrador et al report on redistribution of ezrin and moesin to the uropod of polarized T lymphoblasts, suggesting their role in establishing cell-cell contacts. The ERM (ezrin-radixin-moesin) family proteins colocalize in nonhematopoietic cells with actin filaments in surface projections, microvilli, microspikes, filopodia, ruffles, etc, where they function in regulated linkage of plasma membrane proteins with actin in the cytoskeleton. Cells contain soluble pools of ERM monomers, which are dormant due to intramolecular association of their N- and C-terminal regions. Phosphorylation and other activation reactions conformationally unmask binding sites and promote assembly of target-associated oligomeric ERM structures. Although ezrin is the most broadly expressed ERM protein, moesin is quantitatively dominant in leukocytes and is the only ERM protein in platelets.

When smooth surfaced circulating platelets are stimulated to participate in hemostasis, they undergo rapid cytoskeletal rearrangements, developing filopodia and ruffling lamellae. To better understand the role of ERM proteins in blood cells, we used established approaches to determine moesin localization in resting and thrombin-activated platelets.

Immunofluorescent microscopy showed moesin localized at the periphery of resting platelets with the central cytoplasmic cores essentially unstained (Fig 1A, first panel). One minute after thrombin addition, moesin became localized in newly formed filopodial and lamellipodial projections, and double staining showed filamentous actin also localized

![Fig 1. Moesin localization in resting and thrombin-treated platelets.](image-url)
The cytoskeleton fraction 7,8 (Fig 1B, lower left). Several membrane filament assembly and cross-linking, causing actin binding protein Thrombin initiates rapid rearrangements including peripheral actin filament assembly and cross-linking, causing actin binding protein (ABP), talin, moesin, α-actinin, and actin to become incorporated into the cytoskeleton fraction7,8 (Fig 1B, lower left). Several membrane skeletal proteins, including a subfraction of GPIIb/IIIa, also redistribute to the cytoskeletal fraction9 (Fig 1B, GPIIb blot). In contrast, moesin, which was found exclusively in the soluble fraction in resting platelets, redistributed to the membrane skeleton fraction, which is known to contain short actin filaments, vinculin, spectrin, and ABP9 (Fig 1B, moesin blot).

Quantitation showed that moesin redistribution to the membrane skeleton fraction was rapid, increasing dramatically in the first minute after thrombin addition, reaching maximal levels (18% of moesin molecules incorporated) after 2 to 3 minutes, and then decreasing (Fig 1C). Thus, incorporation of moesin molecules into the membrane skeleton coincides with early activation events that include formation of filopodial extensions and onset of platelet aggregation (not shown).

Although their tissue distributions differ, the ERM proteins are approximately 70% identical in sequence, structurally similar, and considered functionally equivalent.2,3 Ardis study of permeabilized cells demonstrated an absolute requirement for moesin (or ezrin or radixin) for actin filament assembly mediated by Rho family GTPases.10 Another response of platelet activation during platelet concentrate filtration. Several groups endeavored to find a causative role for negatively charged filters in hypotensive/ anaphylactoid reactions have reported activation of the coagulation cascade intrinsic pathway (contact phase) by measuring changes in bradykinin and/or kallikrein activity before and after filtration.2 Al-

References

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Dynamic Association of Moesin With the Membrane Skeleton of Thrombin-Activated Platelets

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