

# Difference Between Plasmolysis and Deplasmolysis

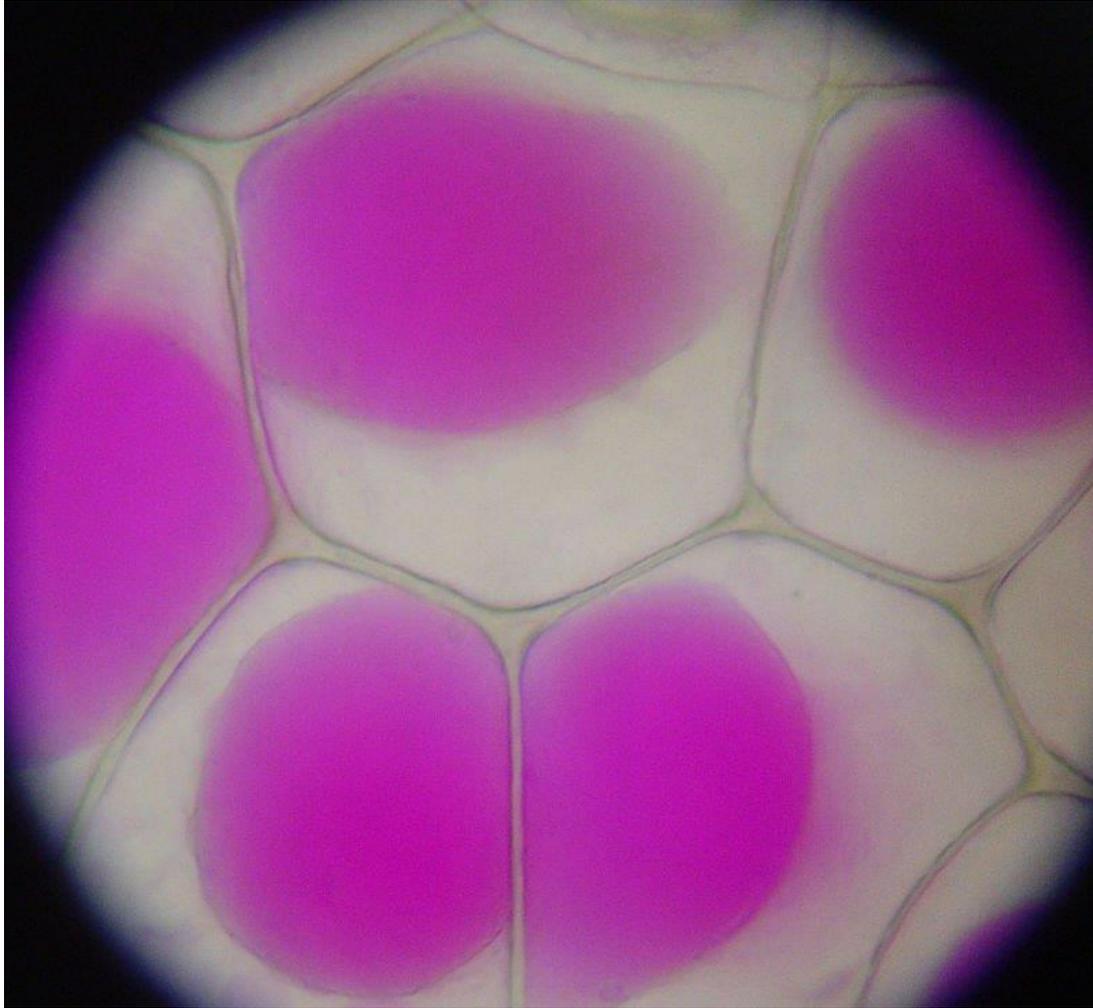
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## Key Difference - Plasmolysis vs Deplasmolysis

Water molecules move across the cell membrane according to the difference of water potential in and out of the cell. When the outside solution has a low water potential, until water potential becomes equal, the cell loses water molecules to the outside solution. When the water potential of the cell interior is low compared to the outside solution, water molecules enter the cell. Plasmolysis was the process of [protoplasm](#) shrinkage and detachment with the [cell wall](#) due to the loss of water when it placed in a solution with low water potential ([hypertonic solution](#)). Deplasmolysis is the reverse of plasmolysis. Deplasmolysis occurs when a plasmolyzed cell is placed in a solution having a high water potential (hypotonic solution). The **key difference** between the plasmolysis and deplasmolysis is that, **during the plasmolysis, water molecules go out of the cell and cell protoplasm shrinks while during the deplasmolysis, water molecules enter the cell and cell protoplasm swells.**

