

## List of synthetic genes and plasmids involved in the study:

### 1. *bkt3* gene (GenBank: AY603347) from *Haematococcus pluvialis*;

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#### Primers

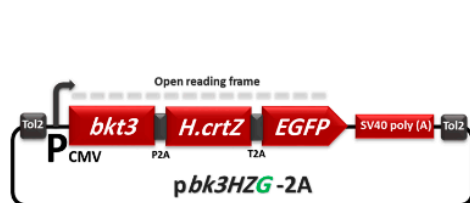
#### Forward

CCATCGATATGCACGTGGCTAGCGCTCT

#### Reverse

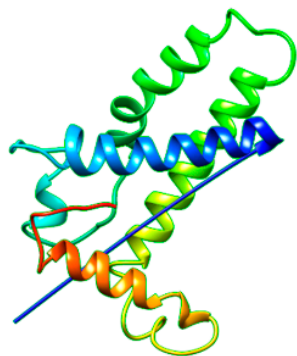
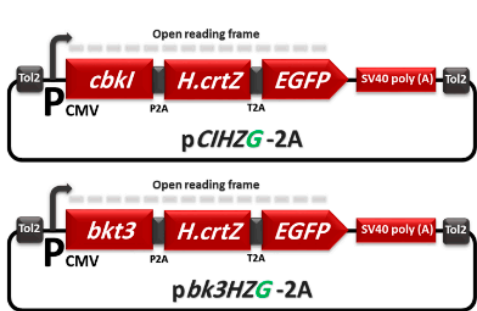
CCCAAGCTTAGCCAGAGCAGGCACCAGT

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2. *H-crtZ* gene (GenBank: AY187011) from *Haematococcus pluvialis*

Primers	
Forward	CCCAAGCTTGGATCCGGAGCCACGAACTTCTCTCTGTTAAAGCAAGCAGGAG
Reverse	ACGTGGAAGAAAACCCCGGTCCTCTCAGCAAGCTGCAGAGCAT
	CGGAATTCTCTTTTGCTCCAGTCCAGTT



### 3. *CBK1* gene (RefSeq: XM\_001698647) from *Chlamydomonas reinhardtii*

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#### Primers

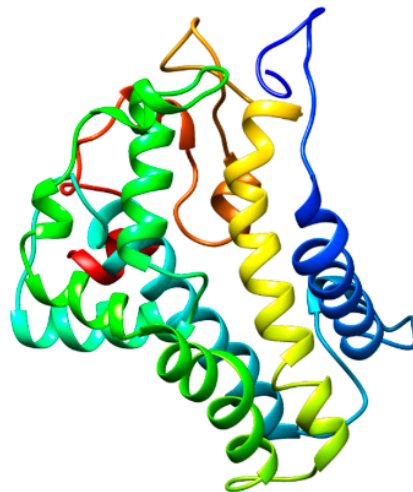
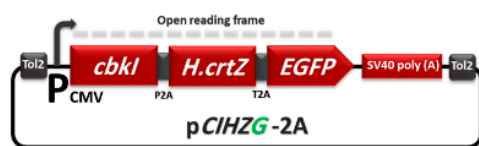
##### Forward

CCATCGATATGGGACCTGGAATCCAGCCGA

##### Reverse

CCCAAGCTTAGCCATAACCCCCACAGGA

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#### 4. *DGTT1* gene (GenBank: MN561785.1) from *Haematococcus lacustris*

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##### Primers

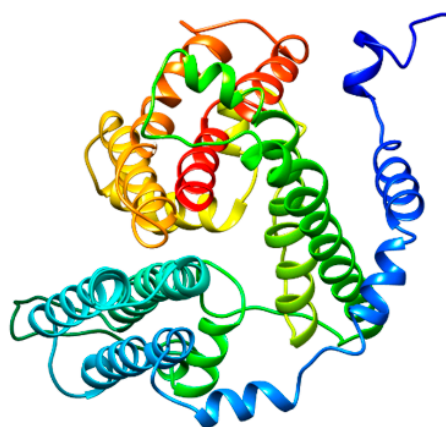
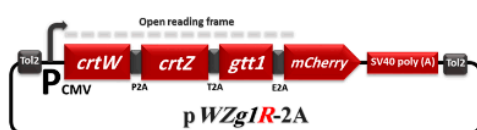
##### Forward

