CORRESPONDENCE

EXPRESSON OF TARTRATE-RESISTANT ACID PHOSPHATASE

Letter to the Editor:

In their recent article on expression of tartrate-resistant acid phosphatase (TracP), Snipes et al detected TracP activity in monocyte-derived macrophages cultured for three days, but not in the primary monocytes. These data confirm previous findings by Radzun et al2 who observed TracP expression in “stimulated” monocytes, but not in normal peripheral blood monocytes.

What is puzzling in this article is the fact that induced U-937 cells remained TracP-negative. It is correct that untreated U-937 cells do not show the TracP band.3 However, when incubated with the phorbol ester TPA, U-937 cells clearly demonstrate TracP activity beginning on days 2 to 3 (depending on the concentration of the inducing agent) which increases over the following days as analysed by isoelectric focusing.4 As U-937 cells show an overall “monocytic phenotype” and acquire macrophage features upon induction of differentiation, the expression of TracP in U-937 cells would rather support the conclusions drawn by the authors referring to the relationship between monocytic/phagocytic cells and bone osteoclasts.

Finally, we do not agree with the statement that, “…the latter technique [gel electrophoresis] is relatively cumbersome”; at least, the improved technique of isoelectric focusing on horizontal polyacrylamide thin-layer gels is fast and easy to perform and gives consistent and reproducible results. Furthermore, isoenzyme analysis appears to be more sensitive in detecting TracP expression than cytochemical staining.5

H.G. DREXLER
The Royal Free Hospital
Department of Haematology
London NW3 2QG, UK

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We appreciate the comments of Dr Drexler regarding our recent publication in Blood.1 One of our main goals was to determine whether monocytes, monocyte-derived macrophages, or U937 cells could produce the isoenzyme of acid phosphatase (Band 5b or E2) found in bone tissue. Radzun and coworkers2 limited their investigation to the use of cytochemical staining. Our results suggest a good correlation between cytochemical staining and enzyme analysis.

Regarding the use of gel electrophoresis, there is no doubt that it is more difficult to perform than cytochemical staining. However, we agree with Dr Drexler about the increased specificity of information from gel electrophoresis, as we emphasized in our article.

We were intrigued to learn that phorbol-treated U937 cells express a tartrate-resistant acid phosphatase band and we await publication of these results. Our work was limited to exposure of U937 cells to 1,25(OH)2D3, which we have previously shown2 causes differentiation of U937 cells and facilitates their ability to release radiolabeled calcium from bone chips.4 The specific function of tartrate-resistant acid phosphatase is unknown, but it is not required for resorption of bone by phagocytic cells in vitro. Identification of conditions (eg, phorbol treatment) that allow U937 cells to express the tartrate-resistant acid phosphatase of bone further strengthens use of this cell line as a model for the study of osteoclast formation and function.5

M.S. COHEN
T.K. GRAY
R.C. DODD
R.G. SNIPES
University of North Carolina-Chapel Hill
Chapel Hill, NC
K-W. LAM
University of Texas at San Antonio
San Antonio, Texas

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Expression of tartrate-resistant acid phosphatase [letter]

HG Drexler