

# Compound light microscope parts and functions



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## 1. 1 Introduction:-

The compound light microscope is used for anatomy and physiological uses. (Robert et al. 2007). The people observe an enlarged image of a small object by using spherical shaped glass like thing in 2000 years ago (Chen, Zheng and Liu, 2011). The scientist named Janssen and his son made an assembled cylinder by using more lenses into a cylinder in 16<sup>th</sup> century (Chen, Zheng and Liu, 2011). The assembled cylinder is the first microscope and the telescope (Chen, Zheng and Liu, 2011). The British scientist Robert Hooke observed a soft-wood specimen through a microscope and named it as cell in 1665 (Chen, Zheng and Liu, 2011). Therefore, the magnification power and the image quality of the compound light microscope got improved (Chen, Zheng and Liu, 2011). The scientist called Antony van Leeuwenhoek designed a new microscope having high magnification power and from that can observe detailed cell (Chen, Zheng and Liu, 2011). The compound light microscope contains eye piece and the objective lenses to magnify the objectives (Amitrano and Tortora, 2007). The objects which are smaller than 0.3 micrometer cannot be observed from compound light microscope, the reason for that is the microscope using long wavelength visible light (Amitrano and Tortora, 2007). The Eukaryotic and prokaryotic cells can be visualized by the compound light microscope (Alerts, 1999). The proper way of carrying a microscope is to place one hand around the arm and other hand should be in the base (Amitrano and Tortora, 2007).

The electron microscope was observed in 1933 (Toole and Toole, 1977). Comparing to electron and compound light microscope the electron microscope uses electrons and the light microscope uses visible light

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(Toole and Toole, 1977). The electron microscope having greater power than compound light microscope (Alerts, 1999). The transmission electron microscope and the scanning electron microscope are the two kinds of electron microscopes (Toole and Toole, 1977). The modern electron microscope can increase its magnification power up to 300 million times than the normal compound light microscope (Chen, Zheng and Liu, 2011). The optical microscopes are mostly used for pathology related clinical laboratories to diagnose some diseases such as based on fluid of the body changed and variation of atomic structures (Chen, Zheng and Liu, 2011). The transmission electron microscope is used for visualise the slices of the cell (Chen, zheng and Liu, 2011). The scanning electron microscope is used for visualize the surface of the specimen (Chen, Zheng and Liu, 2011). The compound light microscope contains 4X, 10X, 40X and 100X objective lenses attach to nosepiece (Engelkirk and Engelkirk, 2008). To observe a clear image of a specimen the light must be properly adjusted to the specimen (Engelkirk and Engelkirl, 2008).

### Oculars (eyepiece)

The eyepiece of a compound light microscope should be monocular or binocular (Colville and Bassert, 2009). The magnification of the eyepiece is 10X (Colville and Bassert, 2009).

### Objective lenses

The objective lenses in a compound light microscope is attached to the nosepiece (Coville and Bassert, 2009). The 4X lens is known as the scanning lens and the lens used for the first viewing a specimen (Coville and Bassert, <https://assignbuster.com/compound-light-microscope-parts-and-functions/>

2009). The 10X magnification lens is the lowest power objective lens is used for the coarse focusing of a large specimen (Coville and Bassert, 2009). The 40X lens is the high power objective lens of the compound light microscope is used for magnify the small specimen (Coville and Bassert, 2009). The 100X is the highest power lens is also known as oil immersion lens is used for see the detailed specimen (Coville and Bassert, 2009).

### Condenser

The condenser is located near to the light source (Coville and Bassert, 2009). The condenser focuses the light into the slide (Coville and Bassert, 2009).

### Stage and stage clips

The stage is the place where the slides or the specimen is placed (Coville and Bassert, 2009).

The stage contains a hole where the light from the condenser passes to the slide (Coville and Bassert, 2009). The knobs are located below the mechanical stage to move slide or a specimen which is kept in the mechanical stage (Coville and bassert, 2009). The stage clips are used for to tight the slide or specimen o mechanical stage (Coville and Bassert, 2009).

### Arm and base

The base, mechanical stage, and the body tube are connects to the arm of the microscope (Coville and Bassert, 2009). The illuminator takes place in the base of the compound light microscope (coville and Bassert, 2009).

Always the microscope has to carry from the arm and the base (Coville and Bassert, 2009).

### Light source

The light source connect to the base of the microscope (Coville and bassert, 2009). To regulate the intensity of the microscope have to use the controllers (Coville and Bassert, 2009).

### Coarse and fine adjustment

The microscope contains the knobs to change the distance between the stage and the objectivs (Coville and Bassert, 2009). The coarse adjustment is use for the low power and can move the stage quickly (Coville and Bassert, 2009). The fine adjustment is use for the high dry magnification and oil immersion cannot move stage quickly (Coville and Bassert, 2009).

#### 1. Objectives:-

- To know about the parts and their functions of Compound light microscope.
- To observe the pre prepared slides of Ovary and Tongue looking through eye piece.

#### 1. 3 Materials:-

- Compound light microscope
- Pre prepared slide of Ovary
- Pre prepared slide of Tongue

#### 4. Methodology:-

The Microscope was switched on. The condenser was in the lowest position. Stage was in the lowest position. Light intensity was in the lowest position. The slide was kept in the stage. The slide was tightened by the stage clips. The 4X magnification lens was selected. The slide was adjusted to a correct position by using the stage controller. The stage was moved upwards by looking through a side by using the coarse adjustment of the microscopy. While looking through the eye piece the stage was moved downwards. The image of the Ovary was focused. The focused image was drawn in the book. The highest dry magnification 40X was selected. The condenser was moved into their highest position. Light intensity was moved into their highest position. While looking through the eye piece the image was focused by using fine adjustment. The image was drawn in the book. Before the next slide the stage was moved into its lowest position. the light intensity was moved into its lowest position. The condenser was moved into its lowest position. The slide of tongue was taken. The slide was kept in the stage and tightened by using stage clips. The same procedure was followed for the second slide. The image was focused successfully. The image was drawn in the book. The stage was moved into its lowest position. The condenser was moved into lowest position. The light intensity was moved into its lowest position. The lowest dry magnification was selected. The microscopy was switched off.

#### 1. 6 Conclusion:-

The parts of the compound light microscope and their functions were known successfully. The image of Ovary and Tongue was observed under the lowest dry magnification ( 4X ) and the highest dry magnification ( 40X )

successfully. From these the basic method of a compound light microscope was understood successfully.

#### 7. Discussion:-

All images of the slides observed without any errors. In Objective lenses when the changing of low dry magnification to high dry magnification occur there will be a 'krick' sound will happen when the fixation is happened. In low dry magnification the light intensity should be low and when it changing into high dry magnification the light intensity should be high.

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