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Walter Brendel Zentrum München

Intravital Imaging and its Applications and Pitfalls

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Chair of Gerbi IVM workgroup

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Vacuum chamber

HHS Public Access
Author manuscript
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Stabilized Imaging of Immune Surveillance in the Mouse Lung

Mark R. Looney[1,2,5], **Emily E. Thornton**[3,5], **Debasish Sen**[3], **Wayne J. Lamm**[4], **Robb W. Glenny**[4], and **Matthew F. Krummel**[3]

[1]Department of Medicine, University of California, San Francisco

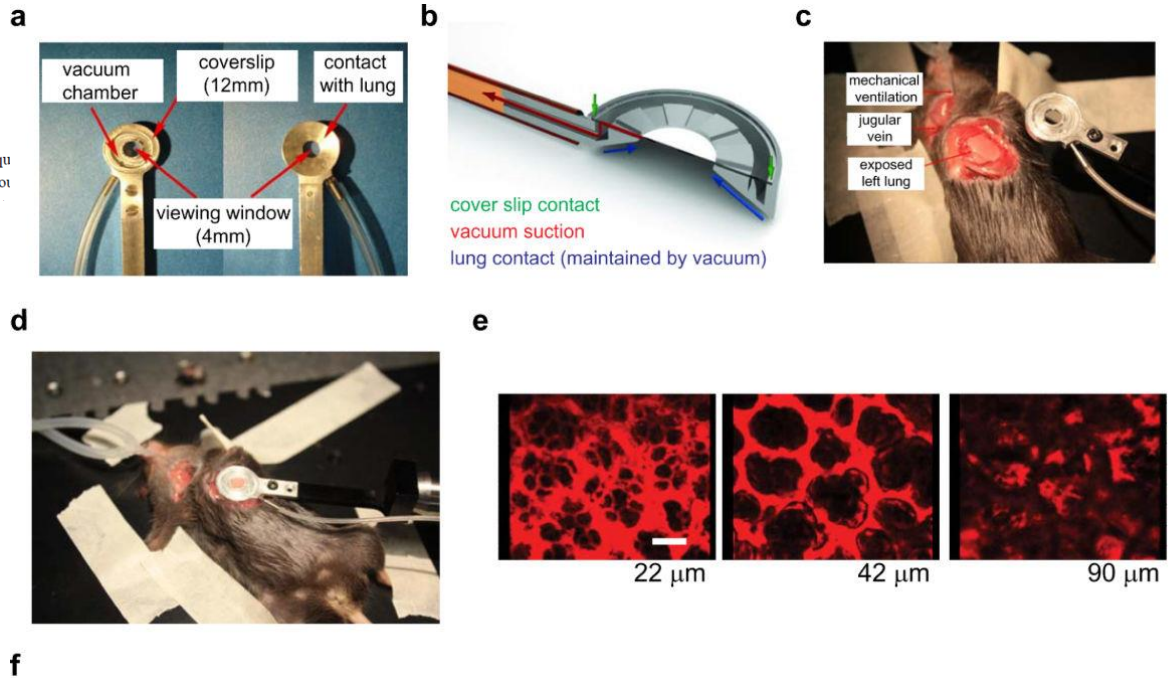
[2]Department of Laboratory Medicine, University of California, San Francisco

[3]Department of Pathology, University of California, San Francisco

[4]Department of Medicine, University of Washington

Abstract

Real-time imaging of cellular and sub-cellular dynamics in vascularized organs requ
resolution, image-registration, and demonstrably intact physiology to be simultaneou



VivoFollow – real-time offset correction system

Journal of Immunological Methods 438 (2016) 35–41

Contents lists available at ScienceDirect

Journal of Immunological Methods

journal homepage: www.elsevier.com/locate/jim

Research paper

Real-time tissue offset correction system for intravital multiphoton microscopy☆

Mykhailo Vladymyrov [a,*], Jun Abe [b], Federica Moalli [b], Jens V. Stein [b], Akitaka Ariga [a]

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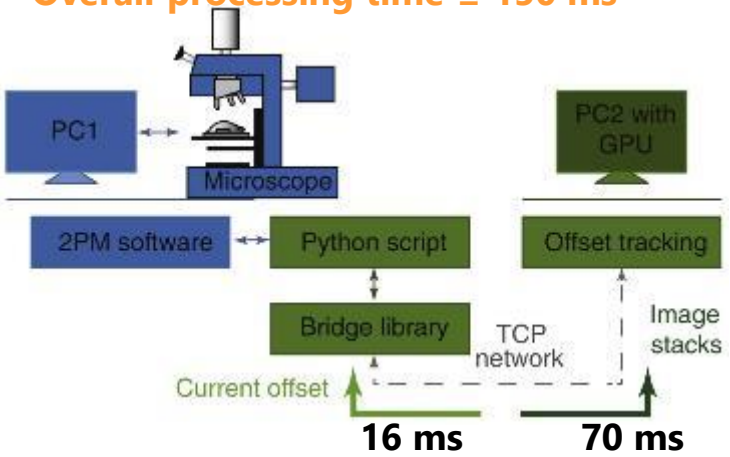
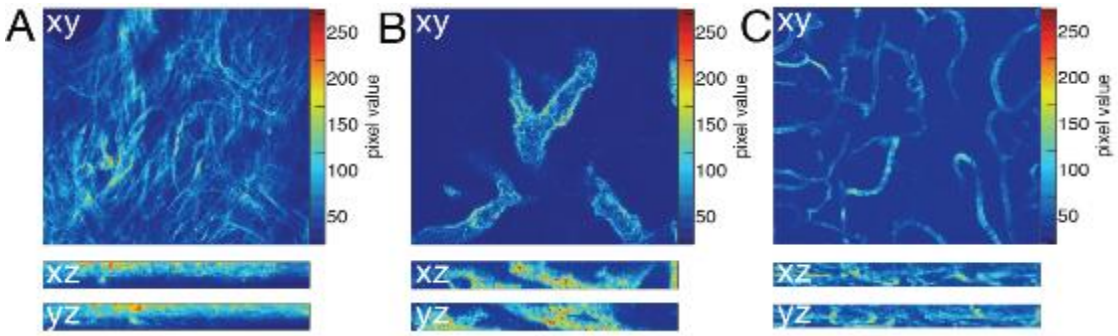
[b] Theodor Kocher Institute, University of Bern, Freiestrasse 1, 3012 Bern, Switzerland

