

# Wyniki beta-3 oraz beta-1

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## Wyniki sekwencjonowania

### Kolonia 1:

Range 1: 1 to 580 <a href="#">Graphics</a>					<a href="#">▼ Next Match</a>	<a href="#">▲ Previous Match</a>
Score	Expect	Method	Identities	Positives	Gaps	
1213 bits(3138)	0.0	Compositional matrix adjust.	579/580(99%)	579/580(99%)	0/580(0%)	
Query 1	MVSKGEEDNMAIIKEFMRFKVHMEGSVNGHEFEIEEGEGEGRPYEGTQTAKLKVTKGGLP		60			
Sbjct 1	.....		60			
Query 61	FAWDILSPQFMYGSKAYVKHPADIPDYLKLSFPEGFKWERVMNFEDGGVVTVTQDSSLQD		120			
Sbjct 61	.....		120			
Query 121	GEFIYKVKLRTNFPSDGPVMQKKTMGEASSERMPEDGALKGEIKQRLLKDGGHYDA		180			
Sbjct 121	.....		180			
Query 181	EVKTTYKAKKPVQLPGAYNVNIKLDITSHNEDYTIVEQYERAEGRHSTGGMDELYKGGSG		240			
Sbjct 181	.....		240			
Query 241	SELDQLRQEAEQLKNQIRDARKACADATLSQITNNIDPVGRIQMTRRTLRLGHLAGIYAM		300			
Sbjct 241	.....		300			
Query 301	HWGTDSSLVSASQDGKLIIWDSYTTNKVHAIPLRSSWVMTCAVAPSGNYVACGGLDNIC		360			
<b>Sbjct 301</b>	<b>A.....</b>		360			
Query 361	SIYNLKTREGNRVRSRELAGHTGYLSCCRFLDDNQIVTSSGDTTCALWDIETGQQTTFT		420			
Sbjct 361	.....		420			
Query 421	GHTGDVMSLSLAPDTRLFVSGACDASAKLWDVREGMCRTFTGHESDINAICFFPNGNAF		480			
Sbjct 421	.....		480			
Query 481	ATGSDDATCRLFDLRADQELMTYSHDNIICGITSVSFSKSGRLLLADYDDFCNVWDALK		540			
Sbjct 481	.....		540			
Query 541	ADRAGVLAGHDNRVSCLGVTDGMAVATGSWDSFLKIWN*	580				
<b>Sbjct 541</b>	<b>.....*</b>	580				

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Kolonia 2:

Range 1: 1 to 580 Graphics					▼ Next Match	▲ Previous Match
Score	Expect	Method	Identities	Positives	Gaps	
1214 bits(3141)	0.0	Compositional matrix adjust.	580/580(100%)	580/580(100%)	0/580(0%)	
Query 1	MVSKGEEDNMAIIKEFMRFKVHMEGSVNGHEFEIEGEGRPYEGTQTAKLKVTKGGLP		60	60		
Sbjct 1	.....					
Query 61	FAWDILSPQFMYGSKAYVKHPADIPDYLKLSFPPEGFKWERVMNFEDGGVVTVTQDSSLQD		120	120		
Sbjct 61	.....					
Query 121	GEFIYKVKLRTGNFPSDGPVMQKKTMGWEASSERMYPEDGALKGEIKQRLKLKDGGHYDA		180	180		
Sbjct 121	.....					
Query 181	EVKTTYKAKKPVQLPGAYNVNIKLDITSHNEDYTIVEQYERAEGRHSTGGMDELYKGGSG		240	240		
Sbjct 181	.....					
Query 241	SELDQLRQEAEQLKNQIRDARKACADATLSQITNNIDPVGRIQMRRRTLRGHLAKIYAM		300	300		
Sbjct 241	.....					
Query 301	HWGTDSSLVSASQDGKLIIWDSYTTNKVHAIPRLSSWVMTCAYAPSGNYVACGGLDNIC		360	360		
Sbjct 301	.....					
Query 361	SIYNLKTREGNVRVSRERLAGHTGYLSCCRFLDDNQIVTSSGDFTCALWDIETGQQTTTFT		420	420		
Sbjct 361	.....					
Query 421	GHTGDVMSLSLAPDTRLFVSGACDASAKLWDVREGMCRQTFTGHESDINAICFFPNGNAF		480	480		
Sbjct 421	.....					
Query 481	ATGSDDATCRLFDRADQELMTYSHDNIICGITSVSFSKSGRLLLAGYDDFNCSVWDALK		540	540		
Sbjct 481	.....					
Query 541	ADRAGVLAGHDNRVSCLGVTDGMAVATGSWDSFLKIWN*	580				
Sbjct 541	.....*	580				

Kolonia 3:

	<b>Score</b>	<b>Expect</b>	<b>Identities</b>	<b>Gaps</b>	<b>Strand</b>
	1844 bits(998)	0.0	1015/1023(99%)	1/1023(0%)	Plus/Plus
Query Sbjct	1 1	ATGGGGAGATGGAGCAACTGCCGTAGGAACGGAGCAGCTAAGAACGAGATTGCAGAT .....G..A.G.....G.....		60	60
Query Sbjct	61 61	GCCAGGAAAGCCTGTGCTGACGTTACTCTGGCAGAGCTGGTGTCTGGCTAGAGGTGGTG .....		120	120
Query Sbjct	121 121	GGACGAGTCCAGATGCCGACGCCGGACGTTAAGGGACACCTGCCAAGATTACGCC .....		180	180
Query Sbjct	181 181	ATGCACTGGGCCACTGATTCTAAGCTGCTGGTAAGTGCCTCGCAAGATGGAAAGCTGATC .....		240	240
Query Sbjct	241 241	GTGTGGGACAGCTACACCACCAACAAGGTGCAGCCATCCCCTGCGCTCCTCTGGTC .....		300	300
Query Sbjct	301 301	ATGACCTGTGCCTATGCCCATCAGGAACTTGTGGCGTGTGGGGCTGGACAACATG .....A.....		360	360
Query Sbjct	361 361	TGTTCCATCTAACACCTCAAATCCCGTGAGGGCAATGTCAAGGTCAAGCCGGAGCTTCT .....		420	420
Query Sbjct	421 421	GCTCACACAGGTTATCTCTCTGCTGCCGCTTGGATGACAACAATATTGTGACCAGC .....		480	480
Query Sbjct	481 481	TCGGGGACACACCGTGTGCCCTGGGACATTGAGACTGGGCAGCAGAACAGACTGTATTT .....		540	540
Query Sbjct	541 541	GTGGGACACACGGGTGACTGCATGAGCCTGGCTGTCTCTGACTCAATCTTCATT .....		600	600
Query Sbjct	601 601	TCGGGGCCTGTGATGCCAGTGCCAAGCTCTGGATGTGGAGAGGGACCTGCCGACAG .....T.....		660	660
Query Sbjct	661 661	ACTTCACTGCCACGAGTCGGACATCAACGCCATCTGTTCTTCCCCAATGGAGAGGCC .....		720	720
Query Sbjct	721 721	ATCTGCACGGCTCGGATGACGCTCCTGCCCTTGGTACCTGCCAGACCCAGGAG .....		780	780
Query Sbjct	781 781	CTGATCTGCTCTCCACGAGAGCATCATCTGGCATCACGTCTGGCCTTCTCCCT .....C.....		840	840
Query Sbjct	841 841	AGTGGCCGCCTACTATTCGCTGGCTACGACGACTTCAACTGCAATGTCTGGACTCCATG .....		900	900
Query Sbjct	901 901	AAGTCTGAGCGTGTGGCATCCTCTGGCCACGATAACAGGGTGAGCTGCCCTGGAGTC .....		960	960
Query Sbjct	961 961	ACAGCTGACGGATGGCTGTGGCACAGGTTCTGGACAGCTTCTCAAAATCTGGAAC .....-		1020	1019
Query Sbjct	1021 1020	TGA 1023 ... 1022			

