

Lung Anatomy + Particle Deposition (lapd) Mouse Archive for Modeling and Computational Toxicology

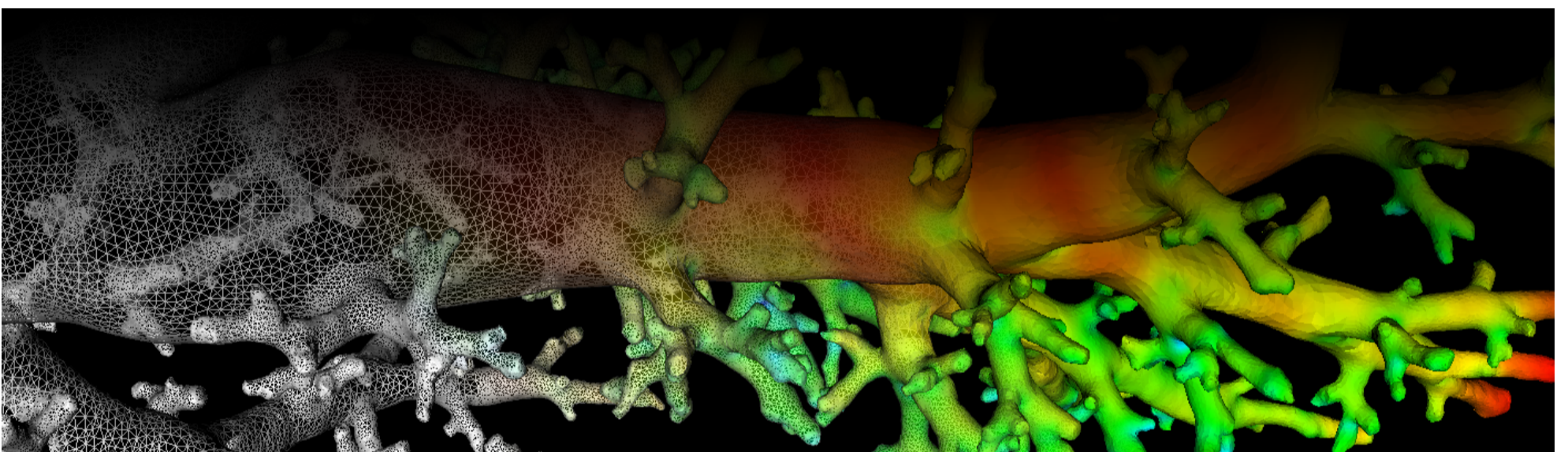
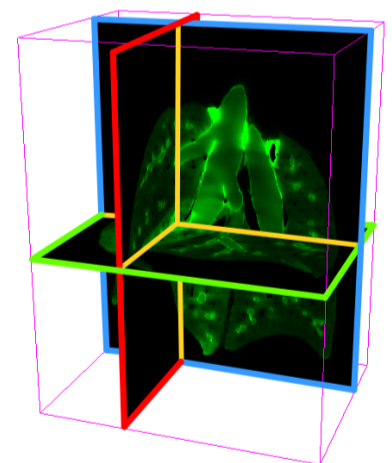


Image volume *_Autofluorescent*.mha

Autofluorescent image volume showing anatomical structures.

The autofluorescent color channel of the imaging cryomicrotome shows anatomical structures such as the lungs, fissures, airway walls etc. ([Fig.1](#)). The full resolution image *_Autofluorescent.mha* as well as versions downsampled by by factor 2 and 4 in each dimension are stored in files *_AutofluorescentSub2.mha* and *_AutofluorescentSub4.mha*, respectively.



