



# LIFEx v7.4.0

## Announcement

— LIFEx —

C. Nioche, F. Orlhac, I. Buvat



# What is new?



LIFEx version 7.4.0

Last update of document: 2023/06/26



# LIFEx v7.4.0

## Annoucement

— LIFEx —

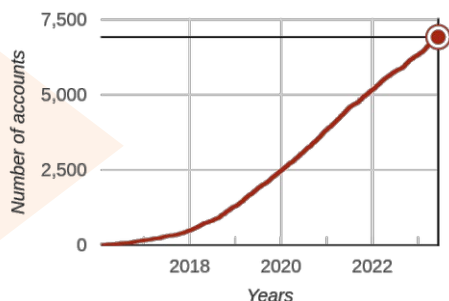
# Acknowledgements

Dear LIFEx users,

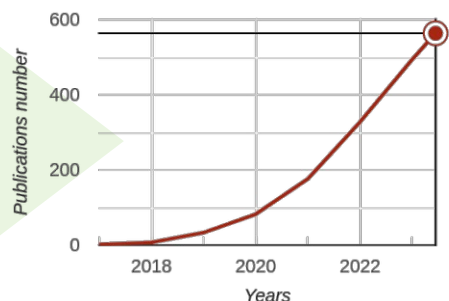
We are pleased to announce the release of **LIFEx v7.4.0**

We would like to take this opportunity [to thank all 7.000 LIFEx users](#) for their feedback and relevant suggestions. We took into account your comments to enhance the software and produce this version. We hope you will enjoy it.

Do not hesitate to download this new release and replace your old LIFEx version. Your feedback will always be welcome.



Evolution of the number of accounts  
(from our site web)



Evolution of Publications referencing  
LIFEx (from PubMed)

**LIFEx is free of charge.**

Please help us to keep it free by always quoting the LIFEx reference: (see below)

Please note that the correct reference to be cited is:

C Nioche, F Orlhac, S Boughdad, S Reuzé, J Goya-Outi, C Robert, C Pellot-Barakat, M Soussan, F Frouin, and I Buvat. LIFEx: a freeware for radiomic feature calculation in multimodality imaging to accelerate advances in the characterization of tumor heterogeneity. Cancer Research 2018; 78(16):4786-4789



