Press release
15th October 2012

CYTOO's 2D+ Cell Culture Platform reproduces *in vivo* conditions to study tumor cell motility

New perspectives in oncology, genetics and drug screening.

Grenoble, France, 15th October 2012 – CYTOO S.A., a life science systems & tools company that offers solutions for cell-based assays and High Content Screening (HCS), announces today new results that demonstrate the ability of the Company's 2D+ Cell Culture Platform to reproduce *in vivo* conditions to analyze tumor cell motility and in particular to study fibrillar ECM-dependent tumor cell-macrophage pairing and migration involved in tumor metastasis. These results have recently been published in the first issue of the journal *IntraVital*, edited by Landes Bioscience.

The CYTOO 2D+ Cell Culture Platform is based on the use of adhesive micropatterns to guide cell architecture and behavior in culture, in contrast to current 2D cell culture where cells spread and move in an uncontrolled manner. By defining the 2D topology of cell adhesion, 2D+ Technology enables the fine control of the spreading and 3D shape of cultured cells in single- or multi-cellular configurations resulting in control of cell contractility, cell polarity, organelle positioning, or cell division axis.

Researchers Ved Sharma, Brian Beaty, Antonia Patsialou, Dianne Cox, John Condeelis and Robert Eddy from the Albert Einstein College of Medicine, NY, with collaborators Huiping Liu from University of Chicago and Michael Clarke at Stamford School of Medicine, used CYTOOchips™ *Motility* to reconstitute an *in vitro* model of fibrillar tumor extracellular matrix (ECM). The micropatterned 1D adhesive tracks were used to mimic the linear ECM fibers of the tumor microenvironment. Figures below show *in vivo* streaming migration and 1D cell migration, both presenting tumor cells alternating with macrophages.

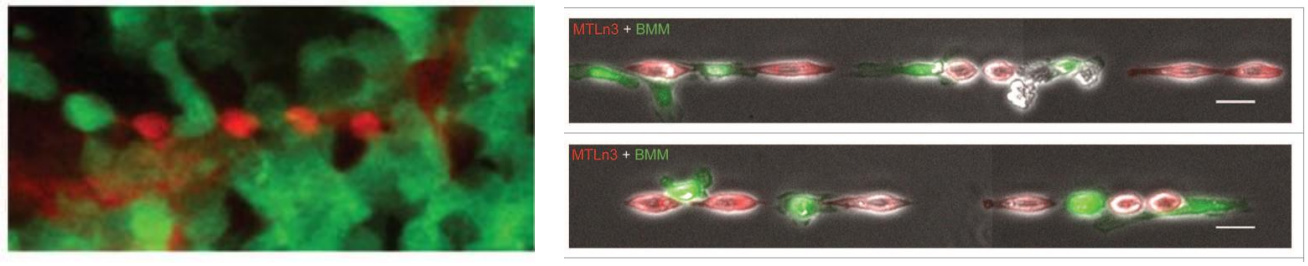

Figure 1: Modelling the fibrillar ECM of the tumor microenvironment using CYTOO's 1D micropatterned adhesive substrates

Courtesy of Landes Bioscience, reproduced from IntraVital 2012;1(1):77-85.

(Left: *in vivo* imaging and Right: *in vitro* imaging on micropatterned 1D tracks)

Similar morphologies, behaviors and motility rates were observed *in vivo* and on micropatterned lines. In particular, tumor cell velocity on 1D substrates was in agreement with the high velocity values of tumor

cells on ECM fibers observed *in vivo*. In contrast, on classical 2D substrates, motility rates were ten fold lower than what can be observed *in vivo*. On micropatterned lines, the authors could also reproduce the assembly of alternating tumor cells and macrophages identified as streams *in vivo*, the ability of macrophages to enhance protrusion velocity and average velocity of tumor cells and showed that this effect was dependent on an intact paracrine loop without any additional need of co-factors.

The authors concluded that their "1D micropatterned substrate model more closely approximates the fibrillar nature of the *in vivo* tumor microenvironment and offers a simple and more appropriate substrate for detailed analyses of cell protrusion, cell-cell pairing and migration than conventional 2D substrates. The data presented here validates the use of micropatterned 1D adhesive substrates to study the fibrillar ECM found within the tumor microenvironment."

Co-author Robert Eddy commented "It was a surprise that tumor cell and macrophage streaming behavior we observe in the highly complex tumor microenvironment was self-organizing and required no other extracellular cues on 1D adhesive substrates."

References

Sharma V, Beaty B, Patsialou A, et al. Reconstitution of in vivo macrophage-tumor cell pairing and streaming motility on one-dimensional micro-patterned substrates. *IntraVital*. 2012;1(1):77-85.

About CYTOO S.A.

CYTOO S.A. is a distinctive life sciences systems & tools company that offers a disruptive solution that brings robustness, sensitivity and powerful quantification to cell-based assays and High Content Screening (HCS). The Company's 2D+ Cell Culture Platform based on adhesive micropatterns offers control over the cells' microenvironment, leading to normalized cell morphology and behavior. The technology allows the optimization or resurrection of complex or difficult cell-based assays and opens possibilities of innovative assay development.

For more information about the complete product portfolio, visit www.cytoo.com

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