## What is Plasmolysis?

Plasmolysis is the process occurs due to [exosmosis](#). When a plant cell is placed in a solution, which has low water potential, water molecules come out the cell until water potentials of the cell and the solution become equal. Due to the water loss, protoplasm of the cell shrinks and detaches from the cell wall. However, due to the rigid cell wall of the plant cell, cells resist the breakage. Water molecules come out from the cell by exosmosis during the plasmolysis. Plasmolysis causes the plant to wilt. When the plants are watered again, plasmolysis can be reversed. Water will absorb the plant cells by the [endosmosis](#) and plants return to the normal turgid state.



**Figure 01: Plasmolysis**

There are several internal and external factors affecting the plasmolysis process and the plasmolysis time. They are cell wall attachment, protoplasmic viscosity, cell species, cell wall pore size etc. The age of the plant, cell type and the development stage of the plant also affects the plasmolysis and the time.

## **What is Deplasmolysis?**

Deplasmolysis is the reverse process of plasmolysis. When a plasmolyzed plant cell is placed in a solution having a high water potential, water molecules enter the plant cell across the [cell membrane](#). Hence, the volume of the protoplasm increases and the cell return to the normal position gradually.



**Figure 02: Deplasmolysis**

The water potential of the cell restores due to plasmolysis. Deplasmolysis is a result of water entering the cell by endosmosis.

**What are the Similarities Between Plasmolysis and Deplasmolysis?**

- Plasmolysis and deplasmolysis are two processes occur in plant cells.
- Both plasmolysis and deplasmolysis processes occur due to water molecule movement across the cell.
- Both plasmolysis and deplasmolysis processes can be reversed.
- Both plasmolysis and deplasmolysis processes occur due to the difference in water potential.
- Both plasmolysis and deplasmolysis occur due to [osmosis](#).

## What is the Difference Between Plasmolysis and Deplasmolysis?

Plasmolysis vs Deplasmolysis	
Plasmolysis is the process of contracting the cell protoplasm due to the loss of water when placed in a hypertonic solution.	Deplasmolysis is the reverse of plasmolysis in which cell swells due to the absorption of water when placed in a hypotonic solution.
Cause	
Plasmolysis occurs due to exosmosis.	Deplasmolysis occurs due to endosmosis.
Protoplasm	
Protoplasm shrinks during the Plasmolysis.	Protoplasm swells during the Deplasmolysis.
Type of Solution	
Plasmolysis occurs when the plant cell is placed in a hypertonic solution.	Deplasmolysis occurs when a plant cell is placed in a hypotonic solution.
Water Movement	
Water molecules lose from the cell to the outside during the plasmolysis.	Water molecules enter the cell during the deplasmolysis.
Water Potential	
The cell has a higher water potential	The cell has a lower water potential than

than the outside solution during the plasmolysis.	the outside solution during the deplasmolysis.
<b>Osmotic Pressure of the Cell</b>	
Osmotic pressure is low in the cell due to plasmolysis.	Osmotic pressure is high in the cell due to deplasmolysis.
<b>Final Outcome</b>	
Plasmolysis causes plants to wilt.	Deplasmolysis causes restore the turgidity of the plants.

## Summary - Plasmolysis vs Deplasmolysis

Plasmolysis and deplasmolysis are two processes important for the water balance of the plants. Plants wilt or shrink when there is insufficient water surrounding the soil area. This process is known as plasmolysis. When we water them, plants absorb water and regain the turgidity by the process of reverse plasmolysis or deplasmolysis. Plasmolysis occurs by the exosmosis. Water leaves the cell hence, protoplasm shrinks. Deplasmolysis occurs by the endosmosis. Water enters the cell hence, cell protoplasm swells. This is the difference between plasmolysis and deplasmolysis.

### Reference:

1. “[17] Plasmolysis and deplasmolysis.” ScienceDirect, Academic Press, 29 Nov. 2003. [Available here](#)

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