ARTICLE INFO ABSTRACT

Overall processing time ≤ 150 ms





SHG collagen layer HEV in the LN Other BVs

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VivoFollow: following the RoI

Max Planck Institute of Biochemistry

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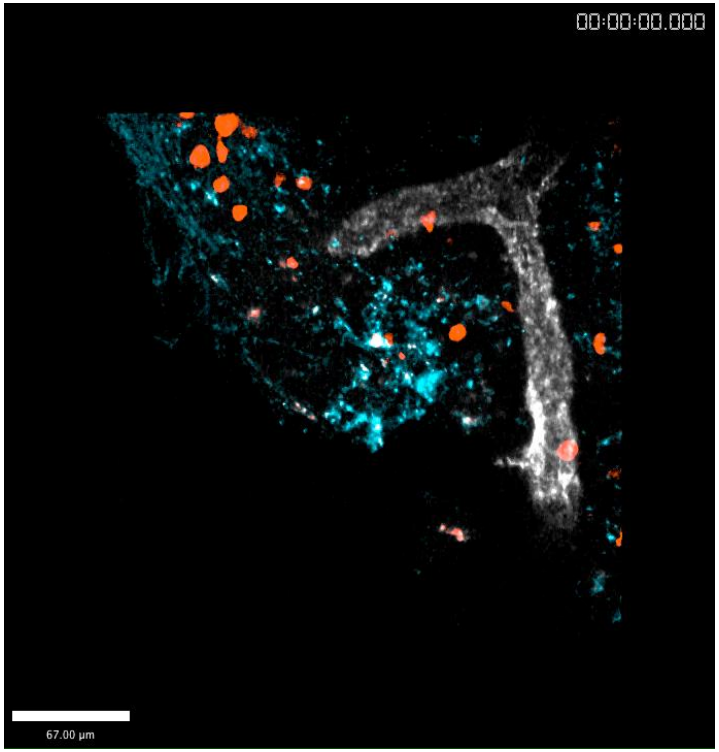
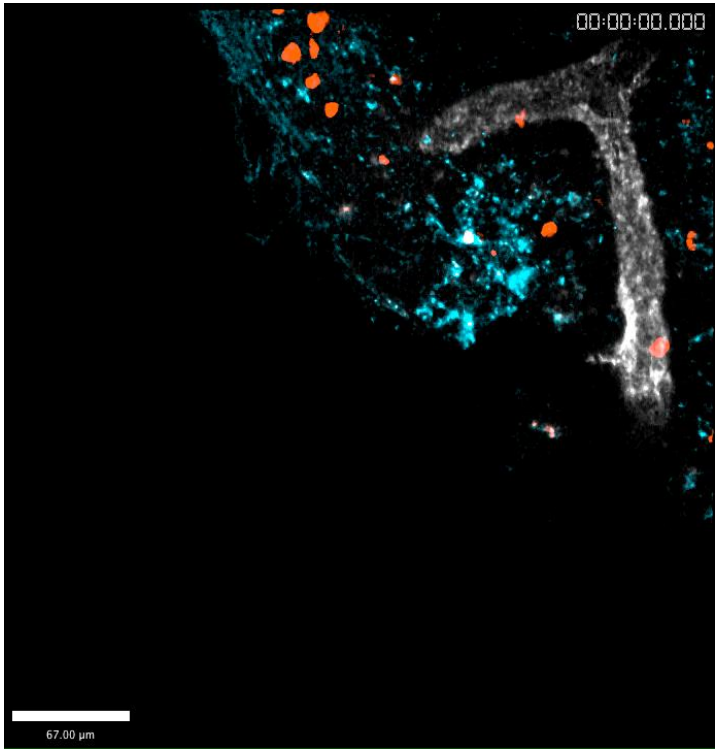
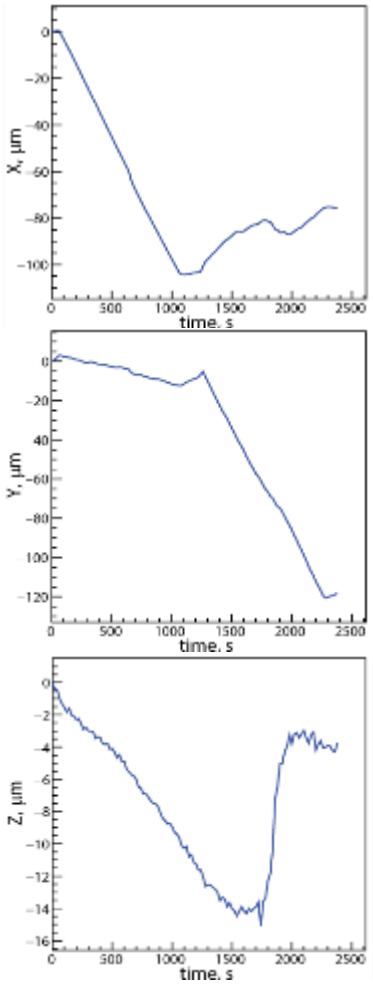