GGACTAGTGGATCCGGAGAGGGCAGGGGAAGTCTTCTAACATGCGGGGACGTGGA  
GGAAAATCCCGGCCCCAGAATCATGCCCTGGCCTTT

##### Reverse

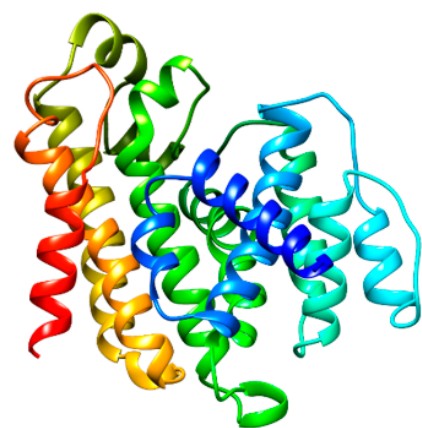
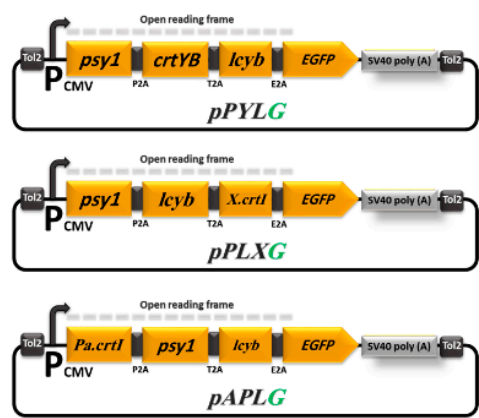
CCGCTCGAGGATCACGATTCCAGAGCTTGT

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5. *psy1* gene (GenBank: FJ971252.1) from *Zea mays subsp*

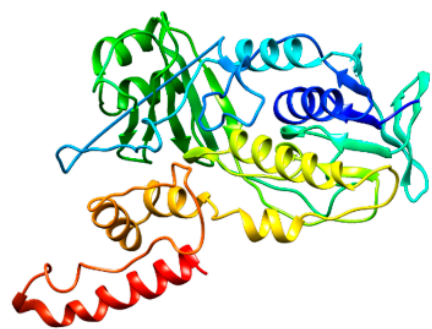
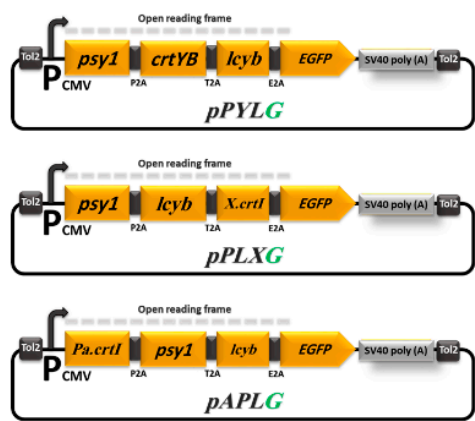
Primers	
Forward	CCATCGATatggcaatcatcctggtgaga
Reverse	CCCAAGCTTTGTCTGTCCGTTTCTCAGGCT
Primers	
	CCCAAGCTTGGATCCGGAGCCACGAACTTCTCTCTGTTAAAGCAAGCAGGAGACGTG
	GAAGAAAACCCCGGTCCTATGGCAATCATCCTGGTGAGA
Forward	CGGAATTCTCATGTCTGTCCGTTTCTCAG



6. *lcyb* gene (GenBank: KX424526.1) from *Haematococcus lacustris*

Primers	
Forward	CGGAATTCGAGGGCAGGGGAAGTCTTCTAACATGCGGGGACGTGGAGGAAAATCCC GGCCCCATGCTGAGCCCTCTGCAGAGACT
Reverse	CGGGATCCTCACTTGATCATAGCGGGTGGG

Forward	CCCAAGCTTGGATCCGGAGCCACGAATTCTCTCTGTTAAAGCAAGCAGGAGACGTG GAAGAAAACCCCGTCCTATGCTGAGCCCTCTGCAGAGA
Reverse	CGGAATTCTCACTTGATCATAGCGGGTGG