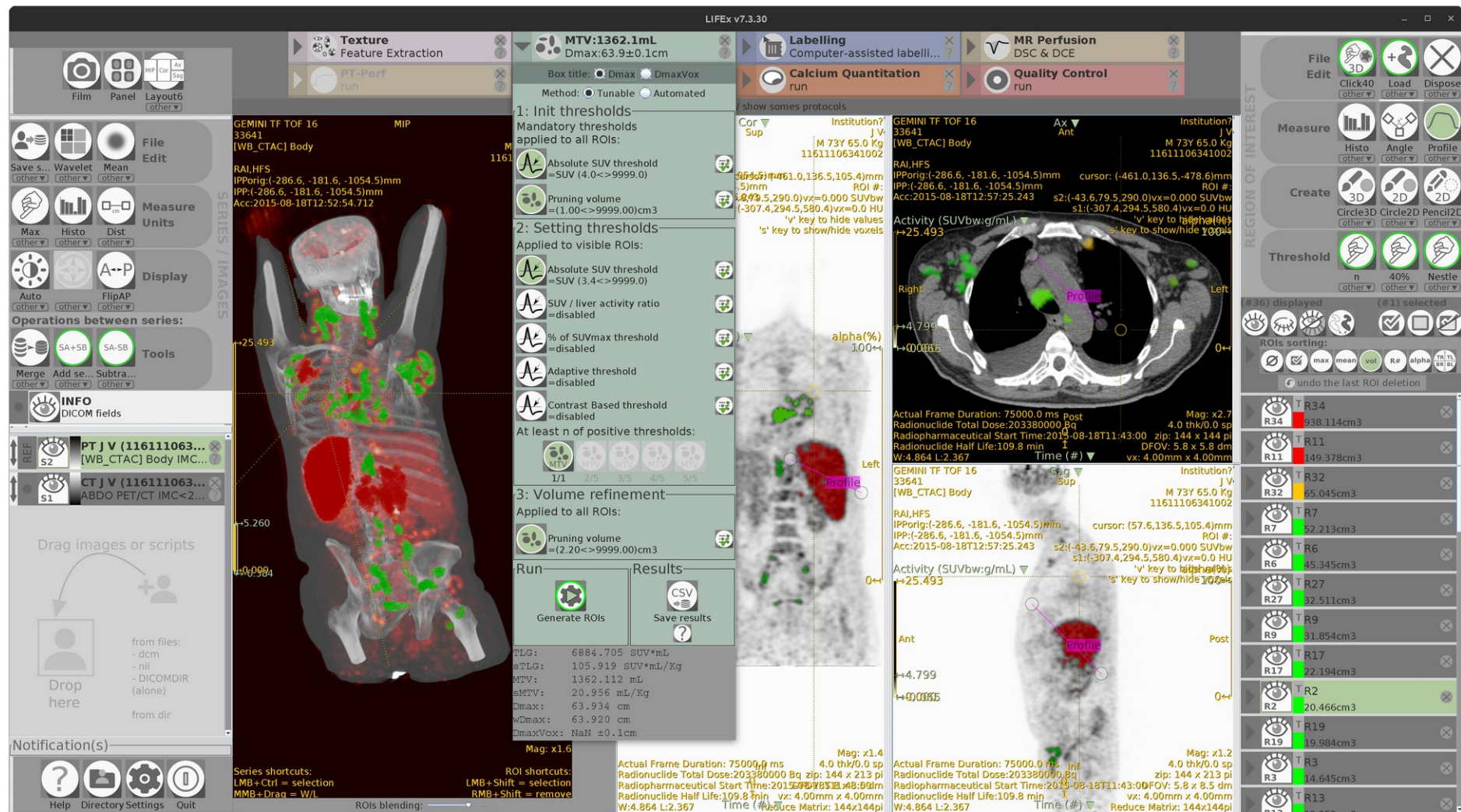
# LIFEx v7.4.0

## Annoucement

— LIFEx —

# Interface screenshot

Christophe Nioche





# LIFEx v7.4.0

## Annoucement

— LIFEx —

# Interface screenshot

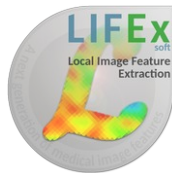
Christophe Nioche

### Main:

- added: search field in DICOM viewer
- fixed: (group, item) of DICOM tag in DICOM viewer

Tag hex	Tag name	VR Value	Length	Field
(0008,0005)	Specific Character Set	CS [ISO_IR 100]	#10	Specific Character Set
(0008,0016)	SOP Class UID	UI [1.2.840.10008.5.1.4.1.1.30]	#26	SOP Class UID
(0008,0018)	SOP Instance UID	UI [1.2.826.0.1.3680043.2.228.1.2054.1669742199566]	#46	SOP Instance UID
(0008,0020)	Study Date	DA [2015-10-02]	#10	Study Date
(0008,0021)	Series Date	DA [2015-10-02]	#10	Series Date
(0008,0022)	Acquisition Date	DA [2015-10-02]	#10	Acquisition Date
(0008,0023)	Content Date	DA [2015-10-02]	#10	Content Date
(0008,002A)	Acquisition DateTime	DT [2015-10-02T14:47:23]	#20	Acquisition DateTime
(0008,0030)	Study Time	TM [14:47:23]	#8	Study Time
(0008,0031)	Series Time	TM [14:47:23]	#8	Series Time
(0008,0032)	Acquisition Time	TM [14:47:23]	#8	Acquisition Time
(0008,0033)	Content Time	TM [14:47:23]	#8	Content Time
(0008,0050)	Accession Number	SH (no value available)	#0	Accession Number
(0008,0060)	Modality	CS [PT]	#2	Modality
(0008,0070)	Manufacturer	LO [LIFEx]	#6	Manufacturer
(0008,0090)	Referring Physician's Name	PN [Demo LIFEx]	#10	Referring Physician's Name
(0008,1030)	Study Description	LO (no value available)	#0	Study Description
(0008,1060)	Name of Physician(s) Reading Study	PN [Demo LIFEx]	#10	Name of Physician(s) Reading Study
(0008,1090)	Manufacturer's Model Name	LO [LIFEx]	#6	Manufacturer's Model Name
(0008,1120)	Referenced Patient Sequence	SQ (SequenceDelimitationItem)	#76	Referenced Patient Sequence
(0008,1150)	Referenced SOP Class UID	UI (no value available)	#0	Referenced SOP Class UID
(0008,1155)	Referenced SOP Instance UID	UI (no value available)	#0	Referenced SOP Instance UID
(0008,9205)	Pixel Presentation	CS [MONOCHROME]	#10	Pixel Presentation
(0008,9206)	Volumetric Properties	CS [VOLUME]	#6	Volumetric Properties
(0008,9207)	Volume Based Calculation Technique	CS [NONE]	#4	Volume Based Calculation Technique
(0010,0010)	Patient's Name	PN [Demo LIFEx]	#10	Patient's Name
(0010,0020)	Patient ID	LO [LIFEx]	#6	Patient ID





# LIFEx v7.4.0

## Annoucement

— LIFEx —

# SUV editor

Christophe Nioche

SUV Properties

Changing these values directly impacts the SUV calculation.  
Please use them with great care.

Patient:

Patient's Weight:

65.0

kg

Patient's Size:

175.0

cm

Series:

Series (date and time (T)):

2015-08-18 12:47:46

yyyy-MM-dd HH:mm:ss

Acquisition/Instance:

Acquisition (date and time (T)):

2015-08-18 13:00:05

yyyy-MM-dd HH:mm:ss

Corrected Image:

DECY RADL ATTN SCAT DTIM RAN NOR

ATTN DECY

RadioPharmaceutical:

Decay Correction:

START

START || ADMIN|| NONE

Units:

BQML

BQML || CNTS || GML || GML1

Radiopharmaceutical start (date and time (T)):

2015-08-18 11:43:00

yyyy-MM-dd HH:mm:ss

Radionuclide Total Dose:

2.0338E8

Bq

Radionuclide Half Life:

6586.199707

seconds

Cancel

Apply SUV



# LIFEx v7.4.0

## Annoucement — LIFEx —

# MTV updates

## Christophe Nioche

1 The MTV results have become independent of the generation of ROIs  
→ i.e. they can therefore now be saved with already existing ROIs

2 New automated method (without input parameters)  
to generate ROIs

**Applied to selected series:**

- File Edit
- Measure
- Create
- Threshold

**Operations between series:**

- SA+SB
- SA-SB

**Tools**

- PT J V (11611063...)
- [WB\_CTAC] Body IMC...