Fixed PLN with correction

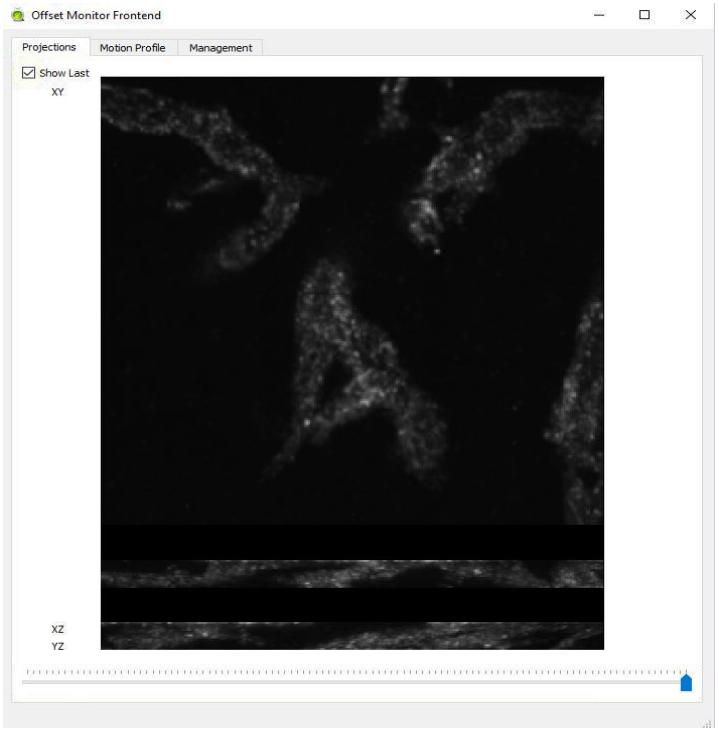


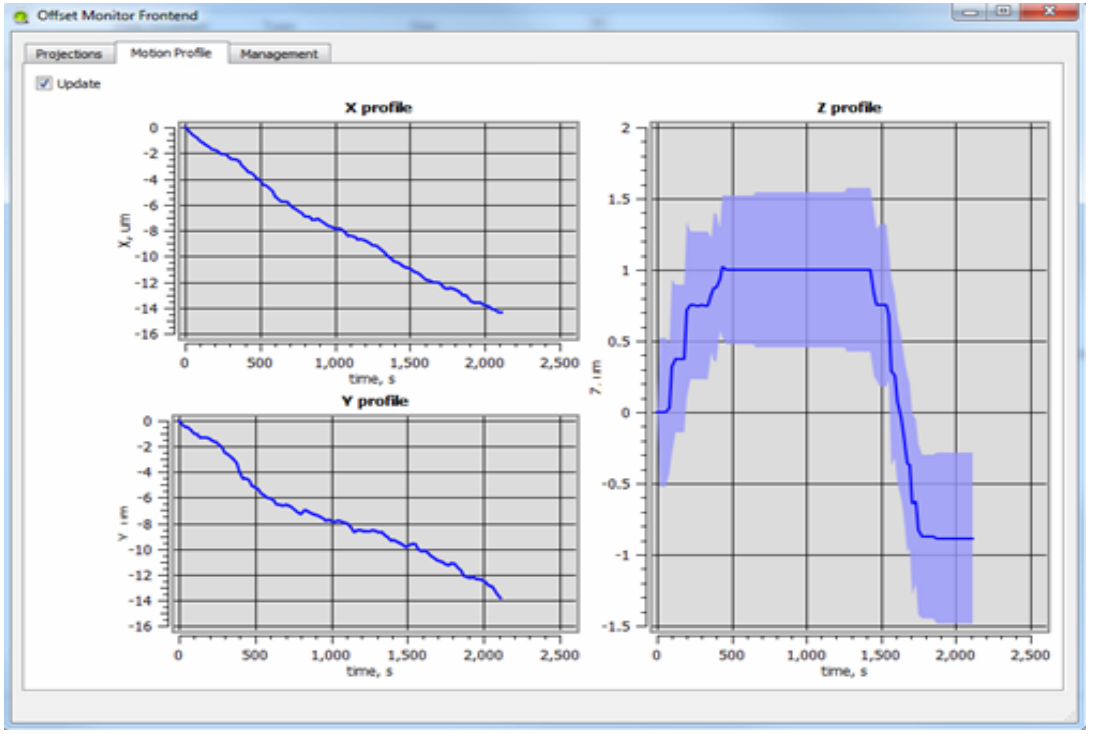
Restored by stage position



Vladymyrov M, Abe J, Moalli F, Stein JV, Ariga A. Real-time tissue offset correction system for intravital multiphoton microscopy. *J Immunol Methods.* (2016) **438**:35–41. doi: 10.1016/j.jim.2016.08.004