MGEMEQLRQEAEQLKKQIADARKACADVTLAEVLSGLEVGRVQMRTRRTLRGHLAKIYA  
 MHWATDSKLLVSASQDGKLIVWDSYTTNKVHAIPRLSSWVMTCAYAPSGNFVACGGLDNM  
 CSIYNLKSREGNVKVSRELSAHTGYLSCCRFLDDNNIVTSSGDTTCALWDIETQQQKTVF  
 VGHTGDCMSLAVSPDFNLFISGACDASAKLWDVREGTCRQFTGHESDINAICFFPNEA  
 ICTGSDDASCRLFDLRADQELICFSHESIICGITSVAFSLSGRLLFAGYDDFNCNVWDSM  
**KSERVGILSGHDNRVSCLGVTADGMAVATGSWDSFLKIWN\***

MGEMEQLRQEAEQLKKQIADARKACADVTLAEVLSGLEVGRVQMRTRRTLRGHLAKIYA  
 MHWATDSKLLVSASQDGKLIVWDSYTTNKVHAIPRLSSWVMTCAYAPSGNFVACGGLDNM  
 CSIYNLKSREGNVKVSRELSAHTGYLSCCRFLDDNNIVTSSGDTTCALWDIETQQQKTVF  
 VGHTGDCMSLAVSPDFNLFISGACDASAKLWDVREGTCRQFTGHESDINAICFFPNEA  
 ICTGSDDASCRLFDLRADQELICFSHESIICGITSVAFSLSGRLLFAGYDDFNCNVWDSM  
**KSERVGILSGHDNRVSCLGVTADGMAVATGSWDSSSKSGT**

#### Uporządkowanie danych dla donora: *alfa-s-mCitrine*

Odrzucenie danych o skrajnie odstających czasach życia. Uzupełnienie brakujących wartości przy dopasowaniach monoeksponencjalnych. Brakujące wartości zastąpiono 21 wartościami wygenerowanymi pseudolosowo, z rozkładu normalnego o średniej 1.75 i odchyleniu standardowym 0.25. Uzyskane wartości:

```

## [1] 2.174721 1.551352 1.837109 1.183650 1.709449 2.032716 1.636114
## [8] 1.525208 1.931710 1.547640 1.816771 1.315684 1.397144 1.636612
## [15] 1.491127 2.090536 1.979364 1.553714 1.893380 1.979549 1.814072

##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.
##     1.184   1.548   1.709   1.719   1.932   2.175

```

#### Podsumowanie danych dla donora:

```

##                  samples      amp_1      lft_1
## alfa_S_mCitrine_donor_10: 1  Min.   : 462.5  Min.   :1.074
## alfa_S_mCitrine_donor_11: 1  1st Qu.:1907.1  1st Qu.:1.702
## alfa_S_mCitrine_donor_12: 1  Median  :5369.3  Median  :1.979
## alfa_S_mCitrine_donor_13: 1  Mean    :9979.8  Mean    :2.048
## alfa_S_mCitrine_donor_14: 1  3rd Qu.:11088.0 3rd Qu.:2.450
## alfa_S_mCitrine_donor_15: 1  Max.   :80546.3  Max.   :2.975
## (Other)                 :66  NA's   :21
##      amp_2      lft_2      tau_amp
##  Min.   : 2270  Min.   :3.000  Min.   :2.530
##  1st Qu.: 8874  1st Qu.:3.075  1st Qu.:3.020
##  Median :17663  Median :3.204  Median :3.040
##  Mean   :53430  Mean   :3.252  Mean   :3.029
##  3rd Qu.:49566  3rd Qu.:3.324  3rd Qu.:3.060
##  Max.   :450838 Max.   :3.884  Max.   :3.090
##

```

Odchylenie standardowe czasów życia: 0.07

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Porównanie wyników (z akceptorem: beta-3-mCherry)

Dane dla pomiarów z beta-3-mCherry i gamma2:

```
##      amp_1        lft_1        amp_2        lft_2
##  Min.   :1438   Min.   :1.364   Min.   : 373.8   Min.   :1.268
##  1st Qu.:3597   1st Qu.:2.087   1st Qu.: 7308.0   1st Qu.:2.633
##  Median :7052   Median :2.709   Median :11174.8   Median :3.167
##  Mean   :9393   Mean   :2.758   Mean   :11327.7   Mean   :2.927
##  3rd Qu.:14768  3rd Qu.:3.279   3rd Qu.:13765.8   3rd Qu.:3.283
##  Max.   :22275  Max.   :4.724   Max.   :29005.3   Max.   :5.791
##      tau_amp
##  Min.   :2.870
##  1st Qu.:2.960
##  Median :2.980
##  Mean   :2.973
##  3rd Qu.:2.990
##  Max.   :3.030
```

---

Przed porównaniem srednich czasów życia fluorescencji donora bez i z akceptorem usunięto wyniki mieszczące się poza 99% poziomem ufnosci.

Dla samego donora:

```
## Loading required package: outliers
## Loading required package: dplyr
##
## Attaching package: 'dplyr'
##
## The following objects are masked from 'package:stats':
##
##     filter, lag
##
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
##
## The outliers for 99 % confidence interval are:
##   2.53 2.84
##   - - - - -
##
## The mean and median with outliers are respectively: 3.03 ; 3.04
## The mean and median without outliers are respectively: 3.04 ; 3.04
```

Dla donora i akceptora:

```
## The outliers for 99 % confidence interval are:  
## 2.87 2.87  
## - - - - -  
  
##  
## The mean and median with outliers are respectively: 2.97 ; 2.98  
## The mean and median without outliers are respectively: 2.98 ; 2.98
```