**Drag images or scripts**

**Drop here**

**Notification(s)**

**Series shortcuts:**

- LMB+Ctrl = selection
- LMB+Shift = selection
- RMB+Drag = W/L
- RMB+Shift = remove

**ROI shortcuts:**

- LMB+Ctrl = selection
- LMB+Shift = selection
- RMB+Drag = W/L
- RMB+Shift = remove

**ROIs blending:**

**MTV:1035.4mL**  
Dmax:73.7±0.1cm

**Method:** Tunable Automated

**1: Init thresholds**  
Mandatory thresholds applied to all ROIs:

- Absolute SUV threshold = SUV (2.2<=9999.0)
- Pruning volume = (1.00<=9999.00)cm3

**2: Setting thresholds**  
Applied to visible ROIs:

- Absolute SUV threshold = disabled
- SUV / liver activity ratio = disabled
- % of SUVmax threshold = 41.0%
- Adaptive threshold = disabled
- Contrast Based threshold = disabled

**3: Volume refinement**  
Applied to all ROIs:

- Pruning volume = (1.00<=9999.00)cm3

**Run** **Results**

**Generate ROIs** **Save results**

**Results:**

ROI	SUVmax	SUVmin	SUVavg	SUVstd	SUVmax/Kg	SUVmin/Kg	SUVavg/Kg	SUVstd/Kg
TLG	4640.583	71.394	1035.392	15.929	73.738	73.673	73.673	73.673

**Acceleration (x10) of the tunable segmentation process**

**1**

**2**

**Applied to selected ROI:**

- File Edit
- Measure
- Create
- Threshold

**1 selected ROI, all: select unselect**

**undo the last ROI deletion**

**ROI List:**

- R105 Rel\_thres40.0 SUVmax:10.5
- R106 Rel\_thres40.0 SUVmax:10.1
- R107 Rel\_thres40.0 SUVmax:9.6
- R108 Rel\_thres40.0 SUVmax:8.9
- R109 Rel\_thres40.0 SUVmax:8.7
- R110 Rel\_thres40.0 SUVmax:8.6
- R111 Rel\_thres40.0 SUVmax:8.5
- R112 Rel\_thres40.0 SUVmax:8.4
- R113 Rel\_thres40.0 SUVmax:8.3
- R114 Rel\_thres40.0 SUVmax:8.2
- R115 Rel\_thres40.0 SUVmax:8.1
- R116 Rel\_thres40.0 SUVmax:8.0
- R117 Rel\_thres40.0 SUVmax:7.9
- R118 Rel\_thres40.0 SUVmax:7.8
- R119 Rel\_thres40.0 SUVmax:7.7
- R120 Rel\_thres40.0 SUVmax:7.6
- R121 Rel\_thres40.0 SUVmax:7.5
- R122 Rel\_thres40.0 SUVmax:7.4
- R123 Rel\_thres40.0 SUVmax:7.3
- R124 Rel\_thres40.0 SUVmax:7.2
- R125 Rel\_thres40.0 SUVmax:7.1
- R126 Rel\_thres40.0 SUVmax:7.0
- R127 Rel\_thres40.0 SUVmax:6.9
- R128 Rel\_thres40.0 SUVmax:6.8
- R129 Rel\_thres40.0 SUVmax:6.7
- R130 Rel\_thres40.0 SUVmax:6.6
- R131 Rel\_thres40.0 SUVmax:6.5
- R132 Rel\_thres40.0 SUVmax:6.4
- R133 Rel\_thres40.0 SUVmax:6.3
- R134 Rel\_thres40.0 SUVmax:6.2
- R135 Rel\_thres40.0 SUVmax:6.1
- R136 Rel\_thres40.0 SUVmax:6.0
- R137 Rel\_thres40.0 SUVmax:5.9
- R138 Rel\_thres40.0 SUVmax:5.8
- R139 Rel\_thres40.0 SUVmax:5.7
- R140 Rel\_thres40.0 SUVmax:5.6
- R141 Rel\_thres40.0 SUVmax:5.5
- R142 Rel\_thres40.0 SUVmax:5.4
- R143 Rel\_thres40.0 SUVmax:5.3
- R144 Rel\_thres40.0 SUVmax:5.2
- R145 Rel\_thres40.0 SUVmax:5.1
- R146 Rel\_thres40.0 SUVmax:5.0
- R147 Rel\_thres40.0 SUVmax:4.9
- R148 Rel\_thres40.0 SUVmax:4.8
- R149 Rel\_thres40.0 SUVmax:4.7
- R150 Rel\_thres40.0 SUVmax:4.6
- R151 Rel\_thres40.0 SUVmax:4.5
- R152 Rel\_thres40.0 SUVmax:4.4
- R153 Rel\_thres40.0 SUVmax:4.3
- R154 Rel\_thres40.0 SUVmax:4.2
- R155 Rel\_thres40.0 SUVmax:4.1
- R156 Rel\_thres40.0 SUVmax:4.0
- R157 Rel\_thres40.0 SUVmax:3.9
- R158 Rel\_thres40.0 SUVmax:3.8
- R159 Rel\_thres40.0 SUVmax:3.7
- R160 Rel\_thres40.0 SUVmax:3.6
- R161 Rel\_thres40.0 SUVmax:3.5
- R162 Rel\_thres40.0 SUVmax:3.4
- R163 Rel\_thres40.0 SUVmax:3.3
- R164 Rel\_thres40.0 SUVmax:3.2
- R165 Rel\_thres40.0 SUVmax:3.1
- R166 Rel\_thres40.0 SUVmax:3.0
- R167 Rel\_thres40.0 SUVmax:2.9
- R168 Rel\_thres40.0 SUVmax:2.8
- R169 Rel\_thres40.0 SUVmax:2.7
- R170 Rel\_thres40.0 SUVmax:2.6
- R171 Rel\_thres40.0 SUVmax:2.5
- R172 Rel\_thres40.0 SUVmax:2.4
- R173 Rel\_thres40.0 SUVmax:2.3
- R174 Rel\_thres40.0 SUVmax:2.2
- R175 Rel\_thres40.0 SUVmax:2.1
- R176 Rel\_thres40.0 SUVmax:2.0
- R177 Rel\_thres40.0 SUVmax:1.9
- R178 Rel\_thres40.0 SUVmax:1.8
- R179 Rel\_thres40.0 SUVmax:1.7
- R180 Rel\_thres40.0 SUVmax:1.6
- R181 Rel\_thres40.0 SUVmax:1.5
- R182 Rel\_thres40.0 SUVmax:1.4
- R183 Rel\_thres40.0 SUVmax:1.3
- R184 Rel\_thres40.0 SUVmax:1.2
- R185 Rel\_thres40.0 SUVmax:1.1
- R186 Rel\_thres40.0 SUVmax:1.0
- R187 Rel\_thres40.0 SUVmax:0.9
- R188 Rel\_thres40.0 SUVmax:0.8
- R189 Rel\_thres40.0 SUVmax:0.7
- R190 Rel\_thres40.0 SUVmax:0.6
- R191 Rel\_thres40.0 SUVmax:0.5
- R192 Rel\_thres40.0 SUVmax:0.4
- R193 Rel\_thres40.0 SUVmax:0.3
- R194 Rel\_thres40.0 SUVmax:0.2
- R195 Rel\_thres40.0 SUVmax:0.1
- R196 Rel\_thres40.0 SUVmax:0.0
- R197 Rel\_thres40.0 SUVmax:0.0
- R198 Rel\_thres40.0 SUVmax:0.0
- R199 Rel\_thres40.0 SUVmax:0.0