Real-time monitoring of the drift





Vladymyrov M, Abe J, Moalli F, Stein JV, Ariga A. Real-time tissue offset correction system for intravital multiphoton microscopy. *J Immunol Methods.* (2016) **438**:35–41. doi: 10.1016/j.jim.2016.08.004

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VivoFollow: Drift correction software application

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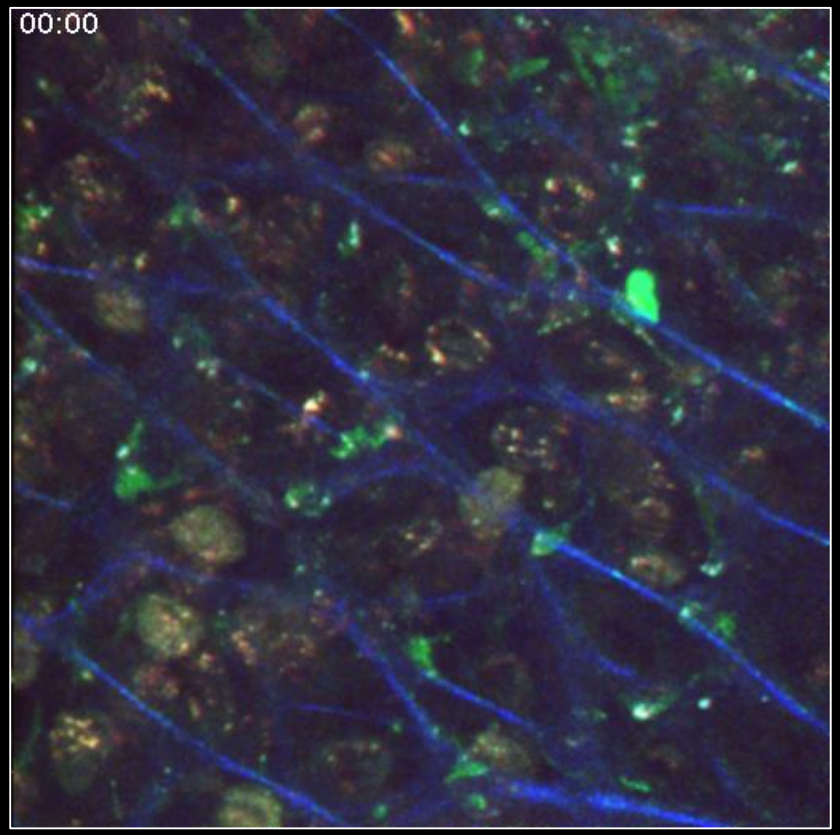
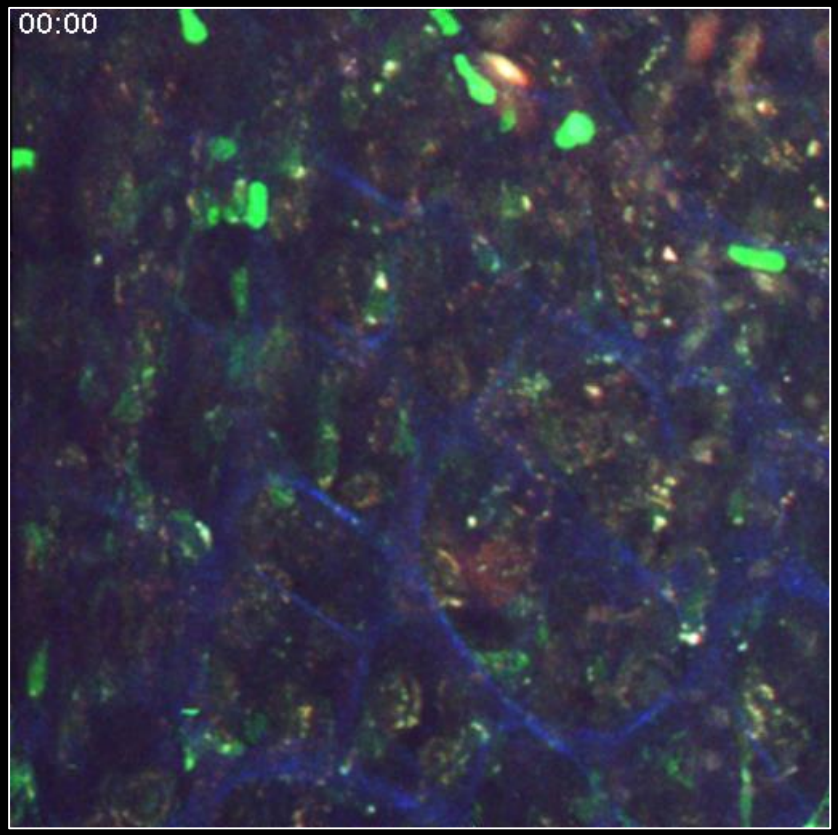
Stomach