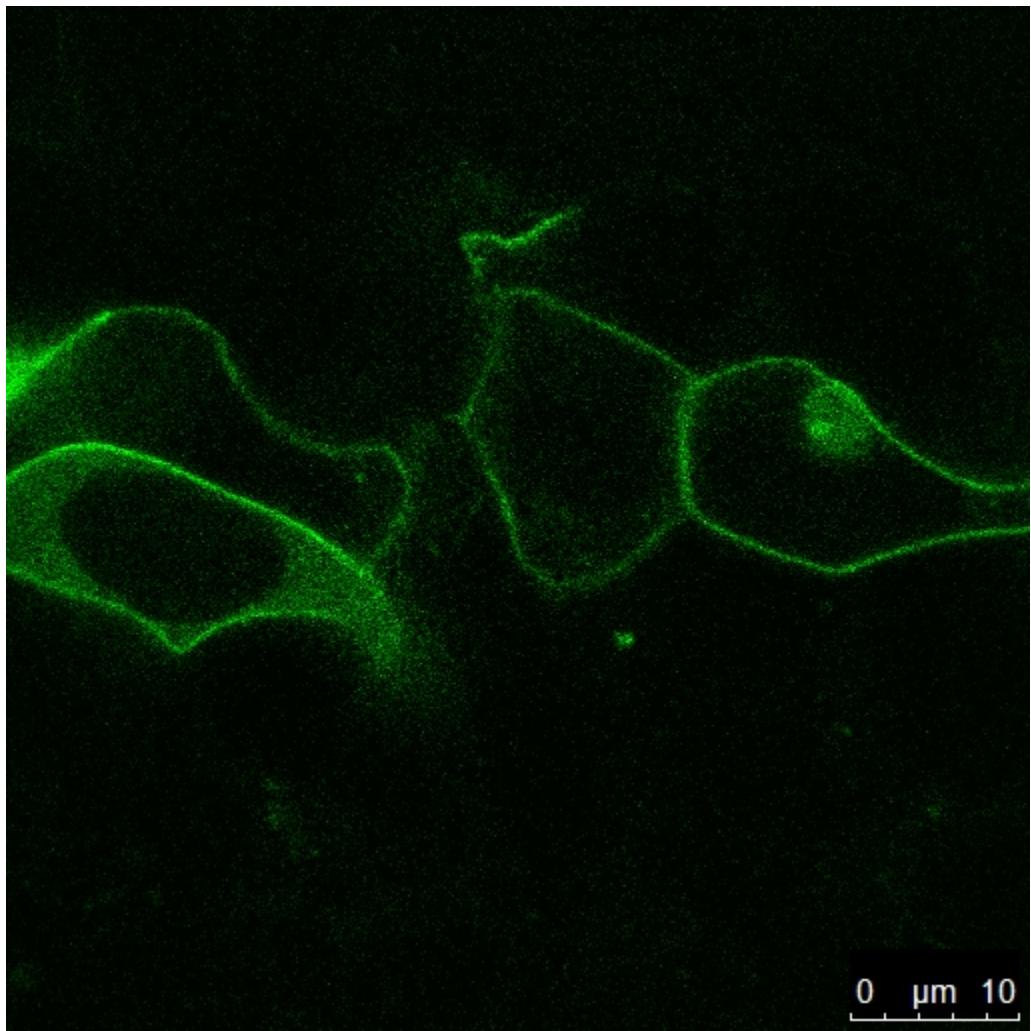
Test na statystycznie istotną różnicę między srednimi czasami życia:

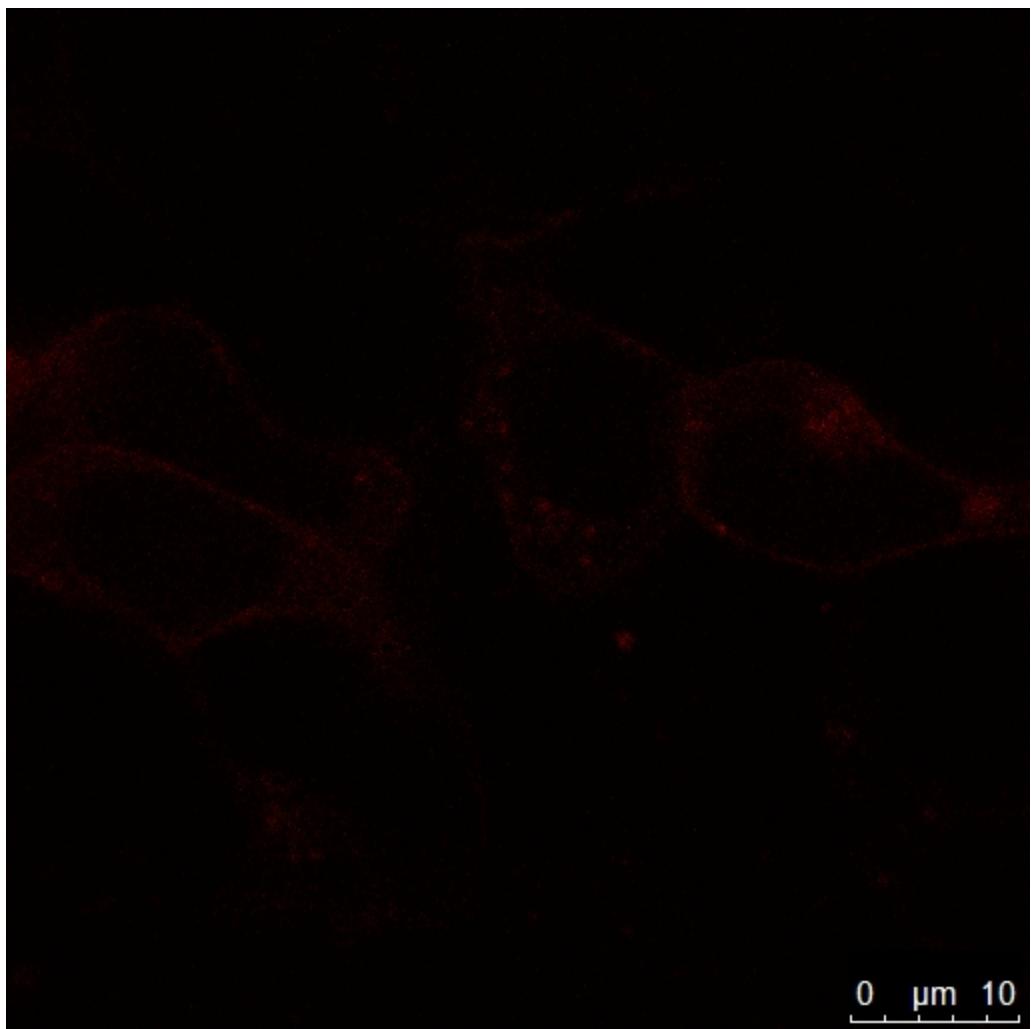
```
##  
## Welch Two Sample t-test  
##  
## data: donor$tau_amp and FLIM$tau_amp  
## t = 10.18, df = 68.862, p-value = 2.278e-15  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 0.04801158 0.07141699  
## sample estimates:  
## mean of x mean of y  
## 3.038857 2.979143  
  
##          amp_1     lft_1     amp_2     lft_2 tau_amp  
## donorout 10087.507 2.074023 54526.34 3.252000 3.038857  
## akceptorout 9674.346 2.820800 11043.14 2.913914 2.979143
```