# LIFEx v7.4.0

## Annoucement

— LIFEx —

# Crop series (...)

Christophe Nioche

**File Edit**  
New (other) Load (other) Dispose (other)

**Measure**  
Max (other) Angle (other) Dist (other)

**Create**  
3D (other) Circle3D (other) Pencil2D (other)

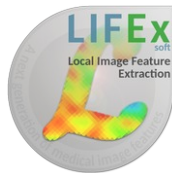
**Threshold**  
n (other) 40% (other) Nestle (other)

**REGION OF INTEREST**  
#184 displayed (#1 selected)  
ROIs sorting: max mean vol R# alpha  
T R86 selected  
T R1 unselected  
T R2 unselected  
T R3 unselected  
T R4 unselected  
T R5 unselected  
T R6 unselected  
T R7 unselected  
T R8 unselected  
T R9 unselected  
T R10 unselected  
T R11 unselected

**Notification(s)**  
**Crop controller**  
Move the handles to resize the series.  
Then press the 'Apply' button below.  
new canvas size (mm on reference):  
start corner: (287.9, 223.3, 259.8) mm  
DFOV: (164.0 x 168.0 x 240.0) cm  
end corner: (454.8, 395.2, 501.4) mm  
new canvas size (voxel on reference):  
start corner: (71, 55, 64) vx  
DFOV: (41 x 42 x 60) vx  
end corner: (113, 98, 125) vx  
Apply

**Actual Frame Duration:** 75000.0 ms  
**Radiopharmaceutical Total Dose:** 203380000 Bq  
**Radiopharmaceutical Start Time:** 2019-08-18T11:43:00  
**Radiopharmaceutical Half Life:** 109.8 min  
**Mag:** x1.6  
**4.0 thk/0.0 sp**  
**zip:** 144 x 213 pi  
**DFOV:** 5.8 x 8.5 dm  
**vx:** 4.00mm x 4.00mm  
**Reduce Matrix:** 144x144