No drift correction



Drift correction with VivoFollow



Ishikawa-Ankerhold, et al, 2024. Novel multiphoton intravital imaging enables real time-study of Helicobacter pylori interaction with neutrophils and macrophages in the mouse stomach. (2024) PLOS Pathogens 20(9): e1012580**.**

Protocol: step by step of VivoFollow application

jove

Multiphoton Intravital Imaging for Monitoring Leukocyte Recruitment during Arteriogenesis in a Murine Hindlimb Model

Manuel Lasch[1,2,3], **Mykhailo Vladymyrov**[4], **Dominic van den Heuvel**[1,5], **Philipp Götz**[1,3], **Elisabeth Deindl**[1,3], **Hellen Ishikawa-Ankerhold**[1,5]

[1] Walter-Brendel-Centre of Experimental Medicine, University Hospital, Ludwig-Maximilians-Universität München [2] Department of Otorhinolaryngology, Head & Neck Surgery, University Hospital, Ludwig-Maximilians-Universität München [3] Biomedical Center, Institute of Cardiovascular Physiology and Pathophysiology, Faculty of Medicine, Ludwig-Maximilians-Universität München [4] TKI, University of Bern [5] Department of Internal Medicine I and Cardiology, University Hospital, Ludwig-Maximilians-Universität München

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Citation

Abstract

Arteriogenesis strongly depends on leukocyte and platelet recruitment to the perivascular space of growing collateral vessels. The standard approach for analyzing collateral arteries and leukocytes in arteriogenesis is *ex vivo* (immuno-) histological

Improved version of VivoFollow with better z-drift correction

frontiers in Physics

METHODS
published: 17 January 2020
doi: 10.3389/fphy.2019.00222

VivoFollow 2: Distortion-Free Multiphoton Intravital Imaging

Mykhailo Vladymyrov[1,2,3], Neda Haghayegh Jahromi[2†], Elisa Kaba[2], Britta Engelhardt[2] and Akitaka Ariga[1]*

[1] Laboratory for High Energy Physics (LHEP), Albert Einstein Center for Fundamental Physics, University of Bern, Bern, Switzerland, [2] Theodor Kocher Institute, University of Bern, Bern, Switzerland, [3] Science IT Support, Mathematical Institute, University of Bern, Bern, Switzerland

Intravital multiphoton microscopy has become one of the central tools used in the investigation of dynamic cellular activity and function in living animals under nearly

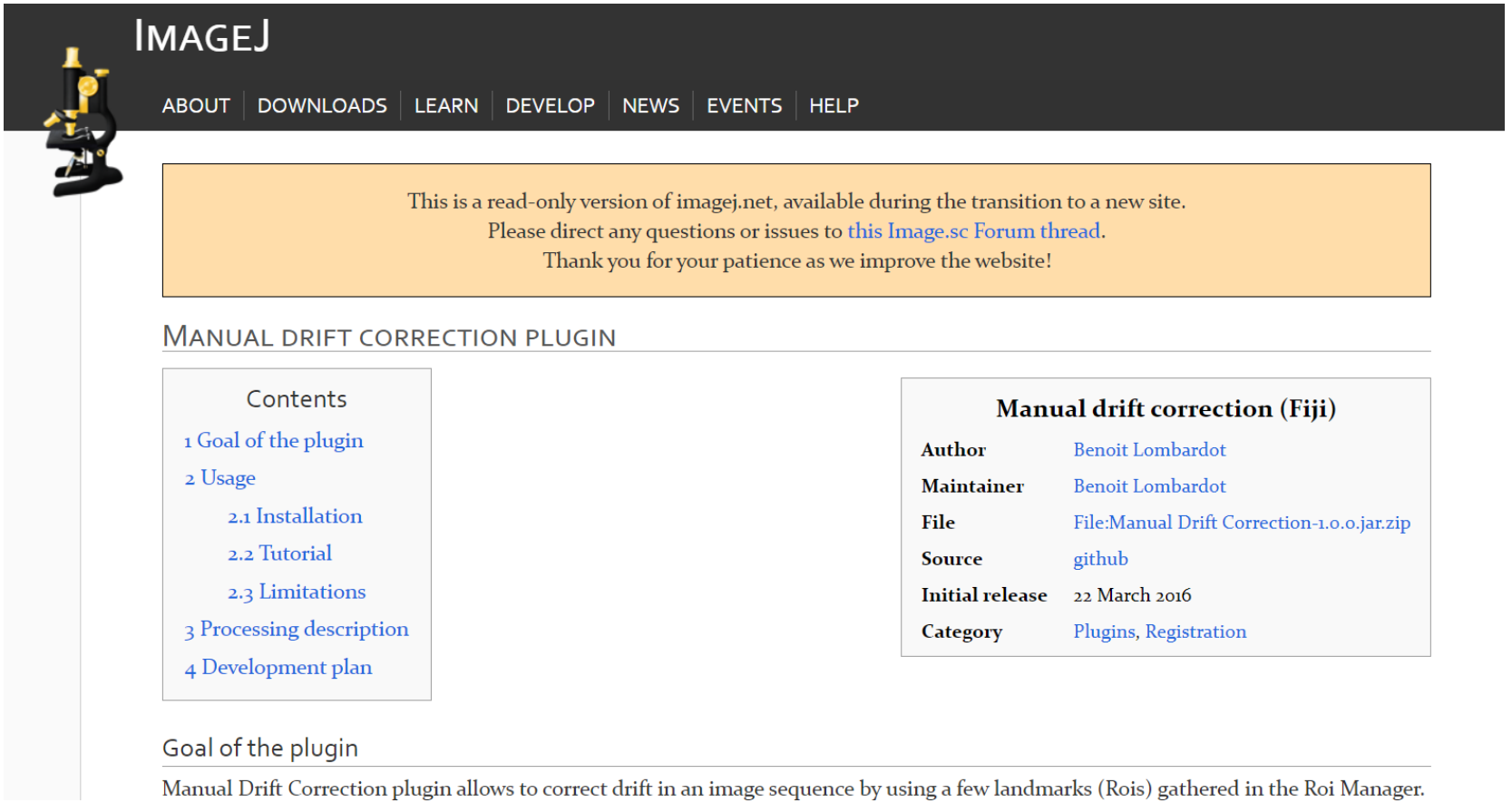
Please if you would like to try this live drift correction software VivoFollow
First contact me: hellen.Ishikawa-ankerhold@med.uni-muenchen.de

