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The role of mast cell proteases in tumor angiogenesis

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Tumors are surrounded by infiltrating inflammatory cells including mast cells. However, the function of mast cells in neovascularization and tumor progression remains obscure. Initially, the expression of mouse mast cell proteases (mMCP)-4, mMCP-5, mMCP-6, mMCP-7, and carboxypeptidase A were analyzed during progression of chemically induced tumors in BALB/c mice. With the exception of mMCP-4, expression of these mast cell proteases increased with tumor progression. Additionally, the number of new blood vessels increased significantly in the early stage of tumor formation, while in the later stages an enlargement of existing blood vessels occurred. In order to understand the role of mast cell tryptases in angiogenesis, SVEC4-10 endothelial cells were cultured on Geltrex® with recombinant mMCP-6 or 7and tube formation was analyzed. The capacity of these tryptases to induce production of pro and anti-angiogenic cytokines/proteins was also investigated. rmMCP-6 and 7 were able to accelerate tube formation in SVEC4-10 cells. Co-cultivation of SVEC4-10 with P815 cells (mouse mastocytoma) also enhanced the process of tube formation. In the presence of these proteases, as observed by SEM, the SVEC4-10 cells penetrated into the gel. However, incubation with the proteases did not alter the expression or activity of metalloproteases. Furthermore, rmMCP-6 and rmMCP-7 are able to induce the differential expression of pro- and anti-angiogenic factors in SVEC4-10 cells. Therefore, both rmMCP-6 and rmMCP-7 can modulate angiogenesis; butrmMCP-7 is more efficient in inducing tube formation and in the production of angiogenic factors.

Biography

Maria Celia Jamur received her PhD in Cell Biology in 1986 from the Ribeirao Preto Medical School. She was a Post-doctoral Fellow at the National Institutes of Health, Bethesda, MD and was a Professor in the Department of Cell Biology at the Federal University of Parana, Curitiba, Brazil. Currently, she is a Professor in the Department of Cell and Molecular Biology and Pathogenic Bioagents at Ribeirao Preto Medical School. She has authored more than 75 publications and is serving as an editorial board member for several journals.

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