Transfer energii: 1.97%

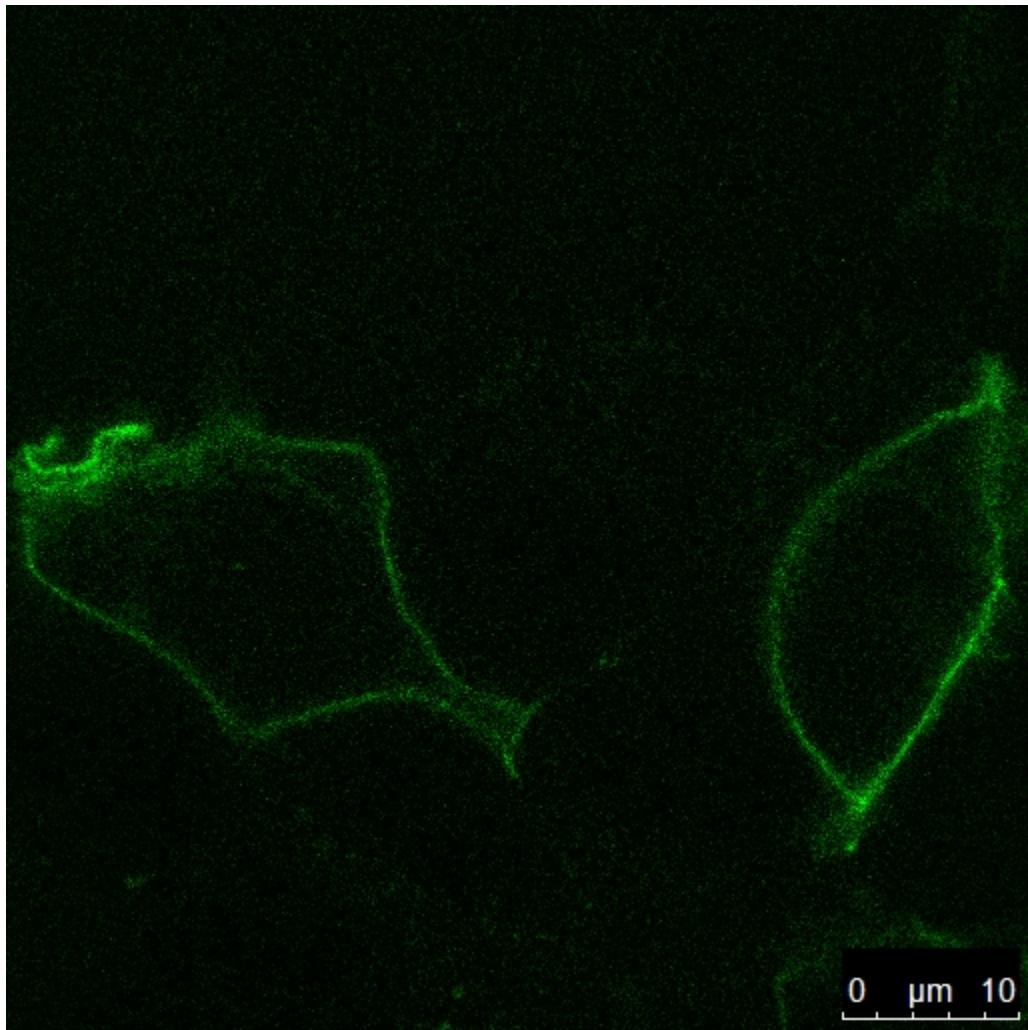
Co z tym transferem?

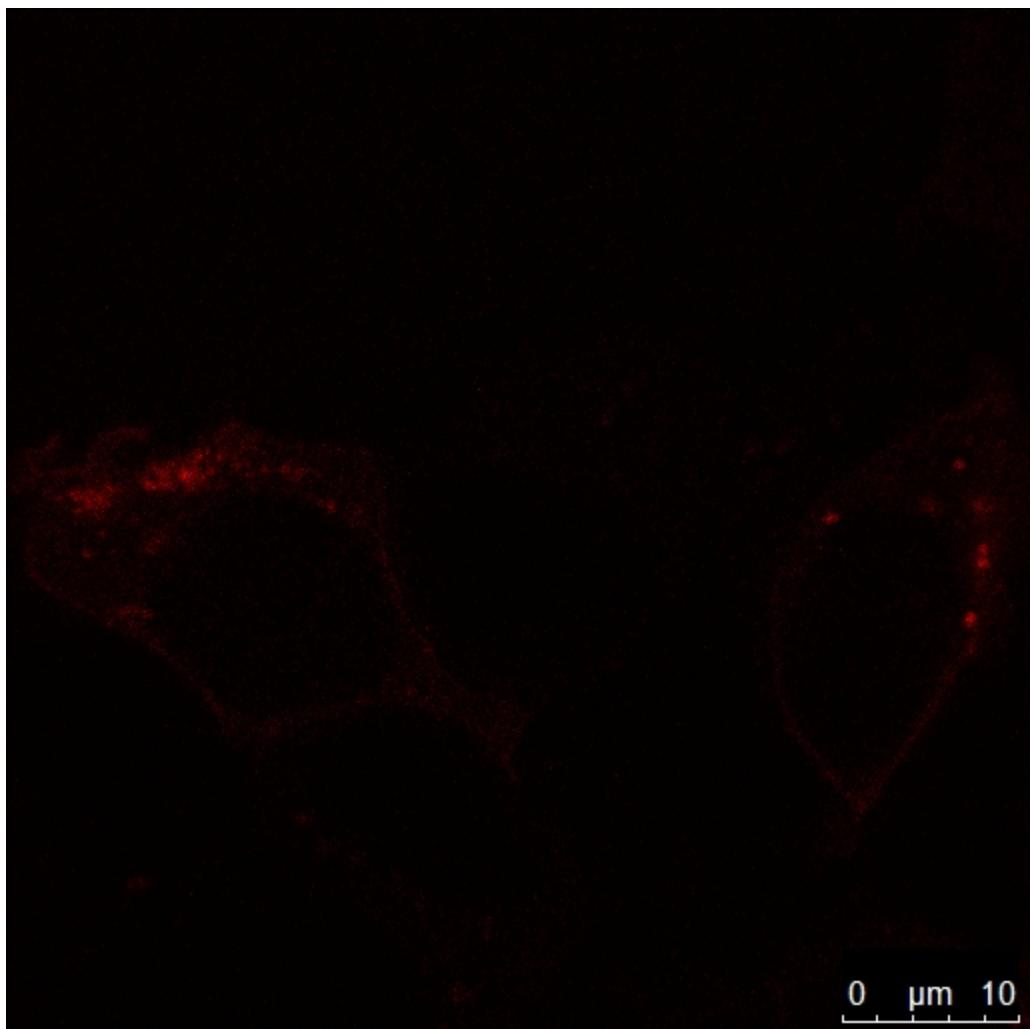
alfa-s z mCitrine, beta-3 z mCherry:



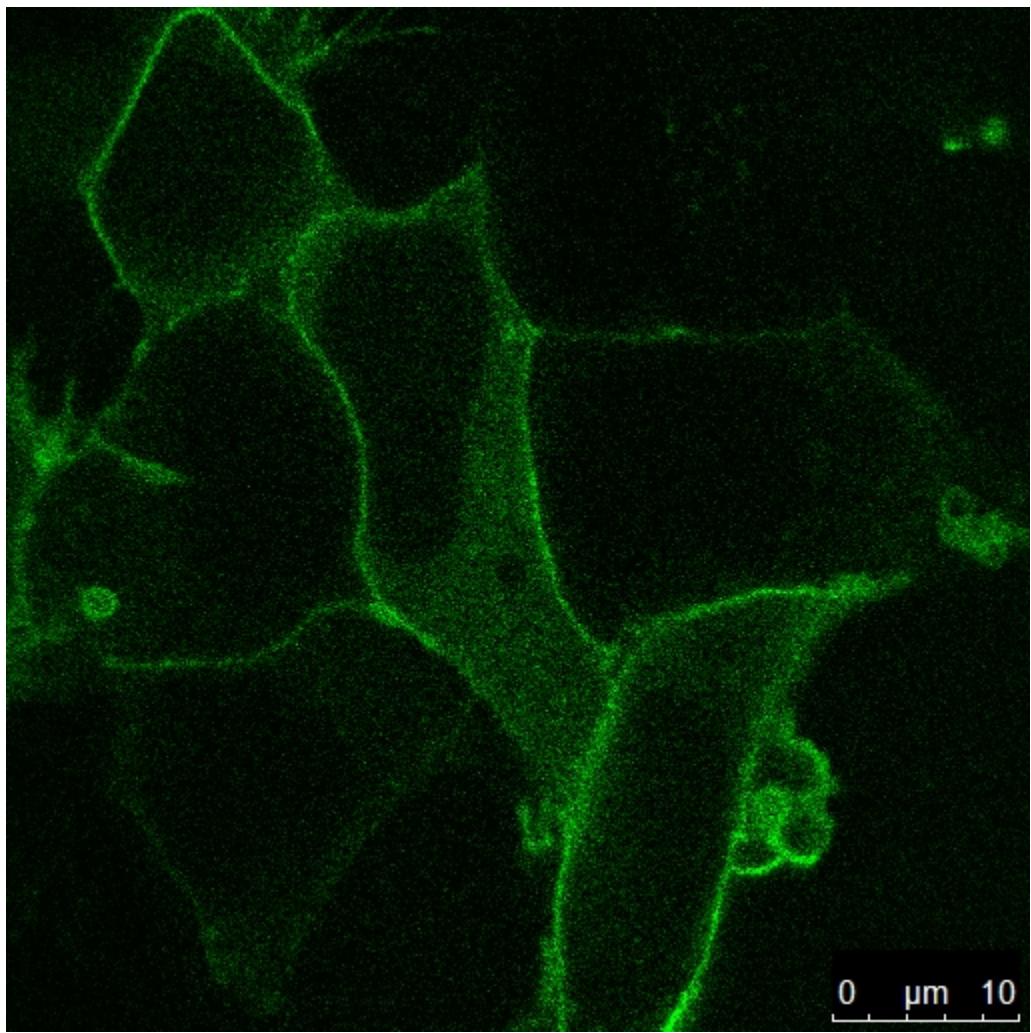


i solidarnie

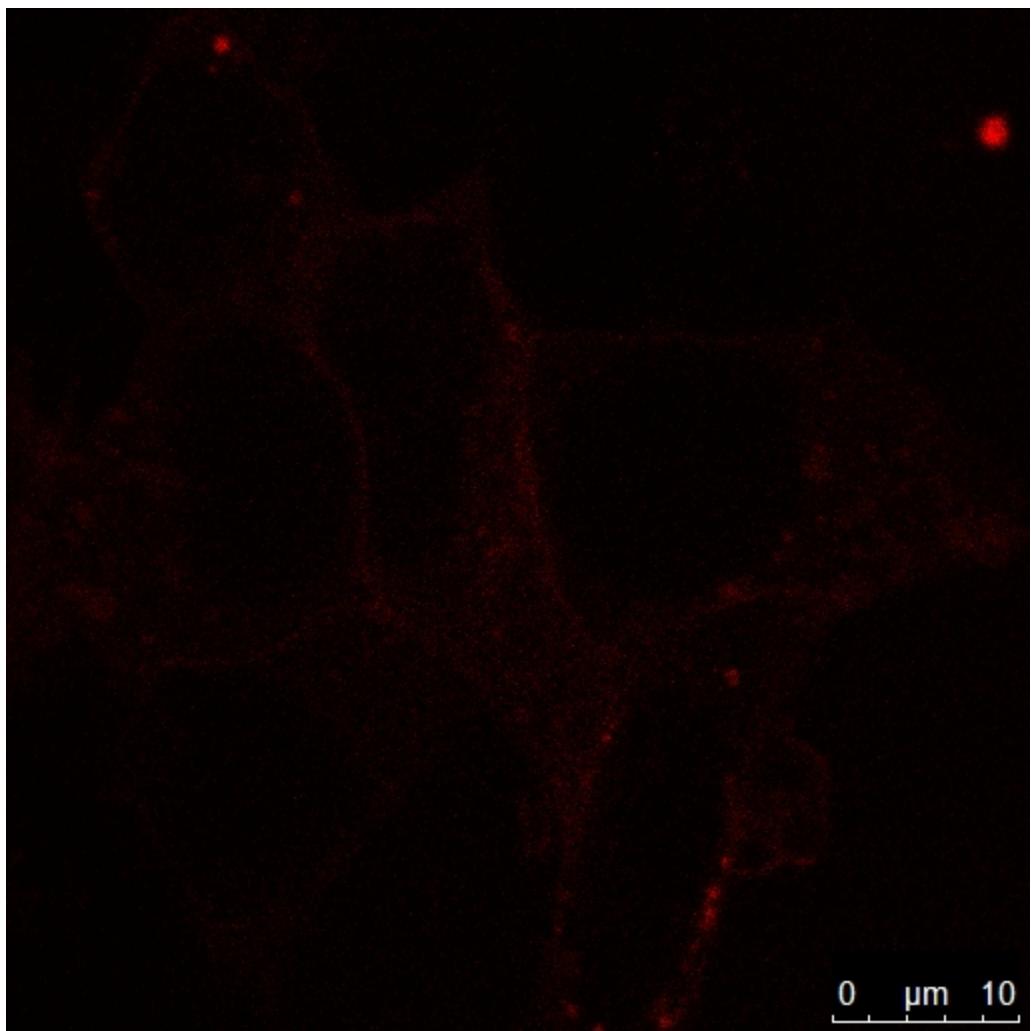




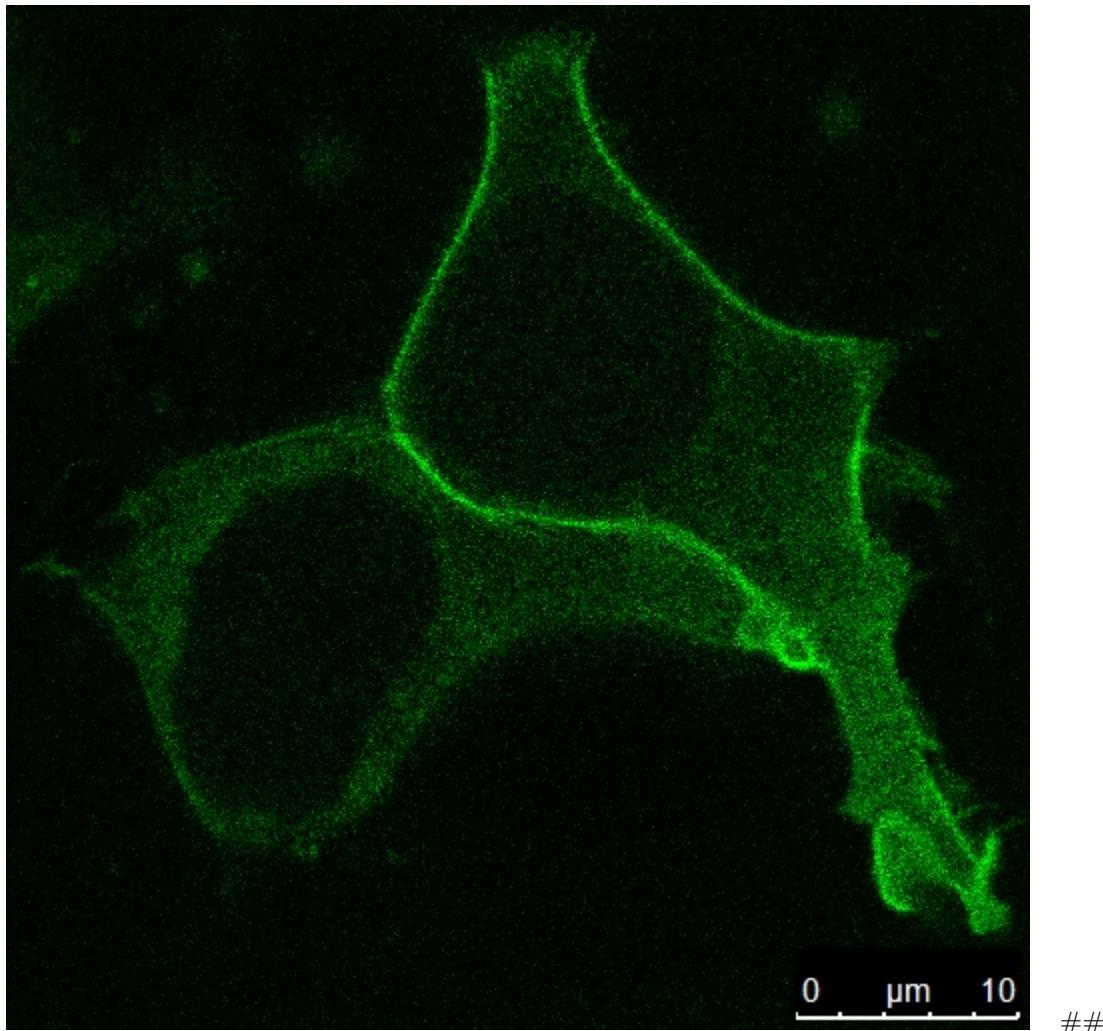
i wciąż



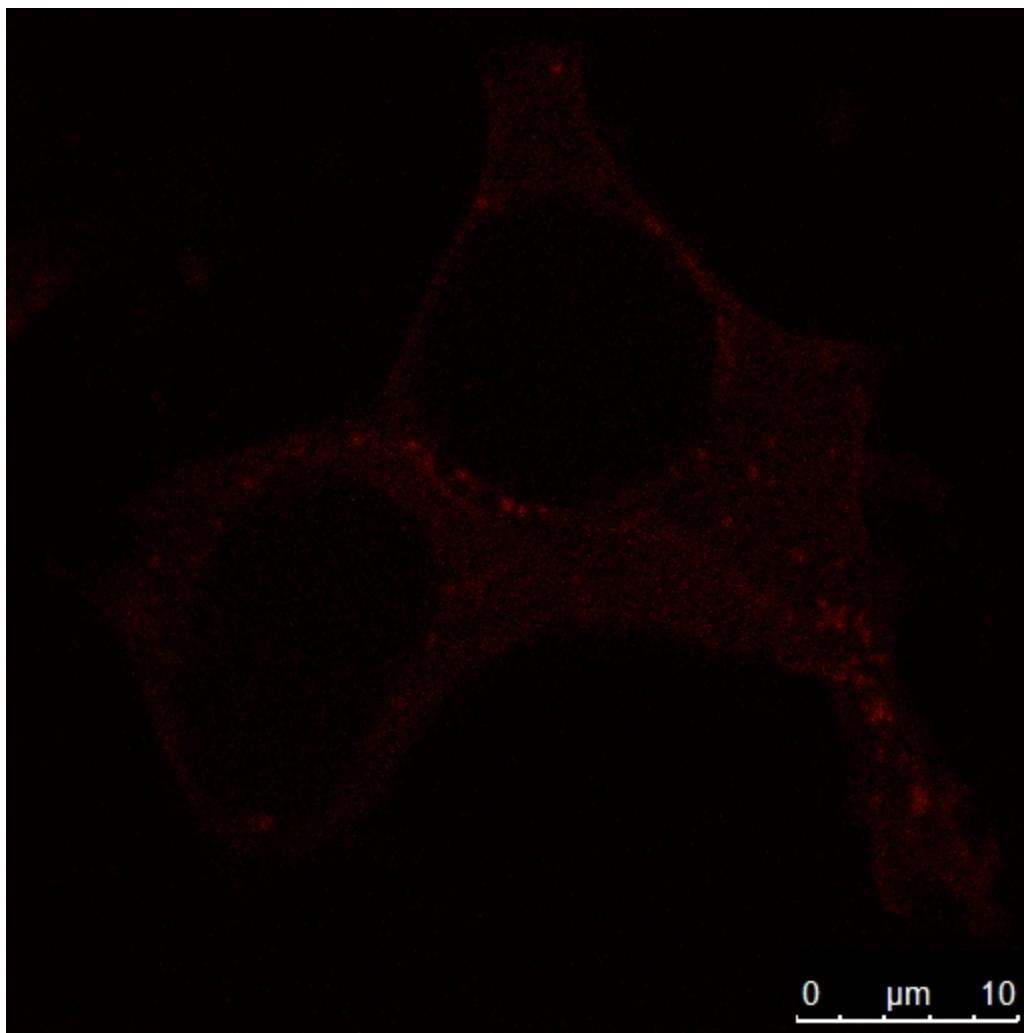
####mCherry



nie świeciło należycie

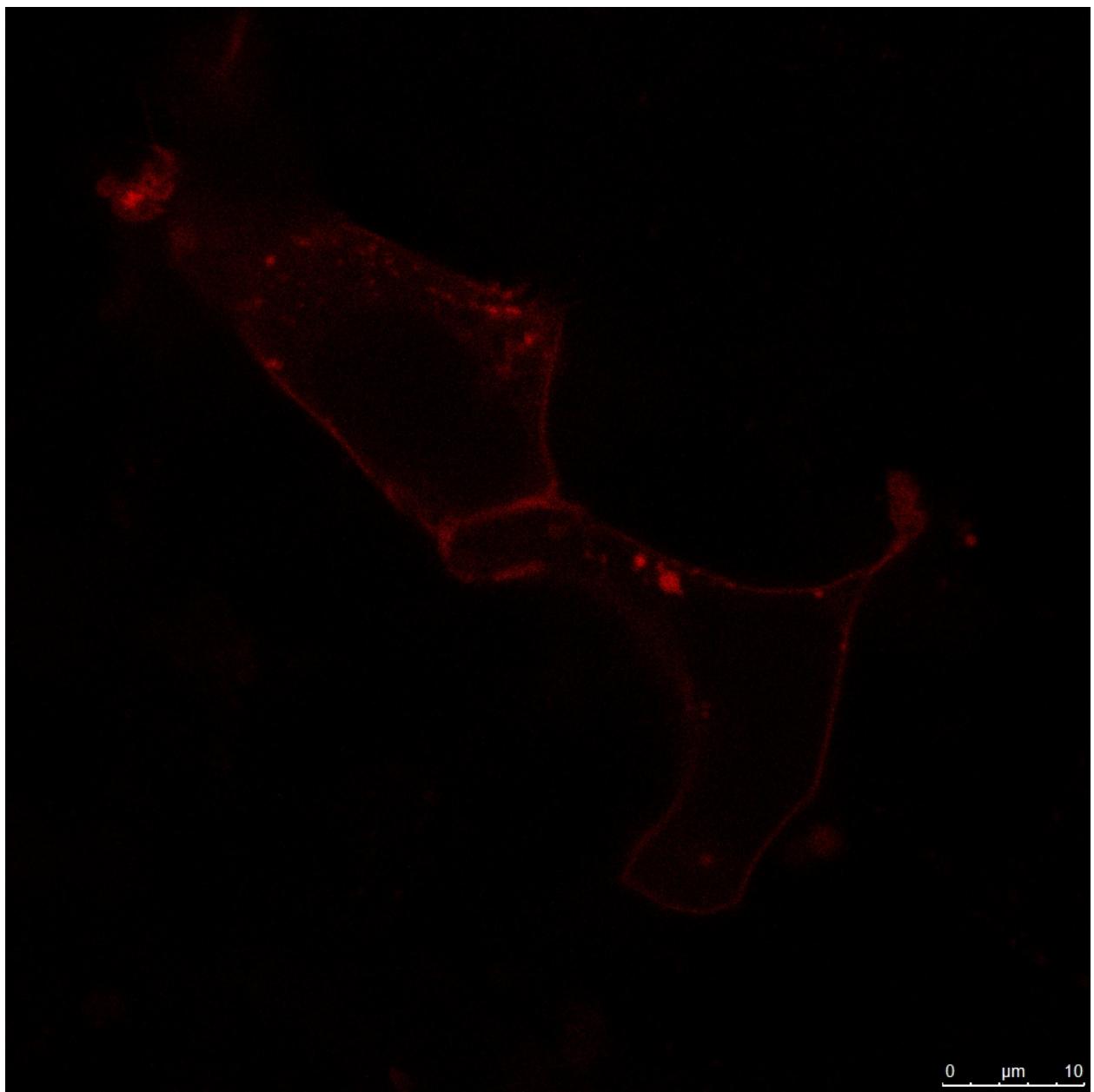


####mCherry



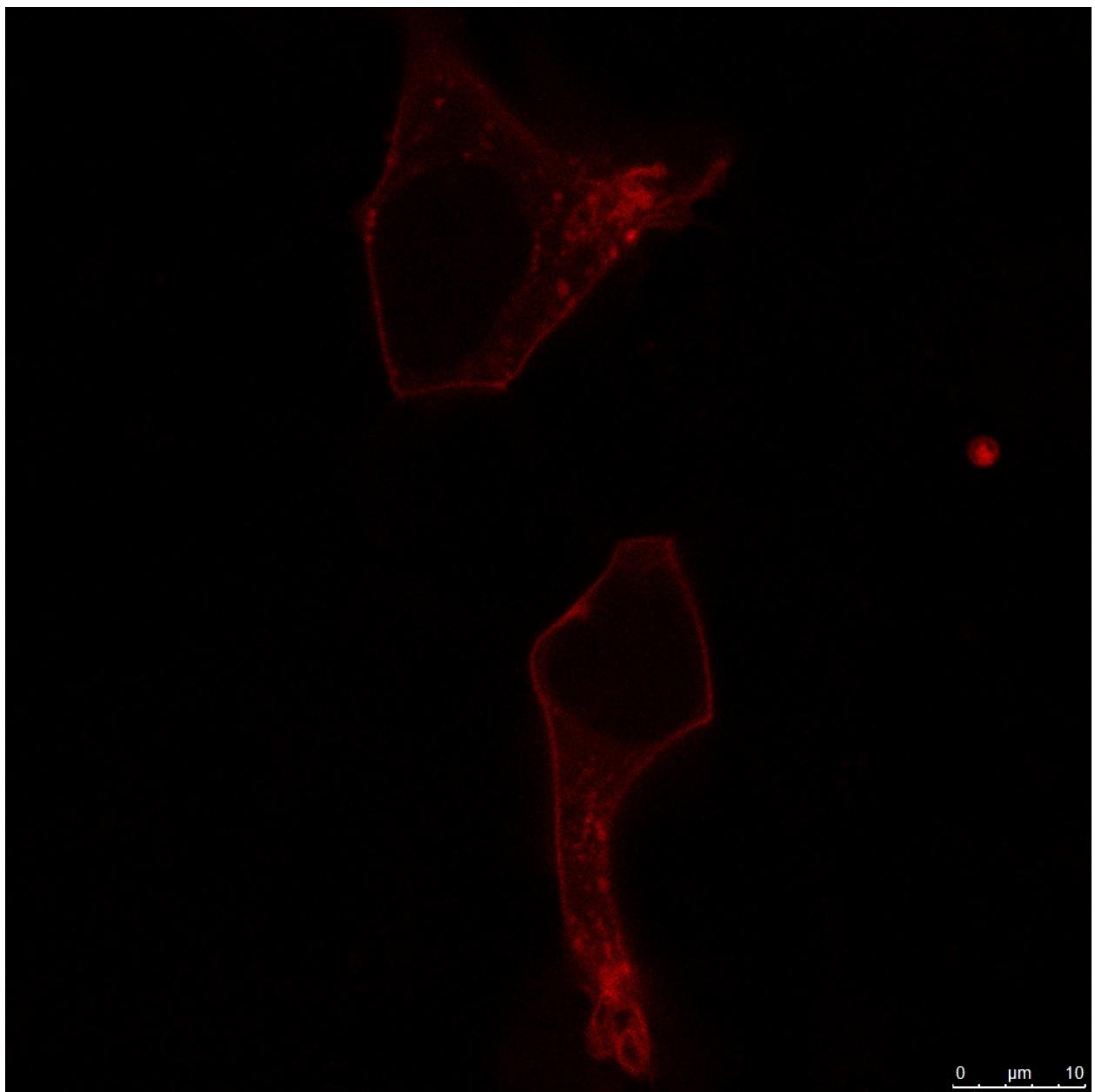
Z kolei beta-1 niosła nadzieję



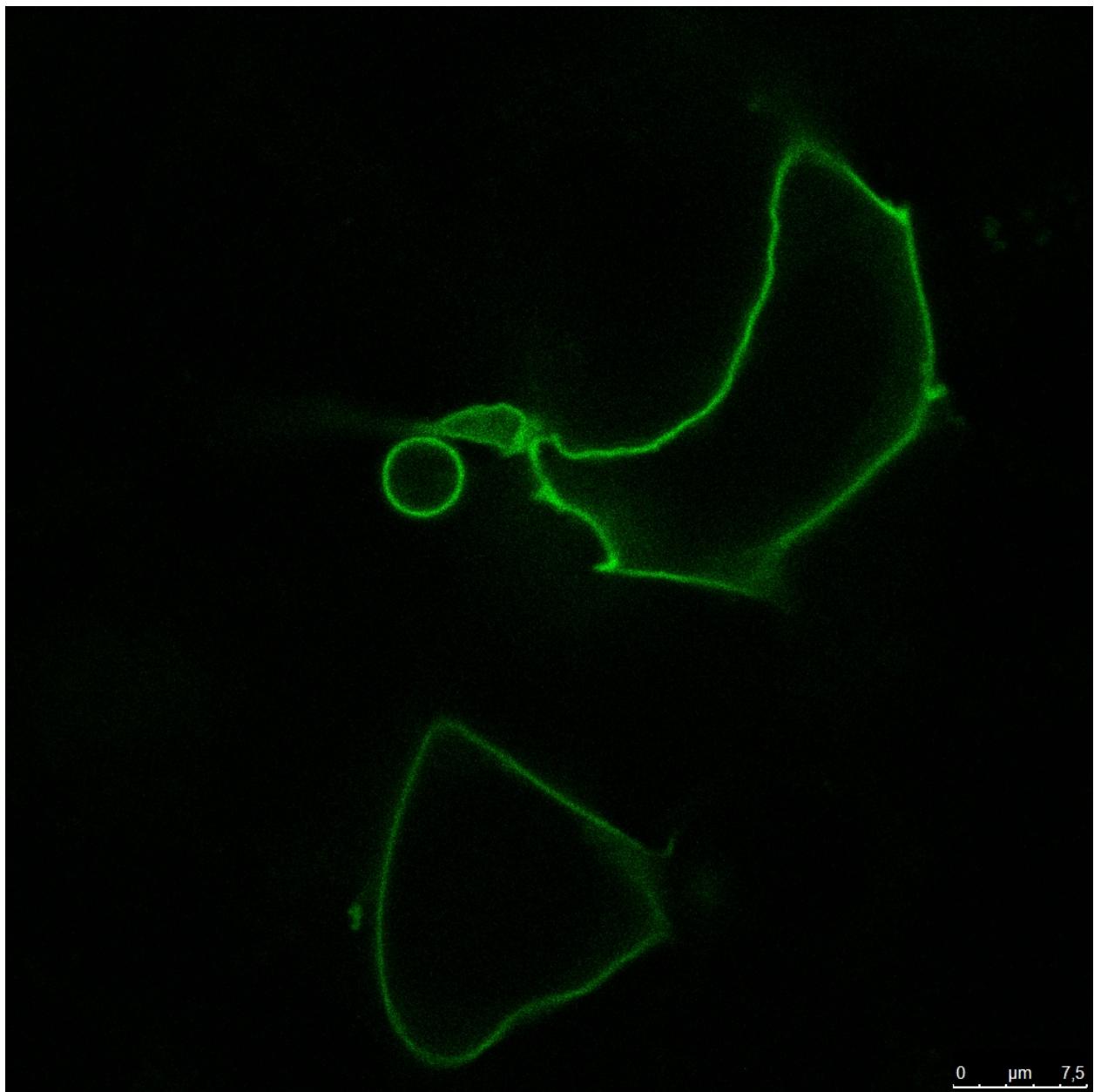


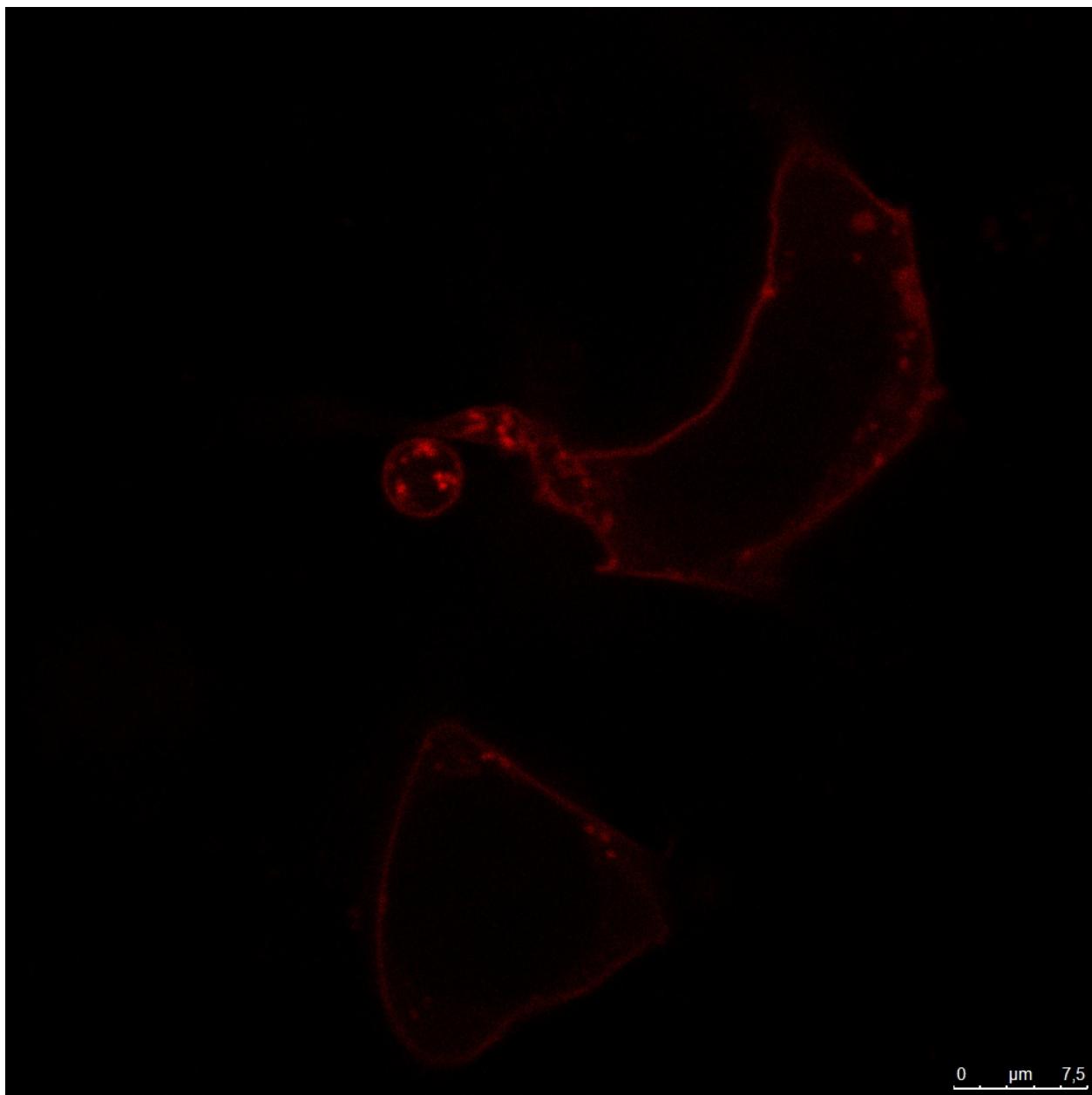
i niosla





ku pokrzepieniu