Imaris BITPLANE: Live imaging drift correction

4th Day of intravital microscopy
13.11.2024, Leuven, BE

https://www.youtube.com/watch?v=-kKAMN3kh34

Image J:
Live imaging drift correction



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Please direct any questions or issues to this Image.sc Forum thread.
Thank you for your patience as we improve the website!

MANUAL DRIFT CORRECTION PLUGIN

Contents

1 Goal of the plugin
2 Usage
2.1 Installation
2.2 Tutorial
2.3 Limitations
3 Processing description
4 Development plan

Manual drift correction (Fiji)

Author	Benoit Lombardot
Maintainer	Benoit Lombardot
File	File:Manual Drift Correction-1.0.0.jar.zip
Source	github
Initial release	22 March 2016
Category	Plugins, Registration

Goal of the plugin

Manual Drift Correction plugin allows to correct drift in an image sequence by using a few landmarks (Rois) gathered in the Roi Manager.

Reference for heart drift

Minimizing motion artifacts in Intravital Microscopy using the sedative effect of Dexmedetomidine

Kim et al., Microscopy & Microanalysis, ,vol 28, Issue 5,1 2022

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Holders: In vivo models established in our IVM facility

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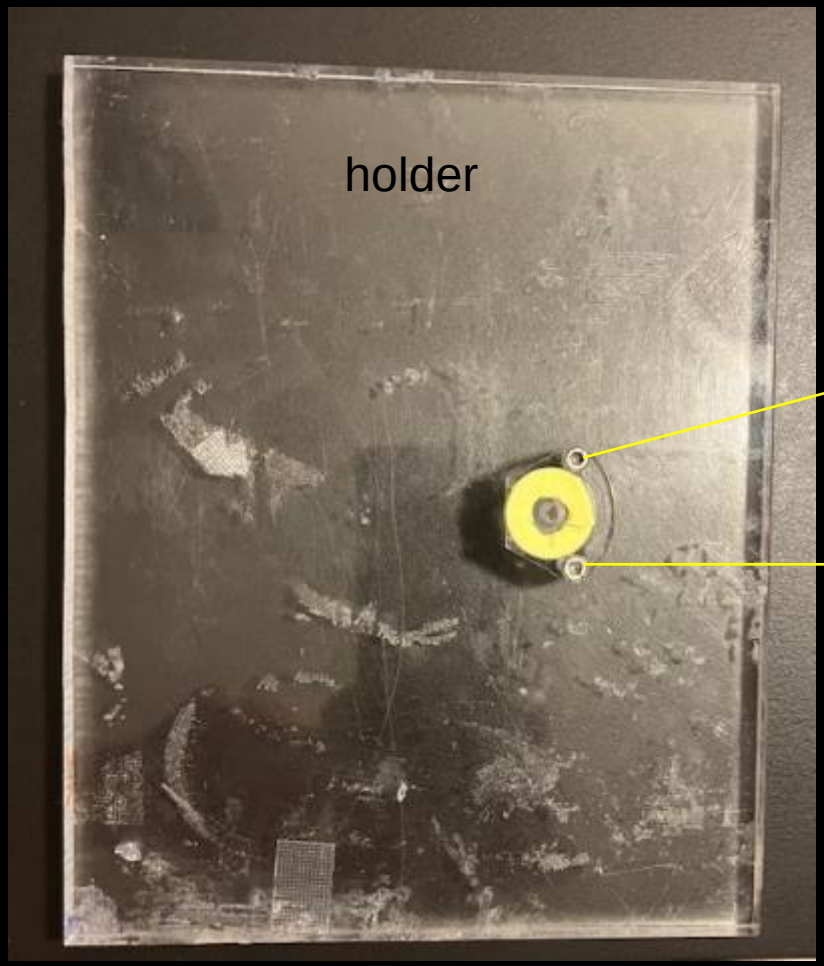
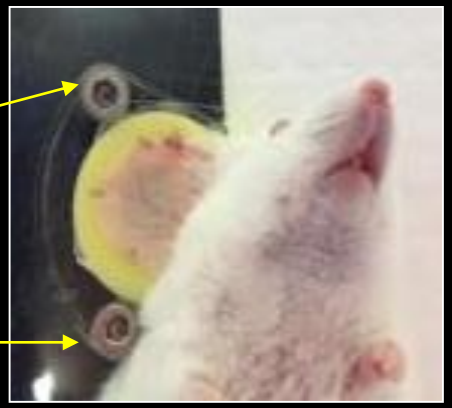
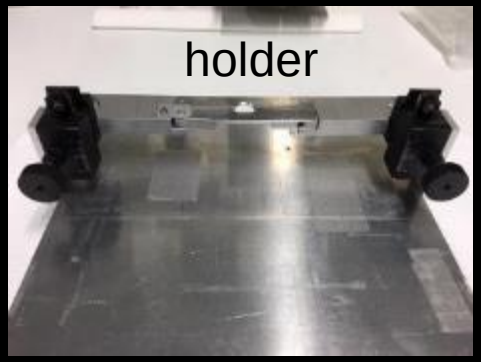


