Angiotropism and Extravascular Migratory Metastasis in Cutaneous and Uveal Melanoma Progression in a Zebrafish Model

Giulia Fornabaio ^{1,2,3}, Raymond L. Barnhill ^{4,5}, Claire Lugassy ², Laurent A. Bentolila ^{6,7}, Nathalie Cassoux^{5,8}, Sergio Roman-Roman ², Samar Alsafadi^{2,*}, Filippo Del Bene^{1,2,*}

* Correspondence to: samar.alsafadi@curie.fr, filippo.del-bene@curie.fr

¹Institut Curie, PSL Research University, Inserm U934, CNRS UMR315 F-75005, Paris, France ²Institut Curie, PSL Research University, Department of Translational Research, F-75005, Paris, France ³Sorbonne Universités, UPMC University Paris 6, CNRS UMR 3215, INSERM U934, F-75005, Paris, France

⁴ Institut Curie, PSL Research University, Department of Pathology, F-75005, Paris, France

⁵ Faculty of Medicine, University of Paris Réné Descartes, F-75006 Paris, France

⁶California NanoSystems Institute, Los Angeles, CA, 90095, USA

⁷ Department of Chemistry and Biochemistry, University of California, Los Angeles, CA, 90095, USA

⁸ Institut Curie, PSL Research University, Department of Opthalmology, F-75005, Paris, France.

Supplementary material legends

Supplementary Video S1. Video showing EVMM of C8161-GFP cutaneous melanoma cells co-cultured with HUVEC endothelial cells (24 hour video, 20x dry objective, acquisition time: 15 minutes).

Supplementary Video S2. Video showing EVMM of OMM 2.3-GFP uveal melanoma cells co-cultured with HUVEC endothelial cells (24 hour video, 20x dry objective, acquisition time: 15 minutes).

Supplementary Video S3. Video showing EVMM of OMM 2.5-GFP uveal melanoma cells co-cultured with HUVEC endothelial cells (24 hour video, 20x dry objective, acquisition time: 15 minutes).

Supplementary Image S4. Other examples of angiotropic cutaneous melanoma cells cuffing the vessels of zebrafish embryos. (A) A 30 hpi embryo, imaged with a 25x oil objective, using a Zeiss LSM 700 confocal microscope. (B) A 30 hpi embryo, imaged with a 40x water objective, using a Zeiss LSM 700 confocal microscope. (C) and (D) 4 dpi embryos, imaged with a 63x water objective, using a Zeiss LSM 880 confocal microscope. (A), (B), (C) and (D) white bar= 20 μ m, white arrows= angiotropic cells, green= melanoma cells, red= zebrafish blood vessels.

Supplementary Video S5. Video showing an angiotropic cutaneous melanoma cell cuffing a vessel (25x oil objective, 25 minute acquisition, 10 hour video, 30 hpi embryo).

Supplementary Video S6. A zoomed-in video of angiotropic cell of Supplement S5.

Supplementary Video S7. 3D reconstruction of the video in Supplement S6 (obtained using the software Bitplane-Imaris).

Supplementary Video S8. Video showing angiotropic uveal melanoma cells attached to the external surface of vessels (40x water objective, 20 minute acquisition, 8 hour video, 30 hpi embryo).

Supplementary Video S9. A zoomed-in video of angiotropic cells of Supplement S8.



Supplementary figure S4