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Journal
Cancer Research, 72(8_Supplement)

ISSN
0008-5472

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Publication Date
2012-04-15

DOI
10.1158/1538-7445.am2012-5183

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Abstract 5183: Raster-image-correlation spectroscopy of paxillin-GFP-expressing breast cancer cell in vitro and in vivo

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DOI: 10.1158/1538-7445.AM2012-5183 Published April 2012

Article | Info & Metrics

Proceedings: AACR 103rd Annual Meeting 2012-- Mar 31-Apr 4, 2012; Chicago, IL

Abstract

Raster-image-correlation spectroscopy (RICS) is a noninvasive technique to detect and quantify events in the living cell, including concentrations of molecules and their diffusion coefficients. Any cell containing a fluorophore that can be imaged with a laser scanning microscope can be analyzed with RICS. We obtained RICS images with an Olympus FluoView FV1000 confocal microscope using Olympus FluoView software to acquire data and SimFCS software to perform RICS analysis. Paxillin is involved in the assembly of focal adhesions, which was linked to green fluorescent protein (GFP) for the current study. In this study, we describe RICS of paxillin-GFP expression in breast cancer cells (MDA-MB-231) in vitro and in vivo. Slow-moving membrane-bound paxillin proteins were measured in live breast cancer cells in vitro. Paxillin-GFP-expressing breast cancer cells (1×10^6) were injected in the epigastric cranials vein of the nude mouse. Paxillin-GFP-expressing breast cancer cells became attached to the inner vessel wall within 3 hours after injection. Rapidly-moving cytosolic paxillin-GFP molecules were imaged with RICS. With the ability to measure the molecular dynamics of paxillin in cancer cells in vitro and in vivo by RICS, we are now capable of studying the role of both slow-moving paxillin in the cell membrane and rapidly-moving cytosolic paxillin in cancer-cell behavior.

Citation Format: {Authors}. {Abstract title} [abstract]. In: Proceedings of the 103rd Annual Meeting of the American Association for Cancer Research; 2012 Mar 31-Apr 4; Chicago, IL. Philadelphia (PA): AACR; Cancer Res 2012;72(8 Suppl):Abstract nr 5183. doi:1538-7445.AM2012-5183

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April 2012
Volume 72, Issue 8 Supplement
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