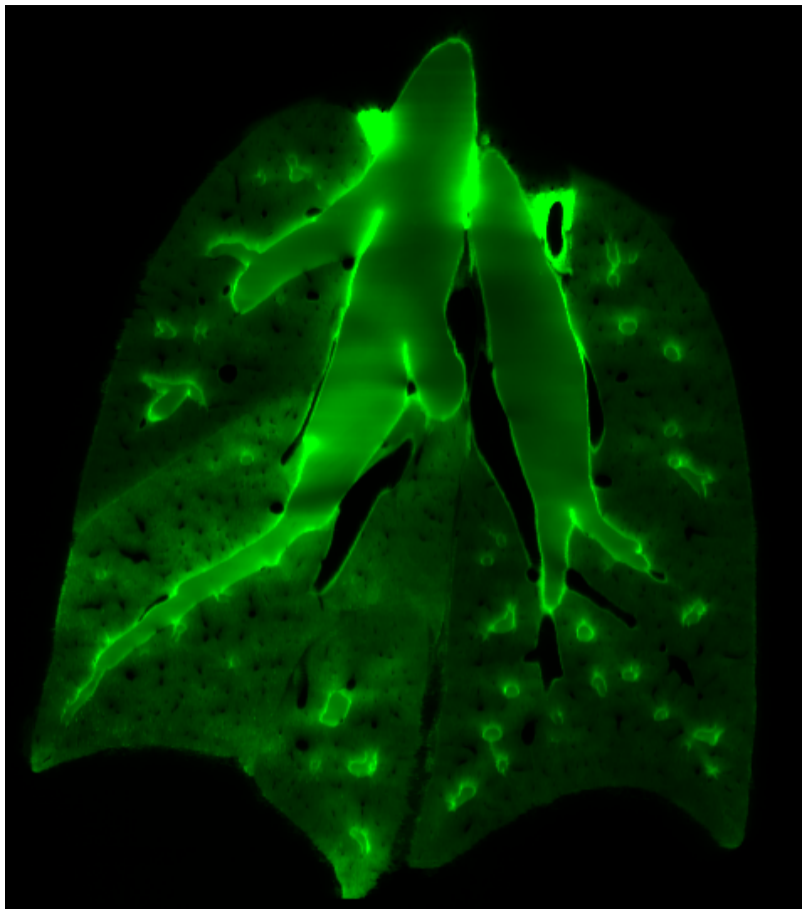


Fig. 1: Coronal image slice of autofluorescent image volume showing anatomical structures.

Starting with the [Raw Cryomicotome Data](#), the individual autofluorescent channel image slices are converted, assembled into an image volume, artifacts are removed, and the volume is cropped to the field of view containing only the lung and trachea. The size and resolution of the resulting image volumes `*_Autofluorescent.mha` vary slightly from mouse to mouse, but the full resolution images have a resolution in the range of $9 \times 9 \times 9 \mu\text{m}$ and size in the range of $2000 \times 2000 \times 2500$ voxels, resulting in an image volume $>10\text{GB}$ per mouse when stored with 16 bit precision per voxel. The size and spacing is identical to their corresponding aerosol deposition volumes [* Aerosol*.mha](#), [* AerosolDeconv*.mha](#) and [* AerosolNormalized*.mha](#).

Code Example

This examples shows how to read and write a volumetric image such as `*_Autofluorescent.mha` using C++ and ITK.

[readWriteImage.cpp](#) hosted with ❤ by [GitHub](#)

[view raw](#)

```
/*
Example how to read and write intensity images used in lapdMouse project using ITK.

```bash
./readWriteImage m01_AerosolSub2.mha out.mha
```
*/

// ITK includes
#include <itkImage.h>
#include <itkImageFileReader.h>
#include <itkImageFileWriter.h>

int main(int argc, char**argv)
{
    if (argc!=3)
    {
        std::cerr << "Usage: " << argv[0] << " input output" << std::endl;
        return -1;
    }

    // typedef for volumetric images used in lapdMouse project
    typedef itk::Image< float, 3 > ImageType;
```

Related Data Structures

[Raw Cryomicotome Data](#) | [* Aerosol*.mha](#) | [* AerosolDeconv*.mha](#) | [* AerosolNormalized*.mha](#)

Related Code Examples

[readWriteImage.cpp](#) | [imageLabelStatistics.cpp](#)

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2018 r2b