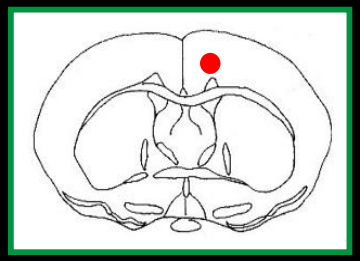
Ear (skin) model



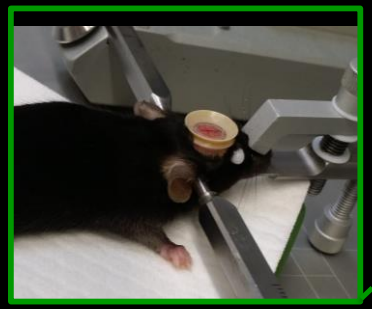
Brain model (tumor growth and metastasis)



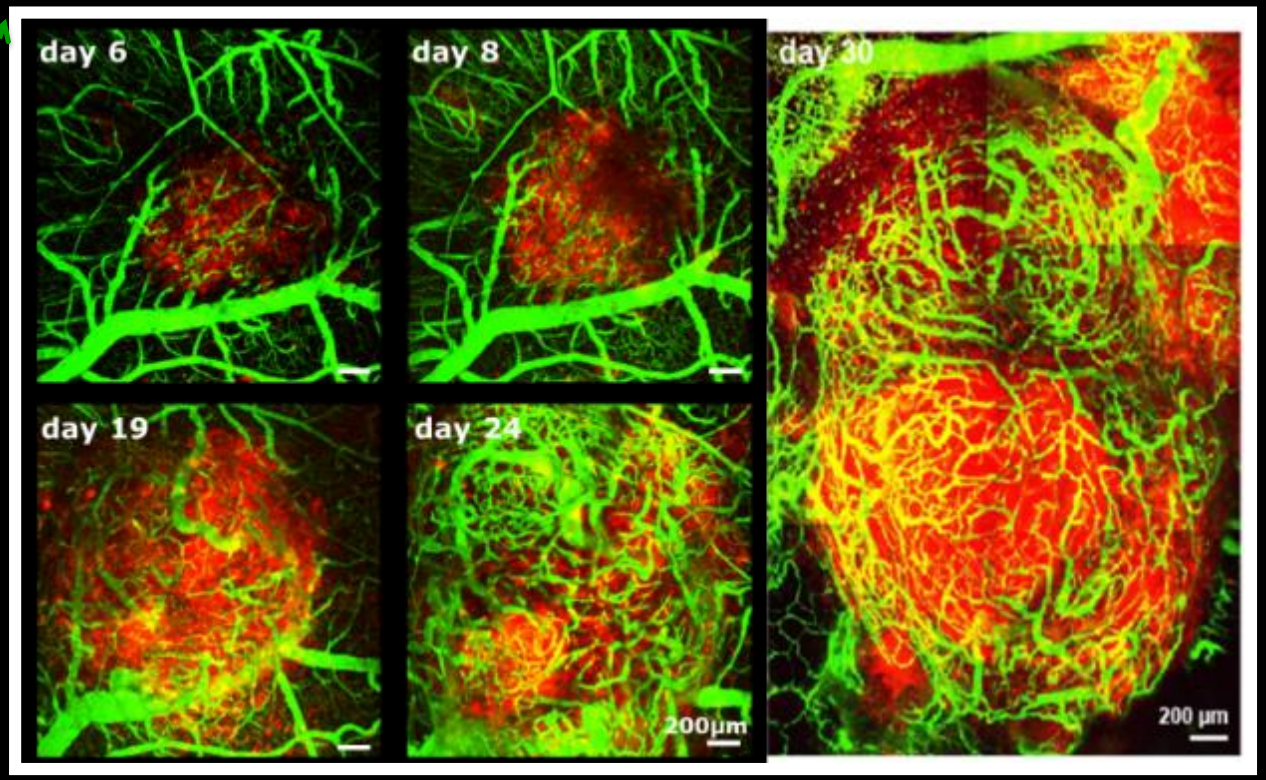
Stereotactic tumor cell implantation



Chronic cranial window

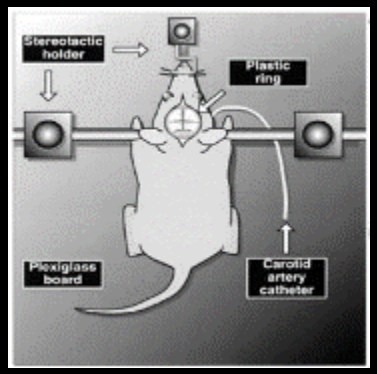


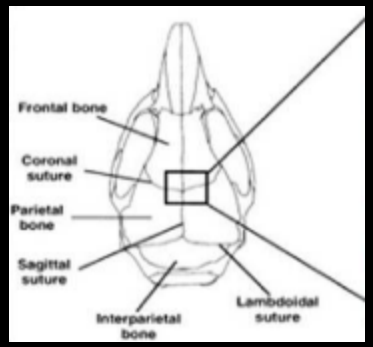
Glioblastoma

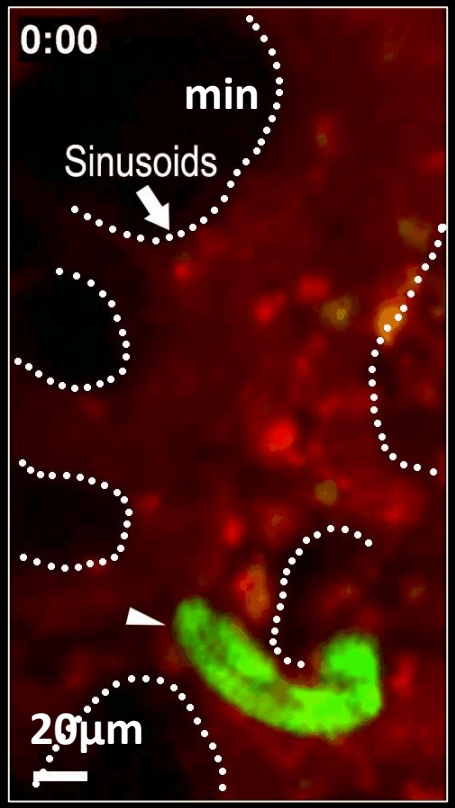


Von Baumgarten et al, Clin Canc Res 2011

Bone marrow vasculature: the birth of circulating platelets





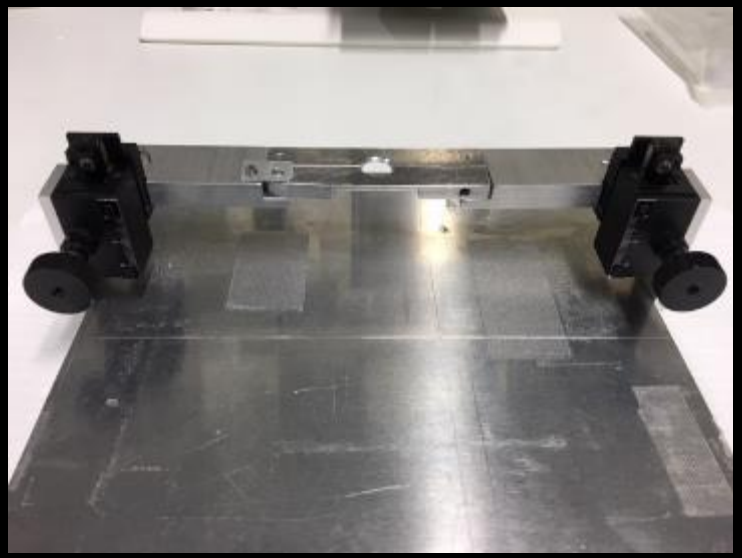


Zhang et al., 2012

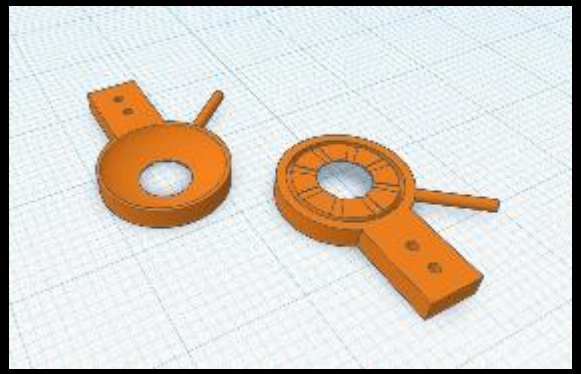
Megakaryocytes Blood plasma

Holders: applied to diverse mouse organs/tissues

Vacuum chamber



3D printing



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3D Printing Technology: vacuum chamber Designs

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max-planck-institut für biochemie

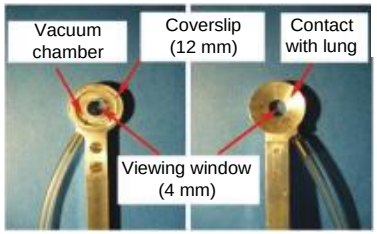
3D printing technology

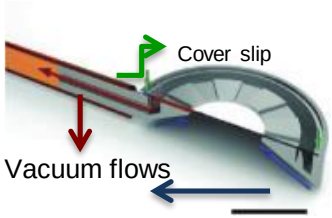
MiCraft Ultra 50

Building size (mm): 57x32x120

XY Resolution: 30µm

Holder with suction ring





Lung model: Looney et al. (2011) Nat. Methods Vol.8, No.1

FreeCAD/Inventor-Software