**Dr. Rima Kumari: Date: 14/09/2020**

Online class and e- content for MSc IIIrd semester students

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| Date and Time | Online class medium  | E. content topic |
| 14/09/202002:00 p.m to 2.40 p.m | Via Google meetLink: Meeting URL: https://meet.google.com/wrr-ahxj-fkc | **Chloroplast** |

**Chloroplast:**

Like mitochondria, chloroplasts are also distinctive organelles of eucaryotic cell. But they are found only in plant cells. Chloroplasts contain membranes forming a system of thin lamellae stacked on top of each other. These membranes contain the pigment chlorophyll whose function is to trap light energy required to make organic molecules particularly sugars. This process is called photosynthesis. It is worth mentioning that chloroplasts resemble the present day cyanobacteria in size and structural organisation of chlorophyll bearing membranes. Chloroplasts also contain DNA and reproduce by self-replication.

Plastids are the organelles found in plant cells only. Like mitochondria they are bounded by two membranes. Plastids self-replicate as they contain their own genetic material, i.e. DNA. RNA and ribosomes. There are many types of plastids such as chloroplasts, chromoplasts and leucoplasts depending on the colour pigment they contain. Chloroplasts that are mainly found in the cells of leaves of green plants and the most common ones are biologically important plastids. Chloroplasts are limited by a smooth outer membrane which regulates the transport of materials between the cytoplasm and the interior of the organelle. The inner membrane runs parallel to the outer membrane and is provided with extensive folding. The inner membrane gives rise to a series of internal parallel membraneous sheets called lamellae. Lamellae are suspended in a fluid-like matrix called stroma. Stroma contains 50% of soluble protein, ribosomes, DNA and the machinery tor protein synthesis. Most of the lamellae in the chloroplast **f**orm sac like structures called thylakoids. Thyllakoids are flattened vesicles arranged as membranous vesicles within the stroma. Thylakoids ma) be stacked like a pile of coins forming the 'grana'. A typical chloroplast has between 30-60 grana and each granum have 2- 100 small flattened thyllakoids. Fifty per cent of the total chloroplast proteins and the various components involved in the main steps of photosynthesis are present in thylakoids.

The pigments, chlorophyll, carotenoids and plastiquinone are present in the thylakoid membranes involved in photosynthesis. Chlorophyll is the green coloured pigment present in chloroplasts. The function **of** chlorophyll is to trap the light energy required for the formation of two products: ATP and NADPH essentisl for the reactions involved in C0,- assimilation. Chromoplasts are the plastids that synthesise and store the coloured pigments like carotenoids. Carotenoids, which include carotene and xanthophyll, are responsible for the yellow. orange or red colouration in plants. They also act as the precursor of vitamin A in animal tissues. Leucoplasts are colourless plastids which act as storage organelles and are classified on the basis of the material stored, e.g. amyloplasts store carbohydrate in the form of starch.