### Porównanie wyników (z akceptorem: beta-1-mCherry)

Dane dla pomiarów z beta-1-mCherry i gamma2:

```
##      amp_1          lft_1          amp_2          lft_2
##  Min.   : 887.3   Min.   :1.645   Min.   :1736   Min.   :0.710
##  1st Qu.:2568.2   1st Qu.:2.048   1st Qu.:5856   1st Qu.:2.307
##  Median :6135.4   Median :2.540   Median :11468   Median :3.048
##  Mean   :7535.9   Mean   :2.705   Mean   :10374   Mean   :2.763
##  3rd Qu.:11775.0  3rd Qu.:3.219   3rd Qu.:13786  3rd Qu.:3.175
##  Max.   :18814.9  Max.   :5.571   Max.   :23198   Max.   :4.259
##      tau_amp
##  Min.   :2.630
```

```

## 1st Qu.:2.870
## Median :2.890
## Mean   :2.887
## 3rd Qu.:2.915
## Max.   :3.030

```

### **Usunięcie danych odstających:**

```
## The outliers for 99 % confidence interval are:  
## 3.03 2.63  
## - - - - -  
  
##  
## The mean and median with outliers are respectively: 2.89 ; 2.89  
## The mean and median without outliers are respectively: 2.89 ; 2.89
```

Test t Welcha na statystycznie istotną różnicę między średnimi czasami życia:

```

## Welch Two Sample t-test
##
## data: donor$tau_amp and FLIM$tau_amp
## t = 23.26, df = 58.544, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## 0.1354953 0.1610069
## sample estimates:
## mean of x mean of y
## 3.038857 2.890606

##                               amp_1     lft_1     amp_2     lft_2 tau_amp
## donorout        10087.507 2.074023 54526.34 3.252000 3.038857
## akceptorbeta1out 7457.869 2.713727 10509.95 2.810727 2.890606

```

Transfer energii: 4.88%

Ale patrząc na poszczególne czasy życia, należy się zastanowić nad modyfikacją dopasowania.