# LIFEx v7.4.0

## Annoucement

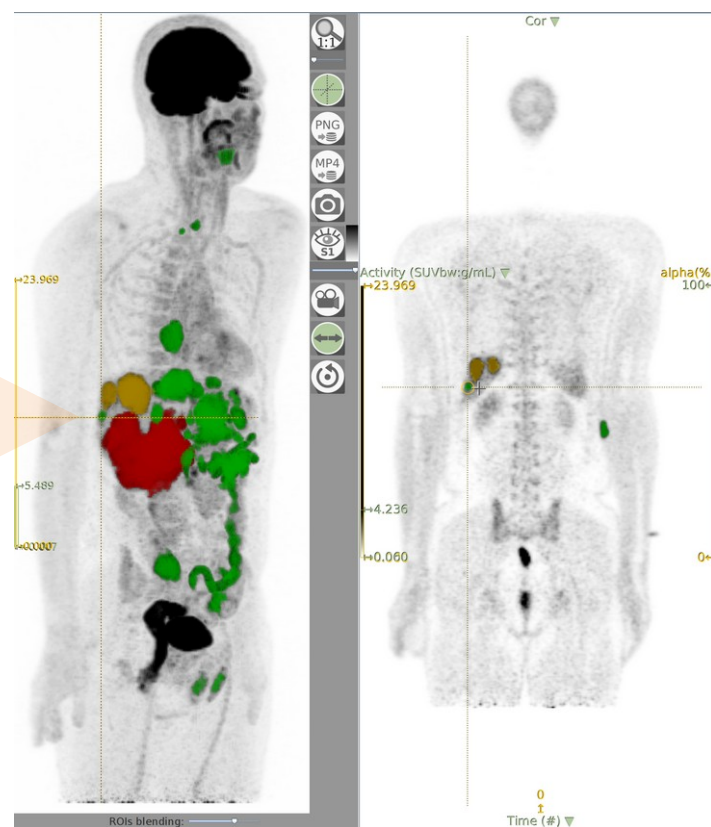
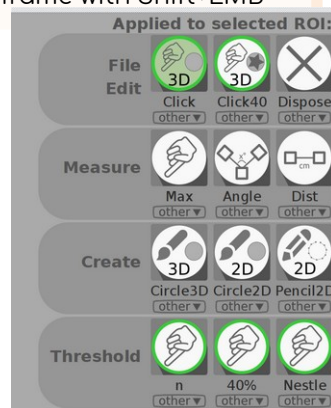
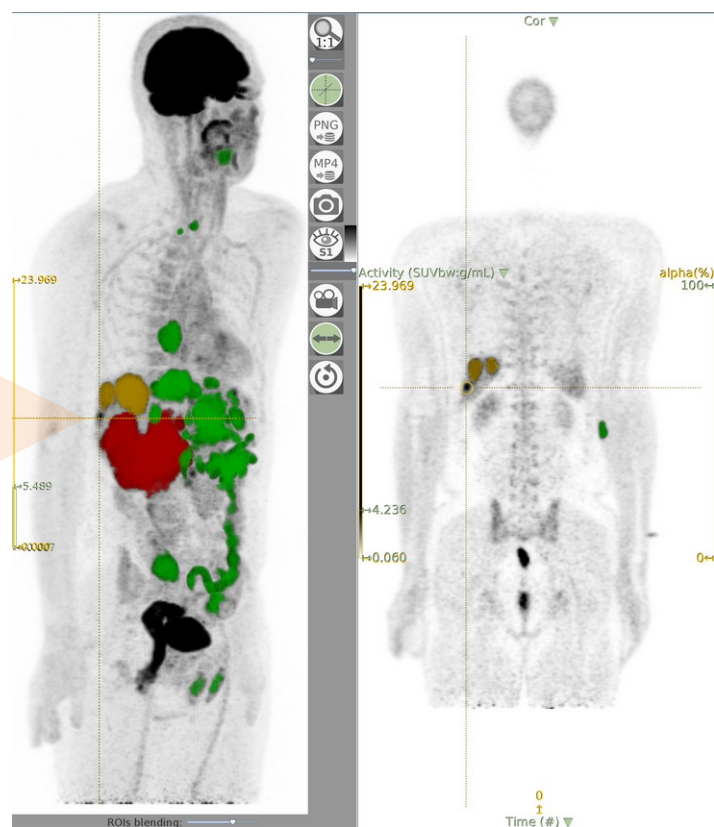
— LIFEx —

# MTV updates

Christophe Nioche

## MIP updates

- improved: Ctrl-LMB on MIP locates crosshair on planar view
- improved: Shift-LMB on MIP selects ROI on planar view and in ROI interface
- improved: added "Click" and "Click40" tools directly on MIP frame with Shift+LMB







