

# In Silico PCR

## In Silico PCR Overview

In silico PCR is used to calculate theoretical polymerase chain reaction (PCR) results using a given set of primers (probes) to amplify DNA sequences.

UGENE provides the In silico PCR feature only for nucleic sequences. To use it in UGENE open a DNA sequence and go to the *In silico PCR* tab of the Options Panel:

The screenshot shows the 'In Silico PCR' panel in UGENE. It is divided into three main sections: Forward primer, Reverse primer, and Settings. The Forward primer section shows the sequence 'ACGTACGTACGTACGTACGT' with a Tm of 57.38°C, 24-mer, and 0 mismatches. The Reverse primer section shows the sequence 'AAAAACGTACGTACGT' with a Tm of 38.25°C, 16-mer, and 0 mismatches. The Settings section includes a '3' perfect match' field set to 15 bp and a 'Maximum product' field set to 5000 bp. A warning message is displayed: 'Warning: Self-dimer can be formed: Delta G: -42.2 kcal/mole Base Pairs: 24'. A 'Find product(s) anyway' button is at the bottom. On the right side of the panel, there is a vertical toolbar with icons for sequence analysis, including a color wheel, a bar chart, and a DNA double helix.

There are the following parameters:

*Forward primer* - forward primer.

*Reverse primer* - on the opposite strand from the forward primer.

*Mismatches* - mismatches limit.

*3' perfect match* - specify the number of nucleotides at the 3' end that must not have mismatches.

*Maximum product* - maximum size of the amplified sequence.

## Choosing primers

Type two primers for running In Silico PCR. If the primers pair is invalid for running the PCR process then the warning is shown. Also, primers for the running In silico PCR can be chosen from a [primer library](#). Click the following button to choose a primer from the primers library:

▼ Forward primer

ACACACGTACTGACAGTCAGCATACG

Tm = 61.39°C, 28-mer

Mismatches 7 bp

The following dialog will appear:

**Choose Primer**

Name	GC-content (%)	Tm (°C)	Length (bp)	Sequence
Primer	22.22	22	9	AAAAAACGT

Choose Cancel Help

The table consists of the following columns: name, GC-content (%), Tm, Length (bp) and sequence. Select primer in the table and click the *Choose* button.

Click the *Reverse-complement* button for making a primer sequence reverse-complement:

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▼ Forward primer

ACACACGTACTGACAGTCAGCATACG

Tm = 61.39°C, 28-mer

Click *Show primers details* for seeing [statistic details](#) about primers.

When you run the process, the predicted PCR products appear in the products table.

## Products table



There are three columns in the table:

- region of product in the sequence
- product length
- preferred annealing temperature

Click the product for navigating to its region in the sequence.

Click the *Extract product(s)* button for exporting a product(s) in a file or use double click for that.

Region	Length	Ta
60822 - 63999	3178	58.56



Extract product(s)

- [Primers Details](#)
- [Primer Library](#)