## 7. *Pa-crtI* gene (GenBank: D90087.2) from *Pantoea ananatis*

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### Primers

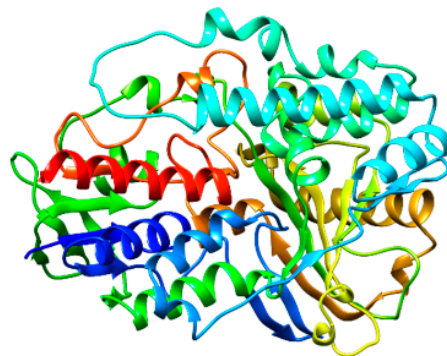
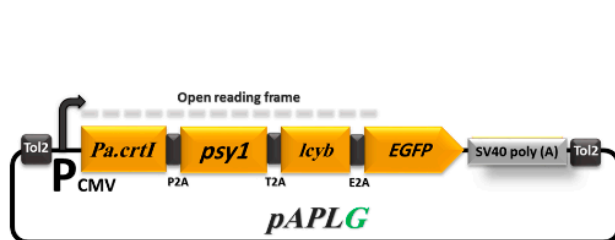
#### Forward

ccatcgatatgaagcccacaaccgtgatc

#### Reverse

CCCAAGCTTTCAGATCAGGTCTTCCAGCAT

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8. *Xd-crtI* gene (GenBank: KR779666.1) from *Xanthophyllomyces dendrorhous*,

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Primers

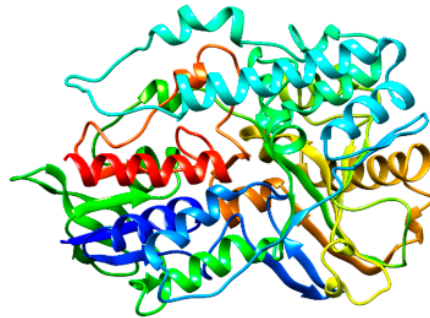
Forward

CGGAATTCGAGGGCAGGGGAAGTCTTCTAACATGCGGGGACGTGGAGG  
AAAATCCCGGCCCATGGGAAAGGAGCAGGACCAGGA

Reverse

CGGGATCCTCAGAAAGCCAGCACTCCCAC

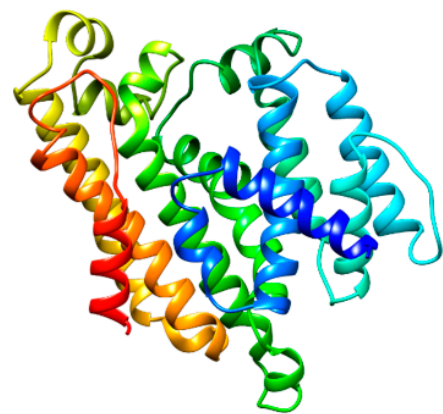
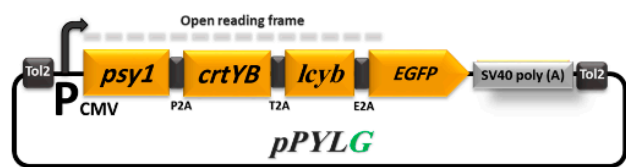
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9. crtYB gene (GenBank: AY177204.1) from Xanthophyllomyces dendrorhous

Primers	
Forward	CCCAAGCTTggatccggagccacgaacttctctctgttaaagcaagcaggagacgtggaagaaaacccggt cctacagccctggcctactacca
Reverse	CGGAATTCCTGTCCCTCCCATCCACTCA



## 10. Self-cleaving 2A peptides coding sequence:

- **P2A peptides**

GGATCCGGAGCCACGAACTTCTCTCTGTAAAGCAAGCAGGAGACGTGGAAGAAAACC  
CCGGT **CCT**

GSGATNFSLLKQAGDVEENPG **P**

- **T2A peptides**

GGATCCGGAGAGGGCAGGGGAAGTCTTCTAACATGCGGGGACGTGGAGGAAAATCCCG  
GC **CCC**

GSGEGRGSLLTCGDVEENPG **P**

- **E2A peptides**

GGATCCGGACAGTGTACTAATTATGCTCTCTTGAAATTGGCTGGAGATGTTGAGAGCAAC  
CCAGGT **CCC**

GSGQCTNYALLKLAGDVESNPG **P**