Anthony Bonfrate





# LIFEx v7.4.0

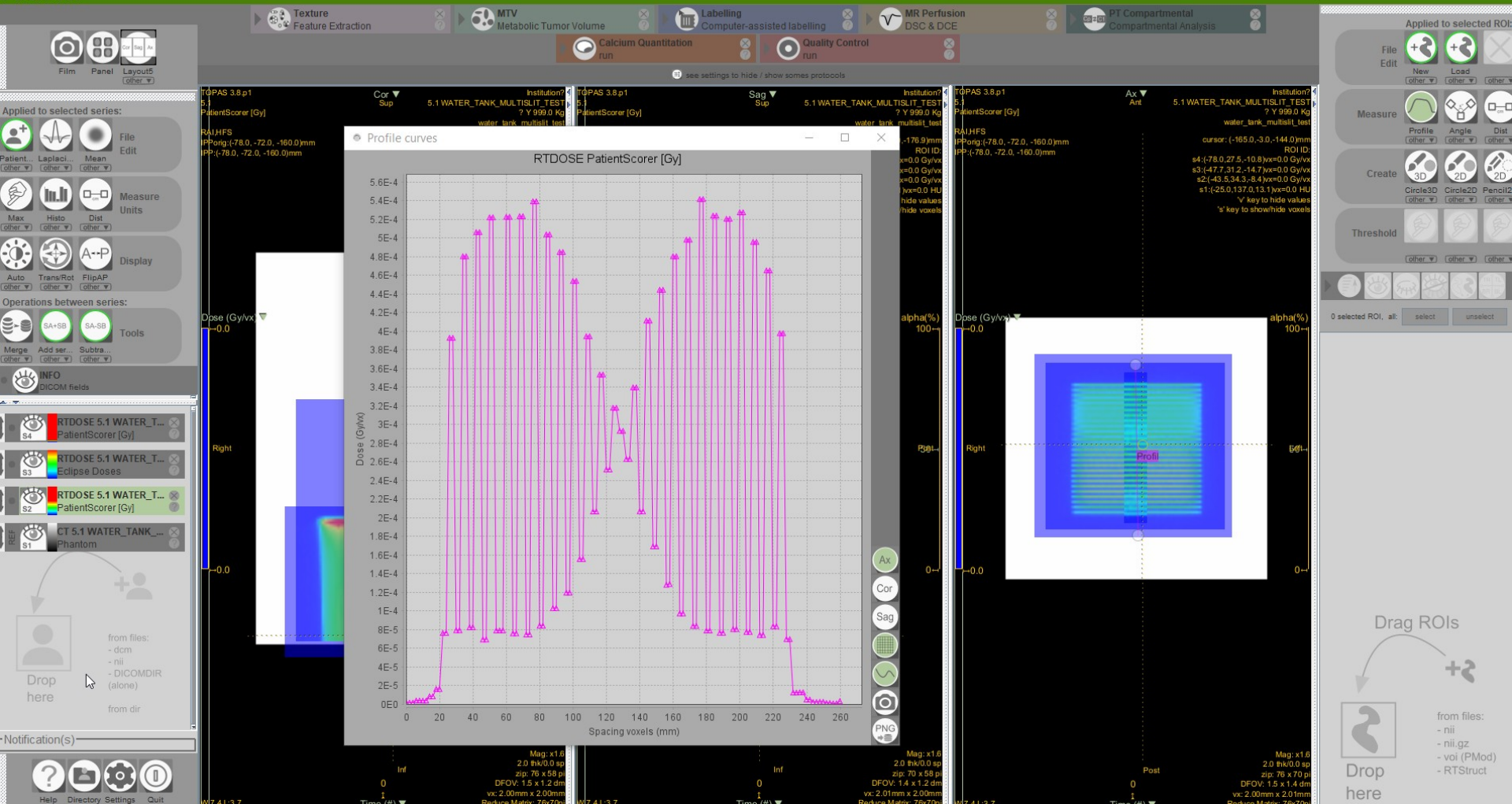
## Annoucement

— LIFEx —

# New: Profile

Anthony Bonfrate

LIFEx v7.3.26





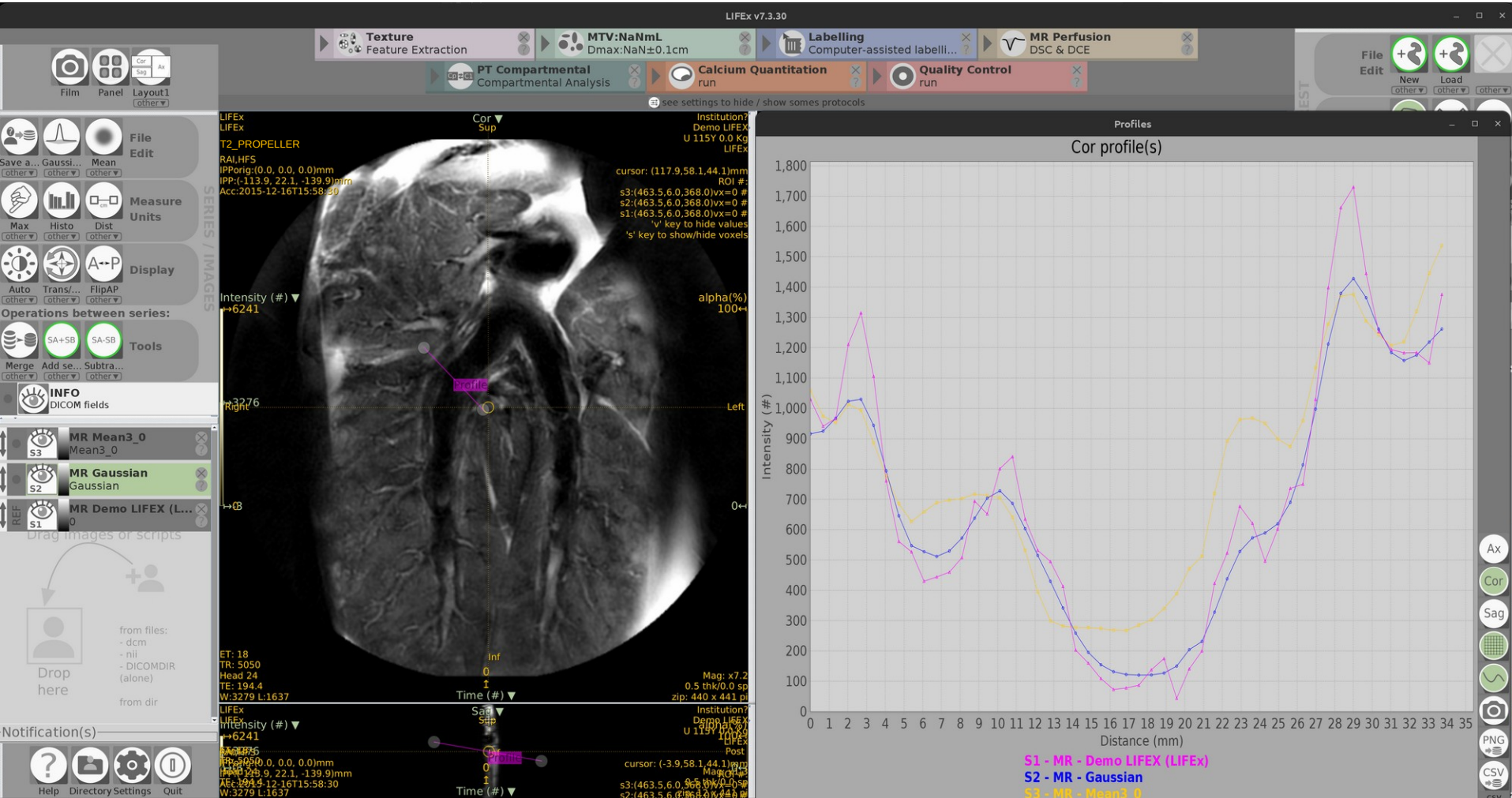
# LIFEx v7.4.0

## Annoucement

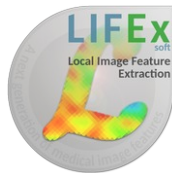
— LIFEx —

# New: Profile

Christophe Nioche







# LIFEx v7.4.0

Annoucement  
— LIFEx —

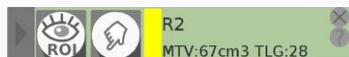
## ROI updates

C. Nioche

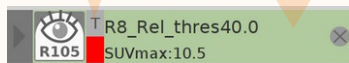
Quick editing  
with predefined organ names

Quick edition		
Recent items	Predefined Organ	Predefined Lymph Node
Mediastinum X	Adrenal-glands	Abdomen-LN
Pancreas X	Aorta	Axillary-LN
Skin X	Bone	Cervical-LN
Spine X	Bone-marrow	Common-iliac-LN
	Brain	Internal-iliac-LN
	Breast	External-iliac-LN
	Bronchi	Deep-cervical-LN
	Esophagus	Deep-inguinal-LN
	Ear	Chest-LN
	Eye	Head-LN
	Gallbladder	Hilaire-liver-LN
	Heart	Liver-hilus-LN
	Kidneys	Inguinal-LN
	Interstitium	Inferior-deep-cervical-LN
	Large bowel	Mediastinal-LN
	Larynx	Mastoid-LN
	Liver	Neck-LN
	Lungs	Occipital-LN
	Mediastinum	Pelvic-LN
	Muscular	Parotid-LN
	Nasal-cavity	Periaortic-LN
	Oesophageal	Popliteal-LN
	Osteo-medullary	Preaortic-LN
	Pancreas	Retro-aortic-LN
	Paramedullary	Retro-peritoneal-LN
	Parathyroid-glands	Retro-clavicular-LN
	Pelvis	Retro-crural-LN
	Peritoneum	Sacral-LN
	Pineal-gland	Superficial-inguinal-LN
	Pituitary-gland	Supraclavicular-LN
	Pharynx	
	Pleural	
	Prostate	
	Rectum	
	Retroperitoneum	
	Skin	
	Small-bowel	
	Soft-tissue	
	Spine	
	Spleen	
	Sternum	
	Stomach	
	Subcutaneous	
	Trachea	
	Thyroid-gland	
	Thymus	
	Urinary-Bladder	
	Urethra	
	Ureter	
	Uterus	

ROI:  
Old display options (v7.3.0)



ROI:  
New display options (v7.4.0)



double-clicks:  
Localize max value

Display ID on icon  
On/Off display



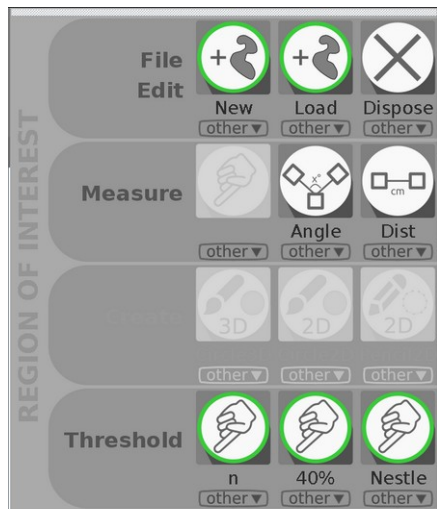
# LIFEx v7.4.0

## Annoucement

— LIFEx —

# ROI multi-selection

C. Nioche

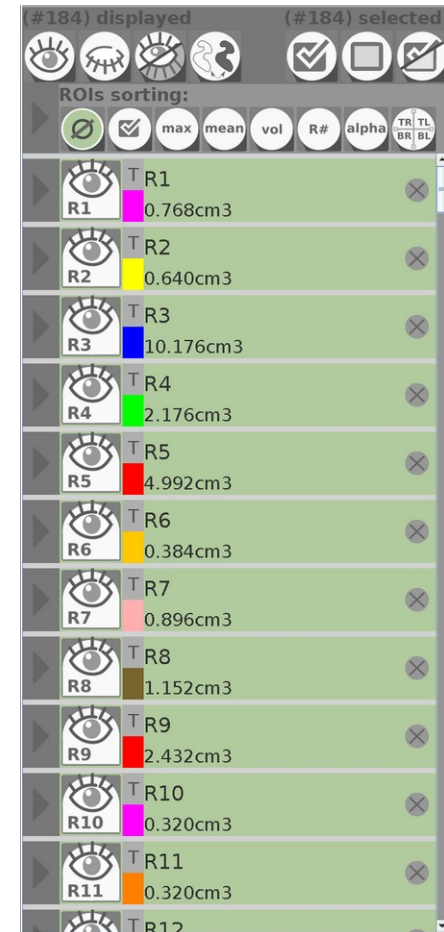
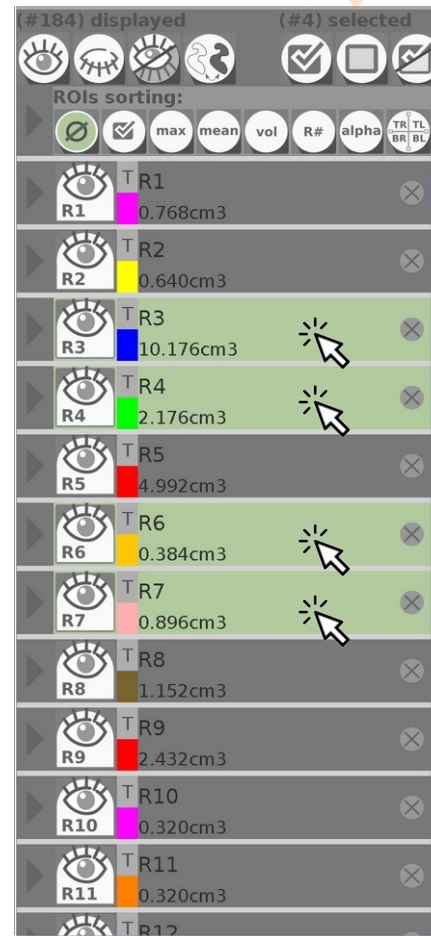


new display  
tool bar

new buttons for :  
show/hide all  
new sorting bar

have a multi selection  
to make grouped action  
one click : select  
another click: deselect

new buttons for :  
un/select all



quick shortcut  
Ctrl+A: un/selection all



# LIFEx v7.4.0

## Annoucement

— LIFEx —

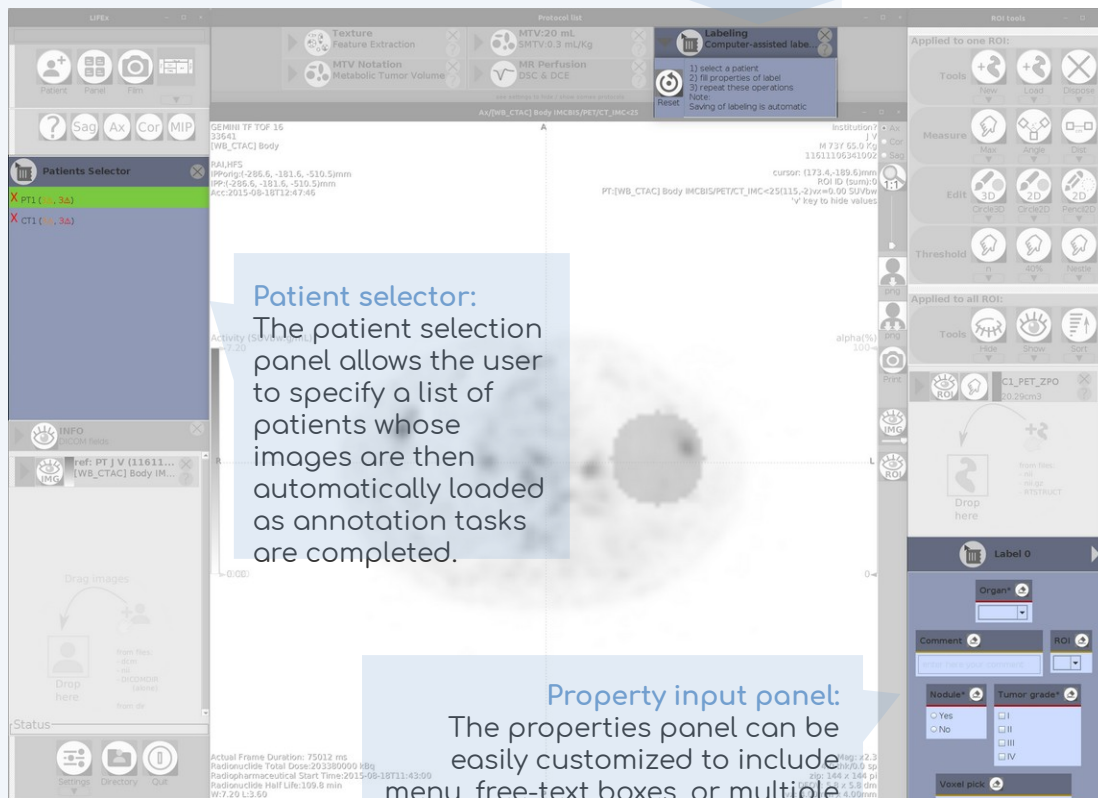
# Labeling Tool

New

**Controller:** The controller panel shows the progress of the annotation job, which can be interrupted at any time and resume exactly where it was left off.

**Patient selector:**  
The patient selection panel allows the user to specify a list of patients whose images are then automatically loaded as annotation tasks are completed.

**Property input panel:**  
The properties panel can be easily customized to include menu, free-text boxes, or multiple choices for interactive annotation.



## LabelingScript.txt

```
# Common
script = labeling
script.version = 1.0
output.props.file=.../res/
labeling.props

# properties
property0.title = Organ*
property0.type = dropdown
property0.value = 1|2|3|4

property1.title = Comment
property1.type = textfield

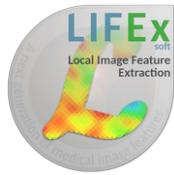
property2.title = ROI
property2.type = roiPick

property3.title = Nodule*
property3.type = radiobutton
property3.value = Yes|No

property4.title = Tumor
grade*
property4.type = checkbox
property4.value = I|II|III|IV

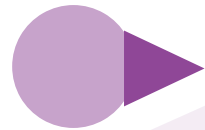
property5.title = Voxel pick
property5.type = voxelPick
```





**LIFEx v7.4.0**  
Annoucement  
— LIFEx —

# Awards thanks



## Awards

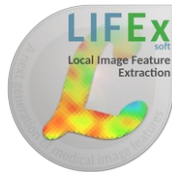
2018

*The Best of*  
**THE AACR JOURNALS**

A COLLECTION OF THE MOST-CITED RESEARCH ARTICLES

2020





# LIFEx v7.4.0

Annoucement

— LIFEx —

## LIFEx is still evolving

C. Nioche

Other functionalities are being added every week.  
Stay tuned !  
We hope you go on enjoying LIFEx !



## LIFEx is free of charge.

Please help us to keep it free by always quoting the LIFEx reference: [\(see below\)](#)

Please note that the correct reference to be cited is:

C Nioche, F Orlhac, S Boughdad, S Reuzé, J Goya-Outi, C Robert, C Pellot-Barakat, M Soussan, F Frouin, and I Buvat. LIFEx: a freeware for radiomic feature calculation in multimodality imaging to accelerate advances in the characterization of tumor heterogeneity. Cancer Research 2018; 78(16):4786-4789